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HEALTH EQUITY REPORT

Volume 1

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Editor: Arlene S. Bierman, MD, MS, FRCPC



Project for an Ontario Women's Health Evidence-Based Report

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Improving Health and Promoting Equity in Ontario

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The POWER Study
Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital
30 Bond St. (193 Yonge St., 6th floor)
Toronto, ON, M5B 1W8
Tel: (416) 864-6060, Ext 3946
Fax: (416) 864-6057
POWERStudy@smh.ca
www.powerstudy.ca

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Arlene S. Bierman, MD, MS, FRCPC

CHAPTER 3

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Arlene S. Bierman, MD, MS, FRCPC

Farah Ahmad, MBBS, MPH, PhD

Jan Angus, RN, PhD

Richard H. Glazier, MD, MPH, FCFP

Mandana Vahabi, PhD, MHSc, RN

Cynthia Damba, MHSc

Janice Dusek, RN, MS, MBA

Susan K. Shiller, MSc

Yingzi Li, MSc,

Stephanie Ross, BSc

Gabriel Shapiro, MPH

Douglas Manuel, MD, MSc, FRCPC

CHAPTER 4

Cancer

Monika K. Krzyzanowska, MD, MPH, FRCPC

Lisa Barbera, MD, MPA, FRCPC

Laurie Elit, MD, MSc, FRCS (C)

Janice Kwon, MD, MPH, FRCS (C)

Aisha Lofters, MD, CCFP

Refik Saskin, MSc

Naira Yeritsyan, MD, MPH

Arlene S. Bierman, MD, MS, FRCPC

CHAPTER 5

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Elizabeth Lin, PhD

Natalia Diaz-Granados, MSc

Donna E. Stewart, MD, FRCPC

Anne E. Rhodes, PhD

Naira Yeritsyan, MD, MPH

Ashley Johns, MSc

Minh Le Duong-Hua, MSc

Arlene S. Bierman, MD, MS, FRCPC

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Arlene S. Bierman, MD, MS, FRCPC
R. Liisa Jaakkimainen, MD, MSc, CCFP
Heart Failure Lead
Beth L. Abramson, MD, MSc, FRCPC, FACC
Ischemic Heart Disease Lead
Moiria K. Kapral, MD, MSc, FRCPC
Stroke Lead
Nahid Azad, MD, FRCPC
Ruth Hall, PhD
Patrice Lindsay, RN, PhD
Gladys Honein, BScN, MPH
Naushaba Degani, PhD

CHAPTER 7

Access to Health Care Services

Arlene S. Bierman, MD, MS, FRCPC
Jan Angus, RN, PhD
Farah Ahmad, MBBS, MPH, PhD
Naushaba Degani, PhD
Mandana Vahabi, RN, MHSc, PhD
Richard H. Glazier MD, MPH, FCFP
Yingzi Li, MSc,
Stephanie Ross, BSc, MSc
Douglas Manuel, MD, MSc, FRCPC

Authors’ Affiliations

CHAPTER 1—INTRODUCTION
TO THE POWER STUDY

Susan Shiller, MSc
Former Project Director, The POWER Study,
St. Michael’s Hospital
Currently Director, Knowledge Transfer, Institute for
Clinical Evaluative Sciences

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Faculty of Medicine,
University of Toronto
Ontario Women’s Health Council, Chair
Senior Scientist, Keenan Research Centre, Li Ka Shing
Knowledge Institute, St. Michael’s Hospital

CHAPTER 2—THE POWER
STUDY FRAMEWORK

Jocalyn P. Clark, MSc, PhD
Former Director of Knowledge Translation,
The POWER Study, St. Michael’s Hospital
Senior Editor, PLoS Medicine, Public Library of Science
Assistant Professor, Department of Medicine,
University of Toronto

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Faculty of Medicine,
University of Toronto
Ontario Women’s Health Council, Chair
Senior Scientist, Centre for Research on Inner City
Health, St Michael’s Hospital

CHAPTER 3—BURDEN OF ILLNESS

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Faculty of Medicine,
University of Toronto
Ontario Women’s Health Council, Chair

Senior Scientist, Centre for Research on Inner City
Health, St Michael’s Hospital

Farah Ahmad, MBBS, MPH, PhD
Assistant Professor, Dalla Lana School of Public Health,
University of Toronto
Associate Scientist, Centre for Research on Inner City
Health, St. Michael’s Hospital

Jan Angus, RN, PhD
Associate Professor, Faculty of Nursing,
University of Toronto
Canadian Institute of Health Research New Investigator
Adjunct Scientist, Toronto Rehabilitation Institute

Richard H. Glazier, MD, MPH, FCFP
Senior Scientist, Institute for Clinical Evaluative Sciences
Research Scientist, Centre for Research on Inner City
Health in the Keenan Research Centre of the Li Ka Shing
Knowledge Institute at St. Michael’s Hospital
Associate Professor, Departments of Family &
Community Medicine and Public Health Sciences,
University of Toronto

Mandana Vahabi, PhD, MHSc, RN
Former Project Director, The POWER Study,
St. Michael’s Hospital
Associate Professor, Faculty of Community Services,
Daphne Cockwell School of Nursing, Ryerson University

Cynthia Damba, MHSc
Former Senior Research Associate, The POWER Study,
St. Michael’s Hospital
Senior Epidemiologist/Planner, Toronto Central Local
Health Integration Network

Janice Dusek, RN, BSN, MS, CHE
Assistant Professor, University of Toronto
Chief Nursing Officer and Vice President, Profession

Practice & Strategic Development, Whitby Mental Health Centre

Assistant Professor, University of Ontario Institute of Technology

Susan Shiller, MSc
Former Project Director, The POWER Study, St. Michael’s Hospital

Currently Director of Knowledge Transfer, Institute for Clinical Evaluative Sciences

Yingzi Li, MSc
Data Analyst, The POWER Study, St. Michael’s Hospital

Stephanie Ross, BSc
Former Research Assistant, The POWER Study, St. Michael’s Hospital

Masters Candidate, London School of Hygiene and Tropical Medicine

Gabriel Shapiro, MPH
Research Coordinator, The POWER Study, St. Michael’s Hospital

Douglas Manuel, MD, MSc, FRCPC
Senior Scientist, Ottawa Health Research Institute
Public Health Agency of Canada / Canadian Institutes for Health Research

Chair, Applied Public Health Sciences
Senior Medical Advisor, Statistics Canada
Senior Scientist, Institute for Clinical Evaluative Sciences

Associate Professor, Department of Family Medicine, University of Ottawa

CHAPTER 4—CANCER

Monika K. Krzyzanowska, MD, MPH, FRCPC
Assistant Professor, Department of Medicine, University of Toronto

Adjunct Scientist, Institute for Clinical Evaluative Sciences

Staff Medical Oncologist, Princess Margaret Hospital/University Health Network

Lisa Barbera, MD, MPA, FRCPC
Assistant Professor, Department of Radiation Oncology, University of Toronto

Scientist, Clinical Epidemiology, Sunnybrook Research Institute

Adjunct Scientist, Institute for Clinical Evaluative Sciences

Staff Radiation Oncologist, Odette Cancer Centre, Sunnybrook Health Sciences Centre

Laurie Elit, MD, MSc, FRCS (C)
Associate Professor, Department of Obstetrics and Gynecology, McMaster University

Gynecologic Oncologist, Juravinski Cancer Centre, Hamilton Health Sciences Centre

Janice S. Kwon, MD, MPH, FRCS (C)
Assistant Professor, Department of Gynecologic Oncology, MD Anderson Cancer Center, Houston, Texas

Assistant Professor, Division of Gynecologic Oncology, University of British Columbia and B.C. Cancer Agency

Aisha Lofters, MD, CCFP
Staff Physician, Department of Family/Community Medicine, St. Michael’s Hospital

Funded Research Scholar, Department of Family & Community Medicine, University of Toronto

Refik Saskin, MSc
Senior Analyst, Institute for Clinical Evaluative Sciences

Naira Yeritsyan, MD, MPH
Research Coordinator, Institute for Clinical Evaluative Sciences

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Faculty of Medicine, University of Toronto

Ontario Women’s Health Council, Chair

Senior Scientist, Centre for Research on Inner City Health, St Michael’s Hospital

CHAPTER 5—DEPRESSION

Elizabeth Lin, PhD
Research Scientist, Centre for Addiction and Mental Health

Adjunct Scientist, Institute for Clinical Evaluative Sciences

Assistant Professor, University of Toronto

Natalia Diaz-Granados, MSc
Epidemiologist, UHN Women’s Health Program, University Health Network, Toronto General Research Institute

Donna E. Stewart, MD, FRCPC
University Professor and Chair of Women’s Health, University Health Network and University of Toronto

Senior Scientist, Toronto General Research Institute

Anne E. Rhodes, PhD
Associate Professor, Departments of Psychiatry and the Dalla Lana School of Public Health, University of Toronto, Faculty of Medicine

Scientist Keenan Research Centre of the Li Ka Shing Knowledge Institute of St. Michael’s Hospital

Research Scientist at the Suicide Studies Unit, St. Michael’s Hospital

Adjunct Scientist, Institute for Clinical Evaluative Sciences

Naira Yeritsyan, MD, MPH
Research Coordinator, Institute for Clinical Evaluative Sciences

Ashley Johns, MSc
Research Coordinator, The POWER Study, St. Michael’s Hospital

Minh Le Duong-Hua, MSc
Senior Analyst, Canadian Institute for Health Information

Former Analyst, Institute for Clinical Evaluative Sciences

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Department of Medicine, University of Toronto

Ontario Women’s Health Council, Chair

Senior Scientist, Keenan Research Centre, Li Ka Shing Knowledge Institute, St. Michael’s Hospital

CHAPTER 6—CARDIOVASCULAR DISEASE

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Department of Medicine, University of Toronto

Ontario Women’s Health Council, Chair

Senior Scientist, Keenan Research Centre, Li Ka Shing Knowledge Institute, St. Michael’s Hospital

R. Liisa Jaakkimainen, MD, MSc, CCFP
Heart Failure Lead

Staff Physician, Family Practice, Sunnybrook Health Sciences Centre

Associate Scientist, Clinical Epidemiology Program, Sunnybrook Research Institute

Assistant Professor, Department of Family and Community Medicine, University of Toronto

Scientist, Institute for Clinical Evaluative Sciences

Beth L. Abramson, MD, MSc, FRCPC, FACC
Ischemic Heart Disease Lead

Director, Cardiac Prevention, Rehabilitation & Women’s Cardiovascular Health, Division of Cardiology, St. Michael’s Hospital

Associate Professor, Department of Medicine, University of Toronto

Maira K. Kapral, MD, MSc, FRCPC
Stroke Lead

Staff Physician, General Internal Medicine & Clinical Epidemiology, Toronto General Hospital

Senior Scientist, Institute for Clinical Evaluative Sciences and Canadian Stroke Network

Associate Professor, Faculty of Medicine, University of Toronto

Scientist, University Health Network Women’s Health Program

Nahid Azad, MD, FRCPC
Associate Professor, Faculty of Medicine,
University of Ottawa

Clinical Investigator, Ottawa Health Research Institute

Director, Geriatric Assessment Inpatient Unit, the
Ottawa Hospital

Director, Office of Gender and Equity Issues, Faculty of
Medicine, University of Ottawa

Ruth Hall, PhD
Evaluation specialist, Ontario Stroke Network

Patrice Lindsay, RN, PhD
Affiliate Investigator, Ottawa Health Research Institute

Lecturer, Department of Health Policy, Management and
Evaluation, University of Toronto

Performance & Standards Specialist, Canadian
Stroke Network

Gladys Honein, BScN, MPH
Research Coordinator, POWER Study,
St. Michael’s Hospital

Graduate Student, Department of Health Policy,
Management and Evaluation, University of Toronto

Naushaba Degani, PhD
Project Director, POWER Study, St. Michael’s Hospital

CHAPTER 7—ACCESS TO
HEALTH CARE SERVICES

Arlene S. Bierman, MD, MS, FRCPC
Associate Professor, Faculty of Medicine, University of
Toronto

Ontario Women’s Health Council, Chair

Senior Scientist, Centre for Research on Inner City
Health, St Michael’s Hospital

Jan Angus, RN, PhD
Associate Professor, Faculty of Nursing, University
of Toronto

New Investigator, Canadian Institute of Health Research

Adjunct Scientist, Toronto Rehabilitation Institute

Farah Ahmad, MBBS, MPH, PhD
Assistant Professor, Dalla Lana School of Public Health,
University of Toronto

Associate Scientist, Centre for Research on Inner City
Health, St. Michael’s Hospital

Naushaba Degani, PhD
Project Director, POWER Study, St. Michael’s Hospital

Mandana Vahabi PhD, MHSc, RN
Former Project Director, The POWER Study, St.
Michael’s Hospital

Associate Professor, Faculty of Community Services,
Daphne Cockwell School of Nursing, Ryerson University

Richard H. Glazier MD, MPH, FCFP
Senior Scientist, Institute for Clinical Evaluative Sciences

Research Scientist, Centre for Research on Inner City
Health in the Keenan Research Centre of the Li Ka Shing
Knowledge Institute at St. Michael’s Hospital

Associate Professor, Departments of Family &
Community Medicine and Public Health Sciences,
University of Toronto

Yingzi Li, MSc
Data Analyst, The POWER Study, St. Michael’s Hospital

Stephanie Ross, BSc
Former Research Assistant, The POWER Study, St.
Michael’s Hospital

Douglas Manuel MD, MSc, FRCPC
Senior Scientist, Ottawa Health Research Institute

PHAC/CIHR Chair Applied Public Health Sciences

Senior Medical Advisor, Statistics Canada

Senior Scientist, ICES

Associate Professor, Department of Family Medicine,
University of Ottawa

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The authors wish to thank the following individuals
and organizations for their contributions to the success
of this project, and apologize in advance for any
inadvertent omissions.

ADVISORY COUNCIL

We wish to thank the Advisory Council, made up of
representatives from various health care sectors and
research areas, for their strategic support and recom-
mendations on the design, implementation and
dissemination of information for the POWER Study.

Matthew Anderson, CEO, Toronto Central Local
Health Integration Network

Caroline Andrew, Chair of the Board, Echo: Improving
Women’s Health in Ontario

Adalsteinn Brown, Assistant Deputy Minister, Health
Strategy Division, Ontario Ministry of Health and
Long-Term Care

Pat Campbell, CEO, Echo: Improving Women’s
Health in Ontario

Jane Cooke-Lauder, President and CEO, Bataleur
Enterprises Inc.

Sheree Davis, Director, Health System Strategy Branch,
Ontario Ministry of Health and Long-Term Care

Marie DesMeules, Director, Innovations and Trends
Analysis Division, Public Health Agency of Canada

Kevin Glasgow, CEO, Crohn’s and Colitis Foundation
of Canada

Brian Golden, Sandra Rotman Chair in Health Sector
Strategy, University of Toronto

Lorraine Greaves, Executive Director, Health System
Strategy Division, Ontario Ministry of Health and
Long-Term Care

David Henry, President and CEO, Institute for Clinical
Evaluative Sciences

Paul Huras, CEO, Southeast Local Health
Integration Network

Andreas Laupacis, Executive Director, Li Ka Shing
Knowledge Institute, St Michael’s Hospital

Jack Lee, Senior Strategic Advisor to CMOH/ADM,
Chronic Disease Prevention and Health Promotion,
Ontario Ministry of Health Promotion

Heather Maclean, Former Director, Centre for
Research in Women’s Health

Verna Mai, Director, Screening Programs,
Cancer Care Ontario

Domenica Ozarco, Director of Strategic Policy and
Planning, Ontario Ministry of Health Promotion

Valerie Palda, Medical Director, Guidelines Advisory
Committee, Centre for Effective Practice

Indra Pulcins, Director, Indicators and Performance
Measurement, Canadian Institute for Health Information

Caroline Rafferty, Director, Quality and Performance,
Cardiac Care Network of Ontario

Jess Rogers, Director, Evidence and Guidelines, Centre
for Effective Practice

Shirlee Sharkey, President and CEO, Saint Elizabeth
Health Centre

Heather Sherrard, Former Acting CEO, Cardiac Care Network of Ontario

Vasanthi Srinivasan, Director, Health System Planning and Research Branch, Ontario Ministry of Health & Long-Term Care

Lisa Watson, Former Director, Strategic Policy and Planning Branch, Ontario Ministry of Health Promotion

Lynn Wilson, Associate Professor and Chair, Department of Family and Community Medicine, University of Toronto

Ruth Wilson, President, College of Family Physicians of Canada

STAKEHOLDERS

The POWER Study Team particularly wishes to thank their various stakeholders from across the community for their invaluable input to the project via roundtable discussions and additional communications.

TECHNICAL EXPERT PANELS

We wish to thank the individuals who provided their time and expertise in the indicator selection process.

Chapter 3—Burden of Illness;
Chapter 7—Access to Health Care Services

Sten Ardal, MA
Director, Health Analytics Branch, Health Systems Information Management, Ontario Ministry of Health and Long-Term Care

Lisa Hall, PhD
Assistant Professor, Department of Public Health Sciences, University of Toronto

Janice Owen
Physician, Womens Health of London
Medical Director, Ontario Telemedicine Network
Adjunct Professor, Departments of Family Medicine and Psychiatry, Schulich School of Medicine and Dentistry, University of Western Ontario

Elizabeth G.S. Rael, MSc, PhD
Senior Epidemiologist, Chronic Disease Prevention and Health Promotion Branch, Ministry of Health Promotion

Russell Wilkins, MURb
Health Analysis Division, Statistics Canada
Department of Epidemiology and Community Medicine, University of Ottawa

Graham Woodward, BSc, MSc
Director, Provincial Planning, Cancer Care Ontario

Chapter 4—Cancer

Andrea Eisen, MD, FRCPC
Head, Preventive Oncology, Odette Cancer Centre

Anna Gagliardi, MSc , MLS, PhD
Assistant Professor, Associate SGS Member
Department of Surgery, University of Toronto
Scientist, Sunnybrook Health Sciences Centre

Eva Grunfeld, MD, DPhil, FCFP
Director, Knowledge Translation Research, Health Services Research Program, Cancer Care Ontario and the Ontario Institute for Cancer Research
Giblon Professor and Director, Family Medicine Research Program, Department of Family and Community Medicine, University of Toronto

S. Lawrence Librach, MD, CCFP, FCFP
Director, Temmy Latner Centre for Palliative Care, Mt. Sinai Hospital
W. Gifford-Jones Professor in Pain Control & Palliative Care, University of Toronto

Marko Simunovic, MD, MPH, FRCSC
Surgical Oncologist, Juravinski Cancer Centre
Associate Professor, Department of Surgery, McMaster University

Gillian Thomas, BSc, MD, FRCPC, FRCR (Hon)
Radiation Oncologist, Toronto-Sunnybrook Odette Cancer Centre
Professor, Department of Radiation Oncology and Obstetrics and Gynecology, University of Toronto

Hal Hirte, MD
Chief, Oncology, Hamilton Health Services
Head, Systemic Therapy Program, Juravinski Cancer Centre

Associate Professor, Department of Oncology & Obstetrics & Gynecology, McMaster University

Chapter 5—Depression

John Cairney, MA, PhD
Assistant Professor, Department of Psychiatry, University of Toronto

Research Scientist, Centre for Addiction and Mental Health
Canada Research Chair in Psychiatric Epidemiology

Catherine Classen, PhD, C. Psych.
Senior Research Scientist, Women’s College Research Institute
Director, Women’s Mental Health Research Program, Women’s College Research Institute

Academic Leader, Trauma Therapy Program, Women’s College Hospital
Clinical Psychologist, Women’s College Hospital
Associate Professor, Department of Psychiatry, University of Toronto

Paula Goering, RN, PhD
Section Head, Health Systems Research and Consulting Unit, Centre for Addiction and Mental Health Professor, Department of Psychiatry, University of Toronto

David Haslam, MD, MSc, FRCPC
Program Director, Education, Department of Psychiatry, University of Western Ontario
Assistant Professor, Department of Epidemiology & Biostatistics, University of Western Ontario

Steve Lurie, BA, MSW, MM
Executive Director, Metro Toronto Branch, Canadian Mental Health Association

Dr. Diane de Camps Meschino, MD, FRCPC
Programme Leader, Reproductive Psychiatry, Women’s College Hospital

Assistant Professor, Department of Psychiatry, University of Toronto

Gail Robinson, MD, D. Psych., FRCPC
Professor, Department of Psychiatry, University of Toronto
Program Director, Women’s Mental Health, University Health Network
Staff Physician, University Health Network

Ruth Wilson, MD, CCFP
Professor, Department of Family Medicine, Queen’s University

Chapter 6—Cardiovascular Disease

Gopal Bhatnagar, MD
Head of Cardiac Surgery, Trillium Health Centre
Adjunct Assistant Professor of Surgery, University of Toronto

Stephanie Brister, MD, FRCSC
Associate Professor, Faculty of Surgery, University of Toronto
Scientist, Toronto General Research Institute, Toronto General Hospital

Chi-Ming Chow, MDCM, MSc, FRCPC, FACC, FASE
Associate Professor in Medicine, University of Toronto
Staff Cardiologist, Division of Cardiology, St. Michael’s Hospital

Ross A. Davies, MD, FRCPC, FACC
Administrative Director, Ottawa Pulmonary Hypertension Program
Division of Cardiology, University of Ottawa Heart Institute
Professor, Department of Medicine, University of Ottawa

David Fell, MD
Cardiologist, South Lake Regional Health Centre

Cheryl Jaigobin, MD, MSc, FRCPC
Staff Physician, Toronto General Hospital
Assistant Professor, Department of Medicine, University of Toronto

Louise Laramée, MD, FRCPD
Cardiologist, University of Ottawa Heart Institute

Kenneth Melvin, MD, FRCPC, FACC
Associate Professor, Division of Cardiology, Department of Medicine, University of Toronto
Cardiologist, Cardiology Program, University Health Network

Sherryn Roth, MD, FRCPC
General Division, Scarborough Hospital

Dr. Michele Turek, MD, FRCPC
Division of Cardiology, Ottawa Hospital
Associate Professor, Department of Medicine, University of Ottawa

EXTERNAL REVIEWERS

We wish to thank the individuals who provided their time and expertise in the external review of individual chapters.

Chapter 3—Burden of Illness

Ahmed M. Bayoumi, MD, MSc
Canadian Institutes for Health Research / Ontario Ministry of Health & Long Term Care Applied Chair in Health Services and Policy Research
Director, Clinical Epidemiology and Health Care Research, Department of Health Policy, Management, and Evaluation
Associate Professor, Department of Medicine, University of Toronto
Scientist, Centre for Research on Inner City Health, Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael’s Hospital

Russell Wilkins, MURb
Health Analysis Division, Statistics Canada
Department of Epidemiology and Community Medicine, University of Ottawa

Cameron Mustard, ScD
President & Senior Scientist, Institute for Work & Health
Professor, Dalla Lana School of Public Health Sciences, University of Toronto

Sheila Dunn, MD, MSc
Practitioner, Family Practice Health Centre, Women’s College Hospital
Associate Professor, Department of Family and Community Medicine, University of Toronto

Chapter 4—Cancer

Craig Earle, MD, MSc, FRCPC
Director, Health Services Research Program, Cancer Care Ontario and Ontario Institute for Cancer Research
Associate Professor, Department of Medicine, University of Toronto
Senior Scientist, Institute for Clinical Evaluative Sciences
Scientist, Sunnybrook Research Institute, Medical Oncologist, Odette Cancer Centre

Eva Grunfeld, MD, DPhil, FCFP
Director, Knowledge Translation Research, Health Services Research Program, Cancer Care Ontario and the Ontario Institute for Cancer Research
Giblon Professor and Director, Family Medicine Research Program, Department of Family and Community Medicine, University of Toronto

Natasha Leighl, MD, MMSc, FRCPC
Staff Medical Oncologist, Princess Margaret Hospital/ University Health Network
Assistant Professor, Department of Medicine, University of Toronto

Carol Sawka, MD, FRCPC
Vice-President, Clinical Programs and Quality Initiatives, and Chair of the Clinical Council for Cancer Care Ontario
Associate Professor, Department of Medicine, University of Toronto
Medical Oncologist, Odette Cancer Centre

Chapter 5—Depression

Sten Ardal, MA
Director, Health Analytics Branch, Health Systems Information Management, Ontario Ministry of Health and Long-Term Care

Linda Baigent, MSc
Senior Health Analyst, Ministry of Health and Long-Term Care

Janet Durbin, PhD
Research Scientist, Health Systems Research and Consulting Unit, Centre for Addiction and Mental Health
Assistant Professor, Department of Psychiatry, University of Toronto

Paula Goering, RN, PhD
Section Head, Health Systems Research and Consulting Unit, Centre for Addiction and Mental Health Professor, Department of Psychiatry, University of Toronto

Chapter 6—Cardiovascular Disease

Wei Luo, MB, MSc
Senior Policy Analyst, Strategic Initiatives and Innovations Directorate, Public Health Agency of Canada

Frank L. Silver, MD, FRCPC
Professor of Medicine (Neurology), University of Toronto
Medical Director, Toronto West Stroke Region
Director, Stroke Program University Health Network

Andreas Wielgosz, MSc, MD, PhD, FRCPC, FACC
Professor of Medicine and Epidemiology & Community
Medicine, University of Ottawa

Chapter 7—Access to Health Care Services

Sten Ardal, MA
Director, Health Analytics Branch, Health Systems
Information Management, Ontario Ministry of Health
and Long-Term Care

Jeff Poss, PhD
Assistant Research Professor, Department of Health
Studies and Gerontology, University of Waterloo

ACADEMIC SUPPORT

Chapter 4—Cancer

Anna Greenberg, MPP
Director, Knowledge Management, Canadian
Partnership Against Cancer

David Hodgson, MD, MPH
Associate Professor and Clinician Scientist, Department
of Radiation Oncology, and Department of Health Policy,
Management and Evaluation, University of Toronto

Lawrence Paszat, MD, BA, MSc, FRCPC
Epidemiologist and Senior Scientist, Institute for Clinical
Evaluative Sciences (ICES)

Linda Rabeneck, BSc, MD, MPH, FRCPC
Professor of Medicine

Professor, Dalla Lana School of Public Health
University of Toronto

David Urbach, MD, MSc, FRCSC, FACS
Associate Professor, Departments of Surgery and
Health Policy, Management and Evaluation (HPME),
University of Toronto

Scientist, Division of Clinical Decision Making and
Health Care, Toronto General Research Institute and
Cancer Care Ontario

Adjunct Scientist, Institute for Clinical
Evaluative Sciences

Chapter 6—Cardiovascular Disease

Veena Guru, BSc, MD
Research Fellow, Institute for Clinical Evaluative Sciences
and the Cardiac Care Network

Chapter 7—Access to Health Care Services

Cynthia Damba, MHSc
Former Senior Research Associate, The POWER Study,
St. Michael’s Hospital
Senior Epidemiologist/Planner, Toronto Central Local
Health Integration Network

Janice Dusek, RN, BSN, MS, CHE
Assistant Professor, University of Toronto
Chief Nursing Office/VP Profession Practice & Strategic
Development, Whitby Mental Health Centre

Assistant Professor, University of Ontario Institute
of Technology

Ruth Lowndes, RN, MN, PhD(c)
Lawrence S. Bloomberg Faculty of Nursing, University
of Toronto

Naomi Cechetto, RN, BScN
Canadian Institutes of Health Research Undergraduate
Student Trainee
Lawrence S. Bloomberg Faculty of Nursing,
University of Toronto

METHODS WORKING GROUP

Institute for Clinical Evaluative Sciences

Kinwah Fung
Alexander Kopp
Rahim Moineddin
Refik Saskin
Thérèse Stukel
Jiming Fang
Ping Li
Ruth Croxford

The POWER Study, St. Michael’s Hospital

Yingzi Li
Naushaba Degani

MAPPING GROUP

Centre for Research on Inner City Health,
St. Michael’s Hospital

Peter Gozdyra
Jaeho Oh
Jonathan Weyman

PRODUCTION ASSISTANCE

Institute for Clinical Evaluative Sciences

Laura Benben
Randy Samaroo

DATA PROVISION, SUPPORT
& ANALYSIS

The following individuals/organizations provided
invaluable information, data, support and analysis
throughout development and writing of this Report:

Chapter 3—Burden of Illness

Marie Muir, Infectious Diseases Surveillance, Infectious
Diseases Branch and Public Health Information, Ministry
of Health and Long-Term Care

Russell Wilkins, Health Analysis and Measurement
Group, Statistics Canada

Alexander Kopp, Institute for Clinical Evaluative Sciences

Yingzi Li, The POWER Study, St. Michael’s Hospital

Chapter 4—Cancer

Refik Saskin, Institute for Clinical Evaluative Sciences

Katya Duvalko, Director of the Cancer Quality Council
Secretariat, Cancer Care Ontario

Graham Woodward, BSc, MSc, Director, Provincial
Planning, Cancer Care Ontario

Anna Greenberg, MPP, Director, Knowledge
Management, Canadian Partnership Against Cancer

Chapter 5—Depression

Asma Razzaq, Former Research Coordinator, Institute
for Clinical Evaluative Sciences

Chapter 6—Cardiovascular Disease

Jiming Fang, Senior Analyst, Institute for Clinical
Evaluative Sciences

Julie Wang, Analyst, Institute for Clinical Evaluative Sciences

Alice Chong, Analyst, Institute for Clinical Evaluative Sciences

Ying Liu, Analyst, Institute for Clinical Evaluative Sciences

Longdi Fu, Analyst, Institute for Clinical Evaluative Sciences

Lingsong Yun, Analyst, Institute for Clinical Evaluative Sciences

Yingzi Li, Biostatistician, The POWER Study, St. Michael’s Hospital

Cynthia Damba, Former Senior Research Associate, The POWER Study, St. Michael’s Hospital

Dr. Jack Tu, Senior Scientist, Institute for Clinical Evaluative Sciences and Principal Investigator, The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study

Ms Linda Donovan, Project Manager, Canadian Cardiovascular Outcomes Research Team, Institute for Clinical Evaluative Sciences

Dr. Veena Guru, Coronary artery bypass graft surgery (CABG) dataset, Institute for Clinical Evaluative Sciences

Kori Kingsbury, Chief Executive Officer, Cardiac Care Network

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Dr. Moira Kapral and Dr. Frank Silver, Co-Principal Investigators of the Registry of the Canadian Stroke Network, Ontario Stroke Audit (RCSN-OSA)

Ms. Melissa Stamplecoski and Ms. Janice Richards, Project Managers of the Registry of the Canadian Stroke Network, Ontario Stroke Audit (RCSN-OSA)

The Canadian Stroke Network

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Chapter 7—Access to Health Care Services

Alexander Kopp, Institute for Clinical Evaluative Sciences

Yingzi Li, The POWER Study, St. Michael’s Hospital

Jeff Poss, University of Waterloo

Home care data supplied by the Ontario Association of Community Care Access Centres through data sharing agreements with interRAI. Data held within the research group led by Dr. John Hirdes at the University of Waterloo and analyses conducted by Dr. Jeff Poss.

STAFF AND STUDENTS

The POWER Study Team particularly wishes to thank the following staff and students for their contributions:

Naushaba Degani, Project Director, The POWER Study, St. Michael’s Hospital

Jennifer Hamilton, Research Coordinator, The POWER Study, St. Michael’s Hospital

Deborah Tonegawa, Administrative Research Coordinator, St. Michael’s Hospital

Rami Garg, Research Assistant, The POWER Study, St. Michael’s Hospital

Tharini Tharmalingam, Research Assistant, The POWER Study, St. Michael’s Hospital

Gladys Honein, Doctoral Candidate, University of Toronto

Marlies Van Tol, Faculty of Nursing, University of Toronto

Sabeeka Shah, University of Toronto, Scarborough Campus

Laura Easty, McGill University

Sunny (Yang Yang) Zhuang, University of Toronto, Scarborough Campus

Hamsha Mahalingasivam, Faculty of Nursing, University of Toronto

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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 1, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 2, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 3: Example of a Choropleth Map

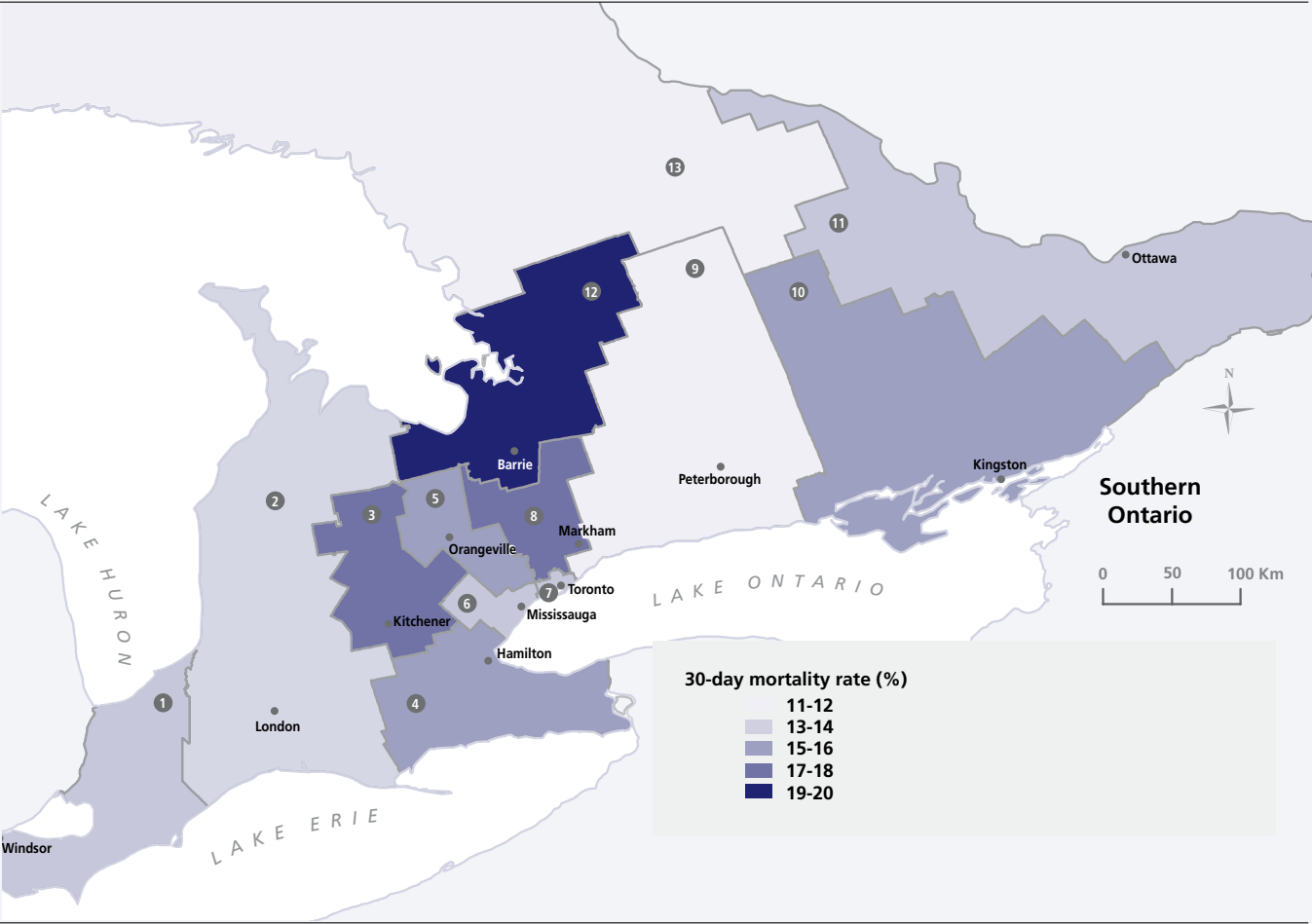


Figure 1: Example of a Two Bar Map

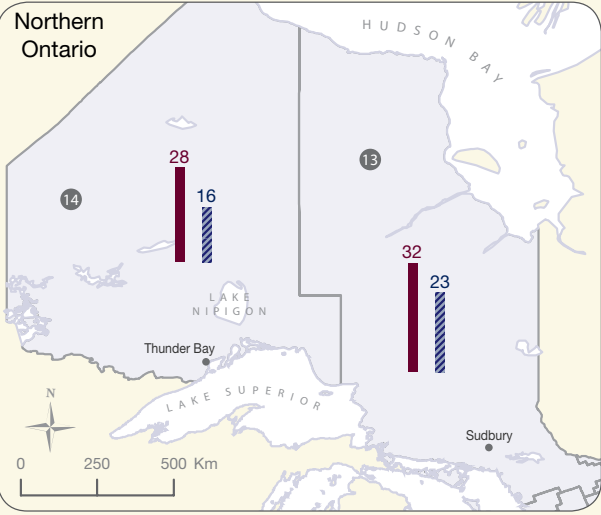
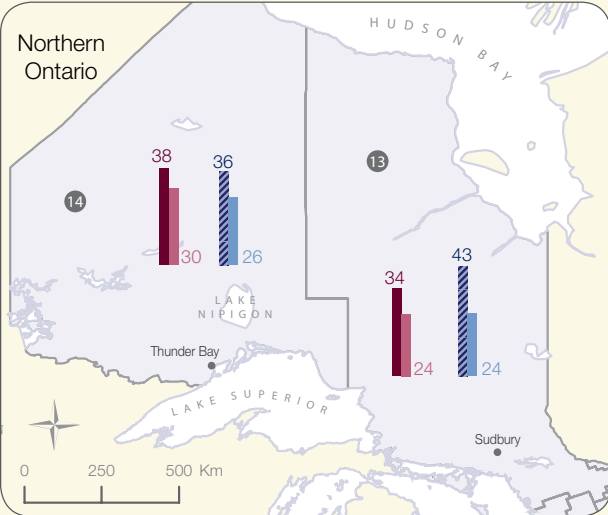


Figure 2: Example of a Four Bar Map



ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Introduction to the POWER Study *Chapter 1*

AUTHORS

Susan K. Shiller, MSc

Arlene S. Bierman, MD, MS, FRCPC

INSIDE

- Why do we need a Women's Health Equity Report in Ontario?
- What's in this volume?
- Who developed the Report?
- How did we choose the indicators?
- Our data

power 

Project for an Ontario Women's Health Evidence-Based Report

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June 2009 • Volume 1 Ontario Women's Health Equity Report
Improving Health and Promoting Health Equity in Ontario

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The POWER Study
Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital
30 Bond St. (193 Yonge St., 6th floor)
Toronto, ON, M5B 1W8
Tel: (416) 864-6060, Ext 3946
Fax: (416) 864-6057
POWERStudy@smh.toronto.on.ca
www.powerstudy.ca

What is the POWER Study?

POWER stands for Project for an Ontario Women's Health Evidence-Based Report. This multi-year project is funded by Echo: Improving Women's Health in Ontario, an agency of the Ontario Ministry of Health and Long-Term Care.

The POWER Study is a partnership between the Keenan Research Centre in the Li Ka Shing Knowledge Institute of St. Michael's Hospital and the Institute for Clinical Evaluative Sciences (ICES) in Toronto, Ontario, Canada.

More than 60 researchers from diverse backgrounds and with expertise in multiple disciplines are collaborating on the study. Their goal is to assemble and analyze comprehensive information on women's health and health care across the continuum of care for important subgroups of Ontario's population. The end result will be a Women's Health Equity Report for Ontario. This is the first volume of the Report.

WHY DO WE NEED A WOMEN'S HEALTH EQUITY REPORT IN ONTARIO?

Health reports measure the performance of health care systems and the health of populations at a given point or points in time. They can serve as an effective tool for helping to improve overall population health and the quality and outcomes of care.

The POWER Study is looking at whether there are current inequities in health and health care in Ontario. Researchers are analyzing data to examine differences between women and men, as well as between different groups of women—for example, according to where they live in the province and their socioeconomic status. The resulting Report will serve as an evidence-based tool for policy makers, providers and consumers in their efforts to improve health and reduce inequities in health care.



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The two-volume Report focuses on key areas of importance to women's health, by examining:

- the overall health of Ontario women, and their access to health care services, as well as how these are related to the social determinants of health
- the leading causes of illness and death among women, including cancer, cardiovascular disease, depression, musculoskeletal disorders, diabetes, Human Immunodeficiency Virus (HIV) infection; and women's reproductive health.

See Chapter 2 for details on the conceptual framework for the POWER Study.

WHAT'S IN THIS VOLUME OF THE WOMEN'S HEALTH EQUITY REPORT?

The POWER Study Women's Health Equity Report will be produced and released in two volumes. This volume contains eight chapters (Exhibit 1.1). In addition to the current introduction, chapters include details on the conceptual framework underlying the research (Chapter 2), conclusions and policy implications (Chapter 8), and five main chapters detailed below:

Chapter 3 | Burden of illness

This chapter provides a detailed analysis of the burden of illness (the overall health and well-being) of Ontarians, and how it varies depending on sex, socio-economic status and geographical area of residence. Up-to-date reporting is provided on the prevalence of chronic conditions among Ontarians (both women and men), their current health and functional status, their risk factors for chronic diseases, the incidence of sexually-transmitted infections, and causes and patterns of mortality.

Chapter 4 | Cancer

Cancer is the second leading cause of death among Ontario women. In this chapter, we report on several of the most common forms of the disease, including cancers of the breast, reproductive system and lung, as well as colorectal cancer. We also provide information on cancer incidence, survival rates and end-of-life care; and include indicators that capture the continuum of cancer care (prevention, screening, treatment and follow-up).

Chapter 5 | Depression

Depression is a major health concern for Canadian women, who are more likely to experience depression than men. Serious and/or untreated depression has a large influence on quality of life. In this chapter we provide data on how well Ontario's health care system currently meets the needs of women and men with depression.

Chapter 6 | Cardiovascular Disease

Cardiovascular disease (CVD) is a leading cause of mortality and a major cause of disability for Ontario women. This chapter focuses on the three major types of CVD that affect both women and men in the province: ischemic heart disease, heart failure and stroke. We provide information on the quality of life of women and men with CVD and wait times for cardiovascular procedures.

Chapter 7 | Access to health care

Access to health care services continues to be an important issue for Ontarians in general and for women in particular. Lack of access to services can result in costly and potentially avoidable complications, increased morbidity (sickness) and reduced quality of life. In this chapter we report on access to primary care, specialist care and home care. We also provide information on rates of hospitalization for diabetes, asthma and heart failure that might be improved through better access to effective outpatient care.

The second volume of the POWER Study Women's Health Equity Report will update and expand on indicators presented in Volume 1. In addition there will be new chapters on musculoskeletal disorders, diabetes, HIV infection and reproductive health, as well as chapters on high-risk subgroups of women (low-income, immigrant and older women) and social determinants of health.

EXHIBIT 1.1 | Content of the POWER Study Women's Health Equity Report (Volume 1)**Chapter 1 | Introduction****Chapter 2 | POWER Study framework****Chapter 3 | Burden of illness (the overall health of women)****Chapter 4 | Cancer****Chapter 5 | Depression****Chapter 6 | Cardiovascular disease****Chapter 7 | Access to health care****Chapter 8 | Conclusions and policy implications**

POWER Study

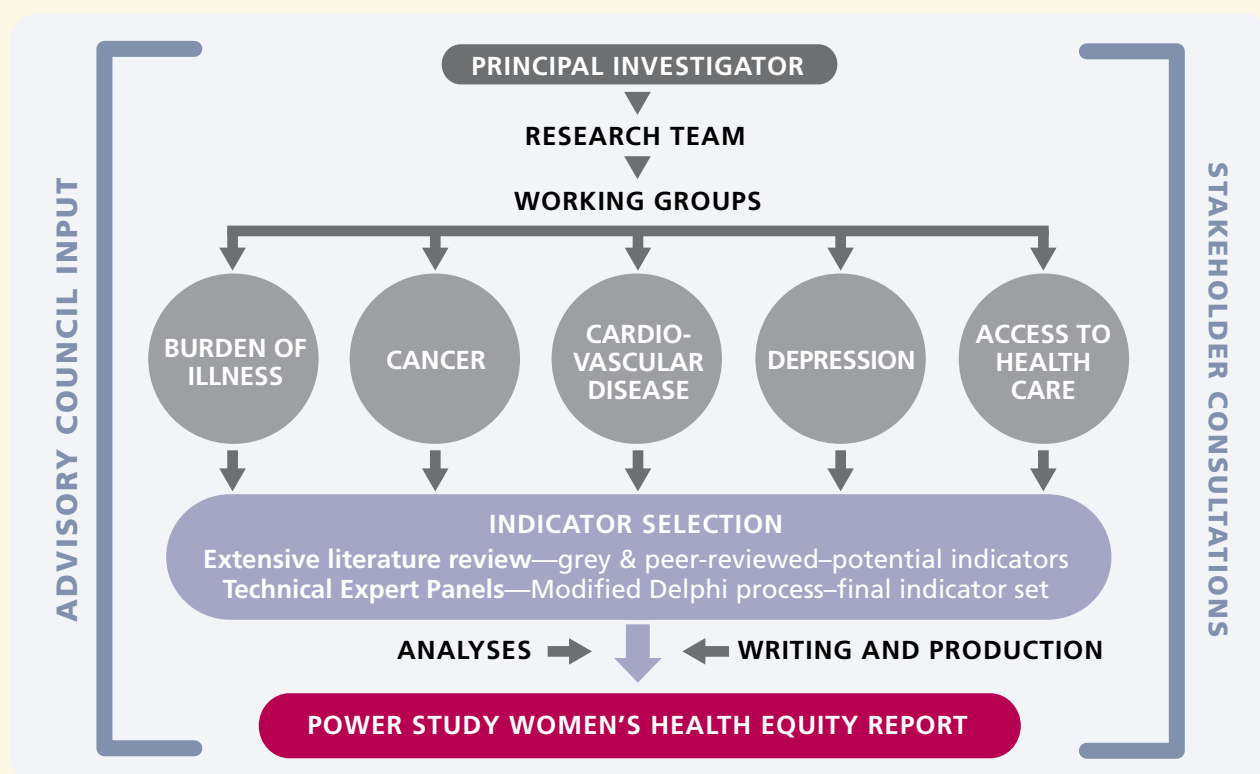
WHO WORKED TO DEVELOP THE REPORT?

The POWER Study is a collaborative effort (Exhibit 1.2). Investigators belong to an interdisciplinary team of researchers with relevant content and methodological expertise from various fields, including health services research, medicine, nursing, social sciences and health care policy:

- The research team was organized into **Working Groups**, based on chapters of the Report (i.e., cardiovascular disease, cancer, depression). Each Working Group had its own lead investigator(s) and was supported by skilled and dedicated statisticians, analysts and research coordinators.
- A **Technical Expert Panel (TEP)** was convened for each chapter. The TEP selected the final indicators using a modified Delphi process (See page 5 – *How did we choose our indicators?*).
- An **Advisory Council**, comprised of representatives from diverse health care sectors and research areas, provided strategic support and recommendations on the POWER Study's design, implementation and dissemination of information.
- **Key stakeholders** in women's health across Ontario were consulted at the outset of the project, and their opinions and feedback shaped both priority-setting and the indicator selection process. Stakeholders included government representatives, health care providers, health data providers, representatives of women's health organizations and consumers. Consultations were held to:
 - engage with stakeholders by creating awareness about the POWER Study and its objectives
 - provide a forum for discussing how we can improve access, quality, and outcomes of care for the women of Ontario
 - elicit stakeholders' needs in terms of how the POWER Study can be most useful
 - help set priorities for reporting in specific areas
 - develop ideas and partnerships for strategic dissemination

EXHIBIT 1.2 | The collaborative model for producing the POWER Study Women's Health Equity Report

KEENAN RESEARCH CENTRE IN THE LI KA SHING KNOWLEDGE INSTITUTE OF ST. MICHAEL'S HOSPITAL AND INSTITUTE FOR CLINICAL EVALUATIVE SCIENCES (ICES)



POWER Study

WHAT IS AN INDICATOR?

To generate the Women's Health Equity Report, the POWER Study used "indicators." Indicators are measures that reflect the health of a population or the performance of health care processes and outcomes. For example:

- Health indicators can assess the life expectancy of the population, or the percentage of the population who are smokers, or whether women with breast cancer are getting recommended treatments such as radiation therapy after a lumpectomy.
- To get a sense of Ontario women's overall health, we could determine how many have been diagnosed with diabetes or high blood pressure. Or we could look at surveys which ask women to rate their own health and to state whether health problems are limiting their activities.
- To assess women's access to health care in Ontario, we might measure how many women say they have a family doctor or feel they can get care when it's needed.
- To evaluate equity in health and health care among women, we could measure what percentage of lower-income versus higher-income women receive regular screening tests to find diseases when they are most treatable—for example, Papanicolaou (Pap) tests to detect cervical cancer.
- Finally, to assess quality of care in Ontario, we might look at how many women are receiving recommended treatments after a disease or condition has been diagnosed—for example, medications prescribed after a heart attack.

HOW DID WE CHOOSE OUR INDICATORS?

Indicators were chosen via a rigorous selection process, with input and agreement from experts in the field.

We conducted an extensive review of existing indicators from peer-reviewed and “grey” (unpublished) literature. From this review, potential indicators were selected according to specified criteria (i.e., their impact on women’s quality of life, functioning and well-being, and whether they affected large groups of women generally or specific populations). We sought to identify indicators which would be most useful to the broadest number of stakeholders:

- The indicators would be amenable to intervention and improvement by those in the public health, health care and non-health sectors.
- The indicators allowed for comparison between and among different subgroups of women by socioeconomic status, ethnicity and geography. To this end, we took into account where inequalities were known to be greatest and where there were significant gender differences, both in health determinants and health outcomes.
- The indicators measured performance across the continuum of care in Ontario, from population health to primary care to tertiary care.

The resulting extensive list of indicators was then reviewed by each Working Group to identify a potential list of indicators for inclusion.

For each chapter, a Technical Expert Panel (TEP), consisting of experts in the field relevant for that chapter, was involved in the final selection of indicators. The TEPs used pre-defined indicator selection criteria (see Chapter 2, Exhibit 2.1) and participated in a modified Delphi process, consisting of an online survey (Survey Monkey) and an “in-person” meeting to rate and select the indicators. Indicators were excluded if limitations in data availability prevented their measurement—even if they had the potential to provide relevant

and important information (**NOTE:** In each chapter of the Report we highlight key areas where data were unavailable or limited, under the heading “What we can’t measure”).

WHAT DATA DID WE USE?

To create this volume of the Women’s Health Equity Report, POWER Study researchers used a variety of secondary data sources. Data were drawn from routinely collected administrative health care databases (such as those which track hospitalizations and visits to the doctor), population health surveys, vital statistics data sets and disease registry data. Information on data sources is available in the Appendices of each chapter.

HOW DID WE ANALYZE THE DATA?

At the provincial level, we report on indicators by sex (women vs. men) and by age, and then stratify them by socioeconomic status (income, education). We provide a breakdown of analyses for selected indicators by ethnicity, immigration status, and knowledge of official languages.

At the level of Local Health Integration Networks (LHINs), we analyzed data first by sex, and then stratified by age, income and education wherever possible.

In order to ensure consistency in methodology and data analysis across all chapters we were supported by a Methods Working Group comprised of statisticians, programmers, analysts and researchers. Indirect standardization was used for age-adjustment and risk-adjustment models were used when indicated.

In the next chapter (Chapter 2), we build on the information presented here, by expanding upon the conceptual framework which guided the selection of indicators for the POWER Study.

ONTARIO WOMEN'S
HEALTH EQUITY REPORT

The POWER Study Framework

Chapter 2

AUTHORS

Jocalyn P. Clark, MSc, PhD

Arlene S. Bierman, MD, MS, FRCPC

INSIDE

- Why focus on women's health?
- Conceptual framework
- Selecting indicators to drive change
- How findings are reported
- The scope of the POWER Study
- Towards a high-performing health system for women



Project for an Ontario Women's Health Evidence-Based Report

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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael’s Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.toronto.on.ca

www.powerstudy.ca

Our goal and approach

The goal of the POWER Study is to produce a comprehensive provincial Report on women's health. The Report will serve as an evidence-based tool to help policy makers, health care providers and consumers improve the health of, and reduce inequities among, the women of Ontario.

The POWER Study reports on a broad set of measures that focus on women's health status, their access to health care services, the quality of the care they receive and the outcomes of that care. These measures, known as indicators, were chosen by technical experts with input from a range of community-based stakeholders representing government, clinical and advocacy organizations. The process has allowed us to generate an up-to-date and comprehensive picture of women's health in Ontario. We report on the leading causes of morbidity and mortality among diverse groups of women across the province and also across the continuum of care.

WHY FOCUS ON WOMEN'S HEALTH AND HEALTH CARE?

There are well-documented differences in the health of women and men, as well as in the kind of health care they receive. There are also documented variations in both health and health care **between** groups of women, depending on their age, income level, education, ethnicity and where they live.

Focusing specifically on women is important for several reasons. Women make up more than half the population, are frequent users of the health care system and have unique health care needs. They also tend to be the primary family caregivers and the main health care decision makers for their families.

Studying the differences in health and health care between women and men, and also between subgroups of women, can help us improve the health of all Ontarians. It can help us target areas where inequities exist, develop interventions to reduce these differences and monitor the effectiveness of our efforts to promote equity.

In the area of cardiac care, for example, previous research has shown that women with cardiovascular disease may experience longer delays accessing appropriate health care and, when they do, often receive poorer quality care than men.¹ These gaps may be greater for more vulnerable groups such as low-income women, Aboriginal women, immigrant women, women of colour and women living in rural or remote areas.^{2, 3}

The POWER Study builds on previous women's health measurement and reporting efforts that have been conducted provincially, nationally and internationally:

- In 2002, the Ontario Women's Health Status Report provided an overview of women's health status and illness in the province.⁴
- The Ontario Hospital Report Cards report sex-stratified indicators on hospital performance and include indicators for select sex-specific conditions.⁵

- In 2003, the Canadian Institute for Health Information (CIHI), in conjunction with Health Canada, published a national women's health surveillance report using gender-based analyses to create a baseline for measuring and monitoring women's health status, and to stimulate further indicator development.⁶
- Several reporting efforts in the United States and Australia have added to our knowledge of women's health status and outcomes.⁷

These reports provided a foundation for the POWER Study Women's Health Equity Report. In order to make a meaningful contribution to the next generation of women's health reporting, we felt it was important to explicitly examine differences between subgroups of women. We were especially interested in investigating differences in women's health associated with women's socioeconomic status, their ethnicity and where they live.

We adopted an approach that integrates both clinical and population health measures and examines women's health across the continuum of care. We chose indicators that are modifiable; that is, where inequities in health and health care exist, there is potential for intervention and improvement.

CONCEPTUAL FRAMEWORK FOR THE POWER STUDY

The conceptual framework of the POWER Study reflects the perspective we used to choose our indicators, analyze the data, interpret the findings and report our results. The framework has five features:

The POWER Study is guided by the holistic definition of women's health used by the former Ontario Women's Health Council.

Women's health is defined as: "a state of emotional, social, cultural, spiritual and physical well-being, determined by the social, political and economic context of women's lives, as well as by biology. Women's health is defined by, and recognizes the

validity of, women's perceptions and life experiences of health and illness, the values and knowledge of women, and the role of women both as users and as providers of health care."⁸

The POWER Study framework emphasizes the importance of the social determinants of women's health.

These are individual and societal factors which create the conditions for better or poorer health and for the delivery of health care. These social determinants include sociocultural factors, education, income, social status, housing, employment, health services, personal health practices and the physical environment.⁹

The POWER Study framework makes a distinction between "sex" and "gender."

Sex refers to the biological differences between men and women, while gender refers to the differences associated with societal roles and the context of women's lives. It is usually difficult to separate the effects of sex and gender when studying women's health care, especially when all the available survey and administrative data are collected and reported only by sex. For example, while sex (male vs. female) influences who will get lung cancer and who will survive it, social factors influence who is more likely to smoke and is therefore at greater risk. These social factors differ by gender.

We felt it was vital to better understand how the interrelated factors of sex and gender influence health and health care. To generate the most helpful findings, we adopted a number of strategies to supplement the sex-disaggregated secondary data that were used in the POWER Study:

- We used the empirical and theoretical literature to help interpret and provide context to our findings.
- We provide an account of what we could not measure given current data availability and quality issues.

- We explicitly measured indicators for subgroups of women (by age, income, education, ethnicity and geography) to reflect some of the social factors that shape women's lives in Ontario.
- We are conducting additional research studies that use multivariable analyses to explore how social and economic status, ethnicity, education and other determinants influence women's health and health care. These will be reported in subsequent academic papers.

The POWER Study framework is centred around the concept of equity.

A primary objective of this Report is to build the evidence base and tools needed to implement changes to reduce health inequities among women.

To accomplish this objective, we felt it was important to have a clear definition of what constitutes "inequity," which is defined by the International Society for Equity in Health as: "The systematic and potentially remediable differences in one or more aspects of health across populations or population groups defined socially, economically, demographically, or geographically."¹⁰ By including "potentially remediable" as a key element, the definition focuses attention on identifying and addressing factors amenable to change.

The POWER Study incorporates equity analyses by using indicators that are capable of measuring differences between subgroups of women and are also modifiable. Results from these analyses are intended to inform the development and evaluation of interventions to reduce inequities in women's health.

The POWER Study framework was developed with stakeholder input.

The perspectives and expertise of women's health stakeholders across the province were included and respected from the outset of the POWER Study. Stakeholders from a range of community organizations,



Photo courtesy of CAAWS – Mariann Domonkos Photography

government, and health care settings were instrumental in shaping the indicator selection and in helping to define priority reporting areas. We consulted specifically with groups and individuals who are most likely to use the Report findings. These include: policy makers interested in measurement and monitoring of the performance of the health care system; community-based health organizations that may use the findings to raise awareness and for advocacy purposes; and health care providers who may use our findings to improve the quality of care provided to women and thus improve their health outcomes.

Together **these five features make up the conceptual framework** which guided us in developing a health Report for Ontario women that is meaningful and actionable, both for decision makers and for other stakeholders in women's health across the province.



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
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SELECTING INDICATORS TO DRIVE CHANGE

The POWER Study aims to be action-oriented. One of our major goals is **to provide evidence that can be used to stimulate and inform both health system change and greater accountability**. This is in line with the efforts of Ontario's Ministry of Health and Long-Term Care (MOHLTC), which recently undertook a major transformation agenda aimed at improving the quality and equity of care and also at making the health care system more patient-focused.

To achieve these goals, we report on a select set of evidence-based health indicators. These indicators were chosen using a rigorous process and well-defined selection criteria including relevance, scientific soundness and feasibility (see Exhibit 2.1).

We previously developed a Women's Health Indicator Framework as part of our work for the Health Canada women's health indicators project.¹¹ This Women's Health Indicator Framework was based on extensive literature review and analytic work and was built upon the Canadian Institute for Health Information (CIHI) health indicator framework.¹²

The health indicator framework used by CIHI and Statistics Canada is comprised of four broad categories: Health

Status; Non-Medical Determinants of Health; Health System Performance; and Community and Health System Characteristics. One strength of this framework is that it recognizes many medical and non-medical determinants of health, including gender. However, the CIHI health indicator framework also has important limitations for women's health reporting. It does not acknowledge that gender interacts with other health determinants to shape women's health, nor does it capture the pathways through which these factors operate.

The POWER Study Women's Health Indicator Framework is dynamic rather than static. It recognizes the pathways through which non-medical determinants of health are the primary determinants of health status, and that population and individual health outcomes are mediated by community and health system characteristics as well as by health system performance. This framework also recognizes that sex and gender influence how all these factors impact on women's experiences with care and on their health outcomes.

Based upon stakeholder input, we adapted the Women's Health Indicator Framework for the POWER Study to explicitly include equity. Our Gender and Equity Health Indicator Framework is presented in Exhibit 2.2.

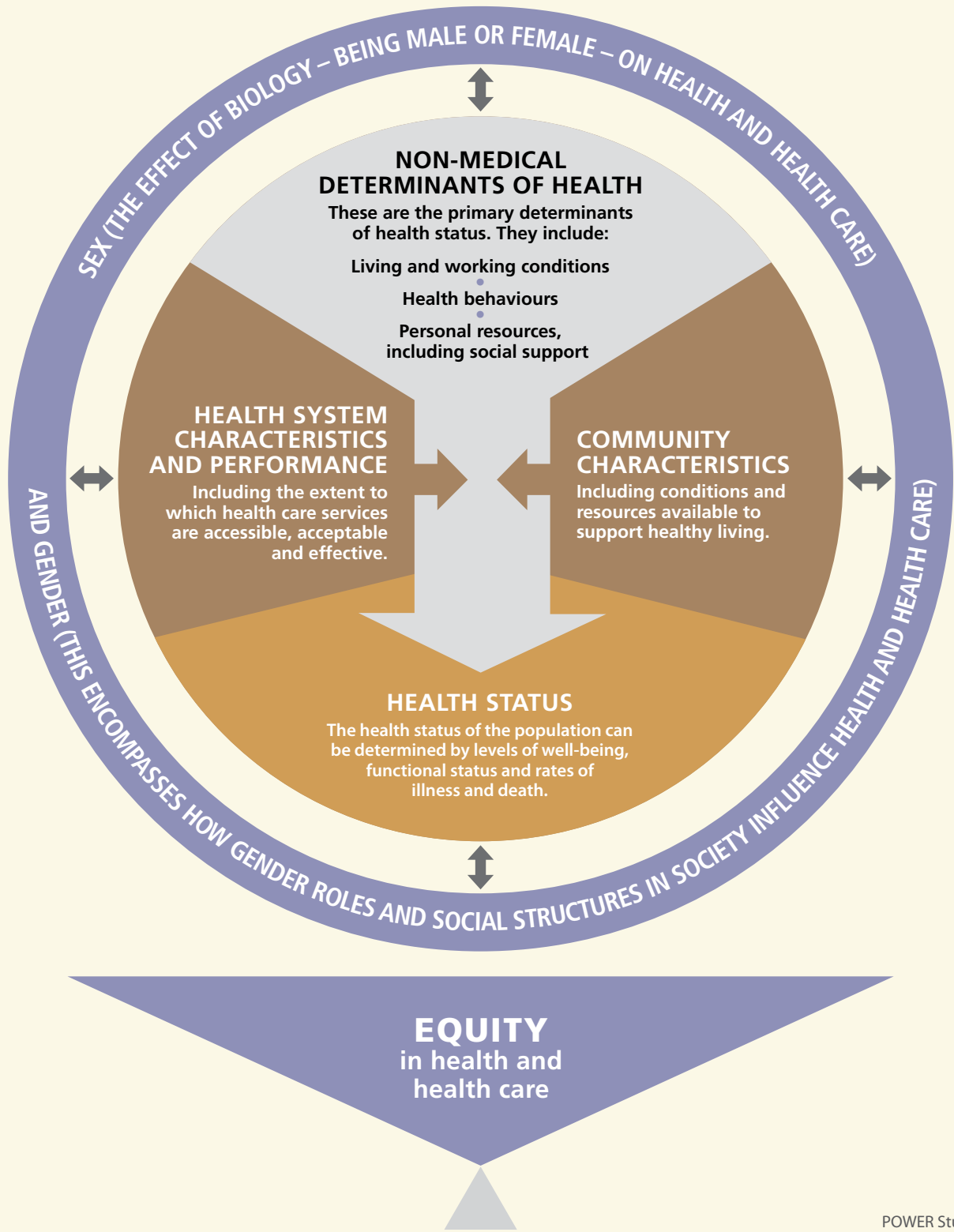
EXHIBIT 2.1 | POWER Study Indicator Selection Criteria*

SELECTION CRITERION	DESCRIPTION
Relevance	
Importance/Usefulness	<ul style="list-style-type: none"> The indicator reflects an important health issue or aspect of health system functioning that matters to the health of the population group in question The indicator assists in monitoring and measuring health system performance over an extended period of time and is meaningful to stakeholders
Amenable to Action	<ul style="list-style-type: none"> The information being collected can be used to inform and influence policy or funding, alter behaviour of health services providers, or increase general understanding in the community in order to improve quality of care and population health
Scientific Soundness	
Validity	<ul style="list-style-type: none"> There is sufficient scientific evidence to support a link between the performance of an indicator and overall positive outcomes to patients The indicator measures what is both intended and acceptable to the community (face validity), covers relevant content or domains (content validity), and has predictive power (criterion validity)
Reliability	<ul style="list-style-type: none"> The same result will be obtained if measurements are repeated under identical conditions
Risk-Adjusted or Stratified	<ul style="list-style-type: none"> The extent to which non-modifiable influences or factors that differ among groups being compared can be controlled or taken into account when necessary for interpretation
Interpretability	<ul style="list-style-type: none"> Changes in the indicator are commonly understood to be good or bad
Comparability	<ul style="list-style-type: none"> The indicator can be compared over time, to other geographic areas or to other standards/benchmarks
Feasibility	
Precisely Defined and Specified	<ul style="list-style-type: none"> The extent to which the measure is standardized with explicit predefined requirements for data collection and calculation of the measure value or score
Data Feasibility	<ul style="list-style-type: none"> Data required for the indicator are available and of sufficient quality for the areas and time periods indicated, such that no unreasonable obstacles or constraints exist either on access to information or restrictions on its use
Reliability of Data Collection	<ul style="list-style-type: none"> The data for the indicator are collected in a consistent manner by one or more agencies over time
Equity	
Health Disparities	<ul style="list-style-type: none"> Indicator selection considers where gender, socioeconomic and ethnic disparities in health and health care are greatest, and where there are significant gender differences in health determinants
Comprehensiveness	
Continuum of Care	<ul style="list-style-type: none"> The indicator selection process seeks to identify health status and health care performance across the continuum of care, from population health to primary and tertiary care

POWER Study

*Developed from a comprehensive review of indicator selection criteria used by other reporting bodies and projects, with specific acknowledgment to the indicator selection criteria developed by the National Committee for Quality Assurance (<http://www.ncqa.org/tabid/415/Default.aspx>) and those used by the Ontario MOHLTC Health System Score Card.

EXHIBIT 2.2 | POWER Study Gender and Equity Health Indicator Framework



HOW THE POWER STUDY FINDINGS ARE REPORTED

When reported in the POWER Study, indicators are first stratified by sex and then by important social determinants of health including—when possible—income, education and ethnicity. This has yielded essential information about differences between and among women and men, as well as insights into how the social determinants of health may affect subgroups differently.

We report our results for the province overall and then—when sample size allows—at the level of Ontario’s 14 Local Health Integration Networks (LHINs).

THE SCOPE OF THE POWER STUDY

The POWER Study provides the most comprehensive provincial women’s health report to date. The Report focuses on inequities in health and health care associated with sex, income, education, geography, and—when possible—with women’s ethnicity, immigration status and knowledge of official languages. By doing this we identify many opportunities for improvement.

Nevertheless, there are important areas of women’s health that we do not address. For example, the Report provides only limited measures of Aboriginal women’s health due to data limitations. We do not look at important vulnerable subgroups of Ontario women such as women with disabilities and Deaf women, lesbian and bisexual women, homeless women and women who have experienced violence. Previous research and advocacy efforts suggest that these groups are more likely to experience poor health, to encounter barriers in accessing care and report receiving poorer quality care.^{4, 6, 13-15}

However, the secondary data sources that we use do not contain information to adequately measure issues related to their health and health care experiences.

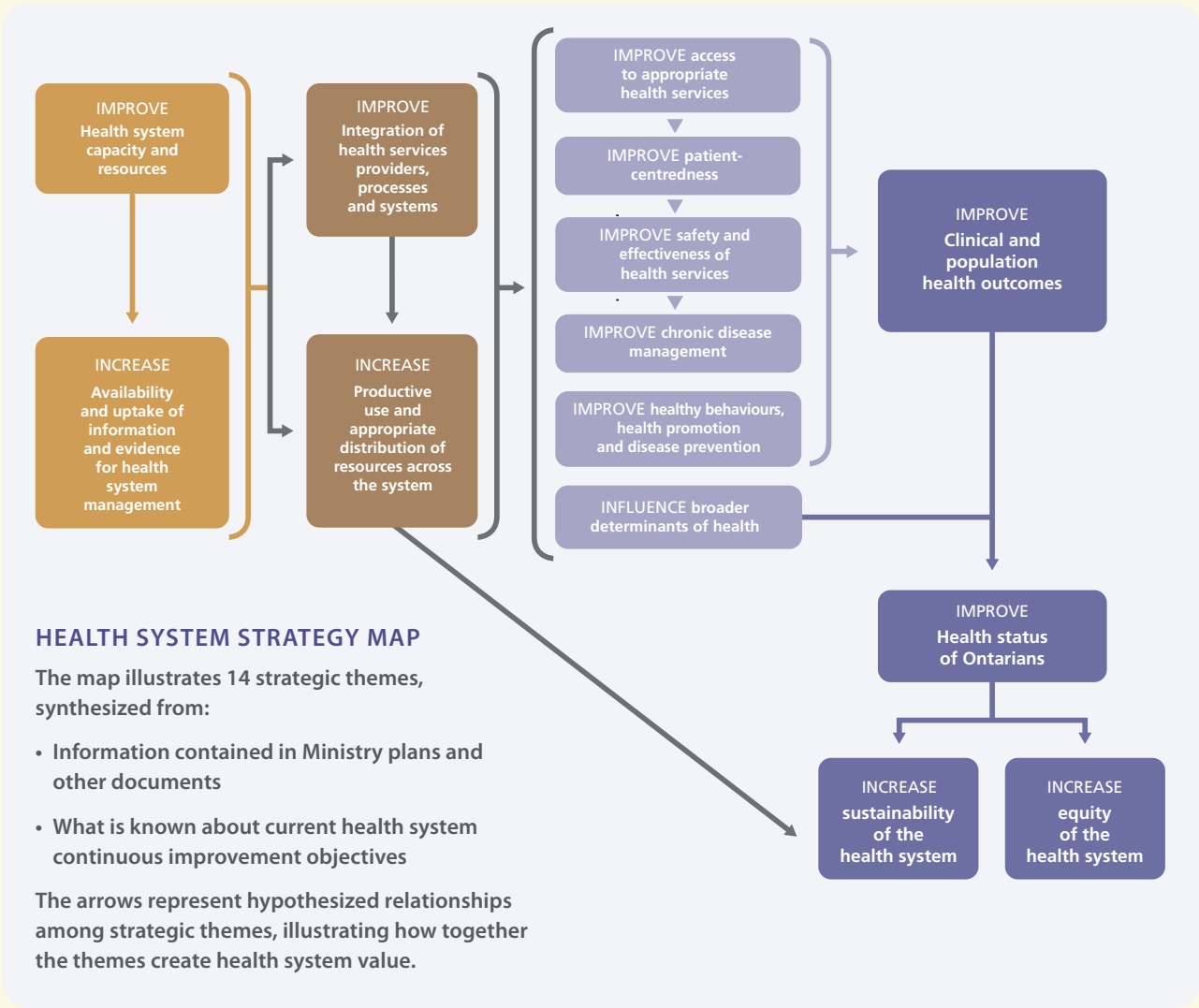
We hope the POWER Study Women’s Health Equity Report provides a robust baseline for understanding women’s health in Ontario and identifies areas where health care data are insufficient. In turn, we hope our work stimulates additional research and advocacy that will benefit all subgroups of women in this province.

TOWARDS A HIGH-PERFORMING HEALTH SYSTEM FOR WOMEN

We produce this report at a time when there is considerable focus on improving health and health care in Ontario. The Ontario Health Quality Council has identified nine attributes of a high performing health system for Ontarians: safe, effective, patient-centred, accessible, efficient, equitable, integrated, appropriately resourced and focused on population health.¹⁶ The Ontario Ministry of Health and Long-Term Care has developed a strategy map that lays out the steps needed to achieve a health system which produces improved clinical and population health outcomes (see Exhibit 2.3).¹⁷ The Ministry of Health Promotion has produced “Ontario’s Action Plan for Healthy Eating and Active Living.”¹⁸

Our indicators have been developed to support these objectives and will capture attributes of a high performing health system. These indicators are intended to be used as tools for transformation and improvement.

EXHIBIT 2.3 | Health System Strategy Map of the Ontario Ministry of Health and Long-Term Care



SOURCE: Health System Strategy Division, Ministry of Health and Long-Term Care, January 2007. This version of the Health System Strategy Map was current at the time of publication; however the health system strategy is currently under revision.

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ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Burden of Illness

Chapter 3



AUTHORS

Arlene S. Bierman, MD, MS, FRCPC
Farah Ahmad, MBBS, MPH, PhD
Jan Angus, RN, PhD
Richard H. Glazier, MD, MPH, FCFP
Mandana Vahabi, PhD, MHSc, RN
Cynthia Damba, MHSc
Janice Dusek, RN, MS, MBA
Susan K. Shiller, MSc
Yingzi Li, MSc
Stephanie Ross, BSc
Gabriel Shapiro, MPH
Douglas Manuel, MD, MSc, FRCPC

INSIDE

- Health and Functional Status
- Chronic Disease Risk Factors
- Chronic Conditions
- Sexually-transmitted Infections
- Mortality



Project for an Ontario Women's Health Evidence-Based Report

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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.toronto.on.ca

www.powerstudy.ca

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Executive Summary

ISSUE

A primary objective of the POWER Study is to develop a tool that can be used to improve the health and well-being of, and reduce health inequities among, the women and men in Ontario.

In this chapter we begin by reporting on the burden of illness experienced by Ontarians and how it differs by sex, socioeconomic status, ethnicity and geographic area of residence. In doing so, we identify opportunities for improvement, present objective evidence to inform priority-setting and provide a baseline from which to measure progress. Much of the morbidity and premature mortality we report in this chapter is preventable through: public health and clinical interventions; health system redesign aimed at chronic disease prevention and management; community engagement and empowerment and social policy aimed at addressing the social determinants of health.

The burden of illness in Ontario is expected to increase as the population ages, since more people will be living with chronic disease and disability. A concerted effort to reduce illness burden among Ontarians would not only improve their quality of life but would also contribute to the sustainability of the health system by reducing demand. This could be accomplished by preventing chronic disease and its complications and thus reducing rates of preventable emergency department visits, hospitalizations and the need for long-term care. In order to succeed, it will be necessary to tackle health inequities by improving the health of all Ontarians regardless of their gender, income, education, ethnicity or where they live.

ABOUT THIS CHAPTER

The Burden of Illness chapter is divided into five sections:

- A. Health and functional status
- B. Chronic disease risk factors
- C. Prevalence of chronic conditions
- D. Sexually-transmitted infections
- E. Mortality

In the first section, the **health and functional status** (measures of an individual's ability to carry out their daily activities and the activities necessary to achieve their goals) of Ontario women and men is profiled. This provides an assessment of the burden of illness and disability by including women's and men's assessments of their health and how it impacts on their daily activities.



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
 Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2009.

Information is also provided on the prevalence of fall-related hospitalizations among Ontarians aged 65 and older—the group most vulnerable to injury from falls—as this is an important and preventable cause of disability. The second section presents the prevalence of the major modifiable **risk factors for chronic diseases**, including health-related behaviours (being overweight or obese, physical inactivity, smoking and inadequate fruit and vegetable intake) and social determinants of health (income and education). The third section looks at selected **chronic conditions**—such as arthritis,

heart disease and diabetes—that have a large impact on women's health and are major contributors to the disease burden in Ontario. The fourth section reports on three **sexually-transmitted infections** (chlamydia, gonorrhea and human immunodeficiency virus [HIV] infection) that have a significant impact on women's health and quality of life. The final section presents overall **mortality** rates for the Ontario population, as well as rates for some of the leading causes of mortality, premature mortality and life expectancy.

STUDY

The reported indicators were derived from a systematic review of the scientific literature and a rigorous selection process by a Technical Expert Panel using a modified Delphi process (see Chapter 1). At the provincial level, indicators were first stratified by sex and by age and—as allowed by sample size and data source—further stratified by socioeconomic variables (income, education, ethnicity and languages spoken). At the Local Health Integration Network (LHIN) level, indicators were stratified by sex, and then by age, income and education

whenever possible. Age adjustment was done using indirect standardization. Data from several sources were used to produce this section. These include: Statistics Canada's Canadian Community Health Survey (CCHS) Cycles 1.1, 2.1 and 3.1; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); integrated Public Health Information System (iPHIS); Statistics Canada Mortality Database; and the 2001 Census of Canada.

KEY FINDINGS

- There were sizable and modifiable health inequities in Ontario associated with gender, income, education and ethnicity. Ontarians of lower socioeconomic position experienced much higher levels of chronic disease and disability than those who were more advantaged. They also were more likely to die prematurely ([Exhibit 3E.2](#)).
- If all Ontarians had the same health as Ontarians with higher income, an estimated 318,000 fewer people (166,000 women and 152,000 men) would be in fair or poor health, an estimated 231,000 fewer people (110,000 women and 121,000 men) would be disabled, and there would be an estimated 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas.
- Women were more likely to report comorbidity (multiple chronic conditions) and disability than men, while men had higher rates of potentially avoidable mortality and premature death.
- Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. The differences in health among women and men associated with socioeconomic position were greater than those between women and men overall, and there were gender differences in the impact of socioeconomic factors on health. The burden of chronic illness and disability was highest among low-income and Aboriginal women, whereas low-income men had the highest rates of potentially avoidable mortality and premature death.
- Overall, one in two Ontarians reported being physically inactive, having inadequate fruit and vegetable intake, or being overweight or obese, and one in five reported currently smoking. Lower levels of education and income were associated with a higher prevalence of these risk factors known to increase the risk of chronic diseases.
- There were also important differences between Ontario's Local Health Integration Networks (LHINs) in the health and functional status of their residents, as well as the distribution of risk factors for chronic disease, including smoking, obesity and sedentary lifestyles.

KEY MESSAGES

There are enormous opportunities to improve overall population health while reducing health inequities in Ontario. It is not surprising that we found health inequities, as these exist in all societies and are well-documented in Canada. However, the large size of the identified inequities is surprising and of concern. The use of these indicators and findings to inform and drive improvement can play an important role in achieving the objectives of improving population health and reducing health inequities.

There is growing evidence for interventions that can reduce overall population risk for disease and disability and close health gaps between the less advantaged and more advantaged members of society. In addition, there are many innovative models to draw upon in Ontario, across Canada and internationally by communities, health care providers, health systems and public health systems and organizations to effect improvement (See [Reducing Burden of Illness: Different Approaches](#)).

Ontario has achieved success in reducing population risk through its Smoke-Free Ontario Strategy; nevertheless, we found that 40 percent of men and 28 percent of women with less than a secondary school education, as well as 39 percent of Aboriginal women and 43 percent of Aboriginal men, currently smoke. Thus, to be most effective, prevention and improvement efforts must also target vulnerable population subgroups.

The following four key actions can accelerate progress in improving the health of and reducing inequities among all Ontarians:

Prioritize Chronic Disease Prevention and Management

- Because chronic diseases and their risk factors contribute greatly to health inequities, the implementation of a comprehensive and coordinated chronic disease prevention and management strategy—one that addresses the need of at-risk populations—is the key to improving population health and achieving health equity.

- It is especially important to identify specific opportunities to improve quality of life and functional status through both community-based and health care interventions. For example, improved pain management and falls prevention interventions can reduce illness burden and contribute to the goal of helping older Ontarians remain active and independent.

Coordinate Population Health, Community and Clinical Responses

- There are many important ongoing activities aimed at improving health in the province including: targeting population-based health promotion, enhancing the quality and capacity of community-based services, and improving the quality of care delivered in clinical settings. Efforts to integrate and coordinate these activities could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

Address the Broader Social Determinants of Health

- There is a need to address the broader social determinants of health (i.e., income, education, food security, housing and environment) and to integrate these efforts with health policy. Cross-sectoral partnerships are needed to accomplish this.
- To guide these efforts, tools such as Health Impact Assessments (HIAs) are available to assess the health impact of policy—including those in non-health sectors such as education, housing and environment—on both population health and health inequities. Conducting HIAs in key priority areas in Ontario could support efforts to achieve health equity.

Routinely Include Gender and Equity Analysis in Health Indicator Monitoring

- Attention to gender issues is required to improve population health because women and men have different health needs and different social contexts that

influence their health. A gender and equity focus should be routinely incorporated into health indicator reporting and monitoring. This provides the needed information to effectively target gender, socioeconomic and ethnic inequities in health. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities.

- Improvements in data quality, availability and timeliness are needed to support monitoring and reporting strategies. There is especially a need for data on ethnicity, knowledge of official languages and length of residence in Canada to improve the capacity to measure, monitor and improve health for Ontario's diverse communities.

KEY FINDINGS BY SECTION

SECTION A | Health and Functional Status

- Low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest income group ([Exhibit 3A.1](#)). They were also more likely to report having two or more chronic conditions and that their activities were limited by a chronic health condition ([Exhibit 3A.8](#)).
- Aboriginal women and men were more likely to report fair or poor health, multiple chronic conditions and activity limitations than women and men in other ethnic groups. Forty-five percent of women who self-identified as Aboriginal reported that their activities were limited by a chronic health condition ([Exhibit 3A.10](#)).
- Ontarians who spoke French only or who did not speak French or English were more likely to report that their health was fair or poor than those who spoke English only or who were bilingual in French and English ([Exhibit 3A.5](#)).
- Low-income Ontarians were much more likely to report that at least some of their activities were prevented due to pain or discomfort than those with higher incomes. ([Exhibit 3A.16](#)). One-quarter of low-income women and men in Ontario reported that their activities were limited by pain or discomfort. Older women were the most likely to report that their activities were limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting activity limitations ([Exhibit 3A.17](#)).

- The number of fall-related hospitalizations increased with age, for both women and men, with highest rates observed among individuals aged 80 and older ([Exhibit 3A.18](#)). Overall, 1,483 per 100,000 adults aged 65 and older in Ontario were hospitalized due to fall-related injuries in 2005/06. A total of 1,837 per 100,000 women and 1,026 per 100,000 men in Ontario were hospitalized due to fall-related injuries over the course of that year.

SECTION B | Chronic Disease Risk Factors

- Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. Forty-four percent of women aged 65-79 and 52 percent of those aged 80 and older reported living in a lower-income household compared to 33 percent and 35 percent of men in these age groups, respectively ([Exhibit 3B.1](#)).
- Recent immigrants, members of racial and ethnic minority groups, and Francophones who spoke French only were also more likely to live in lower-income households than the overall Ontario population ([Exhibit 3B.1](#)).
- The proportion of Ontarians who reported four major risk factors that increase the risk for chronic diseases and their associated morbidity and premature mortality (physical inactivity, inadequate fruit and vegetable intake, being overweight or obese, and smoking) was high across all levels of education and income ([Exhibit 3B.5](#)).
- Lower levels of education and income were associated with a higher prevalence of these risk factors. For

example, women and men with lower levels of education were more likely to smoke; 28 percent of women and 40 percent of men with less than a secondary school education compared to eight percent of women and 13 percent of men who had a Bachelor's degree or higher ([Exhibit 3B.5](#)).

- Women were more likely to report that they were physically inactive but less likely to report inadequate fruit and vegetable intake, being overweight or obese, and smoking than men.
- While five percent of Ontarians overall reported food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat or did not eat the quality or variety of foods desired due to a lack of money ([Exhibit 3B.4](#)).

SECTION C | Chronic Conditions

- The majority of women and men in Ontario were living with at least one chronic condition. Nearly one in three women and one in four men reported having two or more chronic conditions ([Exhibit 3C.7](#)).
- There was an income gradient in the prevalence of common chronic diseases among both women and men and a similar pattern was seen for education. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression) as well as having multiple chronic conditions (comorbidity) ([Exhibit 3C.1](#)).
- The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women ([Exhibit 3C.10](#)).
- Women were more likely to report having arthritis, depression, and multiple chronic conditions than men.
- Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in

five reported having diabetes, and one in four reported having heart disease or stroke ([Exhibit 3C.2](#)).

SECTION D | Sexually-transmitted Infections

- Chlamydia infection and its consequences primarily affects adolescent and young adult women (aged 15–24) ([Exhibit 3D.1](#)).
- Reported incidence rates of gonorrhea infection among women aged 15–19 were more than twice as high as rates reported for adolescent men. For those aged 20 and older, rates were higher among men than women; however, this difference was small among those aged 20–24 ([Exhibit 3D.2](#)).
- While men were more likely than women to be infected with HIV, one quarter of new HIV infections occurred in women. Risk factors for HIV infection differed greatly for women and men. Among women in Ontario most infections were due to heterosexual transmission, whereas homosexual transmission was more common for men ([Exhibit 3D.4](#)).

SECTION E | Mortality

- Low-income women and men had higher mortality rates both overall ([Exhibit 3E.1](#)) and for specific causes of death—including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher incomes.
- For most measures of mortality, an income gradient was observed across neighbourhood income quintiles. In addition, sex differences in mortality rates tended to be greatest among low-income women and men indicating a marked survival disadvantage for low-income men.
- Forty-one percent of men and 26 percent of women in the lowest income quintile died before age 75 (premature mortality), compared to 28 percent of men and 19 percent of women in the highest income quintile ([Exhibit 3E.2](#)).

Introduction

A primary objective of the POWER Study is to develop a tool that can be used to improve the health and well-being of, and reduce health inequities among, the women and men in Ontario.

We begin by reporting in this chapter on the burden of illness experienced by Ontarians and how it differs by sex, socioeconomic status and geographical area of residence. In doing so, we identify opportunities for improvement, present objective evidence to inform priority setting, and provide a baseline from which to measure progress.

Much of the morbidity and premature mortality we report in this chapter is preventable through: public health and clinical interventions; health system redesign aimed at chronic disease prevention and management; community engagement and empowerment; and social policy aimed at addressing the social determinants of health. Given an aging population, a concerted effort to reduce the illness burden among Ontarians can contribute to the sustainability of the health system by reducing demand for health care services.^{1, 2} This could be accomplished by preventing chronic disease and its complications and thus reducing rates of preventable emergency department visits, hospitalizations and the need for long-term care. It can also diminish the financial burden associated with the substantial direct and indirect costs of illness and disability.³⁻⁷

The Burden of Illness chapter is divided into five sections:

- Health and functional status
- Chronic disease risk factors
- Chronic conditions
- Sexually-transmitted infections
- Mortality

In the first section, the **health and functional status** of Ontario women and men is profiled. This examines the burden of illness and disability through women's and men's assessments of their health and how it affects their daily activities. Information is also provided on the prevalence of fall-related hospitalizations among Ontarians aged 65 and older—the group most vulnerable to injury from falls—as this is an important and preventable cause of disability. The second section presents the prevalence of the major modifiable **risk factors for chronic diseases**, including social determinants of health (income and education) and health-related behaviours (overweight or obesity, physical inactivity, smoking and inadequate fruit and vegetable intake). The third section looks at selected **chronic conditions** such as arthritis, heart disease and diabetes, that have a large impact on women's health and are major contributors to the disease burden in Ontario. The fourth section reports on three STIs (**sexually-transmitted infections**) (chlamydia, gonorrhea, and human immunodeficiency virus [HIV] infection) that have a significant impact on women's reproductive health and quality of life. The final section presents overall **mortality** rates for the Ontario population, as well as rates for some of the leading causes of mortality, premature mortality, and life expectancy.

The indicators we report are the result of a rigorous selection process which included an extensive literature review of existing indicators as well as input and agreement from experts in the field (see Chapter 1). Some indicators included in this chapter are also used by other reporting projects in the province, such as

the Ministry of Health and Long-Term Care (MOHLTC) Health System Scorecards, the Cancer Care Ontario Cancer System Quality Index, and the Ontario Health Quality Council annual reports. Many of these indicators are from the core indicator set recommended by the Association of Public Health Epidemiologists of Ontario.

We have built on these reports by incorporating gender and equity analyses. This is important because women and men have different patterns of disease, disability and mortality. Women and men also have different social contexts and different experiences with health care which, together with differences in biology, contribute to observed gender differences in health (see Chapter 2).

Health inequities associated with gender and socioeconomic position have been well documented.⁸⁻¹² Men and women with lower income and lower levels of educational attainment have worse health status, are more likely to suffer from chronic conditions, and have higher rates of mortality than those who have higher income and higher levels of educational attainment.^{13, 14} Thus, differences in illness burden between subgroups of women are often larger than overall differences between women and men.¹⁵

Health inequalities resulting from social conditions are manifested through preventable or treatable chronic conditions, such as heart disease, diabetes or asthma, which are therefore more prevalent among disadvantaged and marginalized groups. As a result, when socioeconomically disadvantaged women and men experience barriers to accessing care or receive health care of lower quality, they experience suboptimal health outcomes. Access to quality health care can potentially improve the health of population groups of lower socioeconomic status, whereas poor access and quality of care can compound these inequalities.^{13, 16} There is evidence that access to effective primary care can contribute to reducing health inequities.¹⁷

In this chapter we assessed the magnitude of health inequities in Ontario associated with gender, socio-



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
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economic position, ethnicity, immigration status, knowledge of official languages and geography. As Ontario grows more diverse, it becomes increasingly important to understand and improve the health and well-being of the many different ethnic groups in the province. So, when possible, we analyzed survey data from Ontarians who self-identified as being from different ethnic groups (e.g., Aboriginal people, including North American Indian, Métis, or Inuit living off-reserve). While health inequities are present in all societies, the size of the gap in health status between the most advantaged and disadvantaged members of society not only varies greatly between and within countries but changes over time in response to changing political policies and social conditions.⁸ The health inequities reported here are amenable to change, as political, social, and health policies may lead to more or less equitable distribution of health among women and men.¹⁷⁻¹⁹

Data from several sources were used to produce this chapter. These include: Statistics Canada's Canadian Community Health Survey (CCHS) cycles 1.1, 2.1 and 3.1; the Canadian Institute for Health Information

Discharge Abstract Database (CIHI-DAD); the integrated Public Health Information System (iPHIS); the Statistics Canada Mortality Database and the 2001 Census of Canada. We report on adults age 25 and older (with the exception of STI Indicators) in order to examine the relationship between education and illness burden. All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators of health status and functional status were first stratified by sex and by age, and then further stratified by socioeconomic variables (income, education, ethnicity, immigration status and languages spoken) as allowed by sample size. At the LHIN level, indicators were stratified by sex, and then by age, income and education whenever possible. Age adjustment was done using indirect standardization. [Appendix 3.3](#) provides a brief description of research methods.

A complete list of the indicators in this chapter and their data sources can be found in [Appendix 3.2](#). The Table in [Appendix 3.1](#) indicates which of the Ontario Health Quality Council's nine attributes of a high performing health system each indicator assesses, and also which of the strategic objectives included in the MOHLTC strategy map would be met through improvement on each indicator.

Information presented in this chapter provides an overall picture of priority issues related to the burden of illness and disability in Ontario. More detailed information on selected chronic conditions that have a major impact on women's health (e.g., cancer, cardiovascular disease, and depression) is included in subsequent sections of this report. By focusing on prevention and chronic disease management, it is possible to improve health and well-being, prevent or postpone disability and extend life expectancy for all Ontarians. We present this information as a tool to assist patients, providers, policy-makers, and advocates in achieving these objectives.

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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 1, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 2, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

Figure 1: Example of a Two Bar Map

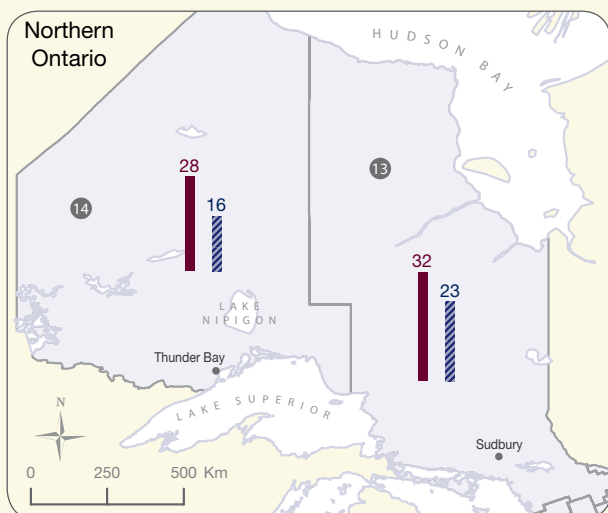
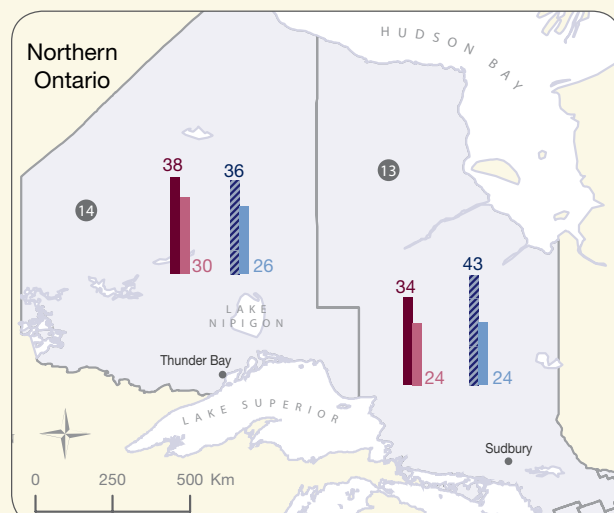


Figure 2: Example of a Four Bar Map

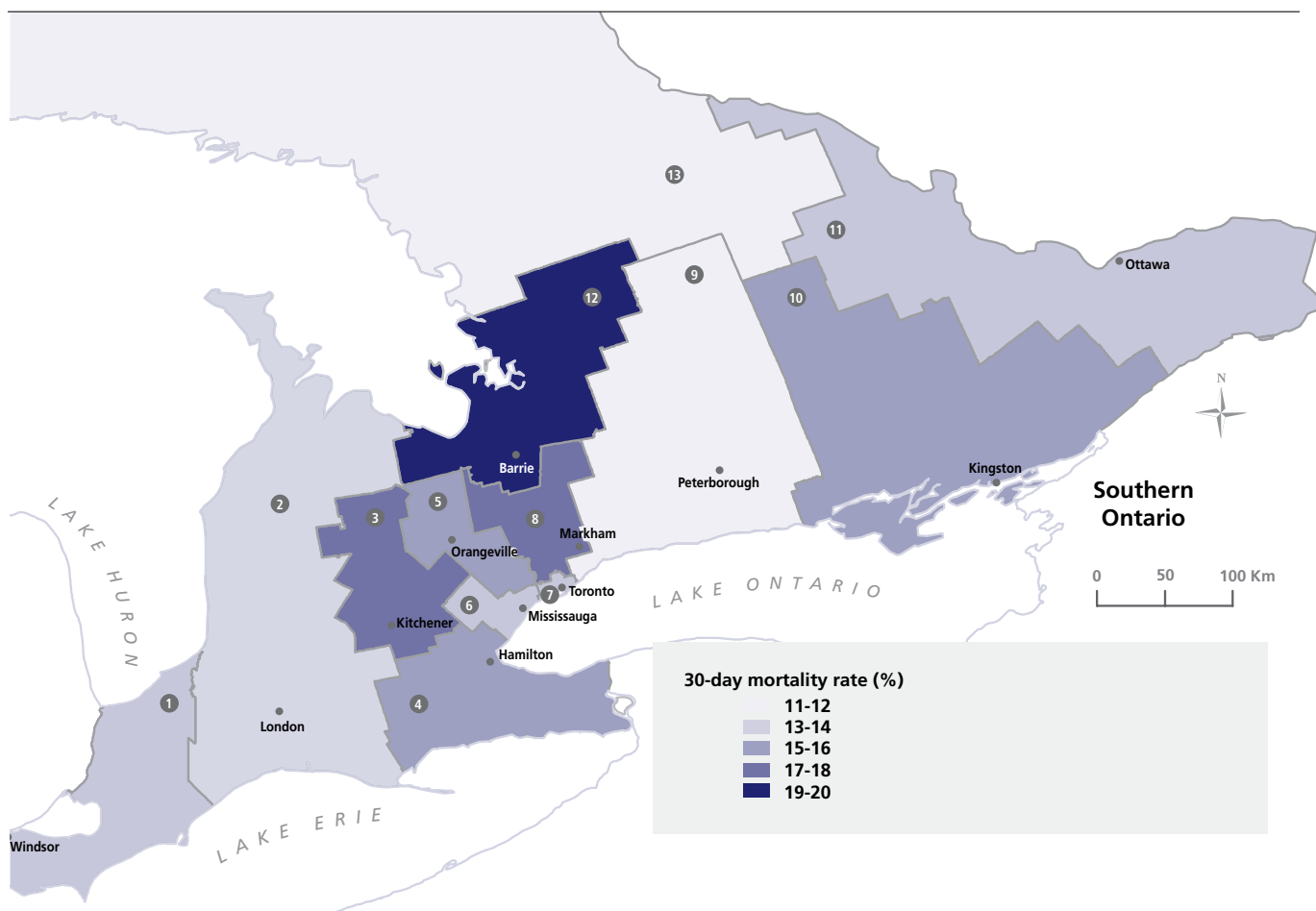


CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 3: Example of a Choropleth Map





Section 3A

Health and Functional Status

INTRODUCTION

A primary goal of both public health and health care services is to improve quality of life by optimizing health and functional status.^{16, 20} A person's overall health status is a product of their experiences over the life course.

These experiences are shaped by their socioeconomic position, the characteristics of their communities, and their interactions with the health care system.^{10, 21} Functional status, or an individual's ability to carry out their daily activities and the activities necessary to achieve their goals, is a product of overall physical and mental health.²⁰ This section provides an assessment of the health and functional status of women and men in Ontario and how it varies by socioeconomic status, ethnicity and geographic area of residence.

There are important gender differences in health and functional status. For example, women are more likely than men to report impairments in their functional status.^{14, 22} Income and education are also strong predictors of health and functional status for both women and men.^{14, 23, 24} An understanding of these differences is needed to inform the development of interventions aimed at improving the health and well-being of the population. In fact, there are enormous opportunities to improve the health and functional status of the population while at the same time reducing these gender and socioeconomic inequities in health.²⁵ These goals can be achieved by addressing the social determinants of health, developing effective strategies for health promotion, and improving the quality and effectiveness of health care services across the continuum of care.

In this section we report on indicators that assess a number of different domains of health and functional status. These include:

- overall self-rated health and mental health status;
- the extent to which women's and men's activities are limited by long-term health conditions;
- the prevalence of disability as measured by limitations in Instrumental Activities of Daily Living (IADLs) (e.g., meal preparation, running errands, light or heavy housework, money management) and/or Activities of Daily Living (ADLs) (e.g., washing, dressing, eating, taking medications, moving about inside the house).
- the contribution of pain to activity limitations (there are effective but underused strategies for pain management that can lead to improvement on this indicator); and,
- rates of fall-related injury among seniors, the leading cause of injury-related hospitalizations for seniors in Canada (i.e., poor health and functional status increases the risk of falls and there is evidence for effective community-based and clinical interventions to reduce the risk of falls and their associated injuries).

EXHIBITS AND FINDINGS

SELF-RATED HEALTH

Self-rated health—also referred to as global, self-reported or self-perceived health—is an indicator of how people rate their overall health status.

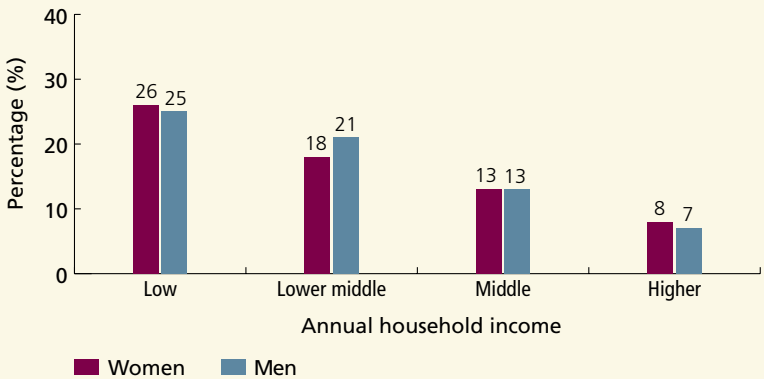
Self-rated health is a well-validated measure of health status that has been shown to have strong predictive relationships with numerous health outcomes including mortality, health care utilization and health care costs in diverse populations.²⁶⁻²⁸ The percentage of the population who rated their health as being fair or poor is reported.

Overall, 13 percent of the adult population aged 25 and older and 13 percent of women and men individually in Ontario rated their health as fair or poor in 2005.

EXHIBIT 3A.1 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and annual household income, in Ontario, 2005

FINDINGS

- The percentage of adults who reported their health as fair or poor increased as income level decreased (an income gradient).
- Low-income women and men were more than three times as likely to report their health as fair or poor compared to those in the higher-income category.
- One in four low-income adults reported their health as fair or poor compared with less than one in ten adults in the higher-income category.
- Similar patterns were seen for both women and men.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

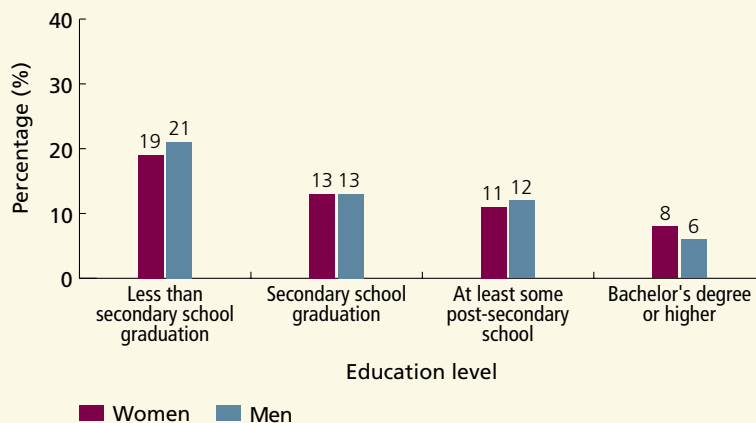
NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3A.2 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and education level, in Ontario, 2005

FINDINGS

- Higher educational attainment was associated with lower rates of reporting fair or poor health. Ontarians with lower education levels were two to three times more likely than those with higher education to report that their health was fair or poor.
- Among women and men who did not graduate from secondary school, one in five reported their health as fair or poor compared to only eight percent of women and six percent of men who had a Bachelor's degree or higher.
- Women and men with the same level of education reported similar rates of fair or poor health.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

POWER Study



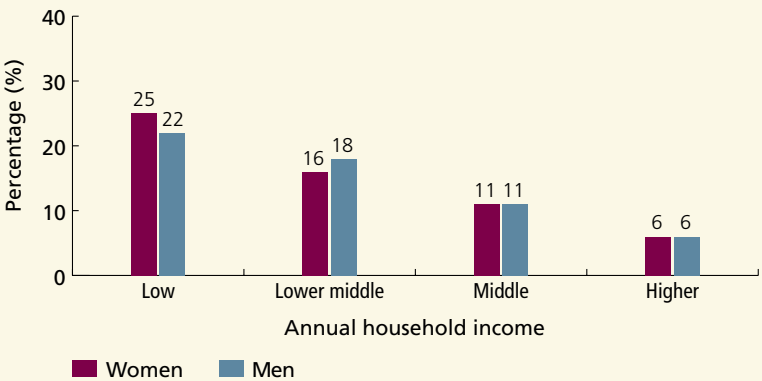
Photo courtesy of CAAWS – Mariann Domonkos Photography

EXHIBIT 3A.3 | Age-specific percentage of adults aged 25 and older who reported their health as fair or poor, by sex and annual household income, in Ontario, 2005

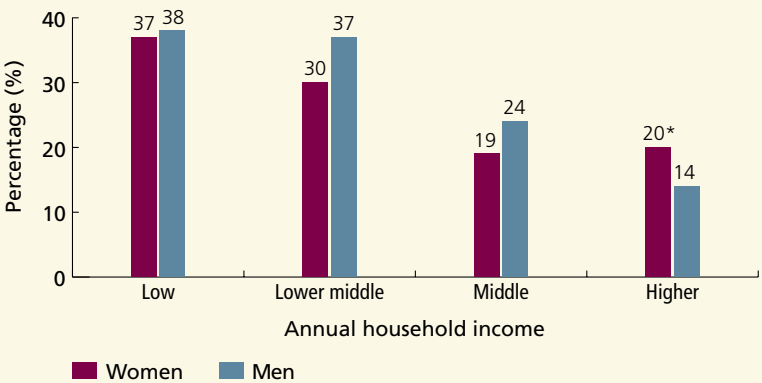
FINDINGS

- As expected, more seniors (aged 65 and older) reported their health as fair or poor compared to adults aged 25–64.
- In both age categories, the percentage of adults who reported their health as fair or poor increased as income level decreased.
- Women aged 25-64 in the low-income category were four times more likely to report fair or poor health compared to those in the higher-income category.
- Thirty-seven percent of low-income women and 38 percent of low-income men, aged 65 and older, reported their health as fair or poor.

Aged 25-64



Aged 65 and older



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

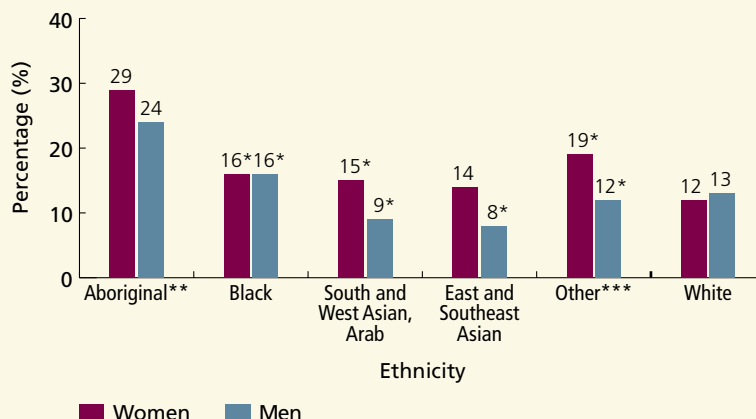
NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3A.4 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and ethnicity, in Ontario, 2005

FINDINGS

- The percentage of women and men who reported their health as fair or poor differed by ethnicity. Aboriginal women and men were most likely to report that their health was fair or poor. Twenty-nine percent of Aboriginal women and 24 percent of Aboriginal men reported their health as fair or poor.
- There were no sex differences in self-rated health in some ethnic groups (White and Black), whereas in other ethnic groups (Aboriginal, South and West Asian and Arab) a greater proportion of women than men reported fair or poor health.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

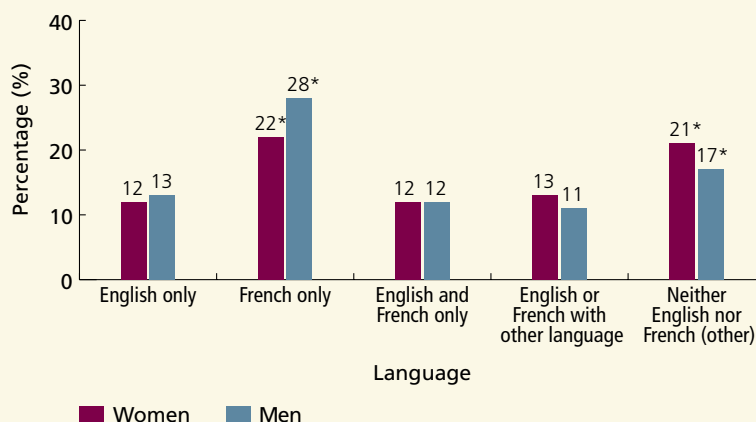
NOTE: Ethnic group names are those used by Statistics Canada in the CCHS

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EXHIBIT 3A.5 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and language spoken, in Ontario, 2005

FINDINGS

- Women and men who spoke French only were more likely to report fair or poor health than those who spoke English only, English and French, or English or French with another language. Ontarians who spoke neither English nor French were also more likely to report fair or poor health than those who spoke English.



DATA SOURCE: Canadian Community Health Survey, Cycle 3.1

* Interpret with caution due to high sampling variability

POWER Study

EXHIBIT 3A.6 | Age-standardized percentage of adults aged 25 and older who rated their health as fair or poor, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

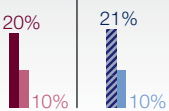
FINDINGS

- Across all LHINs, lower-income women and men reported higher rates of fair or poor health than those with higher income; however, the magnitude of these differences varied substantially across LHINs.
- The proportion of lower-income women who rated their health as fair or poor ranged from 12 percent (North Simcoe Muskoka LHIN) to 29 percent (Mississauga Halton LHIN); in higher-income women the proportion ranged from seven percent (Champlain LHIN) to 14 percent (North West LHIN).
- Nearly a third (31 percent) of lower-income men in the North East LHIN reported their health as fair or poor.

POWER Study

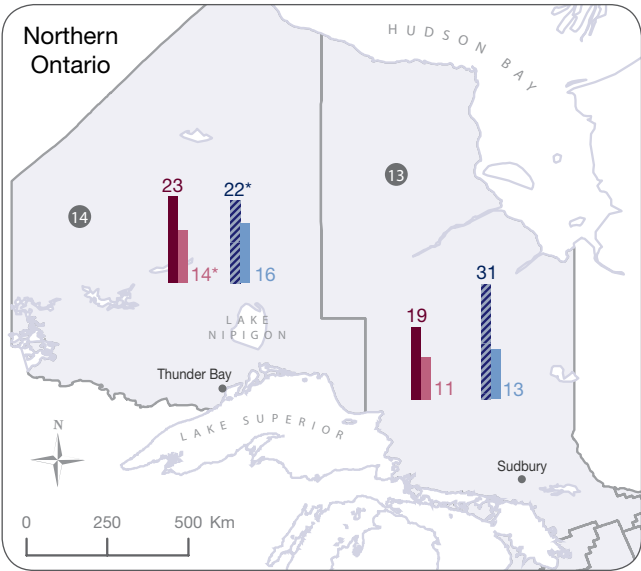
Overall Ontario

In Ontario, 20% of lower-income women, 10% of higher-income women, 21% of lower-income men and 10% of higher-income men reported their health as fair or poor.



Note: See Appendix 3.3 for definitions of annual household income categories

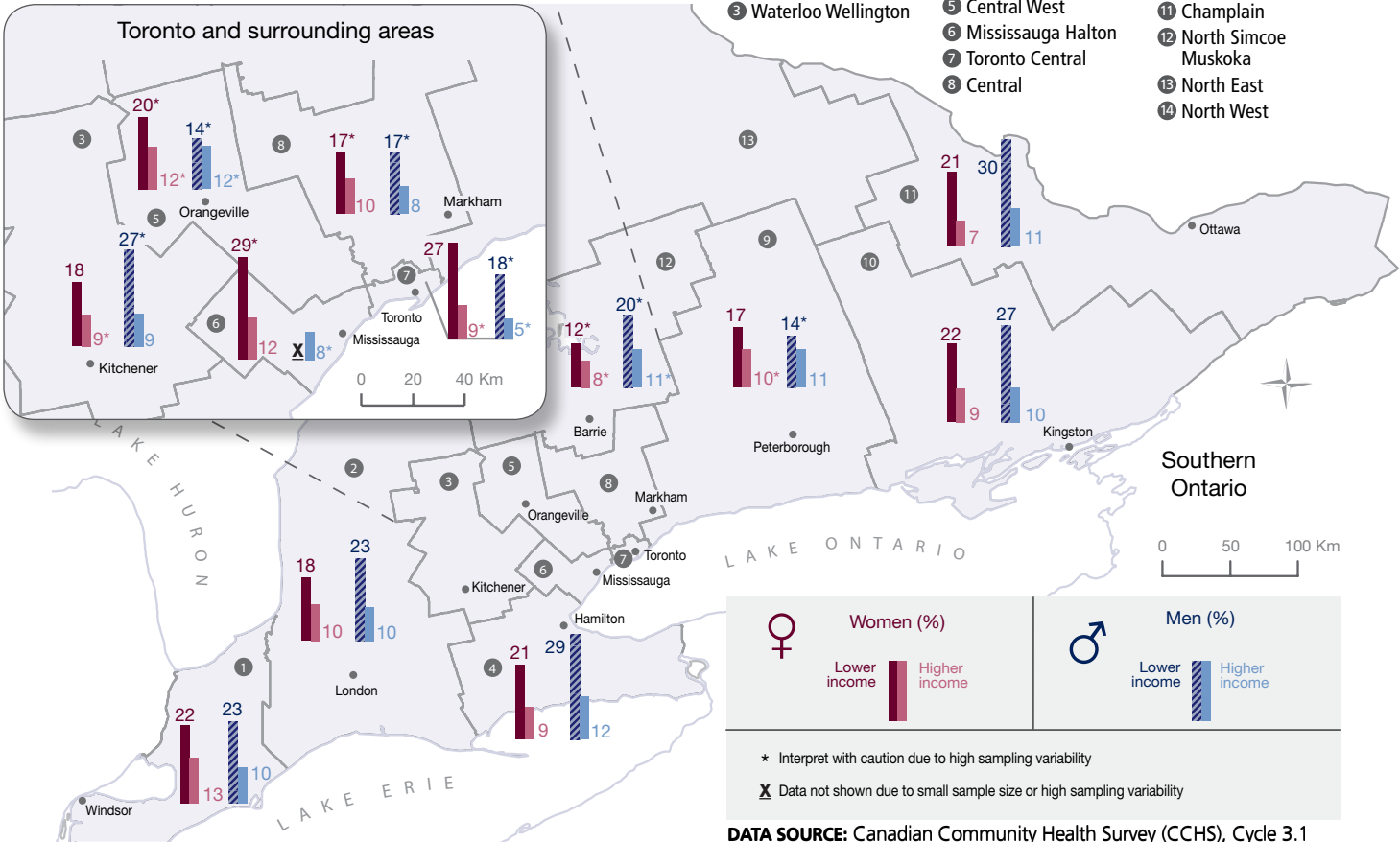
Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |

Toronto and surrounding areas



Women (%)



Men (%)



* Interpret with caution due to high sampling variability

X Data not shown due to small sample size or high sampling variability

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

SELF-RATED MENTAL HEALTH

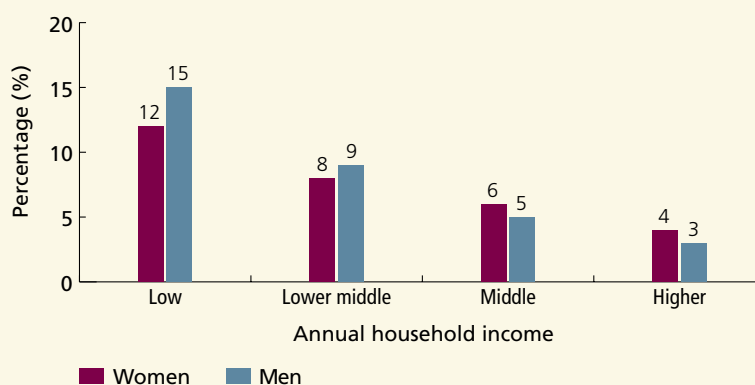
Self-rated mental health—also referred to as global, self-reported or self-perceived mental health—is an indicator of how people rate their overall mental health status. The percentage of the population who rated their mental health as being fair or poor is reported.

Overall, five percent of the adult population aged 25 and older in Ontario rated their mental health as fair or poor. Six percent of women and five percent of men rated their mental health as fair or poor.

EXHIBIT 3A.7 | Age-standardized percentage of adults aged 25 and older who reported their mental health as fair or poor, by sex and annual household income, in Ontario, 2005

FINDINGS

- The percentage of adults who reported their mental health as fair or poor increased as income level decreased.
- Low-income women were three times as likely as higher-income women to report their mental health as fair or poor.
- Low-income men were five times as likely as higher-income men to report their mental health as fair or poor.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

ACTIVITY LIMITATIONS

Activity limitations is an indicator of the percentage of the population who reported that their activities at home, school or work had been limited due to a long-term physical condition, mental condition or health problem.

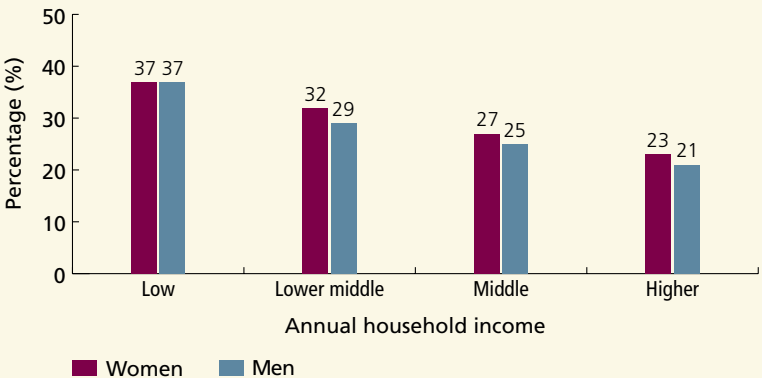
A long-term condition is one that is expected to last or has already lasted six months or more. The proportion of people with activity restrictions is a marker of population health status and will increase with population aging. A goal of public health and clinical practice is to improve functioning and reduce the proportion of the population whose health limits their everyday activities.

Overall, 25 percent of the adult population aged 25 and older in Ontario reported having activity limitations. Twenty-seven percent of women and 24 percent of men in Ontario reported having activity limitations.

EXHIBIT 3A.8 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations¥, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was a sizable income gradient in the percentage of adults who reported having activity limitations. The percentage of adults who reported having activity limitations increased as income level decreased. This pattern was similar for women and men.
- Over one-third of low-income women and men in Ontario reported having limitations in their ability to function at home, school or work.
- Women and men with lower levels of education were more likely to report activity limitations than those who had higher levels of education (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem

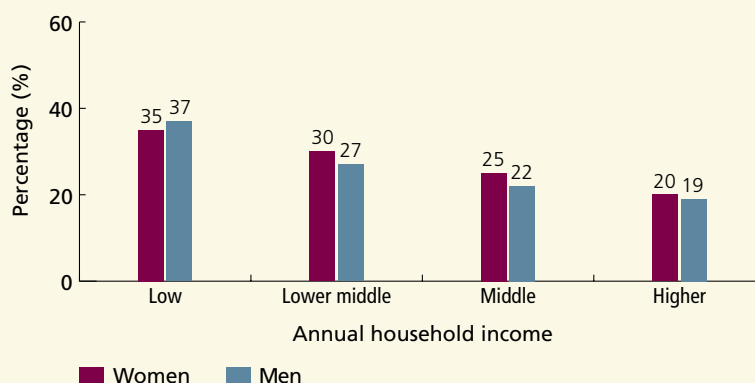
POWER Study

EXHIBIT 3A.9 | Age-specific percentage of adults aged 25 and older who reported having activity limitations¥, by sex and annual household income, in Ontario, 2005

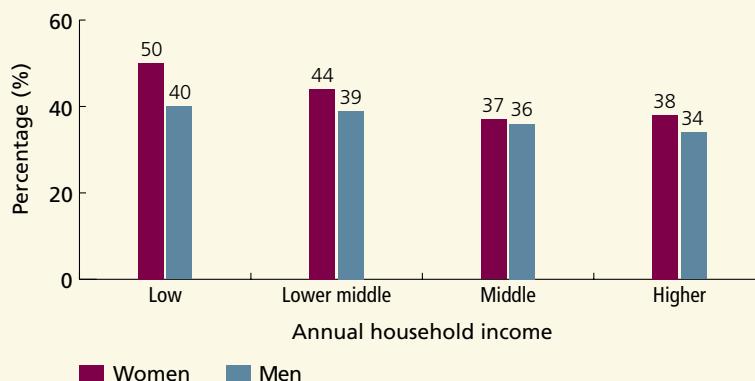
FINDINGS

- As expected, more seniors (aged 65 and older) reported having activity limitations compared to adults aged 25–64.
- In both age categories, the percentage of adults who reported having activity limitations increased as income level decreased.
- Fifty percent of low-income older women reported activity limitations, compared with 38 percent of higher-income older women. There was a similar pattern among adults aged 25–64, where 35 percent of low-income women vs. 20 percent of higher-income women reported activity limitations.

Aged 25-64



Aged 65 and older



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

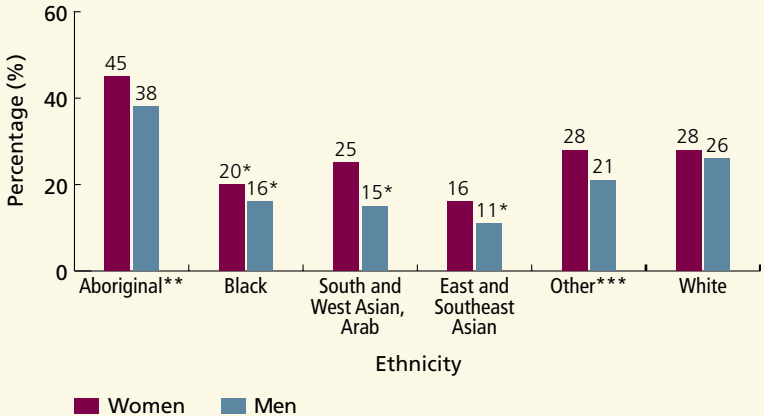
¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem

POWER Study

EXHIBIT 3A.10 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations¥, by sex and ethnicity, in Ontario, 2005

FINDINGS

- The proportion of adults who reported having activity limitations varied with ethnicity. Aboriginal women (45 percent) and men (38 percent) were most likely to report activity limitations.
- Members of some ethnic groups (e.g., East and Southeast Asian) were less likely to report activity limitations than other groups. This observation may be due to the healthy immigrant effect.^{29, 30}
- The extent of the differences between women and men in the proportion who reported activity limitations varied by ethnic group.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem

* Interpret with caution due to high sampling variability

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

NOTE: Ethnic group names are those used by Statistics Canada in the CCHS

POWER Study

EXHIBIT 3A.11 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations¥, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

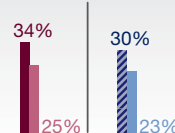
FINDINGS

- There were differences across LHINs in the proportion of women and men who reported having activity limitations.
- The percentage of lower-income women who reported activity limitations ranged from 28 percent (Central West) to 39 percent (Toronto Central and Hamilton Niagara Haldimand Brant LHINs). Among higher-income women, the percentage reporting activity limitations ranged from 22 percent (Toronto Central and Central LHINs) to 30 percent (North West LHIN).
- In the North East LHIN 43 percent of lower-income men reported having activity limitations.

POWER Study

Overall Ontario

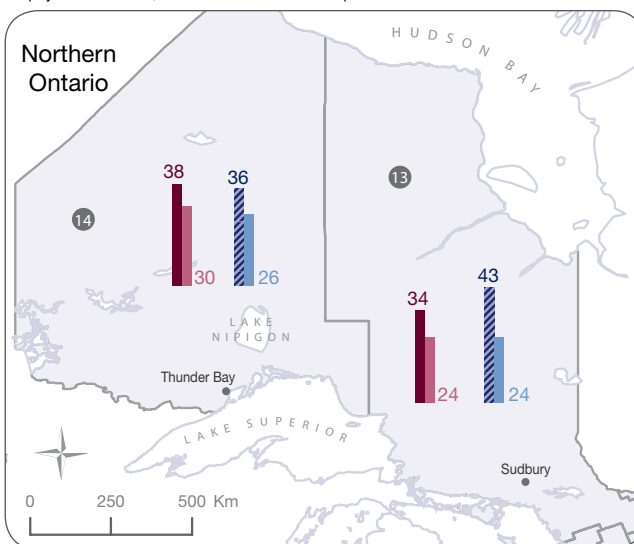
In Ontario, 34% of lower-income women, 25% of higher-income women, 30% of lower-income men and 23% of higher-income men reported having activity limitations.



Note: See Appendix 3.3 for definitions of annual household income categories

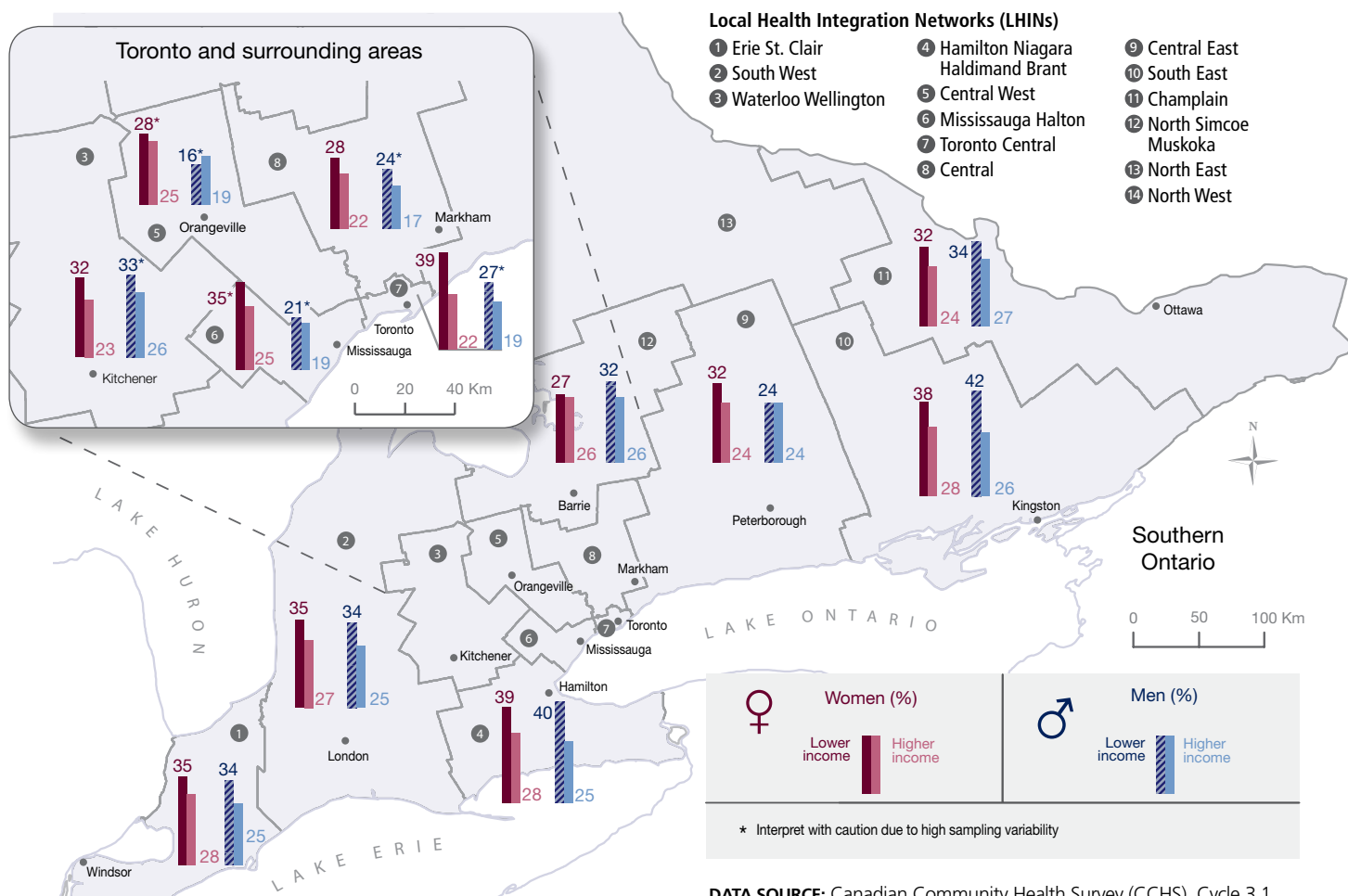
¥Activities at home, school or work that have been limited due to a long-term physical condition, mental condition or health problem

Northern Ontario



Local Health Integration Networks (LHINs)

- 1 Erie St. Clair
- 2 South West
- 3 Waterloo Wellington
- 4 Hamilton Niagara Haldimand Brant
- 5 Central West
- 6 Mississauga Halton
- 7 Toronto Central
- 8 Central
- 9 Central East
- 10 South East
- 11 Champlain
- 12 North Simcoe Muskoka
- 13 North East
- 14 North West



Women (%)

Lower income Higher income



Men (%)

Lower income Higher income

* Interpret with caution due to high sampling variability

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

PREVALENCE OF LIMITATIONS IN IADLS (INSTRUMENTAL ACTIVITIES OF DAILY LIVING) AND/OR ADLS (ACTIVITIES OF DAILY LIVING)

This indicator measures the percentage of the population who need the assistance of another person to carry out IADLs (Instrumental Activities of Daily Living—meal preparation, running errands, light and heavy household work and money management) and/or ADLs (Activities of Daily Living—washing, dressing, eating, taking medications, moving about inside the house).

IADL limitations represent difficulties in carrying out routine life activities and are generally interpreted as an indicator of mild to moderate disability. Limitations in ADLs reflect difficulty in carrying out self-care activities, and therefore represent a more severe disability. IADL and ADL limitations may result from either physical or mental impairments. Most people who report ADL limitations will also have IADL limitations.

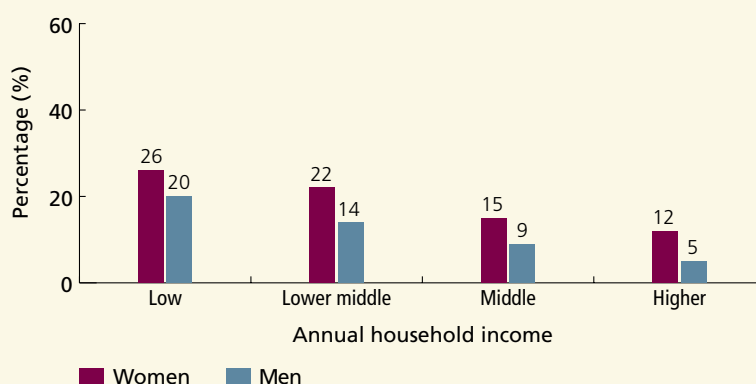
Overall, 16 percent of the adult population aged 25 and older in Ontario reported having IADL and/or ADL limitations in 2005. Twenty percent of women and 11 percent of men reported having limitations in IADLs and/or ADLs.

EXHIBIT 3A.12 | Age-specific percentage of adults aged 25 and older who reported having limitations in IADLs (Instrumental Activities of Daily Living) and/or ADLs (Activities of Daily Living), by sex and annual household income, in Ontario, 2005

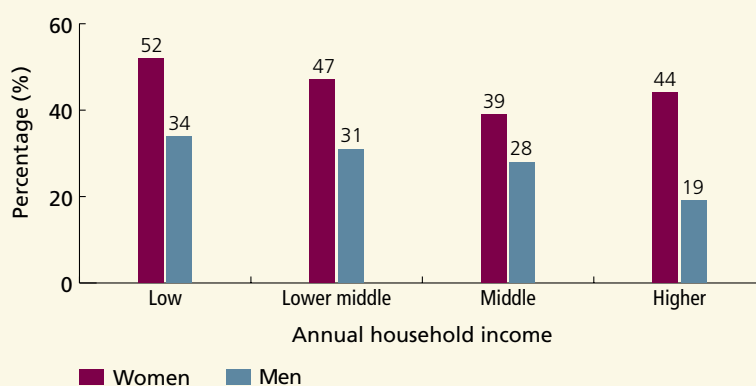
FINDINGS

- There was an income gradient in the percentage of adults reporting limitations in IADLs and/or ADLs among adults aged 65 and older and also among those aged 25–64.
- In both age groups women were more likely than men to report these limitations. The gap between women and men was especially large in those aged 65 and older, regardless of income.
- More than half of low-income women age 65 and older reported IADL and/or ADL limitations.
- Among adults aged 25–64, 26 percent of low-income women and 20 percent of low-income men reported having IADL and/or ADL limitations.
- Women and men with lower levels of education were also more likely to report IADL and/or ADL limitations than those who had higher levels of education (data not shown).

Aged 25–64



Aged 65 and older



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

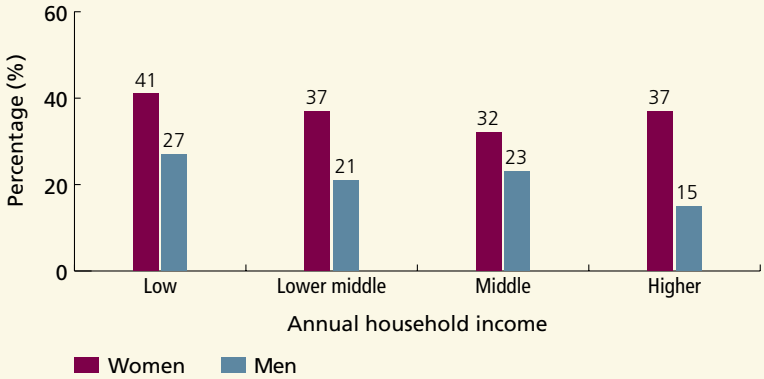
NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3A.13 | Percentage of adults aged 65 and older who reported having limitations in IADLs (Instrumental Activities of Daily Living), by sex and annual household income, in Ontario, 2005

FINDINGS

- In all income categories, older women (those aged 65 and older) were much more likely than older men to report having limitations in IADLs.
- Forty-one percent of low-income older women and 37 percent of higher-income older women reported having limitations in IADLs.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

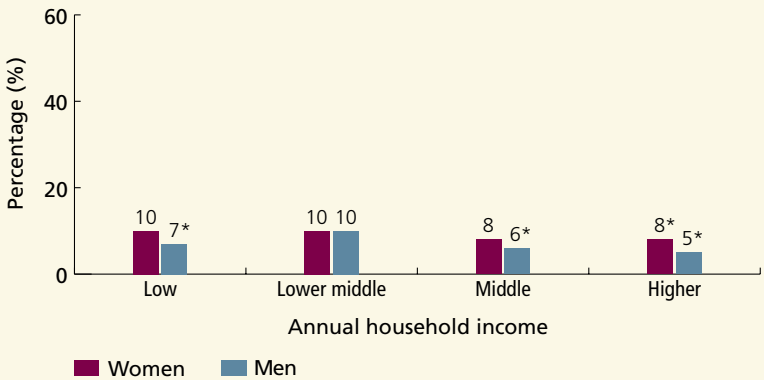
NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3A.14 | Percentage of adults aged 65 and older who reported having limitations in ADLs (Activities of Daily Living)**, by sex and annual household income, in Ontario, 2005

FINDINGS

- Among older women living in the community, eight to 10 percent reported limitations in ADLs across income levels.
- Among older men living in the community, five to 10 percent reported limitations in ADLs across income levels.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

* Interpret with caution due to high sampling variability

** These adults may also have limitations in Instrumental Activities of Daily Living (IADLs)

POWER Study

EXHIBIT 3A.15 | Age-standardized percentage of adults aged 25 and older who reported having limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs), by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

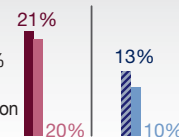
FINDINGS

- There was regional variation in the percentage of adults who reported having limitations in IADLs and/or ADLs. Women were much more likely to report limitations than men, regardless of their level of educational attainment.
- The magnitude of the differences in the percentage of adults reporting limitations that were associated with educational attainment varied across LHINs.
- The percentage of women with a secondary school education or less who reported having IADL and/or ADL limitations ranged from 18 percent (Central West and Champlain LHINs) to 23 percent (Central, South East, North West and Mississauga Halton LHINs); and from 15 percent (Waterloo Wellington LHIN) to 23 percent (North West and South East LHINs) in women with at least some post-secondary school education.

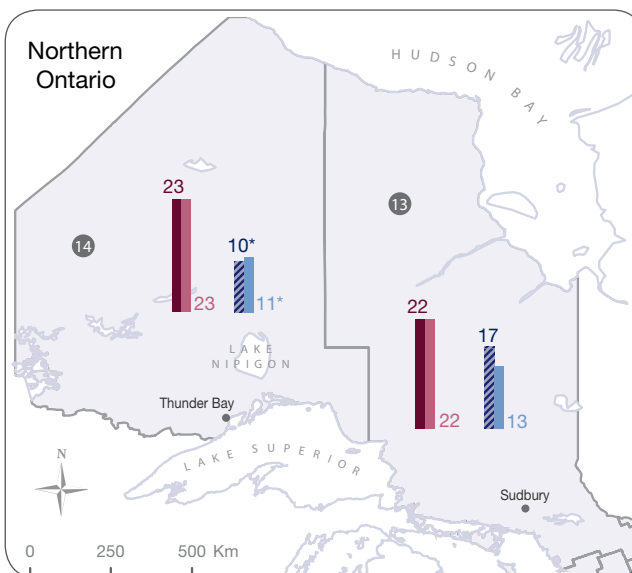
POWER Study

Overall Ontario

In Ontario, 21% of women with lower education, 20% of women with higher education, 13% of men with lower education and 10% of men with higher education reported having limitations in IADLs and/or ADLs.

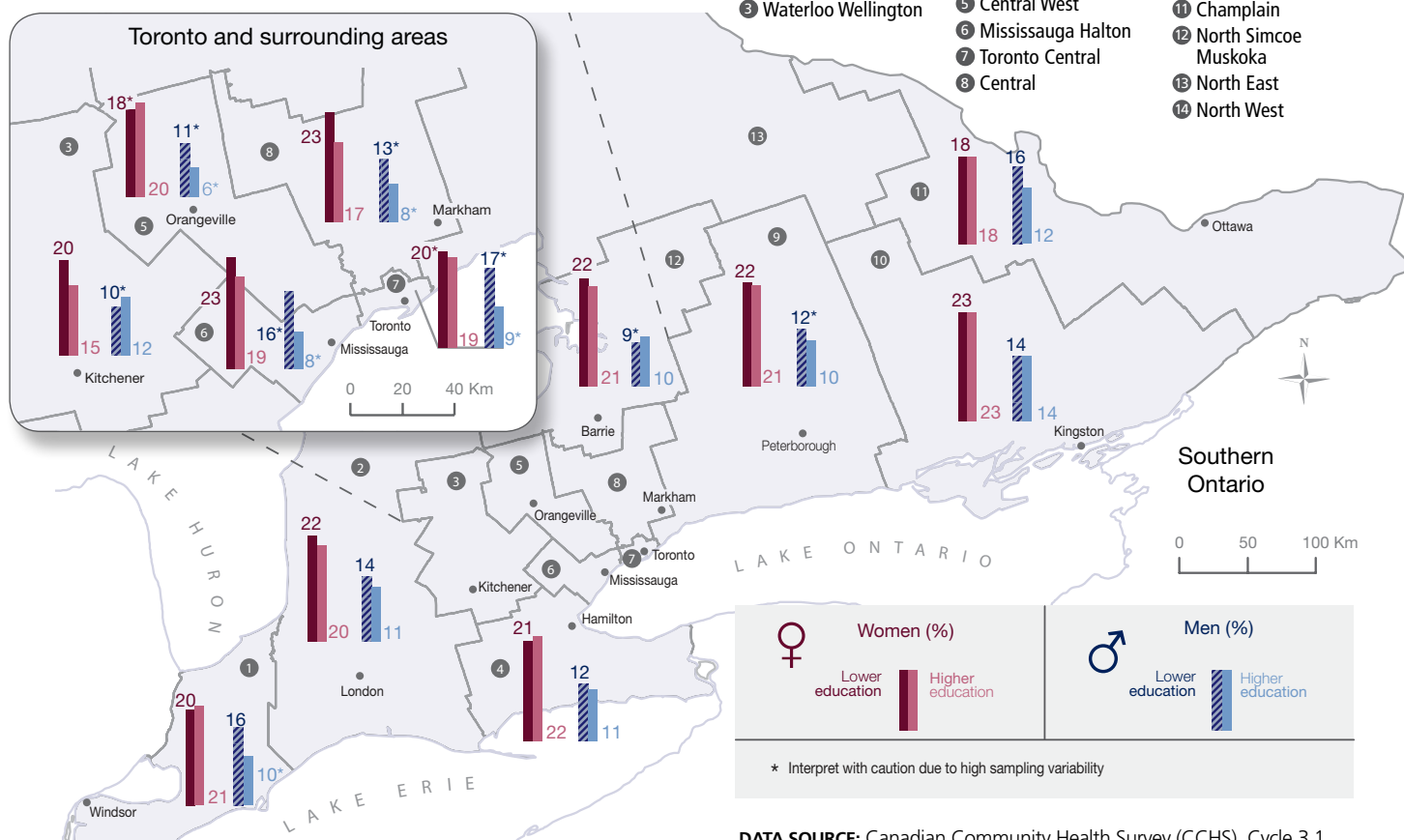


Note: Lower education denotes secondary school graduation or less



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



* Interpret with caution due to high sampling variability

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

ACTIVITIES PREVENTED BY PAIN OR DISCOMFORT

This indicator measures the proportion of the population who reported that at least some of their activities were prevented due to pain or discomfort.

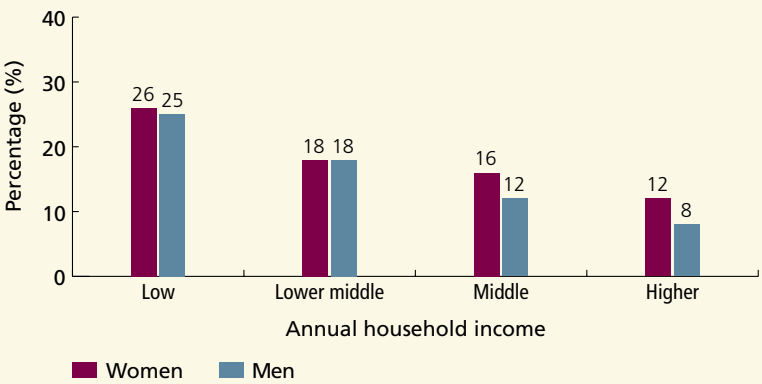
There are effective pain management strategies that can reduce the frequency and severity of chronic pain, therefore reducing its impact on daily activities.^{31, 32} Improvements on this indicator would represent improvements in functional status and quality of life.³³

Overall, 14 percent of the population aged 25 and older in Ontario reported having activity limitations due to pain or discomfort. Sixteen percent of women and 12 percent of men in Ontario reported having these limitations.

EXHIBIT 3A.16 | Age-standardized percentage of adults aged 25 and older who reported that their activities were prevented due to pain or discomfort, by sex and annual household income, in Ontario, 2000/01

FINDINGS

- There was an income gradient in the percentage of adults who reported that at least some of their activities were prevented due to pain or discomfort.
- One-quarter of low-income women and men in Ontario reported that their activities were limited by pain or discomfort.
- There was no difference between women and men in the percentage who reported pain-related activity limitations in both the low- and lower-middle income categories. Middle- and higher-income women were less likely than lower-income women (but more likely than men in these two income categories) to report that their activities were limited by pain or discomfort.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 1.1

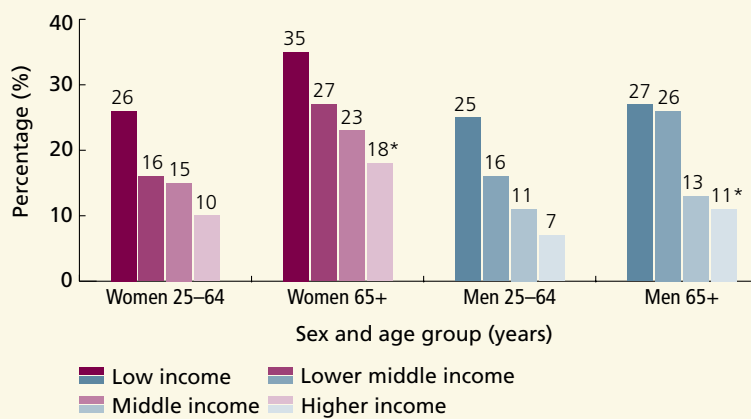
NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3A.17 | Age-specific percentage of adults aged 25 and older who reported that their activities were prevented due to pain or discomfort, by sex and annual household income, in Ontario, 2000/01

FINDINGS

- There was a large income gradient in the percentage of adults who reported that their activities were prevented due to pain or discomfort, for adults aged 25–64 and those aged 65 and older.
- Twenty-five percent of low-income women and men aged 25–64 reported having pain or discomfort which prevented at least some of their activities.
- Older women were the most likely to report that their activities were limited due to pain or discomfort, with more than one-third (35 percent) of low-income women aged 65 and older reporting these limitations.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 1.1

* Interpret with caution due to high sampling variability

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

HOSPITALIZATION RATE DUE TO FALL-RELATED INJURY AMONG SENIORS

Falls are the leading cause of injury-related hospitalizations for seniors in Canada.³⁴

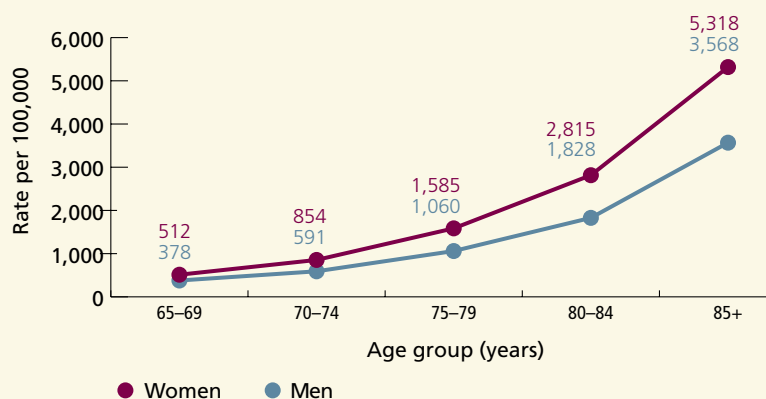
This indicator measures rates of fall-related hospitalizations for older adults in Ontario. Fall-related injuries represent a significant health problem, as the consequences of fall injuries are far-reaching and result in many long-term disabilities and health problems. These injuries can also result in loss of independence or lead to institutionalization. Almost half of seniors who fall experience a minor injury, and five percent to 25 percent suffer a serious injury such as a fracture.^{35, 36} Of all fall-related fractures, hip fractures cause the greatest number of deaths and lead to the most severe health problems and reduced quality of life. In fact, falls cause more than 90 percent of all hip fractures in seniors and 20 percent die within a year of the fracture.³⁷ There are effective public health and clinical interventions for reducing the rates of falls in seniors.

Overall, there were 23,923 fall-related hospitalizations in adults aged 65 and older in 2005/06 (16,692 in women and 7,231 in men). The rate of fall-related hospitalizations in that year was 1,483 per 100,000 adults aged 65 and older (1,837 per 100,000 women and 1,026 per 100,000 men).

EXHIBIT 3A.18 | Rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex, in Ontario, 2005/06

FINDINGS

- The number of fall-related hospitalizations increased with age for both women and men, with the highest rates observed among those aged 80 and older.
- Across all age groups, older women were more likely to be admitted to a hospital for fall-related injury than older men.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

POWER Study

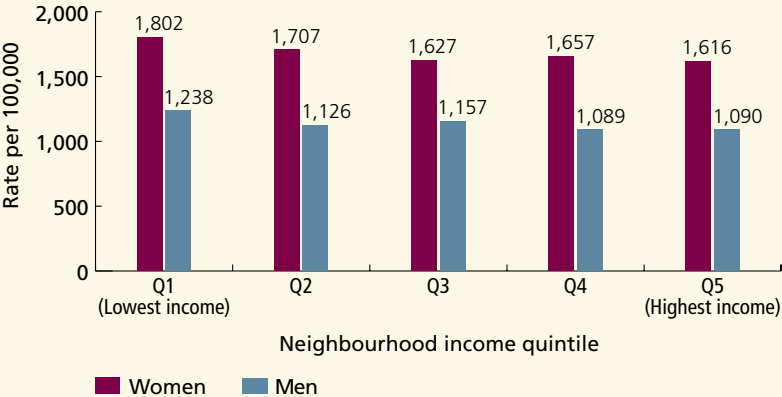


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EXHIBIT 3A.19 | Age-standardized rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- For all income groups, older women were approximately 50 percent more likely than older men to be admitted to a hospital for a fall-related injury.
- Low-income women and men were more likely to have a fall-related hospitalization than higher-income women and men, but the differences associated with income were not large.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 3A.20 | Age-standardized rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

LHIN	Women		Men	
	Lower-income	Higher-income	Lower-income	Higher-income
1. Erie St. Clair	1,877	1,771	1,343	1,158
2. South West	2,187	1,923	1,414	1,228
3. Waterloo Wellington	1,678	1,650	1,265	1,109
4. Hamilton Niagara Haldimand Brant	1,760	1,680	1,256	1,215
5. Central West	1,324	1,350	893	969
6. Mississauga Halton	1,550	1,556	1,057	987
7. Toronto Central	1,255	1,321	819	814
8. Central	1,475	1,319	940	975
9. Central East	1,655	1,473	1,060	1,004
10. South East	2,017	1,796	1,227	1,077
11. Champlain	1,885	1,668	1,398	1,241
12. North Simcoe Muskoka	2,071	1,988	1,589	1,467
13. North East	2,081	2,198	1,314	1,307
14. North West	1,950	1,958	1,326	1,405
Overall Ontario	1,742	1,622	1,171	1,105

FINDINGS

- Across all LHINs, women had a higher rate of fall-related hospitalizations than men.
- Rates of fall-related hospitalizations varied considerably across LHINs. For example, among lower-income women rates ranged from 1,255 per 100,000 (Toronto Central LHIN) to 2,187 per 100,000 (South West LHIN).
- The extent of the differences associated with income varied across LHINs.

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) and Statistics Canada Census 2001

NOTE: Lower-income includes the two lowest neighbourhood income quintiles (Q1 and Q2); higher-income includes the three higher neighbourhood income quintiles (Q3, Q4 and Q5); see [Appendix 3.3](#) for details about neighbourhood income calculation

POWER Study

Section 3A

SUMMARY OF FINDINGS

There were large and potentially modifiable differences in health and functional status associated with income and education in Ontario. Low-income and less educated women and men in Ontario were much more likely to report fair or poor health, fair or poor mental health, activity limitations, IADL and/or ADL limitations, and limitations in their activities due to pain or discomfort than those with higher income or more education. For example, low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest income group. Among seniors, low-income women and men were also somewhat more likely to be hospitalized due to a fall. While women and men reported a similar distribution of fair or poor health, women reported higher rates of disability. Older women had higher rates of fall-related hospitalizations than older men. There was also variation in health and functional status across the Local Health Integration Networks (LHINs).

Ethnicity and language was also associated with health and functional status. In particular Aboriginal women and men (off-reserve) were more likely to report fair or poor health and activity limitations than other ethnic groups, with Aboriginal women more likely to report fair or poor health or activity limitations than Aboriginal men. Ontarians who spoke only French or neither French nor English were more likely to report fair or poor health than Ontarians who spoke English.

Findings for the indicators reported in this section are summarized below.

Self-Rated Health

There were large differences in self-rated health in Ontario associated with income, education, ethnicity and language, as well as across LHINs. Ontarians were more likely to report fair or poor health if they had lower income; lower levels of educational attainment; spoke French only or neither French nor English; or were Aboriginal people (off-reserve).

Overall, low-income women and men were more than three times more likely to report fair or poor health than higher-income women and men—the magnitude of these differences varied across Ontario LHINs.

Self-Rated Mental Health

There were large differences in self-rated mental health associated with income. Low-income women and men in Ontario were much more likely to report fair or poor mental health than those with higher-incomes.

Activity Limitations

Ontarians with low income and less education were much more likely to report that their activities at home, school or work had been limited due to a long-term physical condition, mental condition, or health problem than those with higher income or more education. Over one-third of low-income women and men in Ontario reported having activity limitations. A sizable income gradient in activity limitations was observed among adults both over and under age 65. Aboriginal adults

(women more so than men) were more likely to report activity limitations than other ethnic groups. While the prevalence of activity limitations varied by LHIN, they were more prevalent in lower versus higher-income women and men across most LHINs.

IADL and ADL Limitations

Ontarians with low income and less education were much more likely to report having a disability—as measured by reported limitations in IADLs (Instrumental Activities of Daily Living) and/or ADLs (Activities of Daily Living)—than those with higher income or more education. There was an income gradient in the percentage of adults reporting IADL and/or ADL limitations among adults aged 25–64 and those aged 65 and older. In both age groups women were more likely to report IADL and/or ADL limitations than men. Among lower-income adults, over 50 percent of older women and 25 percent of women aged 25–64 reported having limitations in IADLs and/or ADLs. Among adults aged 65 and older, eight to 10 percent of women and five to 10 percent of men reported limitations in ADLs across income levels.

Activities Prevented by Pain

There was also an income gradient in the percentage of adults who reported that at least some of their activities were prevented due to pain or discomfort. One in four low-income women and men in Ontario reported having activity limitations due to pain or discomfort. Older women were most likely to report that their activities were



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
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limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting these limitations.

Fall-related Hospitalizations

The number of fall-related hospitalizations increased with age, for both women and men, with the highest rates observed among individuals aged 80 and older. Older women were approximately 50 percent more likely than older men to be admitted to a hospital for a fall-related injury. Low-income women and men were somewhat more likely to have a fall-related hospitalization than higher-income women and men. The rate of fall-related hospitalizations varied across LHINs.



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
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Section 3B

Chronic disease risk factors

INTRODUCTION

Chronic diseases are a major contributor to health inequities in Ontario.^{9, 38} Social determinants of health, such as income and education level, and health behaviours, such as smoking and sedentary lifestyle, increase the risk of developing chronic disease.⁵

Common, modifiable risk factors—smoking, obesity, physical inactivity, and inadequate fruit and vegetable intake – contribute to the development of many different chronic conditions including hypertension, cardiovascular disease, diabetes and cancer. Health behaviours are influenced by culture, living and working conditions, income, education, and by other social factors as well as by individual choices.^{10, 39, 40} Health behaviours such as poor diet and sedentary lifestyle are responsible for rising prevalence of obesity, a major public health concern.⁴¹ Food insecurity also increases the risk of obesity as lower-cost foods are often high in calories and fat.⁴² Poverty increases the risk of poor health and creates many barriers to accessing resources to improve health such as safe, well-designed neighbourhoods for physical activity or an affordable nutritious diet.⁴³ Low levels of health literacy associated with lower levels of educational attainment can make it more difficult to access and understand information about improving health.^{44, 45} This section provides an assessment of the prevalence of major risk factors for chronic disease among women and men in Ontario and how these vary by socioeconomic status, ethnicity and where one lives.

While the same risk factors contribute to the development of chronic disease for women and men,

there are gender differences in the prevalence of these risk factors.⁴⁶ Therefore, their relative contribution to the development of chronic disease in women and men also differs. In addition, women are more likely than men to live in poverty, be single parents, or have care-giving responsibilities that can create barriers to a healthy lifestyle.^{47, 48}

Population and public health interventions can be effective in reducing the prevalence of high-risk behaviours, as can chronic disease prevention services in clinical settings. To be successful, interventions need to address the contextual factors—socioeconomic, social and environmental—that influence health behaviours.³⁹ Policies that address the social determinants of health need to be an important component of efforts to reduce population risk for chronic disease.²⁵ To be most effective, prevention efforts must be tailored to gender differences, as well as target the specific needs of vulnerable population subgroups. Tracking these indicators over time can serve to monitor the effectiveness of these interventions.

In this section we report on indicators that assess selected health behaviours and social determinants of health known to increase the risk of developing common chronic conditions.

Social Determinants of Health

Income and **education** are measures of socioeconomic status and are important social determinants of health. A strong relationship has been consistently found between both income and education and health status, such that having lower income and lower levels of educational attainment greatly increases the risk of developing chronic disease.^{25,49,50} As it is possible to reduce the proportion of the population living in poverty, as well as increase the levels of educational attainment these indicators represent important, modifiable risk factors for chronic disease.

Food insecurity, or inadequate access to a healthy diet, is associated with worse health status and increased use of clinical services.⁵¹⁻⁵⁴ Because many lower-cost foods are high in fats and carbohydrates, food insecurity has also been linked to obesity.⁴² Good nutrition promotes health, reduces the risk of illness and chronic disease, and improves health outcomes among individuals with chronic conditions.

Health Behaviours

Physical inactivity increases the risk of many chronic conditions including cardiovascular disease, hypertension, cancer and osteoporosis. Physical activity is associated with positive mental health, leading to increased self-confidence and an improved sense of well-being. Physical inactivity is an important risk factor for being overweight or obese.

Inadequate fruit and vegetable consumption is associated with many negative health consequences including an increased risk of cancer, cardiovascular disease, stroke and the acceleration of many functional declines associated with aging.

Being overweight or obese is associated with numerous health problems including Type 2 diabetes, dyslipidemia, hypertension, ischemic heart disease, stroke, gallbladder disease, obstructive sleep apnea and certain cancers. Obesity costs Ontario \$1.6 billion annually: \$647 million in direct costs and \$905 million in indirect costs.⁵⁵ From 1985 to 2000, a total of 57,000 deaths in Canada were associated with being overweight or obese.⁵⁶

Smoking is linked to high relative risks of mortality and morbidity from cardiovascular and respiratory diseases and lung cancer, making tobacco use the leading preventable cause of premature death, disease and disability. In Ontario, tobacco-related disease results in approximately \$1.6 billion in health care annually, \$4.4 billion in productivity losses, at least 500,000 hospital days, and 16,000 deaths each year.⁵⁷

Ontario has had some success in reducing population risk by reducing the number of its citizens who smoke through Ontario's Smoke-Free Strategy.⁵⁸ Other initiatives through Ontario's Ministry of Health Promotion, Ministry of Health and Long-Term Care and Public Health Units are aimed at increasing physical activity, reducing obesity, and promoting healthy diets in Ontario. However, the prevalence of these risk factors remains high.⁵⁹ To be most effective, prevention efforts must be tailored to gender differences as well as target vulnerable population subgroups.

EXHIBITS AND FINDINGS

INCOME AND EDUCATION

Education and income are measures of socioeconomic status and are important social determinants of health.

They are both strongly associated with health and functional status and the risk of developing chronic disease. These indicators measure the percentage of the population who reported living in lower-income households or having lower levels of education, defined here as secondary school graduation or less.

Overall, 32 percent of Ontarians aged 25 and older reported having secondary school graduation or less and 21 percent lived in lower-income households in 2005. Among women, 33 percent reported having secondary school graduation or less, and 24 percent lived in lower-income households in 2005. Among men, 31 percent reported having secondary school graduation or less, and 18 percent lived in lower-income households in 2005.



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EXHIBIT 3B.1 | Percentage of adults aged 25 and older who reported a lower annual household income or less education, by sex and selected sociodemographic characteristics, in Ontario, 2005

Characteristic		Women Lower-income [^]	Men Lower-income [^]	Women Less education [¥]	Men Less education [¥]
Age group (years)	25–44	21	15	21	23
	45–64	18	15	34	31
	65–79	44	33	57	46
	80+	52	35	68	48
Ethnicity ^{**}	White	21	15	33	31
	Black	42	41	28	38
	East and Southeast Asian	27	29	27	22
	Arab, South and West Asian	47	38	41	25
	Other	32	27	29	33
	Aboriginal	44	34	47	43
Knowledge of official languages ^{**}	English only	22	16	33	34
	French only	36 [*]	53	46	77
	English and French only	19	11	24	24
	English or French with other language	28	23	30	25
	Neither English nor French	45	33	58	58
Urban and rural living ^{**}	Urban	24	18	32	30
	Rural	21	18	35	36
Length of immigration ^{**}	0–9 years	43	45	26	18
	10+ years	28	20	36	30
	Non-immigrants	20	14	32	32

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

** Age-standardized; ethnic group names are those used by Statistics Canada in the CCHS

[^] Lower-income includes the two lowest annual household income categories; see [Appendix 3.3](#) for definitions of annual household income categories

[¥] Less education denotes secondary school education or less

POWER Study

EXHIBIT 3B.1 | Percentage of adults aged 25 and older who reported a lower annual household income or less education, by sex and selected sociodemographic characteristics, in Ontario, 2005

FINDINGS

- The proportion of the population who reported lower income or a lower level of educational attainment varied by sex, as well as by age group, ethnicity, knowledge of official languages, rural or urban living, and length of immigration.

Age Group

- Across all age groups, women were more likely to report lower income than men, with differences greatest among women aged 65 and older. Forty-four percent of women aged 65–79 and 52 percent of those aged 80 and older reported lower income compared to 33 percent and 35 percent of men in those age groups, respectively.
- Among women and men aged 25–64, a similar proportion reported having a secondary school education or less. However, among adults aged 65 and older women were much more likely to report lower levels of educational attainment. Fifty-seven percent of women aged 65–79 and 68 percent of those over 80 years of age reported a secondary school education or less compared to 46 percent and 48 percent of men in those age groups, respectively.

Ethnicity

- There were large differences in income associated with race and ethnicity. White Ontarians were least likely to reside in lower-income households, including 21 percent of women and 15 percent of men. Women and men of all other racial and ethnic groups were more likely to report living in lower-income households. Forty-two percent of Black women and 41 percent of Black men resided in lower-income households, as did 44 percent of Aboriginal women and 34 percent of Aboriginal men, and 47 percent of Arab, South and West Asian women and 38 percent of Arab, South and West Asian men.

- There were also large differences in education associated with race and ethnicity. About one in three White Ontarians reported a secondary school education or less. East and Southeast Asians reported the highest levels of educational attainment with 27 percent of women and 22 percent of men reporting a high school education or less. Among Black Ontarians women had higher levels of educational attainment than men, whereas Arab, South and West Asian men reported higher levels of educational attainment than women. Forty-seven percent of Aboriginal women and 43 percent of Aboriginal men reported secondary school graduation or less.

Knowledge of Official Languages

- Languages spoken were also associated with income and education. Ontarians who spoke only French or neither French nor English were most likely to reside in low-income households and have a secondary school education or less. Only 11 percent of men who spoke both French and English resided in lower-income households.

Length of Immigration

- Despite higher levels of educational attainment than the overall Ontario population, immigrants who have resided in Canada for 0–9 years were much more likely to reside in lower-income households. Among these recent immigrants, 43 percent of women and 45 percent of men lived in lower-income households compared to 20 percent of women and 14 percent of men who were born in Canada.

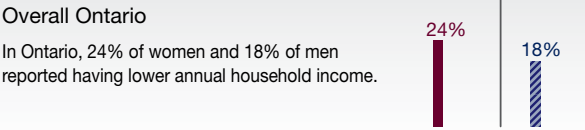
POWER Study

EXHIBIT 3B.2 | Age-standardized percentage of adults aged 25 and older who reported having lower annual household income, by sex and Local Health Integration Network (LHIN), in Ontario, 2005

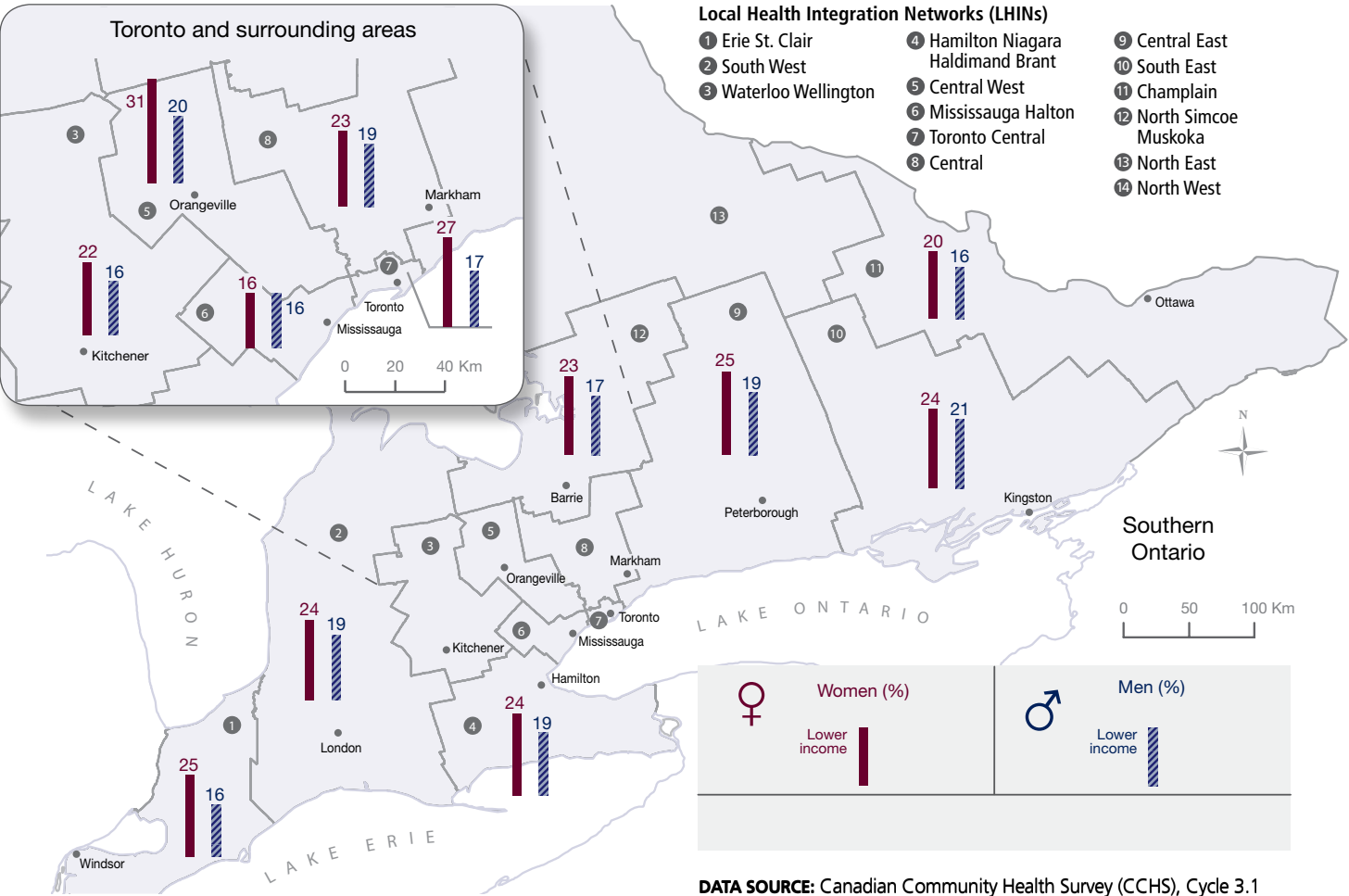
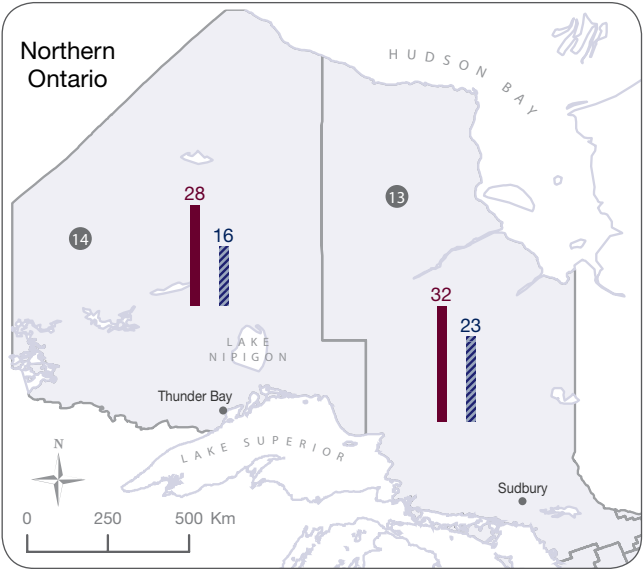
FINDINGS

- The percentage of adults who reported having lower household income (the two lowest annual household income categories) varied by LHIN.
- Across nearly all LHINs, women were more likely to report having lower household income than men.
- The North East LHIN had the highest percentage of low-income women (32 percent) and men (23 percent).

POWER Study



Note: See Appendix 3.3 for definitions of annual household income categories



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

EXHIBIT 3B.3 | Age-standardized percentage of adults aged 25 and older who reported having secondary education or less, by sex and Local Health Integration Network (LHIN), in Ontario, 2005

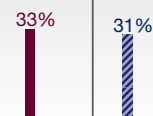
FINDINGS

- The percentage of adults who reported having secondary school graduation or less varied by LHIN.
- The magnitude and direction of the difference in the percentage of women and men who reported having less education also varied across LHINs.
- The percentage of women who reported having less education ranged from 25 percent (Toronto Central LHIN) to 41 percent (North East LHIN); and among men the percentage ranged from 19 percent (Mississauga Halton LHIN) to 42 percent (Central West LHIN).

POWER Study

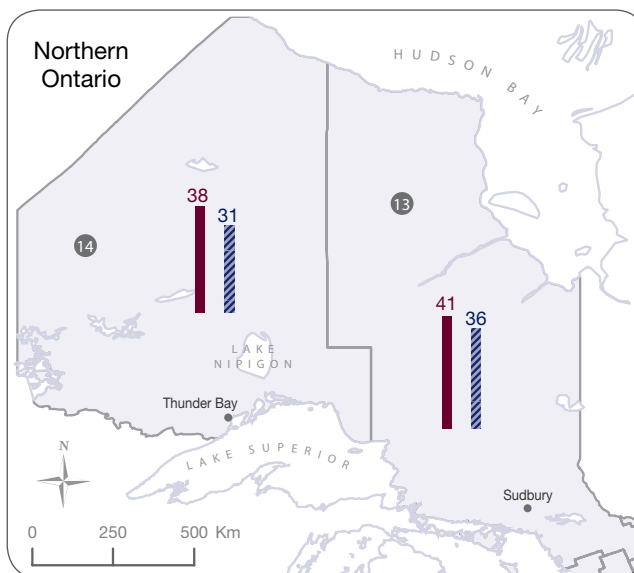
Overall Ontario

In Ontario, 33% of women and 31% of men reported having lower educational attainment.



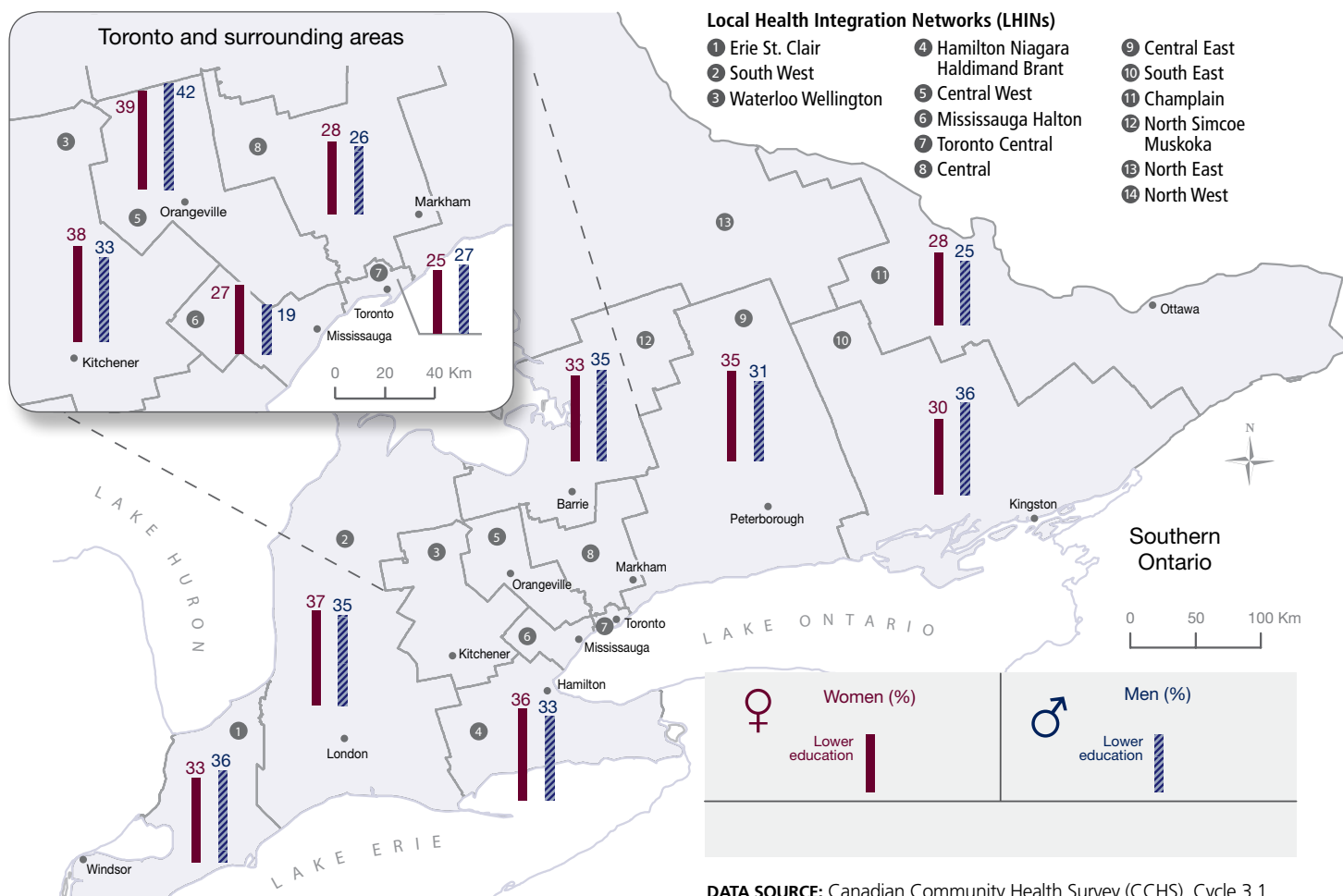
Note: Lower education denotes secondary school graduation or less

Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

FOOD INSECURITY

Food insecurity is an indicator of the percentage of adults who reported that due to a lack of money they or a member of their household did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods desired.

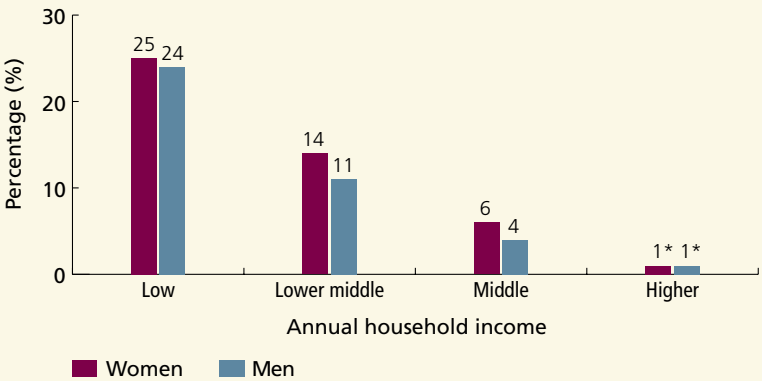
Good nutrition promotes health, reduces the risk of illness and chronic disease, and improves health outcomes among individuals with chronic conditions. As such, food insecurity is associated with worse health status and increased use of clinical services.

Overall, five percent of Ontario adults aged 25 and older reported food insecurity in 2005. Food insecurity was reported by six percent of women and four percent of men.

EXHIBIT 3B.4 | Age-standardized percentage of adults aged 25 and older who reported food insecurity, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was a large income gradient in the percentage of adults who reported food insecurity, with one-quarter of low-income women and men reporting that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods they desired due to a lack of money.
- Not surprisingly, food insecurity was not reported to be a problem in the higher-income category.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for a description of annual household income categories

* Interpret with caution due to high sampling variability

POWER Study

HEALTH BEHAVIOURS THAT INCREASE THE RISK OF CHRONIC DISEASE

This group of indicators measures the percentage of the population who reported four major factors that increase the risk for chronic diseases and their associated morbidity and premature mortality: physical inactivity, inadequate fruit and vegetable intake, being overweight or obese and smoking.

Physical Inactivity: This indicator measures the percentage of the population who reported physical inactivity (physical activity index of less than 1.5 kcal/kg/day).⁶⁰

Inadequate Fruit and Vegetable Intake: This indicator measures the percentage of the population who reported having inadequate fruit and vegetable consumption (less than five servings per day).

Being Overweight or Obese: This indicator measures the percentage of the population whose Body Mass Index (BMI), calculated from self-reported height and weight, is greater than or equal to 25. This indicator is particularly subject to measurement error as people may under or over report their height and weight.

Smoking: This indicator measures the percentage of the population who reported being current smokers (daily or occasional).

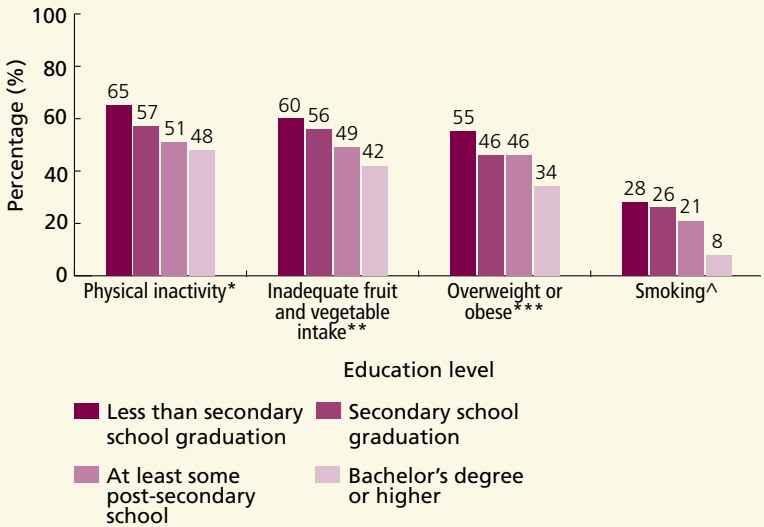
Overall, more than half of Ontario adults aged 25 and older reported physical inactivity (51 percent), inadequate fruit and vegetable intake (57 percent), and being overweight or obese (53 percent), while one fifth were current smokers (22 percent). Among women, 54 percent reported physical inactivity, 50 percent reported inadequate fruit and vegetable intake, 45 percent were overweight or obese and 19 percent were current smokers. Among men, 49 percent reported physical inactivity, 64 percent reported inadequate fruit and vegetable intake, 62 percent were overweight or obese and 24 percent were current smokers.

EXHIBIT 3B.5 | Age-standardized percentage of adults aged 25 and older who reported health behaviours that increase the risk of chronic diseases, by sex and education level, in Ontario, 2005

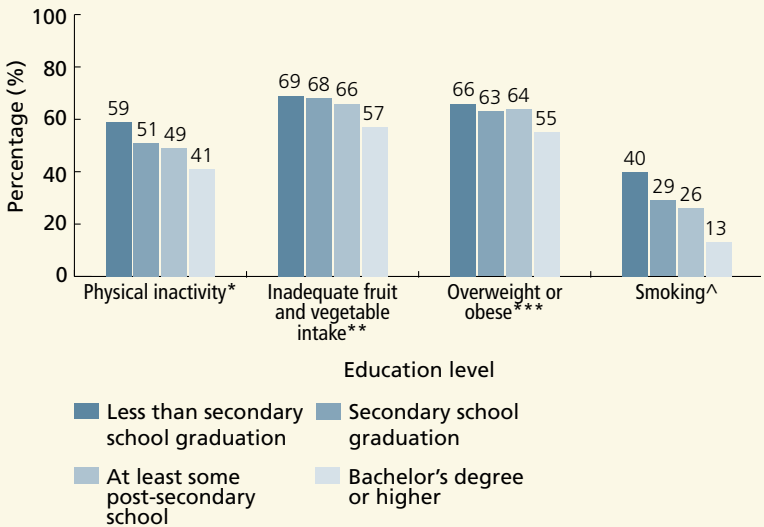
FINDINGS

- The proportion of Ontarians who reported these risk factors was high across all levels of education.
- Overall, lower levels of education were associated with a higher prevalence of factors that are known to increase the risk of chronic diseases. A similar pattern was observed for income (data not shown).
- Women and men with lower levels of education were more likely to report being physically inactive—65 percent of women and 59 percent of men with less than a secondary school education compared to 48 percent of women and 41 percent who had a Bachelor's degree or higher.
- Women and men with lower levels of education were more likely to report inadequate fruit and vegetable intake—60 percent of women and 69 percent of men with less than a secondary school education compared to 42 percent of women and 57 percent who had a Bachelor's degree or higher.
- Women and men with lower levels of education were more likely to be overweight or obese—55 percent of women and 66 percent of men with less than a secondary school education compared to 34 percent of women and 55 percent of men who had a Bachelor's degree or higher. The differences associated with education were larger for women.
- Women and men with lower levels of education were more likely to smoke—28 percent of women and 40 percent of men with less than a secondary school education compared to 8 percent of women and 13 percent of men who had a Bachelor's degree or higher.
- In general, women were somewhat more likely to report that they were physically inactive, but had a lower prevalence of inadequate fruit and vegetable intake, being overweight or obese and smoking, than men.

Women



Men



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Physical Activity Index of < 1.5 cal/kg/day⁶⁰

** Daily consumption of less than five servings of fruits and vegetables

*** Body Mass Index (BMI) ≥25, calculated from self-reported height and weight

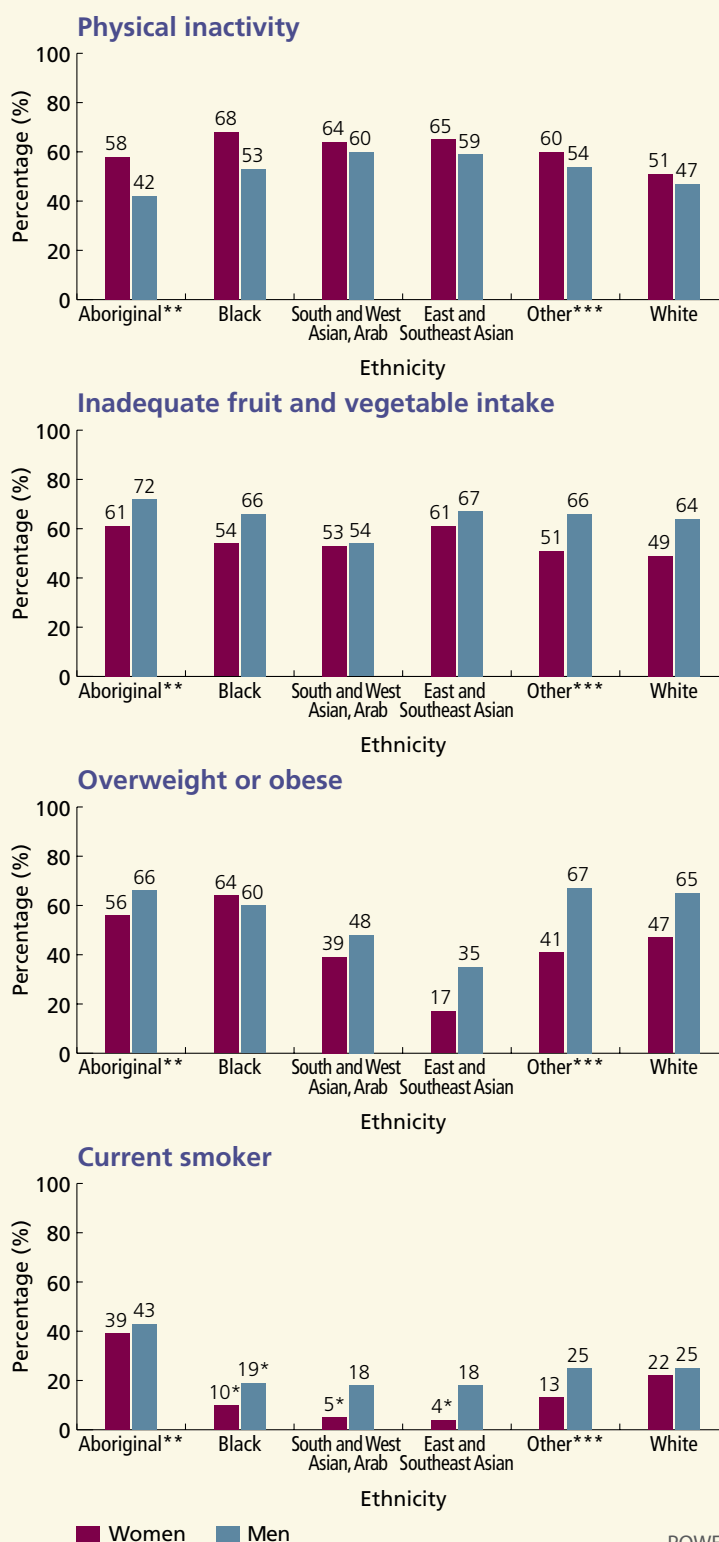
^ Current smokers (daily or occasional)

POWER Study

EXHIBIT 3B.6 | Age-standardized percentage of adults aged 25 and older who reported physical inactivity, inadequate fruit and vegetable intake, being overweight or obese, or being current smokers, by sex and ethnicity, in Ontario, 2005

FINDINGS

- The percentage of adults who reported health behaviours that increase the risk of chronic disease varied by ethnicity and sex.
- Aboriginal men were more likely to be physically active, but reported higher rates of inadequate fruit and vegetable intake, obesity and smoking than women.
- East and Southeast Asian women had the lowest prevalence of being overweight or obese (17 percent).
- East and Southeast Asian women (four percent), South and West Asian, and Arab women (five percent) were least likely to report that they were current smokers.
- Aboriginal women and men (39 percent and 43 percent, respectively), followed by White women and men (22 percent and 25 percent, respectively) were most likely to report that they were current smokers.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

NOTE: The ethnic group names are those used by Statistics Canada in the CCHS

POWER Study

EXHIBIT 3B.7 | Age-standardized percentage of adults aged 25 and older who reported physical inactivity**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

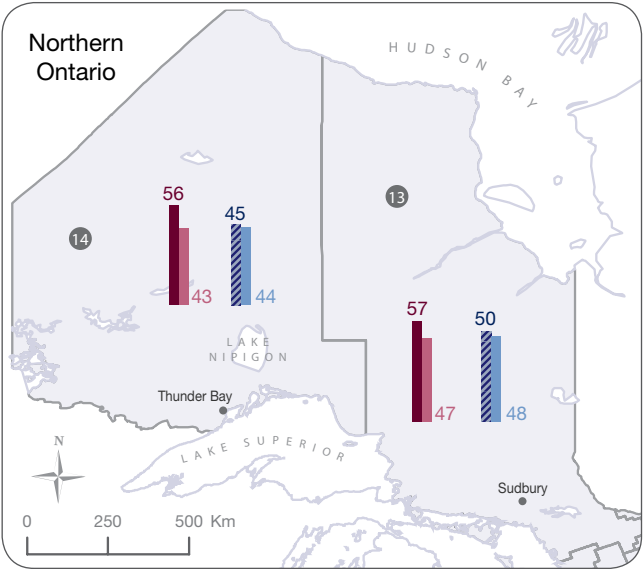
- There was variation across LHINs in the percentage of adults who reported being physically inactive.
- Across all LHINs women and men who had a secondary school education or less were more likely to report being physically inactive than women and men who had at least some post-secondary education.

POWER Study

Overall Ontario

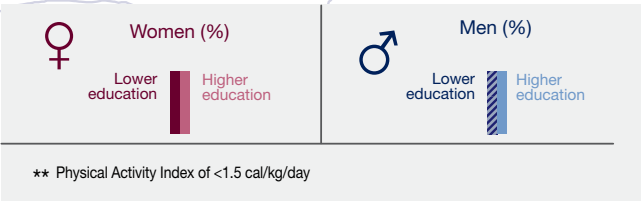
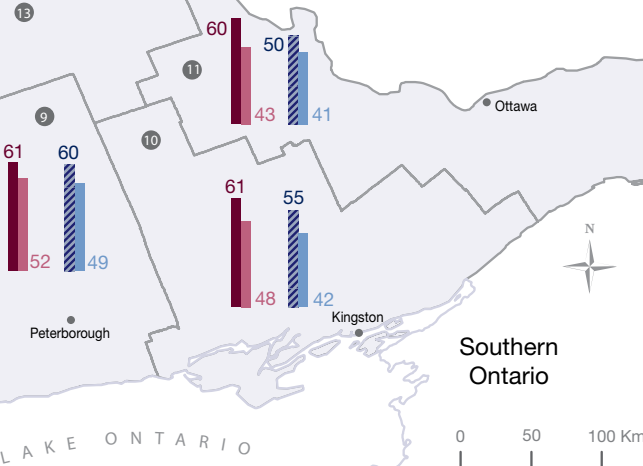
In Ontario, 61% of women with lower education, 50% of women with higher education, 55% of men with lower education and 46% of men with higher education reported physical inactivity.

Note: Lower education denotes secondary school graduation or less



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

EXHIBIT 3B.8 | Age-standardized percentage of adults aged 25 and older who reported having inadequate fruit and vegetable intake**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

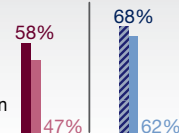
FINDINGS

- There was variation across LHINs in the percentage of adults who reported having inadequate fruit and vegetable intake.
- Across all LHINs, men were more likely to report inadequate fruit and vegetable intake than women; in several LHINs nearly three-quarters of less-educated men reported this risk factor.
- Women with less education were more likely to report having inadequate fruit and vegetable intake than those with more education. The same pattern was seen for men.

POWER Study

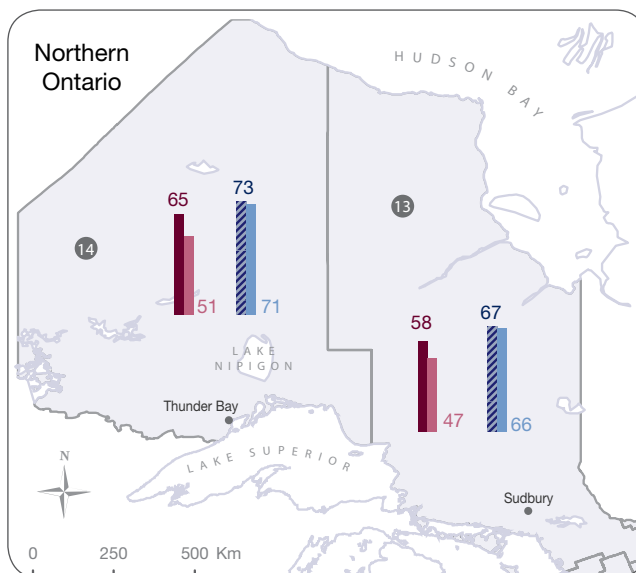
Overall Ontario

In Ontario, 58% of women with lower education, 47% of women with higher education, 68% of men with lower education and 62% of men with higher education reported having inadequate fruit and vegetable intake.



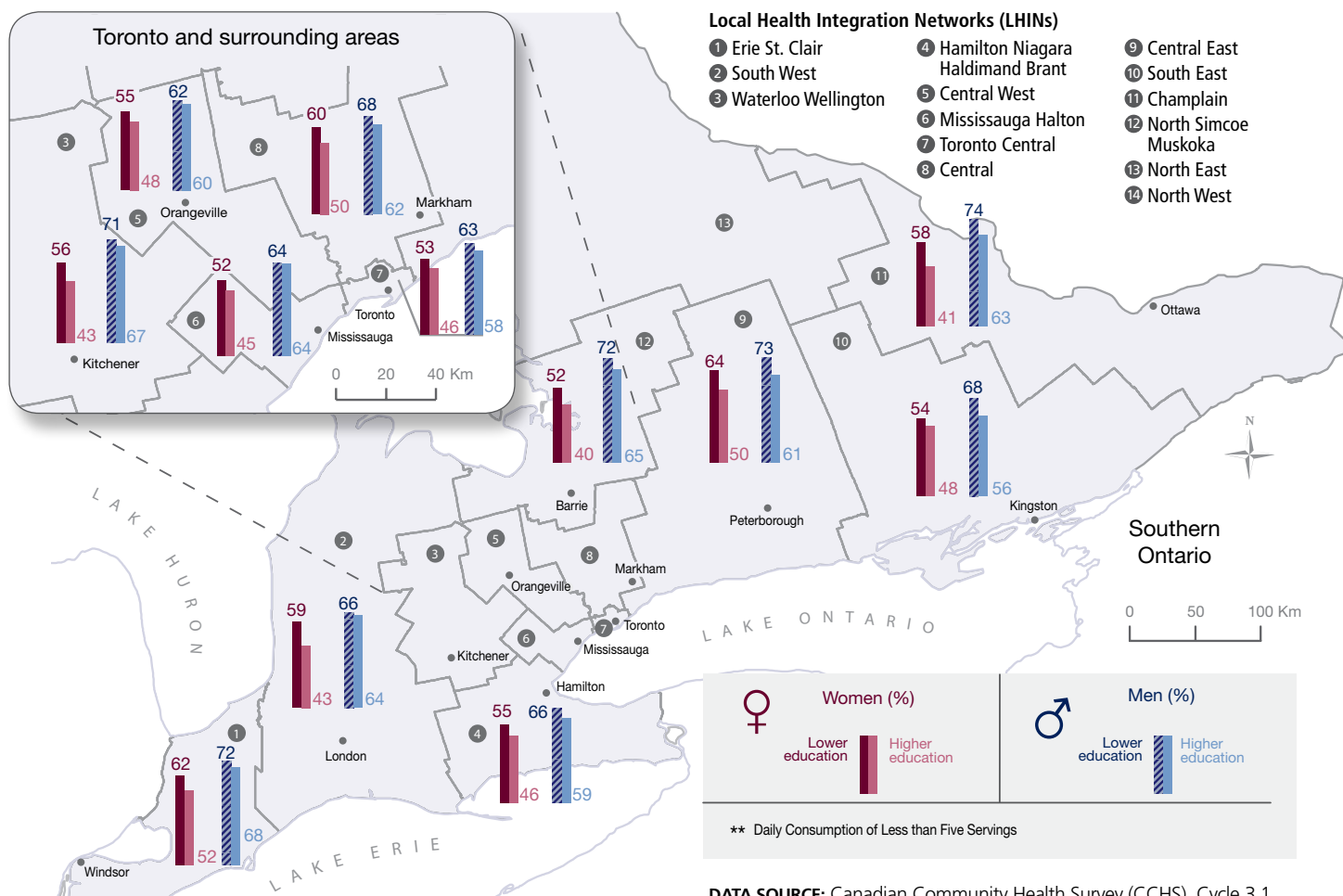
Note: Lower education denotes secondary school graduation or less

Northern Ontario



Local Health Integration Networks (LHINs)

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|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



Women (%)

Lower education Higher education



Men (%)

Lower education Higher education

** Daily Consumption of Less than Five Servings

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

EXHIBIT 3B.9 | Age-standardized percentage of adults aged 25 and older who were overweight or obese**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

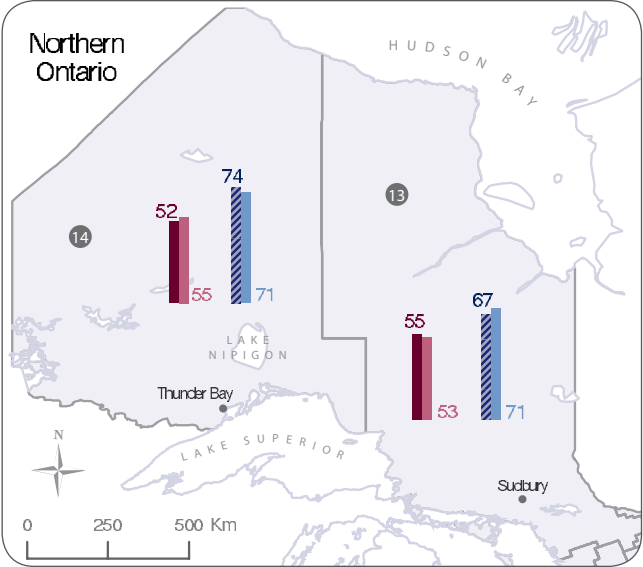
FINDINGS

- There was some variation across LHINs in the percentage of adults who were overweight or obese (using Body Mass Index calculated from self-reported height and weight).
- The percentage of women who were overweight or obese ranged from 45 percent (Central East LHIN) to 56 percent (Erie St. Clair LHIN) among those with less education; and from 35 percent (Central LHIN) to 55 percent (North West LHIN) among women who were more educated.
- The percentage of men who were overweight or obese ranged from 57 percent (Central LHIN) to 74 percent (North West LHIN) among those with less education; and from 54 percent (Toronto Central LHIN) to 71 percent (North East and North West LHINs) among men who were more educated.

POWER Study

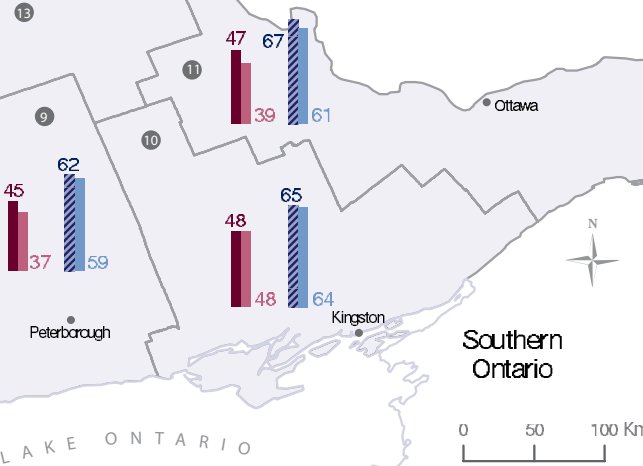
Overall Ontario
In Ontario, 50% of women with lower education, 42% of women with higher education, 64% of men with lower education and 61% of men with higher education were overweight or obese.

Note: Lower education denotes secondary school graduation or less



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



** Body Mass Index (BMI) ≤ 25 calculated from self-reported height and weight

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

EXHIBIT 3B.10 | Age-standardized percentage of adults aged 25 and older who reported being daily or occasional smoker, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

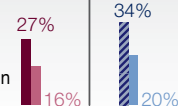
FINDINGS

- There was variation across LHINs in the percentage of adults who reported being current smokers.
- Reported smoking behaviour varied with education level, ranging from 11 percent in more educated women (in the Central and North West LHINs, respectively) and 15 percent in more educated men to 47 percent in less educated men (in the Champlain and Toronto Central LHINs, respectively).
- The magnitude of the difference between women and men with similar levels of education varied across LHINs.

POWER Study

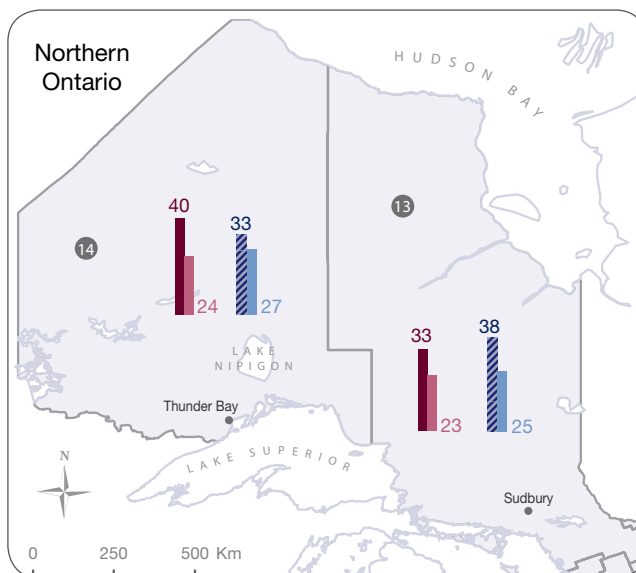
Overall Ontario

In Ontario, 27% of women with lower education, 16% of women with higher education, 34% of men with lower education and 20% of men with higher education reported being current smokers.



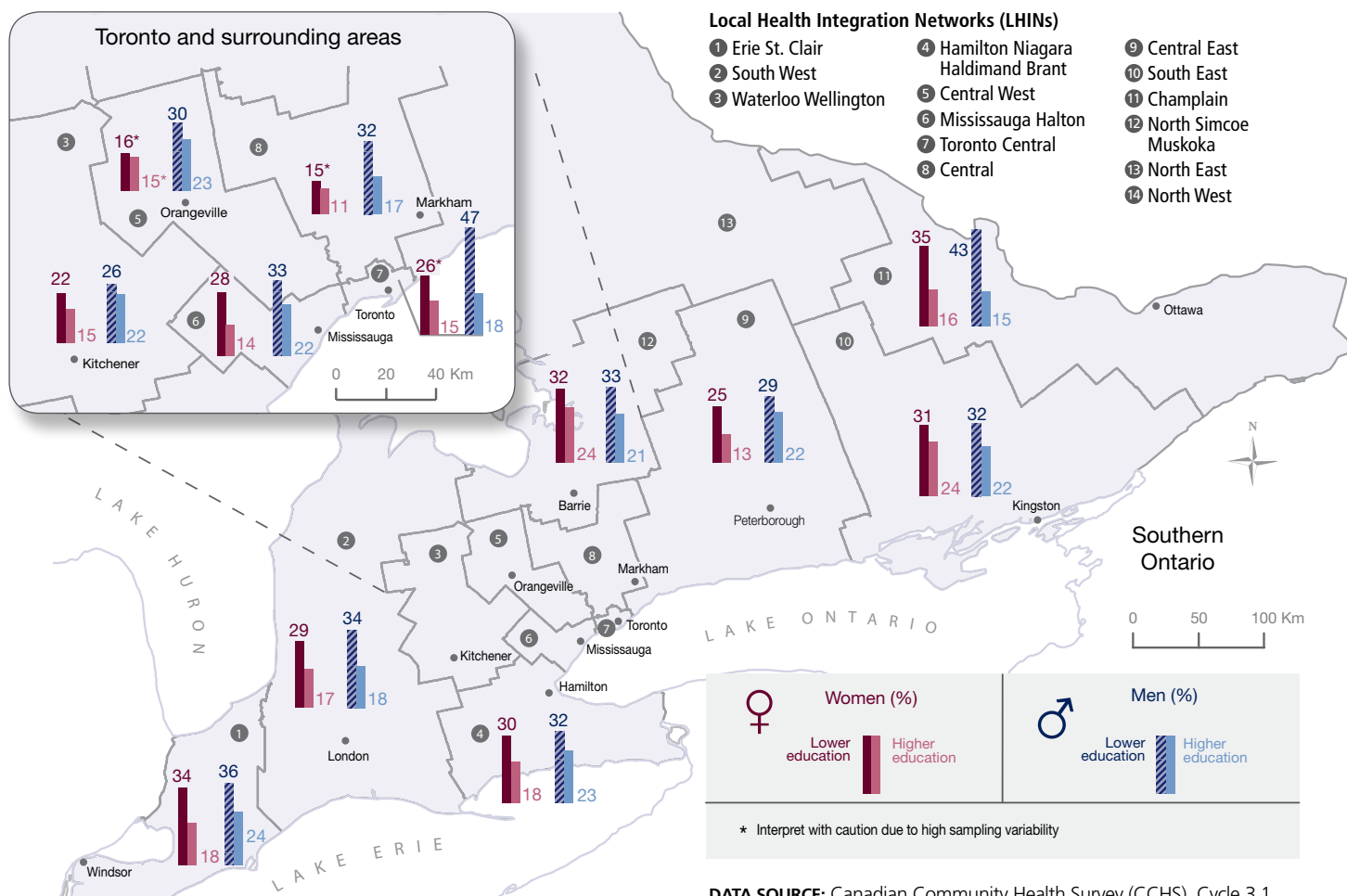
Note: Lower education denotes secondary school graduation or less

Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



Women (%)

Lower education Higher education



Men (%)

Lower education Higher education

* Interpret with caution due to high sampling variability

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

Section 3B

SUMMARY OF FINDINGS

Women were more likely to be living in lower-income households than men. The prevalence of low-income and lower levels of educational attainment varied by age, gender, ethnicity, language spoken and length of time residing in Canada. Food insecurity was common among low-income Ontarians with one in four reporting challenges in accessing a healthy diet. The proportion of Ontarians who reported health behaviours that increase the risk of chronic disease—smoking, obesity, physical inactivity, and inadequate fruit and vegetable intake—was, in general, high across all levels of education and income. There were sizable and modifiable differences in the prevalence of these risk factors associated with education, income and ethnicity. Lower levels of education and income were consistently associated with a higher prevalence of these risk factors. In general, women were somewhat more likely to report that they were physically inactive than men, but had a lower prevalence than men of inadequate fruit and vegetable intake, being overweight or obese and smoking. Across the Local Health Integration Networks (LHINs), there was also variation in income and education, food insecurity and health behaviours that increase the risk of chronic disease.

Findings for the indicators reported in this section are summarized below.

Income and Education

Across all age groups, women were more likely to report lower income than men, with differences greatest among those aged 65 and older. Among men and women aged 25–64, a similar proportion reported having a secondary school education or less. However, among adults aged 65 and older, women

were much more likely than men to report lower levels of educational attainment. There were large differences in income associated with ethnicity. White Ontarians were least likely to reside in lower-income households. Women and men of all other ethnic groups were more likely to report living in lower-income households. There were also large differences in education associated with ethnicity. East and Southeast Asians reported the highest levels of educational attainment. Among Black Ontarians, women had higher levels of educational attainment than men, whereas among Arab, South and West Asians, men reported higher levels of educational attainment than women. Forty-seven percent of Aboriginal women and 44 percent of Aboriginal men reported secondary school graduation or less. Languages spoken were also associated with income and education. Ontarians who spoke only French or neither French nor English were most likely to report residing in low-income households and having a secondary school education or less. Despite higher levels of educational attainment than the overall Ontario population, immigrants who have resided in Canada for 0–9 years were much more likely to reside in households with lower income. There was variation in the proportion of men reporting low income and lower levels of education across the LHINs.

Food Insecurity

While overall five percent of Ontarians report food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods they desired due to a lack of money.



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
 Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2009.

Health behaviours that increase the risk of chronic disease

The percentage of adults who reported health behaviours that increase the risk of chronic disease was high and varied by sex, education, income, ethnicity and geography. Lower levels of education and income were consistently associated with a higher prevalence of these risk factors. Ontario women were more physically inactive but had lower rates of inadequate fruit and vegetable intake, being overweight or obese and smoking than men. East and Southeast Asian women had the lowest prevalence of being overweight or obese. East and

Southeast Asian, South and West Asian and Arab women were least likely to report that they were current smokers, while 39 percent of Aboriginal women reported smoking. Aboriginal men had the lowest rates of physical inactivity but reported higher rates of inadequate fruit and vegetable intake, being overweight or obese and smoking. There was variation in the prevalence of these risk factors and the magnitude of the difference between men and women across LHINs.



Section 3C

Chronic Conditions

INTRODUCTION

Chronic conditions have a large impact on quality of life and the affected individual's ability to function and work, while placing enormous demands upon the health care system.

In this section we report on selected chronic health conditions—hypertension (high blood pressure), arthritis, obstructive lung disease (asthma, chronic bronchitis, emphysema and chronic obstructive pulmonary disease), diabetes, heart disease and stroke, urinary incontinence and depression and how they vary by gender and income. These conditions are among the most prevalent in Canada and cause substantial burden to individuals, their families, the health care system and society as a whole. According to the Public Health Agency of Canada (PHAC), 16 million Canadians live with a chronic illness, and more than half of these are women.⁶¹ Furthermore, chronic diseases are estimated to account for 87 percent of disability in Canada. In 2007, PHAC estimated that 67 percent of total health care costs were due to chronic diseases, with an additional \$52 billion in indirect costs due to loss of productivity and foregone income.⁶¹ As the population of Ontario ages, the prevalence of chronic disease and its associated burden will continue to rise.

The causes of chronic disease are multi-factorial; many of them are modifiable. As such, it is possible to prevent much of the morbidity and premature mortality associated with chronic illness. Factors which contribute to the development of chronic conditions include lifestyle, such as diet, body weight, physical activity level, smoking and drinking; environmental exposures; and genetics.^{62, 63}

Many of the risk factors for different chronic conditions are the same. Therefore, many people with chronic illness have more than one condition. For example smoking increases the risk of lung disease, heart disease, stroke and cancer; obesity increases the risk of arthritis, diabetes, heart disease, hypertension and cancer.

Patterns of chronic disease and their consequences differ for women and men. For example, women are more likely than men to have arthritis, which leads to higher rates of disability. Women usually develop heart disease about ten years later than men, but women who have diabetes lose this advantage. Women are more likely to experience depression or have multiple chronic conditions than men.

The prevalence of chronic disease also varies by ethnicity. Aboriginal people have a higher prevalence of diabetes than Canadians of European origin. South Asians are at increased risk for heart disease. Furthermore, socioeconomic position is strongly associated with an increased burden of common chronic conditions and comorbidity. Individuals with low income and/or less education are more likely to have chronic illness and comorbidity than those who have higher income or more education.^{50, 64, 65}

While much can be done to reduce the burden of illness and disability associated with chronic disease, a number of important challenges exist. First, prevention through both public health and clinical services has traditionally been under-resourced. Second, while there is considerable

evidence that chronic disease prevention and management can be improved through implementation of the Chronic Disease Model together with performance measurement and quality improvement,^{66, 67} the Ontario health system does not have all the necessary elements in place to make this happen. In fact, numerous studies have identified gaps in the quality of care for chronic disease. A recent study in Ontario reported that fewer than half (47 percent) of Ontarians with diabetes have their blood pressure or blood sugar under control.⁶⁸

The mismatch between the way we deliver care and the needs of patients with chronic illness disproportionately affects those with the highest burden of disease; women, people with low income or low levels of education and some ethnic minorities (including Aboriginal people). Furthermore, these groups are at greater risk for receiving care of suboptimal quality, as gender, socioeconomic, and ethnic disparities in quality of care have all been well-documented. Therefore, Ontarians with the greatest needs are also at the greatest risk for worse health outcomes.

In this section we report on indicators that assess the prevalence of common chronic conditions and comorbidity (multiple chronic conditions).

Hypertension (High blood pressure)

- High blood pressure is a major risk factor for congestive heart failure and stroke. Five million Canadian adults have high blood pressure, representing 22 percent of the adult population.⁶⁹
- The risk of hypertension can be reduced by maintaining a healthy weight, being physically active, and limiting the amount of salt in the diet.
- Women are somewhat more likely than men to be diagnosed as having high blood pressure.

Arthritis

- Arthritis is one of the most prevalent chronic conditions in Canada and is a leading cause of pain, physical disability and health care utilization in Ontario.

- Arthritis accounts for over \$17 billion annually in health care expenses and lost workdays. As the baby boomer population ages, the burden of illness due to arthritis will continue to rise. It has been estimated that one million more Canadians per decade will be diagnosed with arthritis.⁷⁰
- Women experience a higher prevalence of arthritis than men.
- Women with arthritis are more likely than women with other chronic conditions to experience long-term disability, report worse health status, experience pain and be dependent upon others for assistance.

Obstructive lung disease

- Obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease [COPD]) is an important cause of morbidity and mortality, and often leads to activity restrictions. These conditions cause obstruction of airflow in the lungs that interferes with normal breathing.
- In childhood, asthma is more common among boys than girls; however, beyond childhood women are more likely to develop asthma than men.⁷¹
- Historically, men were more likely to get COPD than women due to higher rates of smoking, but since the rate of smoking among women has increased, the rate of COPD among women has also increased.
- Important risk factors for obstructive lung disease include exposure to tobacco smoke, long-term exposure to air pollution (both in the home and outdoors) and occupational exposures.

Diabetes

- About 900,000 Ontarians live with diabetes (8.8 percent of the province's population) and this number is expected to grow to 1.2 million by 2010.⁷²
- Diabetes and its complications (e.g., heart disease, stroke, kidney disease and blindness) cost the health care system over five billion dollars annually.

- The number of people with diabetes is projected to increase substantially over the next 20 years, largely as a result of increases in rates of obesity and physical inactivity, and the aging of the population.⁷²
- Lifestyle changes—healthy diet, physical activity and maintaining a healthy weight—reduce the risk of developing diabetes. Evidence-based disease management can greatly reduce the risk of developing complications from the disease.

Heart disease or stroke

- Cardiovascular disease (heart disease and stroke) is a leading cause of morbidity and mortality for both women and men in Ontario.
- The onset of coronary heart disease (CHD) in women lags behind men by about 10 years due to the protective effect of estrogen prior to menopause. Although the prevalence of CHD among women before menopause is lower than that in men, this difference narrows with age—at age 80 the prevalence of CHD is nearly equal for women and men.
- Although men are more likely than women to have a stroke, women are more likely than men to die from stroke, primarily because women who have strokes are older and stroke mortality is higher with increasing age.
- As for other chronic conditions, lifestyle changes—healthy diet, physical activity, maintaining a healthy weight, and smoking cessation—reduce the risk of developing heart disease or stroke, and evidence-based disease management can greatly reduce the risk of developing complications from chronic diseases.

Urinary incontinence

- Urinary incontinence, or the involuntary leakage of urine, is more common in women than in men.
- Urinary incontinence can have a large impact on quality of life and functional status.
- It is a common problem among older adults and is a leading cause of institutionalization among the elderly, with at least 50 percent of long-term care facility admissions listing a diagnosis of incontinence.

- Many people believe that urinary incontinence is a normal part of aging, when in fact it is not. For this reason, many people don't seek medical help and never get properly diagnosed.⁷³

Depression

- Depression is a chronic mental health condition which causes clinically significant distress or impairment in physical, social, occupational and other key areas of functioning.
- Women are twice as likely as men to experience an episode of depression in their lifetime. Factors such as stress, violence, poverty, inequality, sexism, caregiving, relational problems and low self-esteem are thought to increase women's vulnerability to depression.
- Effective treatment can greatly reduce morbidity associated with depression.

Comorbidity (Multiple Chronic Conditions)

- Because many of the risk factors for different chronic conditions are the same (e.g., diet, lack of physical exercise, and smoking) many people with chronic illness have more than one chronic condition.
- The majority of adults aged 65 and older have two or more chronic conditions.
- Women are more likely to have multiple chronic conditions than men.
- People who have multiple chronic conditions require coordinated patient-centred care to optimize health outcomes.

There are a number of initiatives in Ontario aimed at reducing illness burden from chronic disease. For example, the Ontario Ministry of Health Promotion supports chronic disease prevention through the Chronic Disease Prevention Program (CDP). The CDP aims to reduce the premature mortality and morbidity from preventable chronic diseases. The recently released diabetes strategy of the Ministry of Health and Long-Term Care seeks to implement a chronic disease model for diabetes care.⁷²

EXHIBITS AND FINDINGS

PREVALENCE OF SELECTED CHRONIC CONDITIONS

This group of indicators measures the prevalence of selected chronic conditions (the percentage of the population who reported having these conditions diagnosed by a health professional): hypertension, arthritis, obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease), diabetes, heart disease or stroke, and urinary incontinence.

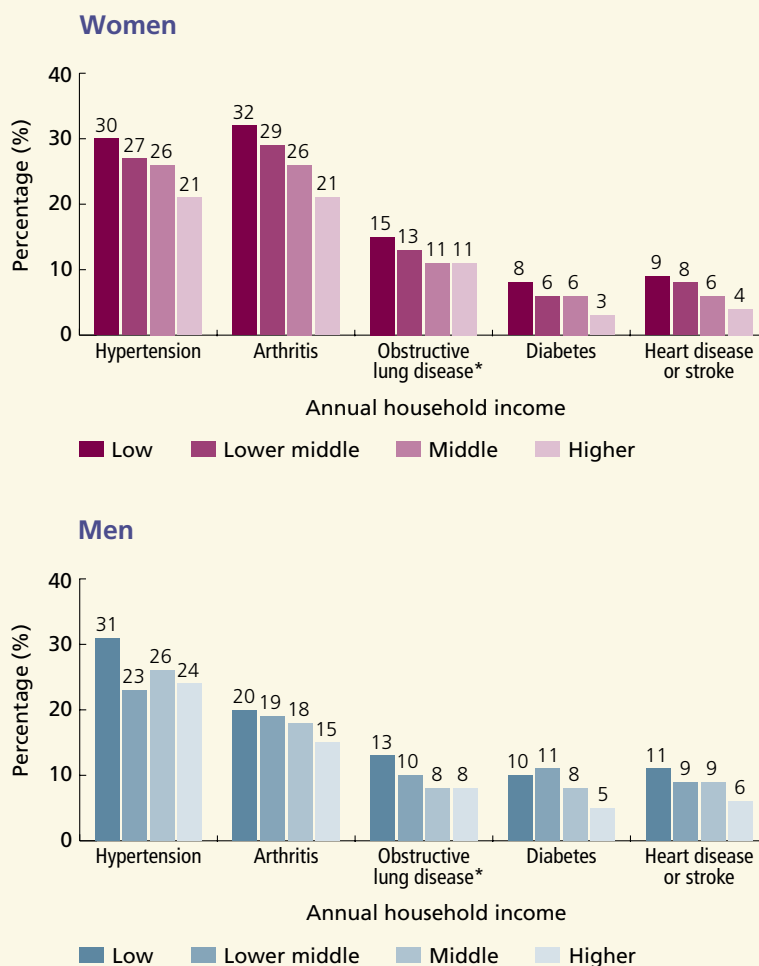
Many chronic conditions such as hypertension or diabetes can be present for years without causing symptoms. If persons who are socioeconomically disadvantaged encounter more barriers accessing care and therefore are not diagnosed, this would result in an underestimate of prevalence in these populations, as well as an underestimate of the differences between the most and least advantaged groups. The causes for these common chronic conditions are multi-factorial, but a large proportion of these conditions are preventable. Health behaviours (e.g., diet, body weight, physical activity, and smoking), environmental exposures, and social and community factors associated with the development of these conditions are all modifiable.

Overall in 2005, 25 percent of Ontario adults aged 25 and older reported hypertension, 21 percent reported arthritis, 10 percent reported obstructive lung disease, six percent reported diabetes, seven percent reported heart disease or stroke and four percent reported urinary incontinence. For Ontario women, 25 percent reported hypertension, 25 percent reported arthritis, 12 percent reported obstructive lung disease, five percent reported diabetes, six percent reported heart disease or stroke and five percent reported urinary incontinence. For Ontario men, 24 percent reported hypertension, 17 percent reported arthritis, eight percent reported obstructive lung disease, seven percent reported diabetes, eight percent reported heart disease or stroke and three percent reported urinary incontinence.

EXHIBIT 3C.1 | Age-standardized percentage of adults aged 25 and older who reported having selected chronic diseases, by sex and annual household income, in Ontario, 2005.

FINDINGS

- Women and men in the low-income category were most likely to report having hypertension, arthritis, obstructive lung disease, diabetes, or heart disease or stroke. An income gradient was observed for most of these conditions.
- Approximately 30 percent of low-income women and men reported having hypertension.
- Across all income categories, women were more much likely than men to report having arthritis—32 percent and 20 percent for low-income women and men, respectively.
- Diabetes was reported by eight percent of women in the low-income category compared to three percent in the higher-income category. Among men, 10 percent in the low-income category reported having diabetes compared to five percent in the higher-income category.
- A similar pattern was observed for education (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Obstructive lung disease includes asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 3C.2 | Age-specific percentage of adults aged 25 and older who reported having selected chronic diseases, by sex and annual household income, in Ontario, 2005

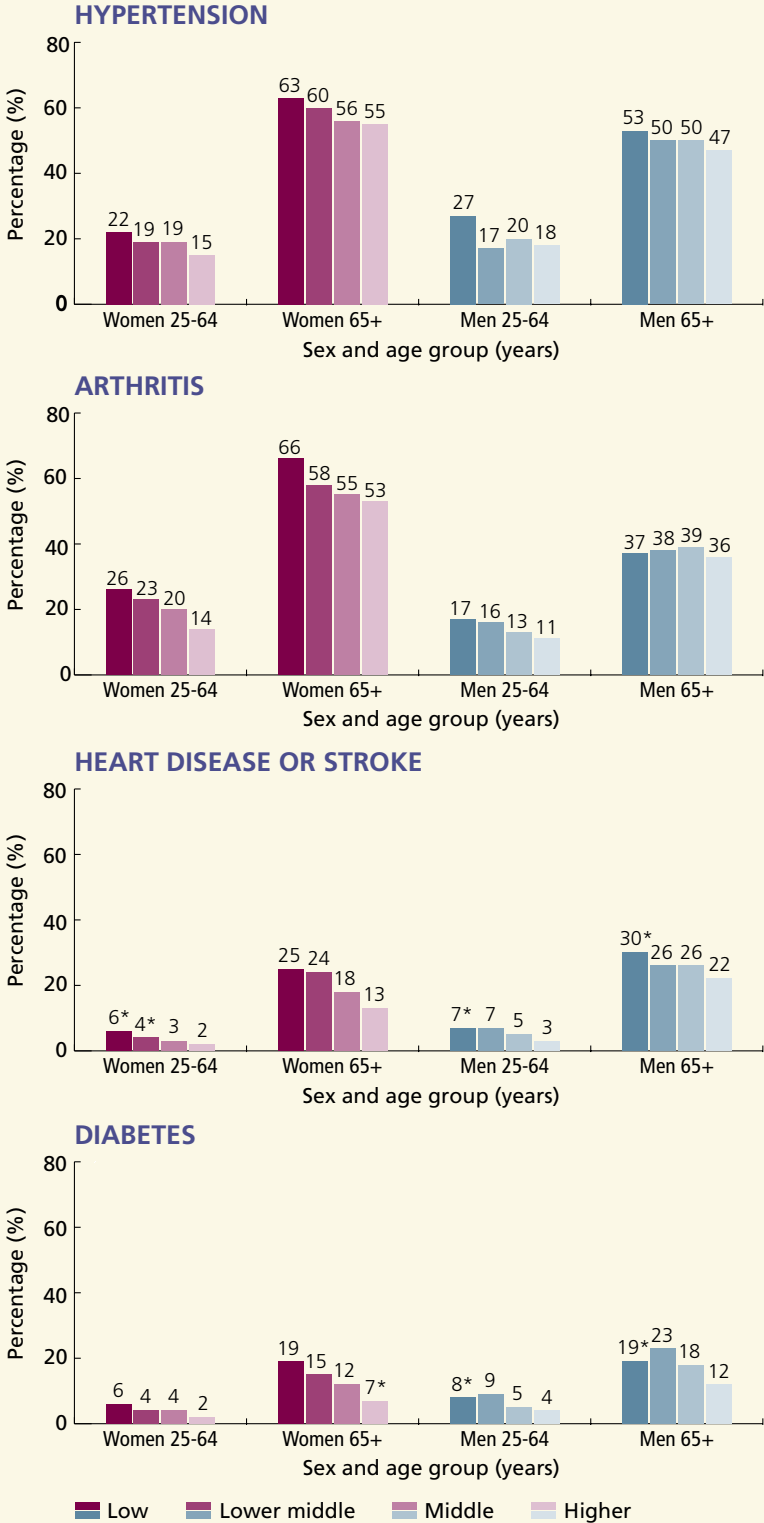
FINDINGS

- As expected, adults aged 65 and older were more likely to report having chronic disease than adults aged 25–64.
- Women of all ages were more likely than men in the same age group to report having arthritis, whereas men were more likely to report having heart disease or stroke and diabetes. Hypertension was more prevalent among older women compared to older men.
- There was an income gradient in the percentage of adults reporting most chronic diseases, specifically among both women and men aged 25–64 and those aged 65 and older.
- Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in five reported having diabetes and one in four reported having heart disease or stroke.
- Among low-income men aged 65 and older, one in two reported having hypertension, one in three reported having arthritis, one in five reported having diabetes and nearly one in three reported having heart disease or stroke.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

NOTE: See [Appendix 3.3](#) for definitions of annual household income categories

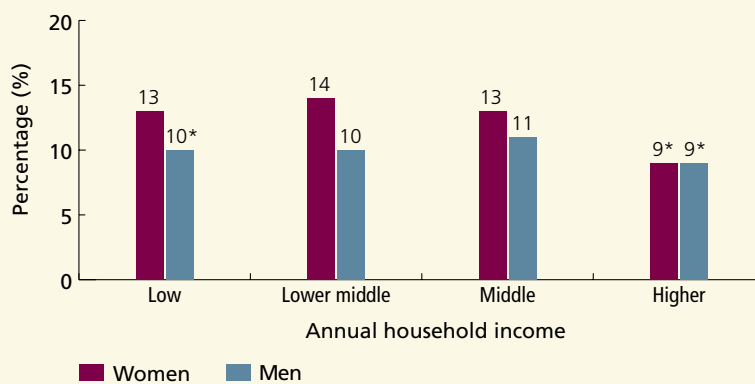


POWER Study

EXHIBIT 3C.3 | Percentage of adults aged 65 and older who reported having urinary incontinence, by sex and annual household income, in Ontario, 2005

FINDINGS

- Urinary incontinence was reported by about one in 10 women and men aged 65 and older (rates of urinary incontinence from the CCHS are lower than those of other population health surveys which may be due to the way the question was asked).⁷³ The percentages of women and men who reported having urinary incontinence did not vary greatly across income categories.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

NOTE: See [Appendix 3.3](#) for a description of annual household income categories

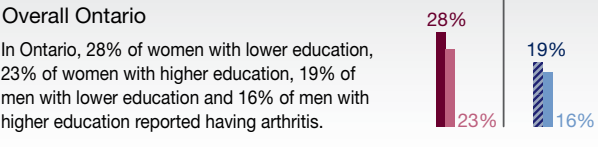
POWER Study

EXHIBIT 3C.4 | Age-standardized percentage of adults aged 25 and older who reported having arthritis, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

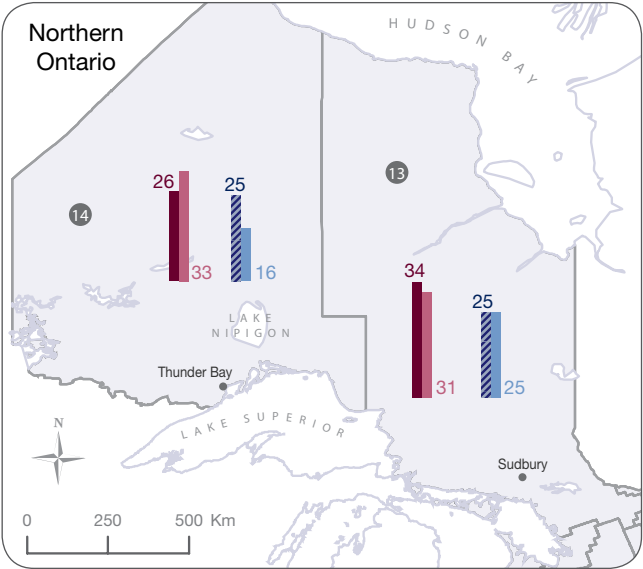
FINDINGS

- The percentage of adults who reported having arthritis was higher in women than in men across all LHINs.
- The percentage of women who reported having arthritis ranged from 24 percent (Central East LHIN) to 34 percent (North East and Erie St. Clair LHINs) among those with less education; and from 18 percent (Central LHIN) to 33 percent (North West LHIN) among women who were more educated.

POWER Study

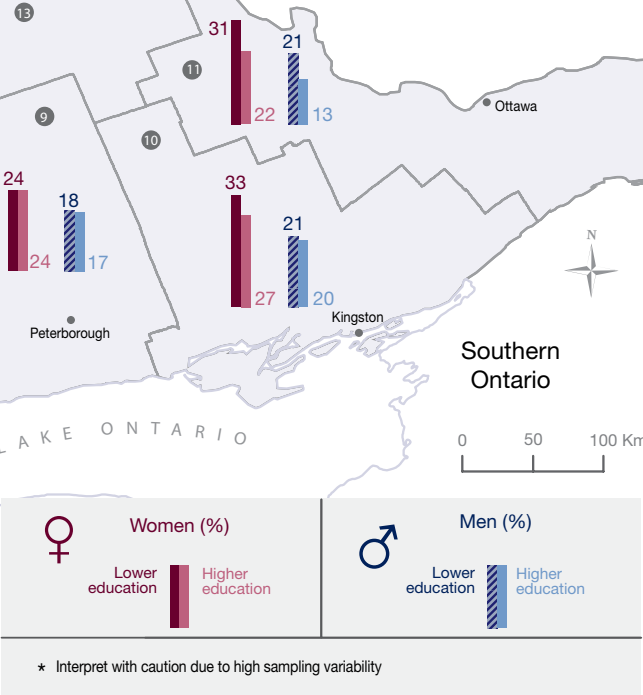


Note: Lower education denotes secondary school graduation or less



Local Health Integration Networks (LHINs)

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|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

EXHIBIT 3C.5 | Age-standardized percentage of adults aged 25 and older who reported having hypertension, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

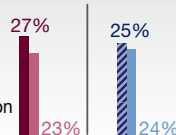
FINDINGS

- The percentage of the population who reported having hypertension varied across LHINs.
- The magnitude and direction of the difference in the percentage of women and men who reported having hypertension varied across LHINs.

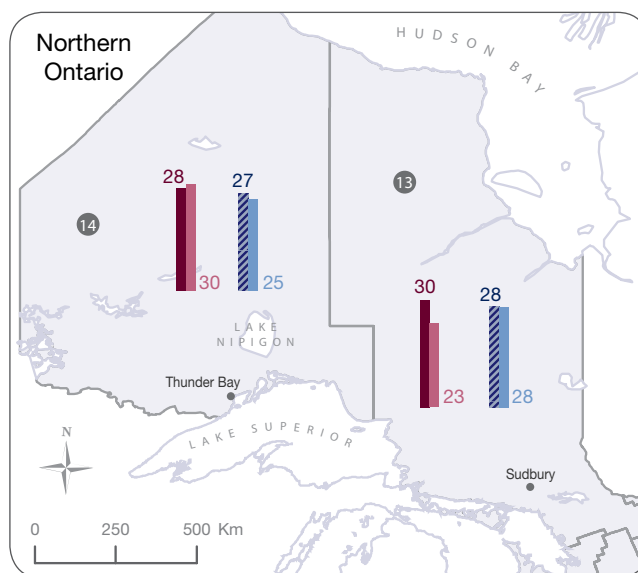
POWER Study

Overall Ontario

In Ontario, 27% of women with lower education, 23% of women with higher education, 25% of men with lower education and 24% of men with higher education reported having hypertension.

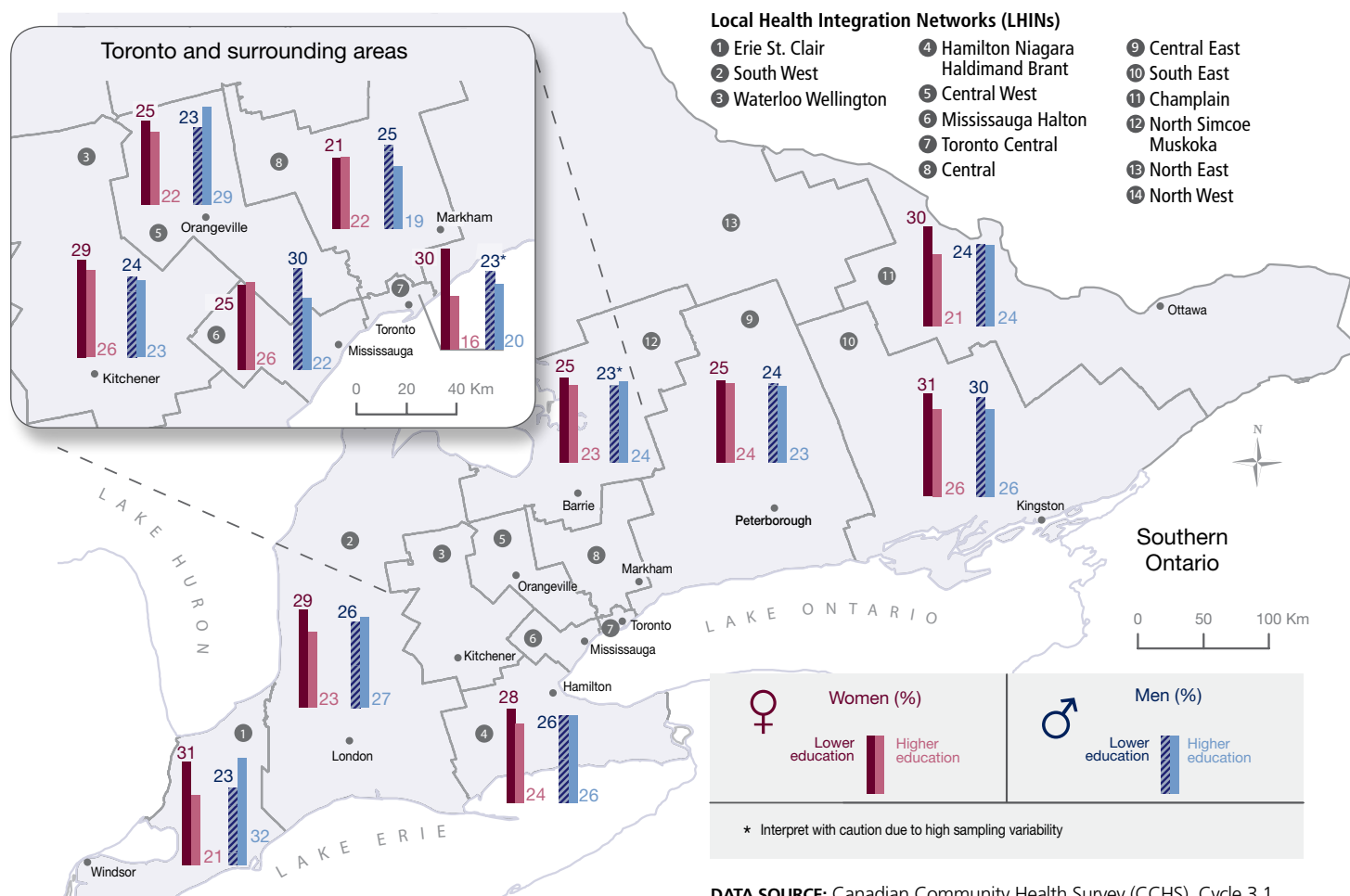


Note: Lower education denotes secondary school graduation or less



Local Health Integration Networks (LHINs)

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| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

PREVALENCE OF DEPRESSION

This indicator measures the percentage of adults who—based on their scores in the Composite International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD) questionnaire⁷⁴—had a high probability of having major depression.

Many more Ontarians have milder forms of depression. The CIDI-SFMD was never fully validated, therefore, the percentages reported here may differ from actual population prevalence. However, the relationship between this indicator and sex and income are illustrated (see [Appendix 3.3](#) for further details).

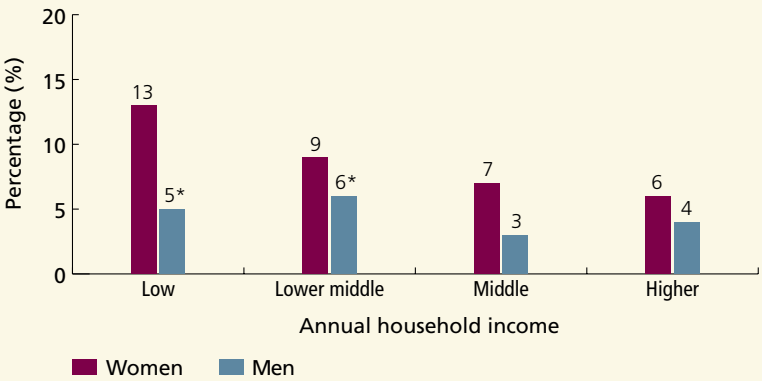
Depression is among the most common mental disorders and is the most treatable one. Approximately eight percent of adults will experience major depression at some time in their lives.⁷⁵ Depression is associated with considerable utilization of health services^{76, 77} and can impair functioning and cause substantial suffering and disruption in the lives of those affected.⁷⁵ Depression is known to be associated with socioeconomic status, ethnicity, immigration status, geography of residence (urban versus rural), health behaviours, psychological well-being, social resources, stress and physical illness.^{75, 78}

In Ontario, an estimated four percent of the population had probable depression. Overall, six percent of Ontario adults aged 25 and older had probable depression in 2005, including seven percent of women and four percent of men.

EXHIBIT 3C.6 | Age-standardized percentage of adults aged 25 and older who had probable depression, by sex and annual household income, in Ontario, 2003

FINDINGS

- There was an income gradient in the percentage of women who had probable depression. Thirteen percent of low-income women had probable depression compared to six percent of higher-income women.
- Men reported lower rates of depression than women and there was no apparent income gradient (five percent and four percent in the low- and higher-income categories, respectively).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 2.1

* Interpret with caution due to high sampling variability

NOTE: See [Appendix 3.3](#) for a description of annual household income categories

POWER Study

PREVALENCE OF COMORBIDITY (MULTIPLE CHRONIC CONDITIONS)

This indicator measures the percentage of adults who reported having more than one chronic condition (comorbidity) diagnosed by a health professional.

Chronic conditions included in this indicator were: Alzheimer's disease or other dementia; bowel disorders (Crohn's disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia.

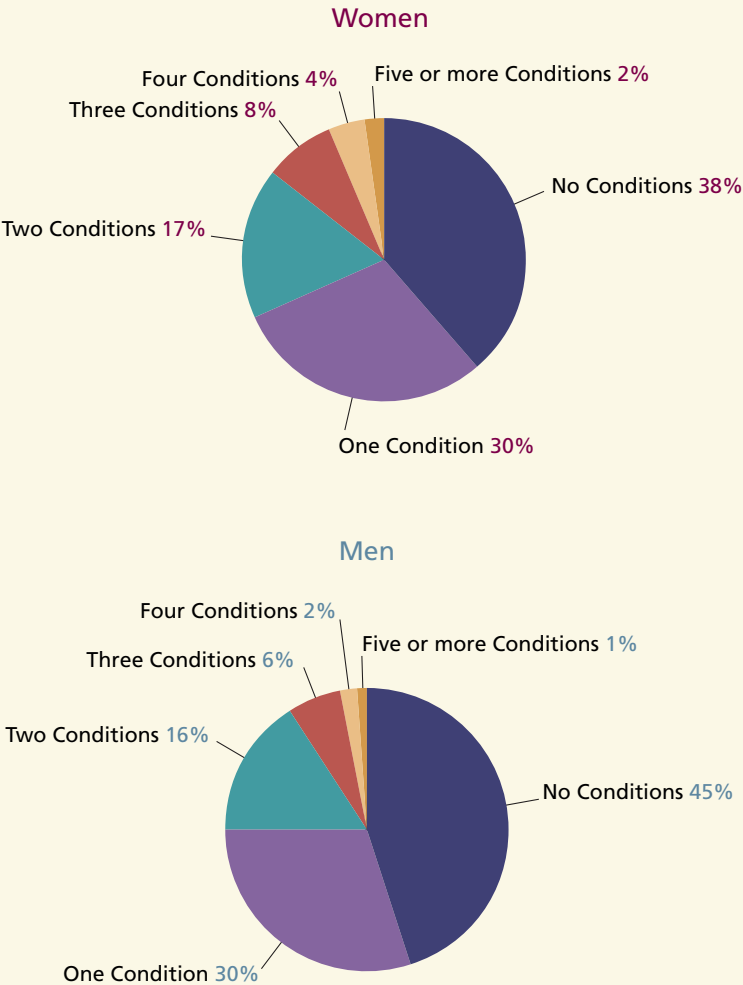
As in the prevalence of specific conditions, the prevalence of multiple chronic conditions may be particularly underestimated in socioeconomically disadvantaged populations if they encounter barriers to care and thus are not diagnosed.

Overall, 29 percent of Ontario adults aged 25 and older reported having two or more chronic conditions in 2005. Thirty-one percent of women and 25 percent of men reported having two or more chronic conditions.

EXHIBIT 3C.7 | Age-standardized percentage** of the population aged 25 and older, by sex and number of chronic conditions, in Ontario, 2005

FINDINGS

- The majority of Ontarians aged 25 and older reported having been diagnosed with at least one chronic condition, with women somewhat more likely to have reported a chronic condition. Sixty-two percent of women and 55 percent of men reported having at least one chronic condition.
- Women were more likely than men to report having two or more chronic conditions (31 vs. 25 percent, respectively).
- Fourteen percent of women and nine percent of men reported having three or more chronic conditions.

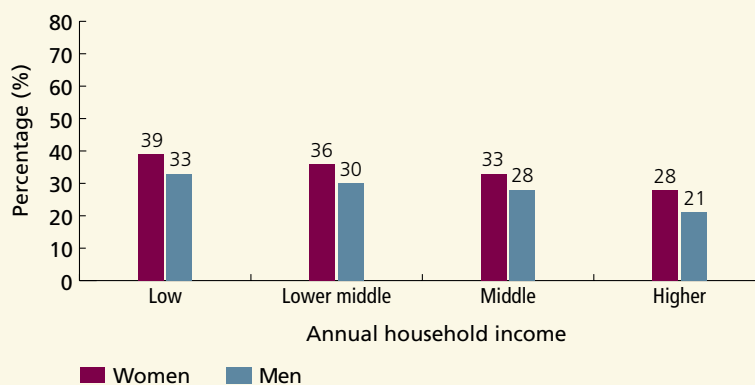


DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
** Proportions may not add up to 100 percent due to rounding
POWER Study

EXHIBIT 3C.8 | Age-standardized percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex and annual household income, in Ontario, 2005

FINDINGS

- An income gradient was observed in the percentage of adults who reported having two or more chronic conditions.
- Low-income women and men were more likely to report having two or more chronic conditions compared to those in the higher-income category.
- Almost four in ten low-income women and one in three low-income men reported having two or more chronic conditions.
- Across all income categories women were more likely than men to report having two or more chronic conditions.
- A similar pattern was observed for education (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 3.3](#) for a description of annual household income categories

POWER Study

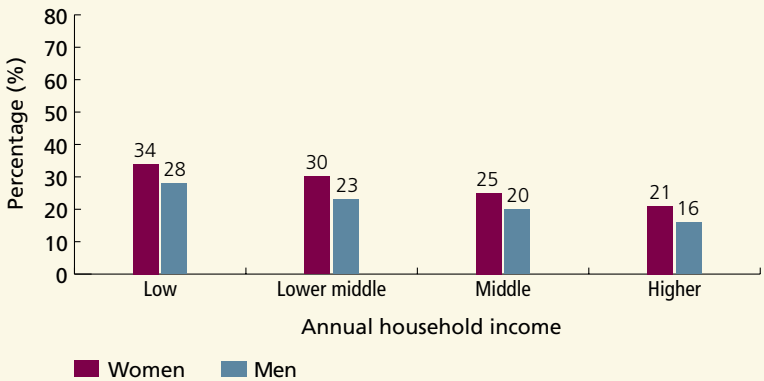


EXHIBIT 3C.9 | Age-specific percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex and annual household income, in Ontario, 2005

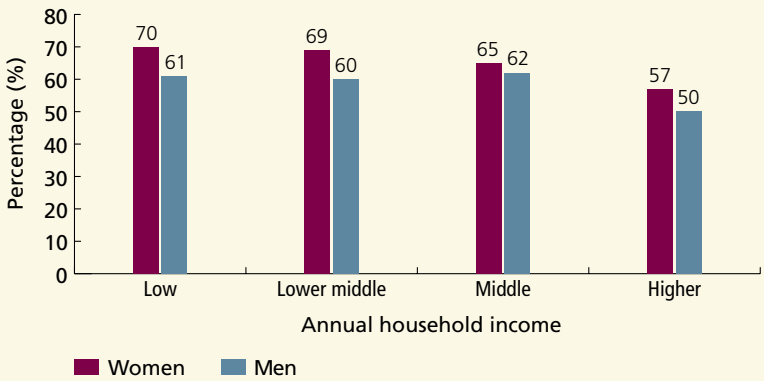
FINDINGS

- Adults aged 65 and older were much more likely to report having two or more chronic conditions than adults aged 25–64.
- For both age groups, those with higher income were less likely to report having two or more chronic conditions. Seventy percent of low-income older women reported having two or more chronic conditions, compared to 57 percent of higher-income older women.
- For adults aged 25–64, 34 percent and 28 percent of low-income women and men, respectively reported having two or more chronic conditions compared to 21 percent and 16 percent of high-income older women and men, respectively.
- Among both age groups, women were more likely to report having multiple chronic conditions than men.

Aged 25-64



Aged 65 and older



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

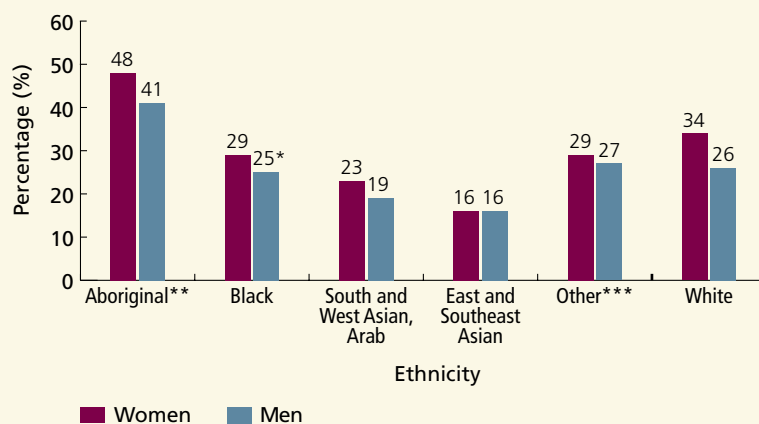
NOTE: See [Appendix 3.3](#) for a description of annual household income categories

POWER Study

EXHIBIT 3C.10 | Age-standardized percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex and ethnicity, in Ontario, 2005

FINDINGS

- The proportion of adults who reported having two or more chronic conditions varied with ethnicity. Aboriginal adults (48 percent of women and 41 percent of men) were most likely to have reported having two or more chronic conditions. Among White adults 34 percent of women and 26 percent of men reported having two or more chronic conditions.
- East and Southeast Asian adults (16 percent of women and men) were least likely to report having two or more chronic conditions.
- In general, women were more likely than men to report having two or more chronic conditions.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability.

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins.

NOTE: Ethnic group names are those used by Statistics Canada in the CCHS.

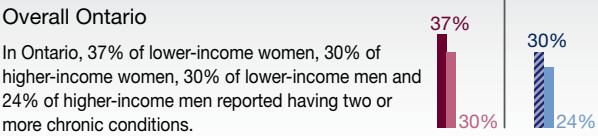
POWER Study

EXHIBIT 3C.11 | Age-standardized percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

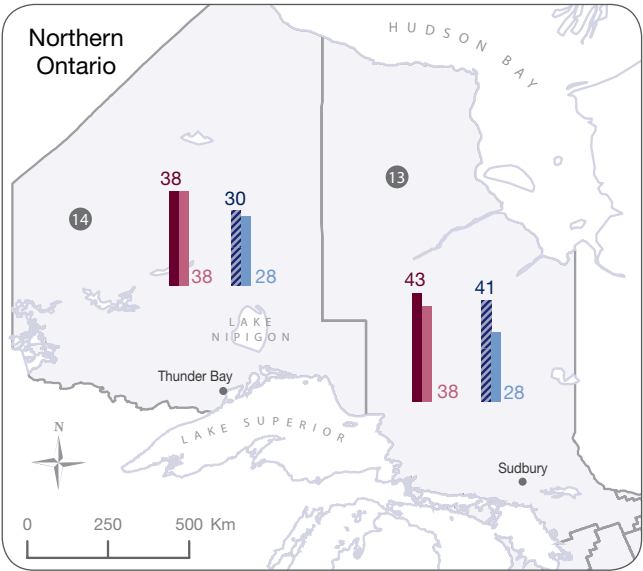
FINDINGS

- Across most LHINs, women were more likely than men to report having two or more chronic conditions.
- Among individuals who reported having two or more chronic conditions, the magnitude of the difference in the proportion of women and men and between those with lower- and higher-incomes varied across LHINs.
- The percentage of women who reported having two or more chronic conditions ranged from 24 percent (Central West LHIN) to 46 percent (South East LHIN) among those who reported lower income; and from 26 percent (Central East LHIN) to 38 percent (North East and North West LHINs) among women those who reported higher income.

POWER Study

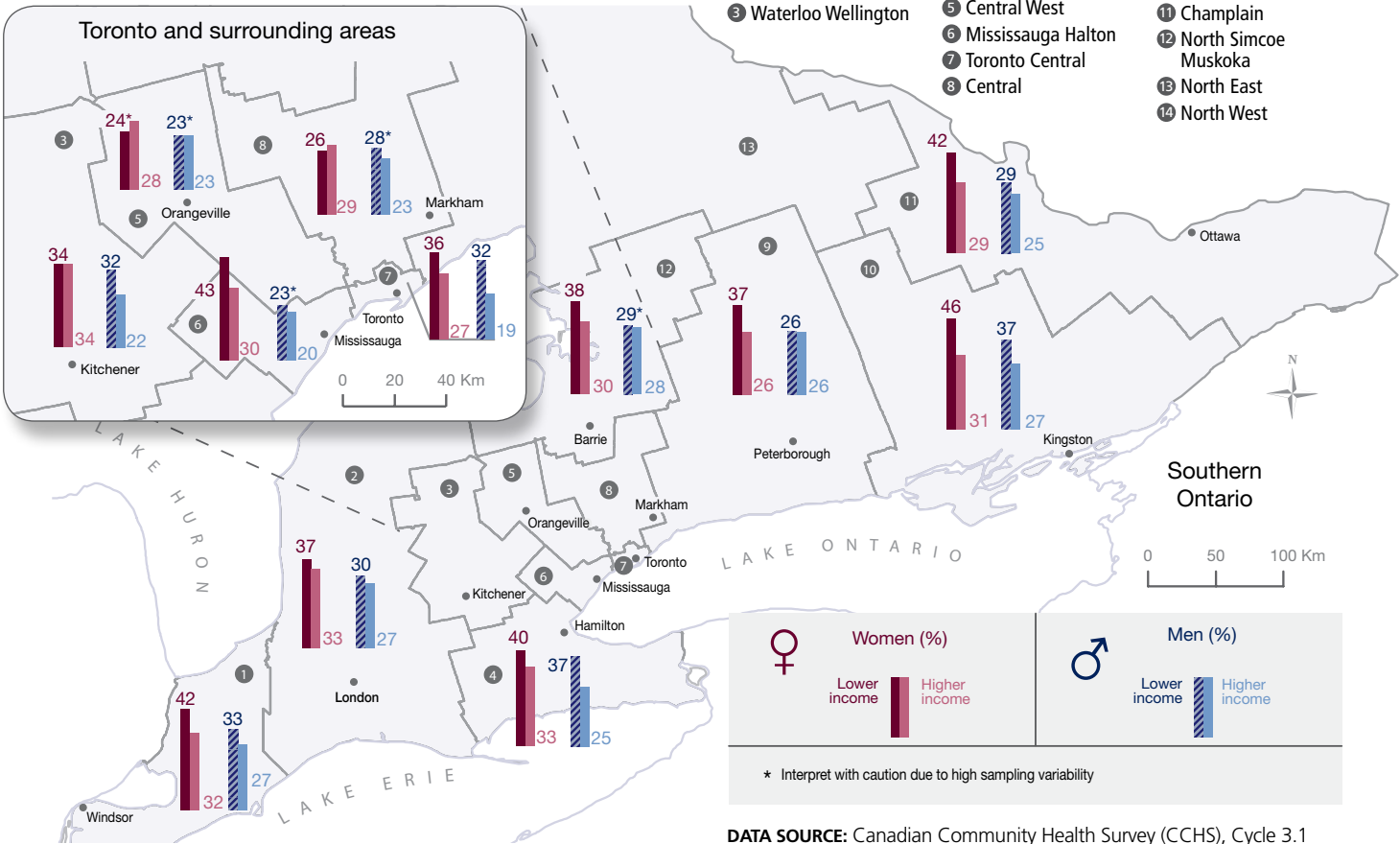


Note: See Appendix 3.3 for definitions of annual household income categories



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

Section 3C

SUMMARY OF FINDINGS

The majority of women and men in Ontario are living with at least one chronic disease. Nearly one in three women and one in four men reported having two or more chronic conditions. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression). They were also more likely to report having multiple chronic conditions (comorbidity). The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women. Women were more likely than men to report having arthritis, depression and multiple chronic conditions. There was variation across Local Health Integration Networks (LHINs) in the percentage of women and men who reported chronic conditions and comorbidity.

Findings for the indicators reported in this section are summarized below.

Prevalence of selected chronic conditions

There was an income gradient in the prevalence of common chronic diseases (hypertension, arthritis, obstructive lung disease, diabetes and heart disease or stroke) among both women and men. A similar pattern was observed for educational attainment. Across all income categories women were much more likely to report having arthritis than men. For example arthritis was reported by 32 percent and 20 percent of low-income women and men, respectively and by 21 percent and 15 percent of higher-income women and men, respectively. Older adults reported a high prevalence of chronic disease. There was an income gradient in the percentage of adults reporting most chronic diseases among women and men aged 25–64 and aged 65 and older. Among low-income women

aged 65 and older, two in three reported having hypertension, two in three reported having arthritis, one in five reported having diabetes, and one in four reported having heart disease or stroke.

Prevalence of depression

There was an income gradient in the percentage of women who had probable depression. Thirteen percent of low-income and six percent of high-income women had probable depression. Men had lower rates of probable depression than women and there was no apparent income gradient among men (five percent and four percent in the low- and high-income categories, respectively).

Prevalence of multiple chronic conditions

The prevalence of multiple chronic conditions varied with sex, age, income and ethnicity. In general, women were more likely than men to report having two or more chronic conditions. Nearly 40 percent of low-income women and 33 percent of low-income men reported having two or more chronic conditions. Older adults were two to three times more likely to report having two or more chronic conditions than adults aged 25 to 64, and there was a clear income gradient for both age groups. Among women aged 65 and older, 70 percent of low-income women, compared to 57 percent of higher-income women, reported having two or more chronic conditions. Among adults aged 25–64, 34 percent and 28 percent of low-income women and men, respectively, reported having two or more chronic conditions. In comparison, 21 percent and 16 percent of higher-income women and men, respectively, reported having two or more chronic conditions. Aboriginal women and men reported the highest prevalence of multiple chronic conditions (48 percent and 41 percent for women and men, respectively).

Section 3D

Sexually-Transmitted Infections

INTRODUCTION

Sexually-transmitted infections (STIs) are an important cause of avoidable morbidity and mortality among women and men.⁷⁹

STIs are transmitted by direct sexual contact via genital, anal and oral fluids of an infected person and from mother to child.^{80, 81}

STIs can have significant health consequences and their incidence is associated with a wide range of biological, psychological and social determinants. While there have been many efforts aimed at STI-related prevention, education and health promotion, rates of STIs continue to rise in Ontario and nationally.⁸² Many STIs go undiagnosed and untreated.

STIs affect women and men differently, largely as a result of differences in the symptoms and long-term health consequences of these infections. In women, chlamydia and gonorrhea can result in infertility and worse outcomes for babies of infected mothers.⁸³ HIV infection is an important and preventable cause of morbidity and mortality. Health behaviours (high-risk sexual activity) and lower socioeconomic status are associated with higher rates of sexually-transmitted infections.

Rates of STI infection and their impact on health status can be reduced through public health and health promotion strategies as well as through clinical diagnosis and management, particularly in primary care. Prevention and intervention programs are most effective when targeted towards high-risk groups. Reporting indicators for these infections provides information needed to assess needs, target interventions and monitor their effectiveness.

We report on indicators for three STIs: chlamydia, gonorrhea and HIV/AIDS.

Chlamydia

Chlamydia infection is the most prevalent reportable STI in North America.^{80, 81} The most common symptoms are vaginal discharge and discomfort when urinating. However, about three-quarters of infected women and about half of infected men have no symptoms, thus increasing the risk of transmission of this infection. Women are disproportionately affected by chlamydia.⁸⁴ Routine chlamydia screening and early treatment can reduce the burden of these infections. Current Canadian STI guidelines⁸⁵ recommend regular chlamydia screening for sexually active women under 25 years of age as well as for high-risk groups (e.g., new sexual partner, two or more sexual partners in the previous year) and all pregnant women. There is insufficient evidence about the effectiveness of screening in men. However, these guidelines also state that it is “prudent” to recommend screening in sexually active men under the age of 25. Practiced-based quality improvement interventions have been shown to improve chlamydia screening rates among young women.⁸⁵

Most cases of chlamydia infection are undiagnosed. Untreated chlamydia can spread to the uterus and the fallopian tubes, causing pelvic inflammatory disease, which can lead to tubal infertility, chronic pelvic pain and ectopic pregnancy.^{62, 81, 83, 84} During pregnancy, chlamydia infection can increase the risk of prematurity and low birth weight. After a vaginal delivery, chlamydia can cause conjunctivitis and pneumonia in newborn infants of infected mothers. In addition, women infected with chlamydia are up to five times more likely to become infected with HIV, if exposed.⁸⁶

Reported rates of chlamydia have been steadily increasing in Canada since 1997. Between 1997 and 2004, the

overall chlamydia rate rose by 70 percent.⁸² Because of underreporting, these rates underestimate the true burden of chlamydia infection in the population.

Gonorrhea

Gonorrhea is the second most commonly reported STI in Canada.^{87, 88} Gonorrhea infection, like chlamydia, can result in pelvic inflammatory disease, infertility, increased risk of ectopic pregnancy and infection of infants born to infected mothers. Individuals infected with gonorrhea are often at the same time infected with chlamydia. Between 1997 and 2004, the overall rate of gonorrhea infection in Canada rose by 94 percent.⁸²

Data on chlamydia and gonorrhea incidence were obtained from the integrated Public Health Information System (iPHIS) at the Ontario Ministry of Health and Long-Term Care.

HIV Infection

HIV infection is a serious condition caused by the human immunodeficiency virus (HIV). The virus causes disease by infecting and destroying specific cells in the immune system, leaving individuals vulnerable to opportunistic infections and some malignancies. Without treatment, HIV infection is commonly a life-threatening condition. Due to effective antiretroviral medications and ways to prevent and treat opportunistic infections, HIV infection has become a chronic disease and individuals infected with the virus can live for many decades. In Ontario, the number of people living with HIV infection has increased significantly over time, from an estimated 18,070 people in 2000 to an estimated 26,356 people in 2006.⁸⁹ While treatment has extended the lifespan of people with HIV, there is currently no cure for HIV infection, which has taken the lives of more than 8,700 Ontarians.⁹⁰

Strategies for tackling HIV/AIDS should be multi-pronged and include prevention, education, support services and research. Further, these strategies should be targeted to specific subpopulations at higher risk. In Ontario, the highest risk populations for HIV/AIDS are

homosexual and bisexual men, Ontarians from African and Caribbean countries, people who use injection drugs and Aboriginal people.⁸⁹

While men represent the majority of those infected with HIV (in particular men who have sex with men [MSM]), HIV infection is an important and growing public health problem for women as well. The percentage of HIV infections in Ontario women rose from 16.9 percent in 1995 to 24.5 percent in 2005. Young women (aged 15–29), as well as Aboriginal and Black women, have been found to be at higher risk of infection.⁹¹ It has been estimated that 30 percent of persons infected with HIV in Canada are unaware of their infection.⁸⁴ Women can transmit HIV to their babies during pregnancy, childbirth and breastfeeding. Significant progress has been made over the last decade in the number of women who receive perinatal HIV testing.

Data on HIV and AIDS were obtained from the Ontario HIV Epidemiologic Monitoring Unit at the Dalla Lana School of Public Health, University of Toronto. We report on the prevalence of HIV cases by sex and Ontario health region, the proportion of HIV cases that can be linked to various HIV exposure categories, as well as the number of new (incident) AIDS cases and cumulative incidence rate of AIDS from 1981 to 2005, by age at diagnosis and sex. We also report on the rates of prenatal HIV testing. Volume 2 of the POWER Study Report will feature a full chapter dedicated to HIV/AIDS, with a more extensive set of indicators and more detailed analyses.

While we know from the literature that rates of STIs are higher for those with lower income and also for Aboriginal people, information on ethnicity and socio-economic status of persons with sexually-transmitted infections is not currently available in Ontario.

Because of data limitations we cannot currently report these indicators by income, LHIN or ethnicity. However, work is being done to improve data quality and it should be possible to report these indicators by income and LHIN in the future.

EXHIBITS AND FINDINGS

INCIDENCE OF CHLAMYDIA

This indicator measures the incidence or new cases of chlamydia among Ontario adults aged 15 and older.

Genital chlamydia is the most commonly reported notifiable disease in Canada.

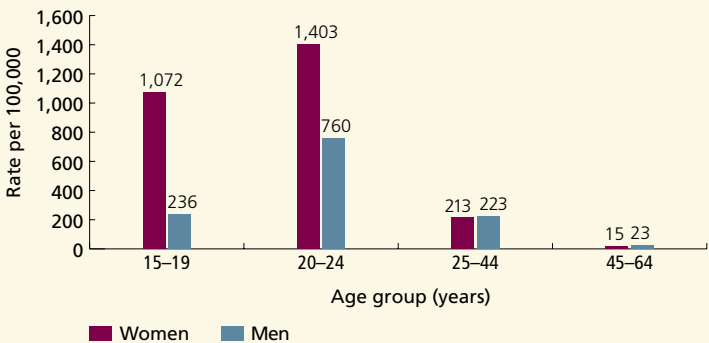
Untreated chlamydia can lead to pelvic inflammatory disease (PID), which can result in chronic pelvic pain, ectopic pregnancy, and infertility. Since this infection disproportionately affects a younger population (women in particular), the consequences of untreated infection are of particular concern. Like all bacterial sexually-transmitted infections, chlamydia increases the risk of acquisition and/or transmission of HIV. Three-quarters of women and half of all men infected with chlamydia will have no symptoms. Therefore, reported incidence underestimate the true incidence of the disease in the population. Chlamydia screening is recommended in sexually active young women and sexual partners should be treated.⁸²

In Ontario in 2006, the overall incidence of chlamydia was 206 per 100,000 population aged 15 and older—252 per 100,000 for women and 157 per 100,000 for men.

EXHIBIT 3D.1 | Age-specific incidence of chlamydia per 100,000 population aged 15 to 64, by sex, in Ontario, 2006

FINDINGS

- The highest incidence of chlamydia was found among women aged 20–24, followed by women aged 15–19 (1,403 and 1,072 per 100,000, respectively).
- Incidence was lower for men in both of these age groups: 760 per 100,000 in men aged 20–24 and 236 per 100,000 in those aged 15–19. Men with chlamydia infection may be less likely to be diagnosed, so the actual difference in incidence between men and women is likely less than reported here.
- Incidence of chlamydia was much lower in those aged 25–44 and lowest in those aged 45–64.



DATA SOURCE: Integrated Public Health Information System (iPHIS)

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INCIDENCE OF GONORRHEA

Gonorrhea is the second most commonly reported STI in Canada. Rates of gonorrhea continue to increase in Canada, with an increase of 94 percent between 1997 and 2004.

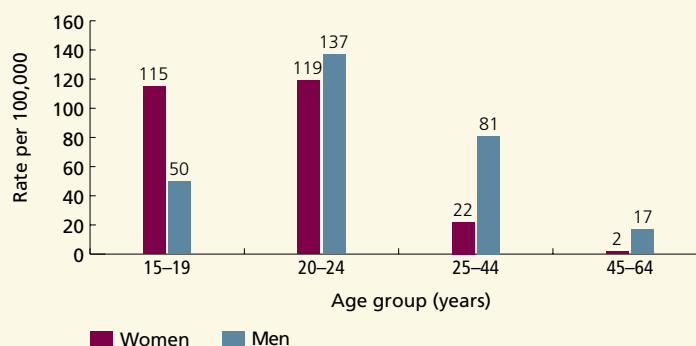
Consequences of untreated gonorrhea infection can be quite severe for women (e.g., pelvic inflammatory disease which can lead to chronic pelvic pain, ectopic pregnancy and infertility). Men with an untreated infection are at risk of epididymitis. Gonorrhea in an HIV-positive individual increases virus transmission, and conversely, those with gonorrhea who are exposed to HIV are more likely to acquire the virus. This indicator measures the rate of incident (new) cases of gonorrhea in Ontario adults aged 15 and older.⁸²

In Ontario in 2006, the overall incidence of gonorrhea was 35 per 100,000 population aged 15 and older—25 per 100,000 for women and 46 per 100,000 for men.

EXHIBIT 3D.2 | Age-specific incidence of gonorrhea per 100,000 population aged 15 to 64, by sex, in Ontario, 2006

FINDINGS

- Among women, the highest incidence of gonorrhea was reported in those aged 20–24, followed by those aged 15–19 (119 and 115 per 100,000, respectively).
- Incidence was higher in men than women, among those aged 20–24 (137 vs. 119 per 100,000), aged 25–44 (81 vs. 22 per 100,000) and aged 45–64 (17 vs. 2 per 100,000).
- Among adolescents (aged 15–19) incidence was higher in women than men (115 vs. 50 per 100,000, respectively).



DATA SOURCE: Integrated Public Health Information System (iPHIS)

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NUMBER OF PREVALENT HIV CASES

HIV has become a major cause of death from infectious diseases particularly in younger men but rates for women continue to rise.

In the nine-year period from 1996 to 2005, HIV prevalence in Ontario increased 69 percent, for an average annual increase of six percent. This increase is partly related to improved survival among HIV-infected persons. HIV surveillance data understate the magnitude of the HIV epidemic and do not reflect the total number of infections due to delays in reporting, underreporting and changing patterns in HIV testing behaviours (i.e., who comes forward for testing). This indicator measures the total estimated number of persons infected with HIV (prevalent HIV cases) in Ontario in 2005.⁹²

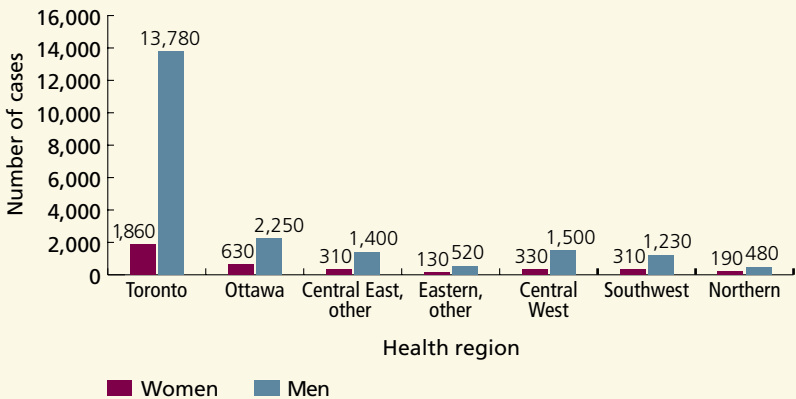
In Ontario overall, in December 2005 there were an estimated 24,890 persons infected with HIV, including 3,750 women and 21,140 men.

Note: Numbers in [Exhibit 3D.3](#) may not add up to these totals due to rounding.

EXHIBIT 3D.3 | Number of persons infected with HIV* (prevalent HIV cases), by sex and health region, in Ontario, in December 2005

FINDINGS

- There were more cases of HIV infection among men than women across health regions in Ontario.
- The Toronto health region had the greatest number of HIV cases in women (1,860 cases) and men (13,780 cases) followed by Ottawa (630 and 2,250 cases in women and men, respectively).
- The Northern health region had the lowest number of cases in men (480 cases) while the Eastern, other health region had the lowest number of cases in women (130 cases).



DATA SOURCE: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care

"Eastern, other" = Eastern health region other than Ottawa;

"Central East, other" = Central East region other than Toronto.

* Modelled⁹² (cumulative HIV incidence less cumulative AIDS mortality). See [Appendix 3.3](#) for further details.

POWER Study

HIV RISK FACTORS

This indicator measures the percentage of HIV infections that can be attributed to specific risk factors for HIV infection (exposure categories).

Knowledge of the distribution of exposures resulting in HIV infection is used to target public health prevention strategies. In Canada, sexual transmission accounts for a large proportion of reported cases of HIV. The HIV exposure categories reported are:

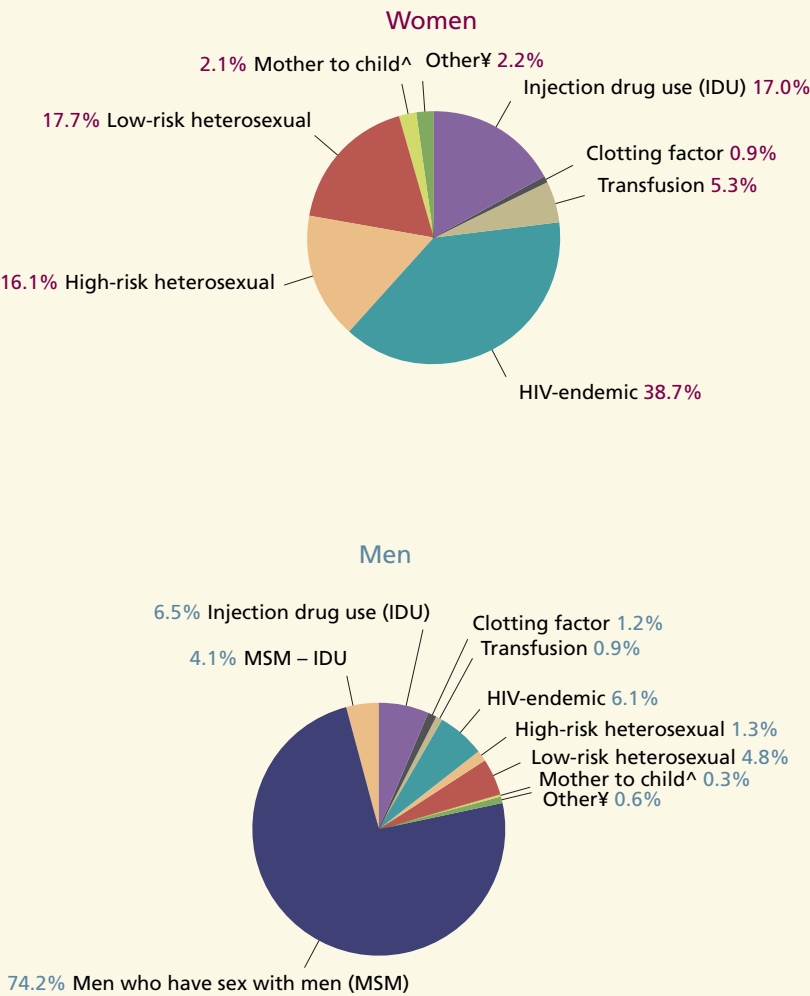
- Men who have sex with men (MSM)
- Men who have sex with men and engage in injection drug use (MSM-IDU)
- Injection drug use (IDU)
- Mother to child (perinatal) transmission (MTC)
- Clotting factor recipient prior to November 1985 (Clotting factor)
- Blood transfusion recipient prior to November 1985 (Transfusion)
- Origin/residence in an HIV-endemic area (HIV-endemic)
- High-risk heterosexual transmission: Persons reporting a history of sexual contact with a person known to be HIV-infected or with someone at high risk of HIV infection. For example, bisexual man (women only), IDU, clotting factor recipient or person from an HIV-endemic region.
- Low-risk heterosexual transmission: All other persons who have had sex with persons of the opposite sex, none of whom were known to be HIV-infected or at increased risk of being HIV-infected.
- Other: includes infection from needle-stick, acupuncture, tattoo, etc.

In Ontario from 1985 to 2005, the most common exposure categories for women and men combined were: men who had sex with men (63.8 percent), those whose origin/residence was an HIV-endemic region (10.7 percent) and injection drug use (7.9 percent).⁹²

EXHIBIT 3D.4 | Percentage* of HIV diagnoses (adjusted), by exposure category and sex, in Ontario, 1985 to 2005**

FINDINGS

- Among persons with HIV infection the percentage of HIV diagnoses attributed to specific HIV risk factors (exposure categories) were very different for women and men.
- Among women, the three top exposure categories associated with HIV infection were: those from an HIV-endemic region (38.7 percent), those who reported only low-risk heterosexual experiences (17.7 percent) and those who reported high-risk heterosexual experiences (16.1 percent).
- For men, the three top exposure categories associated with HIV infection were: men who have sex with men (74.2 percent), injection drug use (6.5 percent) and those from an HIV-endemic region (6.1 percent).



DATA SOURCE: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care

* Percentage of cases with known source of exposure.

** Unknown sex assigned according to the distribution of those with known sex; unknown exposure category assigned according to proportion among the known exposures and results of the Lab Enhancement Study, thus, totals may differ slightly due to rounding.

^ Includes only HIV-infected infants

¥ Includes needle-stick, acupuncture, tattoo, etc.

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AIDS INCIDENCE

This indicator measures the number of incident (new) cases of AIDS and the AIDS incidence (new cases of AIDS per 100,000 population) in Ontario from 1981 to 2005.

The time between infection with HIV and the subsequent development of AIDS is typically many years. Therefore, the number of AIDS cases is smaller than the overall number of people infected with HIV. Treatment with antiretroviral therapy delays the onset of AIDS in persons with HIV infection.

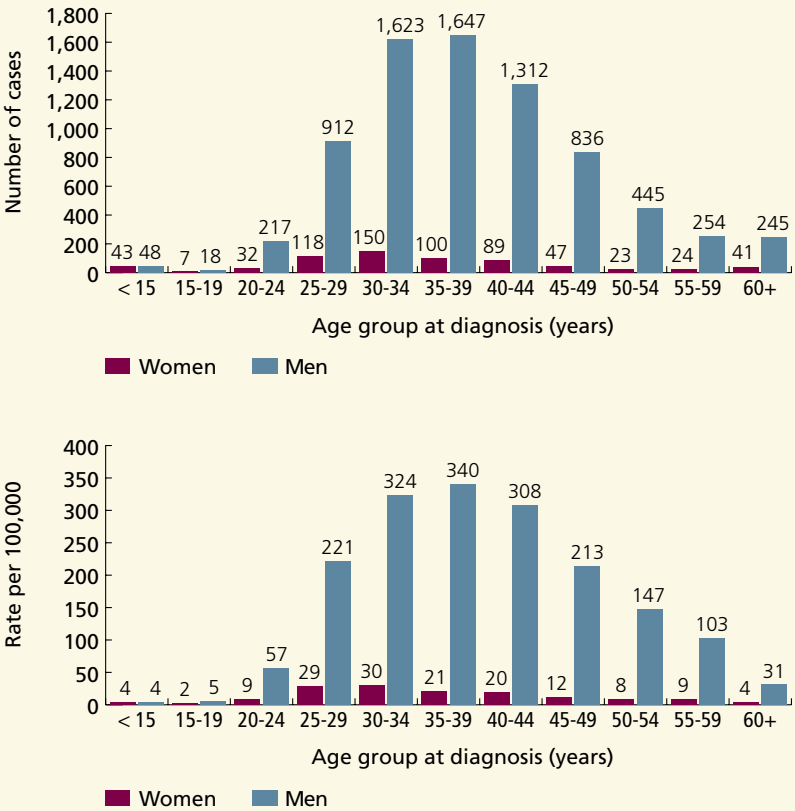
There were 8,233 reported incident cases of AIDS in Ontario from 1981 to 2005—674 for women and 7,559 for men. The overall cumulative incidence of reported AIDS cases was 74 per 100,000 population—12 per 100,000 for women and 138 per 100,000 for men. In 2005, there were 124 new cases of AIDS among men and 36 among women. The highest annual number of new AIDS cases was 699 among men in 1993 and 60 among women in 1996.

Note: Numbers in [Exhibit 3D.5](#) may not add up to these totals due to rounding.

EXHIBIT 3D.5 | Number of AIDS cases and cumulative incidence per 100,000, by sex and age group at diagnosis, in Ontario, 1981–2005

FINDINGS

- Between 1981 and 2005, the greatest number of AIDS cases was diagnosed among men aged 30–34 (1,623 cases) and 35–39 (1,647 cases). Very few men were under the age of 25 at diagnosis.
- The number of AIDS cases diagnosed in women was much smaller, with the greatest number of cases diagnosed in those aged 30–34 (150 cases) and 25–29 (118 cases).
- The cumulative incidence of AIDS was highest in men diagnosed between ages 35–39 (340 per 100,000), 30–34 (324 per 100,000) and 40–44 (308 per 100,000). In women, the cumulative incidence was highest in those diagnosed between ages 30–34 (30 per 100,000) and 25–29 (29 per 100,000).



DATA SOURCES: Ontario AIDS Surveillance Program, Public Health Division, Ministry of Health and Long-Term Care (cases reported to September 2006); Statistics Canada 1996 Census

POWER Study

PRENATAL HIV TESTING

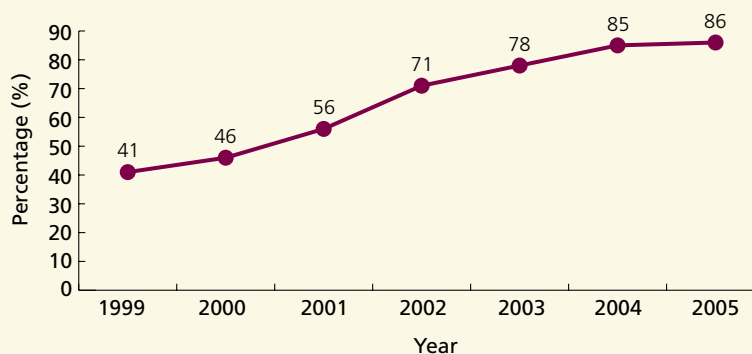
Appropriate treatment can greatly reduce the rate of HIV infection in newborn infants of HIV-infected women.

In Ontario, HIV screening is offered to all pregnant women so that when infection is identified, transmission of the infection to their babies can be prevented.⁹³ This indicator measures the percentage of pregnant women who had prenatal HIV testing in Ontario during their current pregnancy.

EXHIBIT 3D.6 | Annual percentage of pregnant women who had prenatal HIV testing in their current pregnancy, in Ontario, 1999 to 2005

FINDINGS

- The percentage of pregnant women in Ontario who had prenatal HIV testing increased steadily over time, more than doubling from 1999 to 2005 (41 percent to 86 percent).
- No information was available on rates of screening by socioeconomic status, ethnicity or HIV risk group.



DATA SOURCES: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care as cited in Report on HIV/AIDS in Ontario, 2005⁹², Public Health Division, Ministry of Health and Long-Term Care

POWER Study

Section 3D

SUMMARY OF FINDINGS

Sexually-transmitted infections (STIs) are an important public health problem in Ontario. Unlike chronic diseases which are more prevalent among older adults, STIs primarily affect adolescents and young adults. Chlamydia infection and its consequences primarily affect adolescent and young adult women (aged 15–24). Reported incidence of gonorrhea infection among women aged 15–19 were more than twice as high as that for adolescent men. For those aged 20 and older, rates were higher among men than women; however this difference was small among those aged 20–24. While men were more likely than women to be infected with HIV, rates of HIV infection in women have risen, and one-fourth of new HIV infections occur in women. Risk factors for HIV infection differ greatly for men and women. Among women in Ontario most infections are due to heterosexual transmission, whereas for men, homosexual transmission is more common.

Findings for the indicators reported in this section are summarized below.

Chlamydia and Gonorrhea infection

The highest incidence of chlamydia infection was found in young adult women aged 20–24, followed by adolescent women aged 15–19 (1,403 and 1,072 per 100,000, respectively). Incidence was lower among those aged 25–44 and lowest among those aged 45–64.

The incidence of gonorrhea was highest among women and men aged 20–24 (119 and 137 per 100,000, respectively). The incidence of gonorrhea among Ontarians aged 15–19 was more than two times higher in women than in men, but nearly four times higher in men than women aged 25–44.

HIV Infection

There were more estimated cases of HIV infection among men than women across health regions in Ontario in

December 2005. The greatest total number of HIV cases was reported in the Toronto health region for women (1,860 cases) and men (13,780 cases); followed by Ottawa (630 and 2,250 cases for women and men, respectively). The lowest total number of HIV cases was found in the Eastern, other health region for women (130 cases) and in the Northern health region for men (480 cases).

Among persons with HIV infection, the percentage of HIV diagnoses attributed to specific HIV risk factors (exposure categories) were very different for women and men. Among women, the top three exposure categories associated with HIV infection being from an HIV-endemic region (38.7 percent), having only low-risk heterosexual experiences (17.7 percent) and having high-risk heterosexual experiences (16.1 percent). For men, the top three exposure categories associated with HIV infection were: men who have sex with men (74.2 percent), injection drug use (6.5 percent) and being from an HIV-endemic region (6.1 percent).

The number of incident (new) cases of AIDS diagnosed from 1981 to 2005 was highest among men aged 30–34 and 35–39 (1,623 and 1,647 cases, respectively). The number of incident AIDS cases diagnosed in women was much smaller, but followed a similar pattern, with the highest number of cases diagnosed in women aged 30–34 (150 cases) and 25–29 (118 cases). Very few men were under the age of 25 at diagnosis.

In women, the cumulative incidence of AIDS was highest in those diagnosed between the ages of 30–34 (30 per 100,000) and 25–29 (29 per 100,000). The highest rate in men was among those diagnosed between the ages of 35–39 (340 men per 100,000) and 30–34 (324 per 100,000).

The percentage of pregnant women who had prenatal HIV testing increased steadily over time, more than doubling from 1999 to 2005 (41 percent to 86 percent).

Section 3E

Mortality

INTRODUCTION

Mortality indicators are important measures of population health and are widely used internationally to assess health inequities.⁹⁴ Both health care delivery and public health practice are aimed at improving health by enhancing quality and extending length of life.⁹⁵

In previous sections of this chapter we assessed quality of life. In this section we assess length of life by examining patterns of mortality in Ontario.

Overall mortality rates are dynamic, and change in response to the social, economic, and political conditions of society.⁹⁶ Although mortality rates in Canada have declined substantially over the course of the twentieth century, socioeconomic differentials in mortality rates persist.^{97, 98 99} Women have historically had lower mortality rates and longer life expectancies than men; however, in part due to increased smoking rates, differences between women and men have narrowed in recent decades.⁹⁵ Sex and socioeconomic differences in mortality also vary with societal conditions. In addition, rates of premature mortality vary with neighbourhood characteristics and are highest among people who live in socioeconomically deprived neighbourhoods.¹⁰⁰

Canadians who are university educated, employed, working in professional and managerial occupations and in the top income brackets have the lowest mortality rates. The highest mortality rates are seen among those who have not graduated secondary school, are unemployed, are working in unskilled jobs, and are in the lowest income brackets.⁹⁸ Aboriginal people (First Nation, Métis or Inuit) also have higher mortality rates than those without Aboriginal ancestry.⁹⁸

The total number of excess deaths due to higher mortality rates of those in lower-income groups compared to those in the highest-income group make socioeconomic inequalities the second leading cause of death in Canada.¹⁰¹ The four leading causes of income-related deaths in the country were cardiovascular disease, injuries, cancer and infections. Many of these excess deaths can be attributed to preventable causes,^{102, 103} and thus these rates are amenable to change. Between 1971 and 1996, reduction in rates of avoidable mortality from causes amenable to medical care (i.e., physician and hospital services) made the greatest contribution to narrowing socioeconomic inequities in mortality. However, during the same time period there was little improvement in the socioeconomic differentials in mortality rates amenable to public health intervention, those where medical services are less effective and where various interventions are known to prevent the condition from occurring (e.g., changes in health behaviours such as quitting smoking and legislative changes such as requiring the use of seatbelts). This lack of improvement suggests that additional reductions could be achieved by targeting these causes.⁹⁹

Disability-free life expectancy (DFLE) is the number of years of life lived without disability and captures quality as well as the length of life. Rates of DFLE vary by sex and socioeconomic status.^{14, 24} Women not only live longer

than men, but also live more years without disability than men.^{14, 24} However, because they live longer, they also live more years with disability. Chronic disease and certain health behaviours (e.g., smoking, physical inactivity) significantly reduce DFLE.^{14, 24} In Canada, among women the greatest number of years of DFLE lost were for diabetes (14.1 years), arthritis (8.8 years), and physical inactivity (6.0 years); while among men, the greatest number of years of DFLE lost were for diabetes (10.5 years), smoking (6.9 years), arthritis (6.5 years), and cancer (6.4 years).^{14, 24}

We report on indicators of all-cause mortality, premature mortality, cause-specific mortality, life expectancy, and disability-free life expectancy for Ontarians living in census metropolitan areas, by sex and neighbourhood income quintile.

- All-cause mortality rates, or the total number of deaths for all causes per 100,000 population.
- Three measures of premature mortality and its consequences: premature mortality (the probability of dying before age 75), excess number of deaths before age

75 (the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile), and potential years of life lost (PYLL) before age 75 (due to these early deaths).

- Cause-specific mortality rates from chronic disease (circulatory diseases, diabetes, chronic obstructive pulmonary disease) infectious disease (pneumonia), and trauma/injury (road traffic accidents, intentional and non-intentional injuries and falls).
- Life expectancy and disability-free life expectancy, at birth and at age 65.

The findings by neighbourhood income quintile presented in this section were provided by the Health Information and Research Division of Statistics Canada, based on death data from the Canadian Mortality Database coded to census tract. The findings by neighbourhood income tercile were extracted from tables presented in the Performance Indicators Reporting Committee (PIRC) Report²⁴ (see [Appendix 3.3](#) for more details). All indicators are reported at the provincial level.



Source: Health Canada website and Media Photo Gallery, Health Canada, <http://www.hc-sc.gc.ca>
Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2009.

EXHIBITS AND FINDINGS

ALL-CAUSE MORTALITY RATE

All-cause mortality is a measure of the total number of deaths in a given year relative to the total population for that year (per 100,000 population).

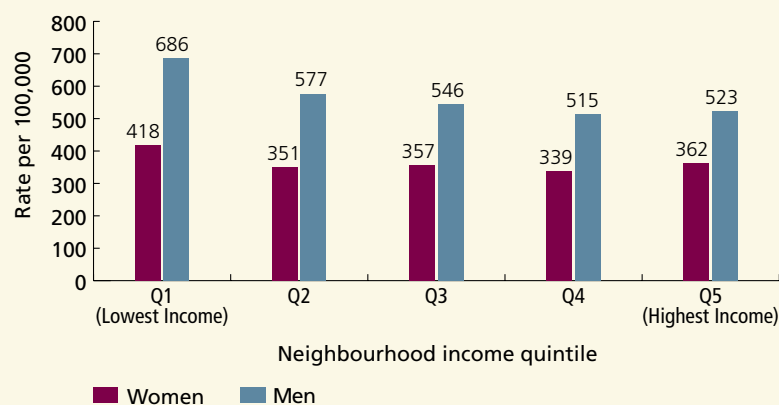
Mortality statistics are an important indicator of population health status.¹⁰⁴ Differences in mortality rates by socioeconomic status (SES) reflect health inequalities. We report age-standardized mortality rates (ASMRs).

The overall Ontario mortality rate was 461 per 100,000 population in 2001—365 per 100,000 for women and 570 per 100,000 for men.

EXHIBIT 3E.1 | Age-standardized all-cause mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Women and men in the lowest neighbourhood income quintiles had the highest mortality rates.
- Women in the lowest neighbourhood income quintile had an all-cause mortality rate of 418 per 100,000 compared to 362 per 100,000 for women in the highest neighbourhood income quintile.
- An income gradient was observed for men. While men in the lowest neighbourhood income quintile had an all-cause mortality rate of 686 per 100,000, the rate was 523 per 100,000 for men in the highest neighbourhood income quintile.
- Across all neighbourhood income quintiles, men had higher all-cause mortality rates than women.
- Differences between women and men were greatest among those in the lower-income quintiles.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

PREMATURE MORTALITY: DEATHS BEFORE AGE 75

Premature mortality, or death before age 75, is a powerful indicator of disparities in health status.

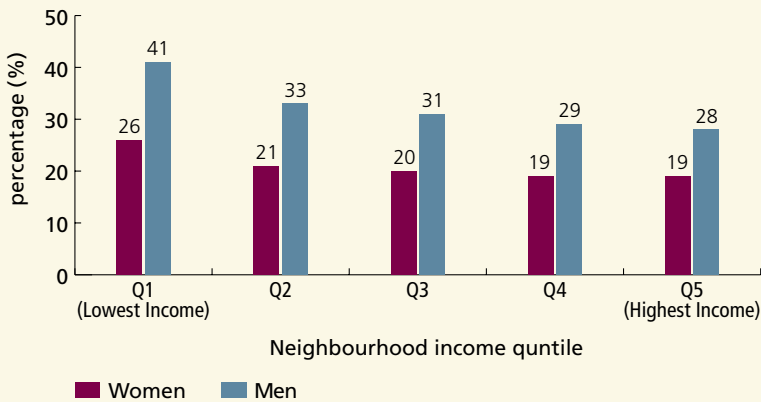
Studies have shown that the risk of premature death directly increases with economic deprivation and thus the incidence of premature mortality is higher among persons living in economically deprived areas compared to those in high-income areas.¹⁰⁰ This indicator measures the percentage of the population who died before reaching the age of 75.

Overall, in 2001, 27 percent of the Ontario population died before reaching the age of 75. Twenty-one percent of women and 32 percent of men died prematurely.

EXHIBIT 3E.2 | Percentage of the population who died before age 75 (premature mortality), by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- The percentage of adults who died before age 75 increased as income level decreased (an income gradient). This income gradient was steeper for men than for women.
- In 2001, 41 percent of men and 26 percent of women in the lowest neighbourhood income quintile (compared with 28 percent of men and 19 percent of women in the highest neighbourhood income quintile) did not live to 75.
- Across all neighbourhood income quintiles, men were more likely to die prematurely than women.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation.

POWER Study

EXCESS DEATHS BEFORE AGE 75

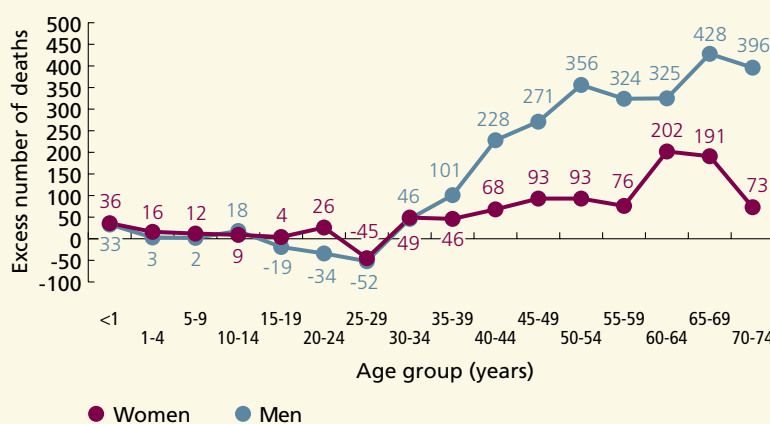
The excess number of deaths before age 75 is the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).

In Ontario, the overall excess number of deaths before age 75 across all age groups was 3,373 in 2001—947 for women and 2,426 for men.

EXHIBIT 3E.3 | Excess number of deaths for the population aged 0–74*, by sex and age group, in Ontario, 2001

FINDINGS

- In Ontario, for nearly all age groups, there were more excess deaths among men than women. For example, in 2001, there were 93 more deaths for women aged 50–54 and 356 more deaths for men aged 50–54 than would be expected in that same age group if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).
- Among children the greatest number of excess deaths occurred in boys and girls in their first year of life.
- After age 30, the excess number of deaths increased with age for both women and men.
- The sex gap in the number of excess deaths widened with increasing age. For example, in those aged 65–69, men had more than twice the excess number of deaths as women (428 vs. 191).



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* The excess number of deaths before age 75 is the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).

POWER Study

POTENTIAL YEARS OF LIFE LOST (PYLL)* BEFORE AGE 75

Potential years of life lost (PYLL) (total mortality) is the number of years of life “lost” when a person dies “prematurely” from any cause—before age 75.

A person dying at age 25, for example, has lost 50 years of life. This indicator places more weight on causes of early death than on causes of death at older ages.^{105, 106}

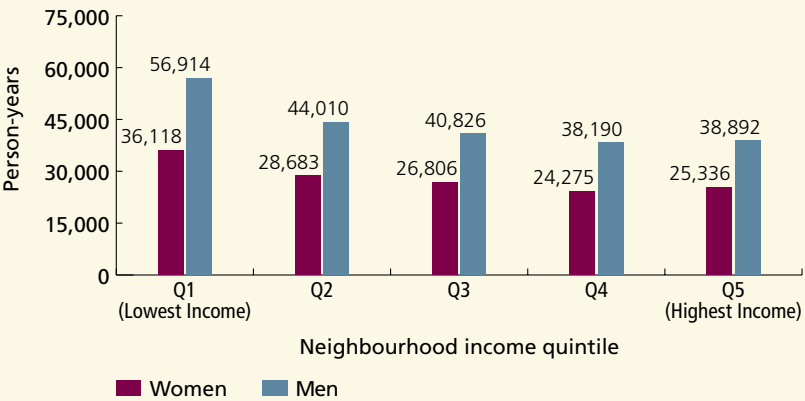
The distribution by cause of PYLL differs by sex. In women, a larger number of PYLL are attributable to cancer, whereas in men, a larger number of PYLL are frequently attributable to accidents. PYLL also varies by socioeconomic status and geographic area.

In Ontario, there were 364,706 PYLL in 2001—142,102 for women and 222,603 for men.

EXHIBIT 3E.4 | Potential years of life lost (PYLL) before age 75 (person-years), by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- There was an income gradient in the potential years of life lost before age 75. Women and men in the lowest neighbourhood income quintiles lost more potential years of life than those in higher-income neighbourhoods.
- Women in the lowest neighbourhood income quintile lost 36,118 years of potential life compared to 25,336 potential years of life lost for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile lost 56,914 years of potential life compared to 38,892 potential years of life lost for men in the highest neighbourhood income quintile.
- Across all neighbourhood income quintiles men lost more potential years of life than women.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

CHRONIC DISEASE MORTALITY RATES

Disease-specific chronic disease mortality rates measure the total number of deaths from selected chronic diseases in a given year per 100,000 population.

We report age-standardized mortality rates (ASMRs) from circulatory diseases (ischemic heart disease, cerebrovascular disease and other circulatory diseases), diabetes and chronic obstructive pulmonary disease (bronchitis, emphysema, and chronic airways obstruction not elsewhere classified).

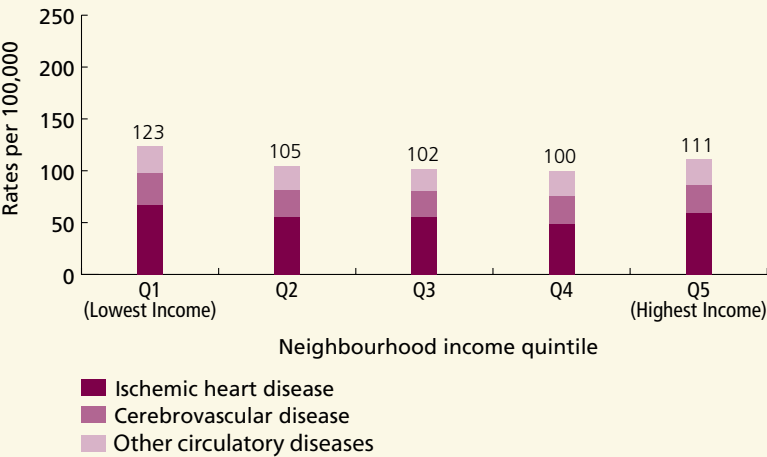
Overall, the 2001 mortality rate in Ontario was 144 per 100,000 for circulatory diseases (108 and 185 per 100,000 for women and men, respectively); 16 per 100,000 for diabetes (13 and 20 per 100,000 for women and men, respectively) and 17 per 100,000 for chronic obstructive pulmonary disease (13 and 22 per 100,000 for women and men, respectively).

EXHIBIT 3E.5 | Age-standardized circulatory disease mortality rate per 100,000 population, by sex, type of disease and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Across all neighbourhood income quintiles men had higher circulatory disease mortality rates than women.
- Women and men in the lowest neighbourhood income quintile had the highest rates of mortality from circulatory disease.
- Women in the lowest neighbourhood income quintile had a circulatory disease mortality rate of 123 per 100,000 compared to 111 per 100,000 for women in the highest neighbourhood income quintile.
- An income gradient was observed for men. Men in the lowest neighbourhood income quintile had a circulatory disease mortality rate of 222 per 100,000 compared to 169 per 100,000 for men in the highest neighbourhood income quintile.
- Ischemic heart disease mortality comprised the greatest proportion of circulatory disease mortality across all neighbourhood income quintiles for both women and men. Ischemic heart disease mortality rates ranged from 49–67 per 100,000 for women and from 102–147 per 100,000 for men.
- Cerebrovascular disease mortality ranged from 25–30 per 100,000 for women and from 32–35 per 100,000 for men.

Women



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

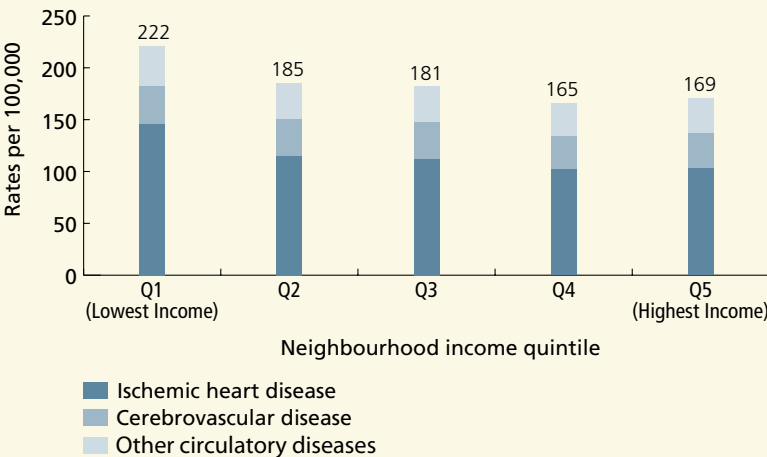
^ Includes bronchitis, emphysema, and chronic airways obstruction not elsewhere classified

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

Men



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

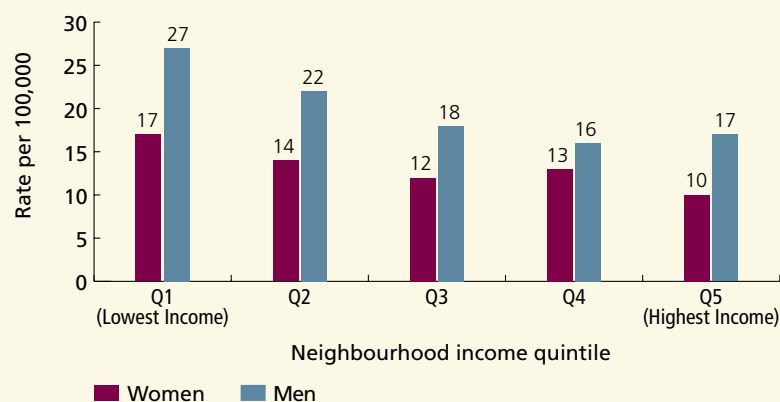
NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 3E.6 | Age-standardized diabetes mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Women and men in the lowest neighbourhood income quintiles had the highest mortality rate from diabetes.
- Women in the lowest neighbourhood income quintile had a diabetes mortality rate of 17 per 100,000 compared to 10 per 100,000 for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile had a diabetes mortality rate of 27 per 100,000 compared to 17 per 100,000 for men in the highest neighbourhood income quintile.
- An income gradient was observed for both women and men.
- Across all neighbourhood income quintiles men had higher diabetes mortality rates than women.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

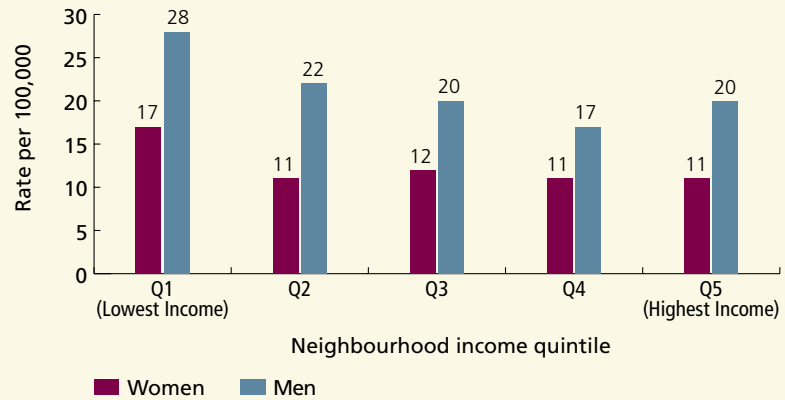
NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation.

POWER Study

EXHIBIT 3E.7 | Age-standardized chronic obstructive pulmonary disease (COPD)[^] mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Women and men in the lowest neighbourhood income quintiles had the highest rates of COPD mortality.
- Women in the lowest neighbourhood income quintile had a COPD mortality rate of 17 per 100,000 compared to 11 per 100,000 for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile had a COPD mortality rate of 28 per 100,000 compared to 20 per 100,000 for men in the highest neighbourhood income quintile.
- Across all neighbourhood income quintiles men had higher COPD mortality rates than women.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

[^] Includes bronchitis, emphysema, and chronic airways obstruction not elsewhere classified

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

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PNEUMONIA MORTALITY RATE

The pneumonia mortality rate measures the total number of deaths from pneumonia in a given year relative to the total population.

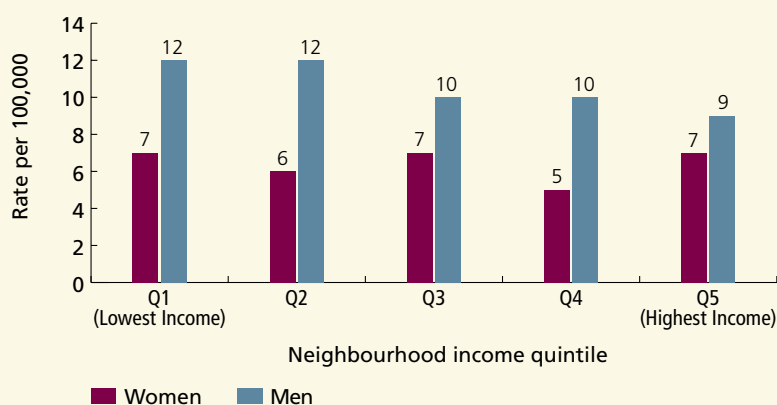
This indicator measures the mortality rate from pneumonia per 100,000 population. We report age-standardized mortality rates (ASMRs).

Overall, the pneumonia mortality rate for the Ontario population was 8.3 per 100,000 in 2001. The rate was 6.7 per 100,000 for women and 10.3 per 100,000 for men.

EXHIBIT 3E.8 | Age-standardized pneumonia mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Pneumonia mortality rates in women ranged from 5 per 100,000 to 7 per 100,000 and did not vary significantly by income.
- Men in the two lowest neighbourhood income quintiles had a pneumonia mortality rate of 12 per 100,000 compared to 9 per 100,000 for men in the highest neighbourhood income quintile. While the data suggest an income gradient in men, the differences were not significant.
- Across all neighbourhood income quintiles men had higher pneumonia mortality rates than women.
- Mortality rates for influenza were negligible and were not included.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

MORTALITY RATE FROM TRAUMA AND INJURY

Mortality rates from trauma and injury measure the rate of death per 100,000 population for selected causes of injury in a given year relative to the total population.

Mortality rates due to road traffic accidents (RTA) (motor vehicle traffic crash; traffic related pedestrian and bicycle accidents), other intentional and non-intentional injuries (homicide; fires; drowning; poisoning) and fall-related injuries are reported. We report age-standardized mortality rates (ASMRs).^{97, 107}

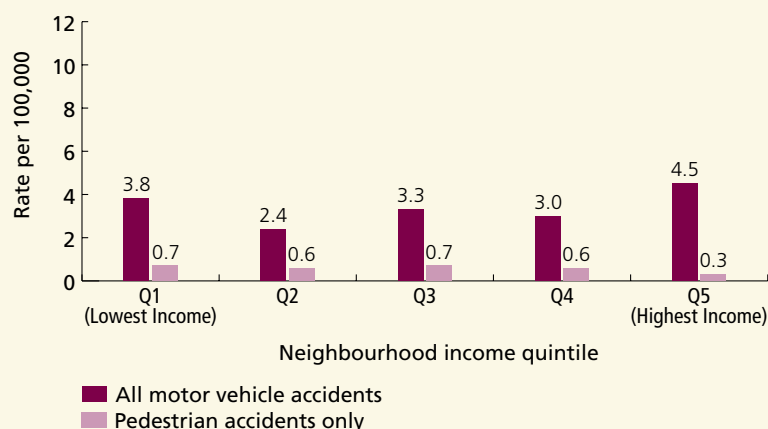
Overall, the RTA mortality rate was 5.3 per 100,000 population—3.4 per 100,000 for women and 7.2 per 100,000 for men. The overall mortality rate from other intentional and non-intentional causes was 4.1 per 100,000 in 2001—2.4 per 100,000 for women and 6.1 per 100,000 for men. The overall fall-related mortality rate was 5.8 per 100,000—4.5 per 100,000 for women and 7.2 per 100,000 for men.

EXHIBIT 3E.9 | Age-standardized mortality rate from road traffic accidents (RTA), including motor vehicle and pedestrian accidents, per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

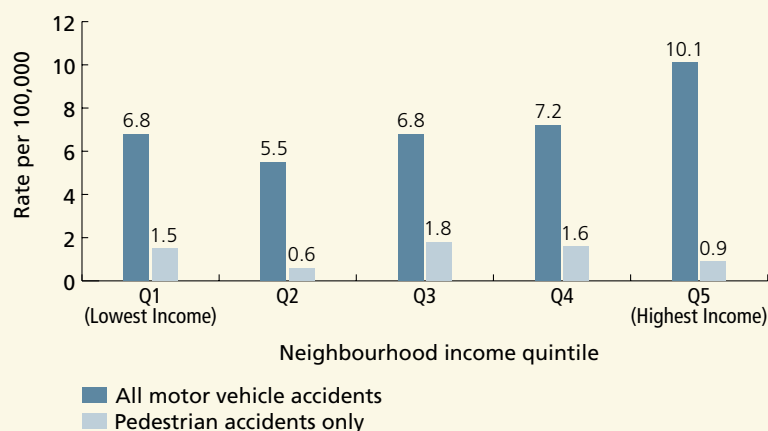
FINDINGS

- Road traffic accident mortality rates ranged from 2.4 to 4.5 per 100,000 women and 5.5 to 10.1 per 100,000 men.
- Women and men in the highest neighbourhood income quintile had higher road traffic accident mortality rates than those in lower neighbourhood income quintiles. However, these differences were not significant.
- Pedestrian accident mortality ranged from 0.3 to 0.7 per 100,000 women and from 0.6 to 1.8 per 100,000 men.
- Across all neighbourhood income quintiles men had higher road traffic accident mortality rates than women. Mortality rates from pedestrian accidents only were the same or higher for men compared with women, across all neighbourhood income quintiles.

Women



Men



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

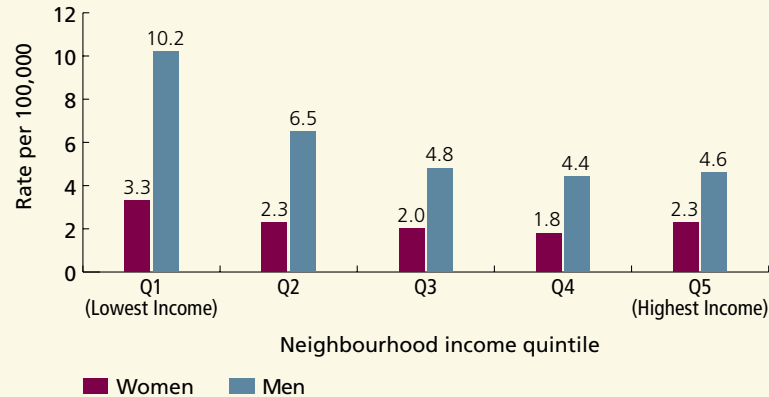
NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 3E.10 | Age-standardized mortality rate from homicide, fire, drowning and poisoning, per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Across all neighbourhood income quintiles men had mortality rates from homicide, fire, drowning and poisoning that were at least twice as high as those of women.
- Women in the lowest neighbourhood income quintile had a mortality rate from homicide, fire, drowning and poisoning of 3.3 per 100,000 compared to 2.3 per 100,000 for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile had a mortality rate from homicide, fire, drowning and poisoning of 10.2 per 100,000 compared to 4.6 per 100,000 for men in the highest neighbourhood income quintile.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

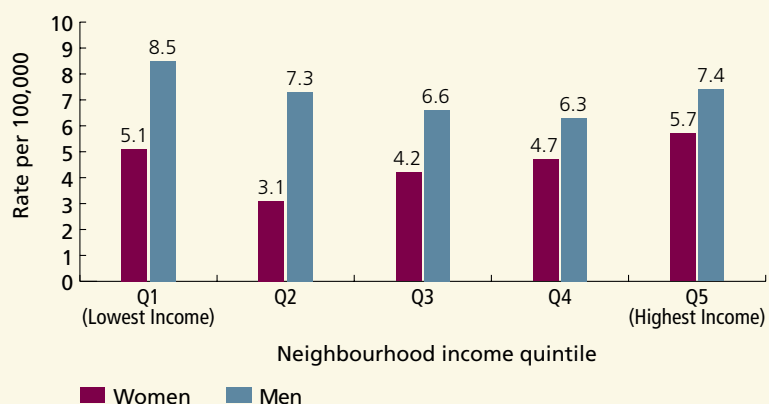
NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 3E.11 | Age-standardized fall-related mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Across all neighbourhood income quintiles, men had higher fall-related mortality rates than women.
- Women in the lowest neighbourhood income quintile had a fall-related mortality rate of 5.1 per 100,000 compared to 5.7 per 100,000 for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile had a fall-related mortality rate of 8.5 per 100,000 compared to 7.4 per 100,000 for men in the highest neighbourhood income quintile.
- Among women, fall-related mortality appeared to be greatest in those in the highest neighbourhood income quintile, while among men fall-related mortality appeared greatest in the lowest neighbourhood income quintile. However, income differences were not statistically significant.



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

LIFE EXPECTANCY AT BIRTH

Life expectancy at birth is the number of years a person would be expected to live from their date of birth, on the basis of the mortality statistics for a given observation period.

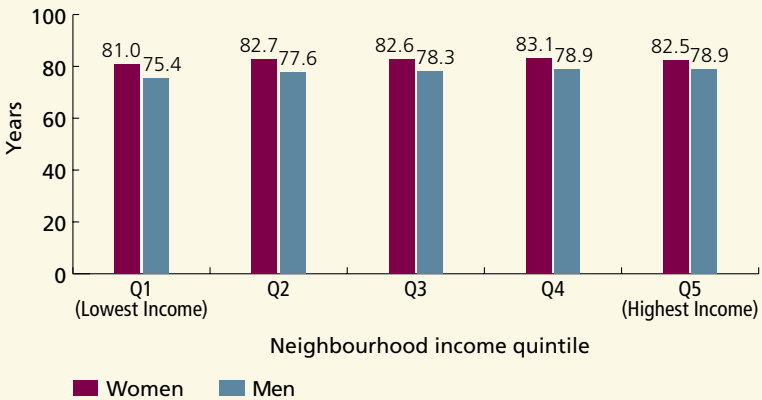
A widely used indicator of the health of a population, life expectancy measures quantity rather than quality of life. It provides a useful summary measure of the overall health status of a population. Use of area level income underestimates mortality differences for women.⁹⁸

Overall, the life expectancy at birth for the Ontario population was 80.1 years in 2001. Women were expected to live for 82.4 years and men for 77.8 years, a difference of 4.6 years.

EXHIBIT 3E.12 | Life expectancy at birth, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Life expectancy at birth was greater for women than for men, across all neighbourhood income quintiles.
- Women residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that is 1.5 years less than women residing in the highest income neighbourhoods (81.0 vs. 82.5 years)
- Men residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that was 3.5 years less than men residing in the highest income neighbourhoods (75.4 vs. 78.9 years).



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

LIFE EXPECTANCY AT AGE 65

Life expectancy at age 65 is the number of years a person would be expected to live, conditional on living to age 65, on the basis of the mortality statistics for a given observation period.

Life expectancy at age 65 is a traditional method of estimating population health, and is an overall indicator of the effect of several factors that influence death rates in older people. These include lifestyle, nutritional and environmental factors, and access to and the quality of treatment services for diseases and injury. Use of area level income underestimates mortality differences for women.⁹⁸

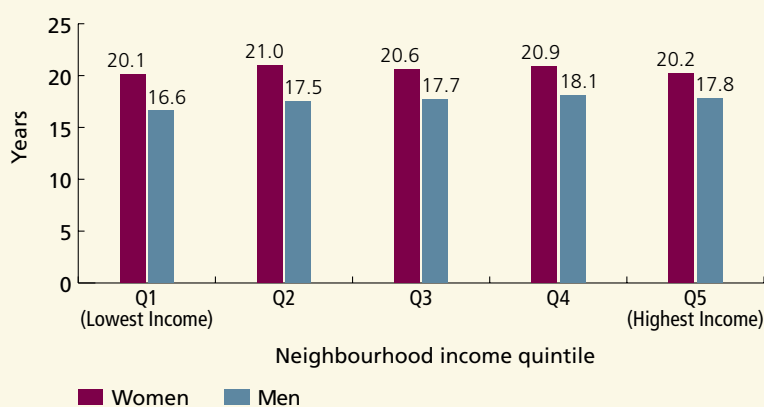
Although women who have reached the age of 65 can still expect to live longer than men of the same age, the difference is smaller than the difference between the sexes for life expectancy at birth. This reflects the fact that men are at greater risk than women of dying before they reach the age of 65, primarily from injury, suicide and cardiovascular disease.

Overall, the life expectancy for Ontario adults aged 65 and older was 19.1 years in 2001. At age 65, women had a life expectancy of 20.6 years and men had a life expectancy of 17.5 years, a difference of 3.1 years.

EXHIBIT 3E.13 | Life expectancy at age 65, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Life expectancy at age 65 was greater for women than for men, across all neighbourhood income quintiles.
- Across income quintiles, at age 65 women could expect to live an additional 20–21 years.
- Men residing in the lowest income quintile neighbourhoods had a life expectancy at age 65 that was 1.2 years less than men residing in the highest income quintile neighbourhoods (16.6 vs. 17.8 years).



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See [Appendix 3.3](#) for details about neighbourhood income quintile calculation

POWER Study

DISABILITY-FREE LIFE EXPECTANCY

Disability-free life expectancy (DFLE) is a measure of the years of life free of any activity limitations.

DFLE is used to distinguish between years of life free of any activity limitation and years experienced with at least one activity limitation. To that end, disability-free life expectancy establishes a threshold based on the nature of such limitations. Years of life lived in conditions above this threshold are counted in full, while those lived in conditions below the threshold are not counted. Thus the emphasis is not exclusively on the length of life, as is the case for life expectancy, but also on the quality of life.

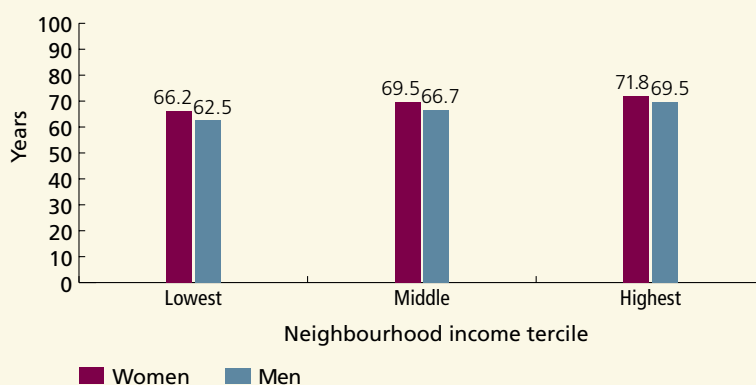
Overall in 1996/97, the disability-free life expectancy at birth for the Ontario population was 67.2 years (68.4 years for women and 65.9 years for men), whereas the DFLE at age 65 was 10.8 years overall (11.4 for women and 10.2 for men).²⁴

EXHIBIT 3E.14 | Disability-free life expectancy at birth and at age 65, by sex and neighbourhood income tercile, in Ontario, 1996/97

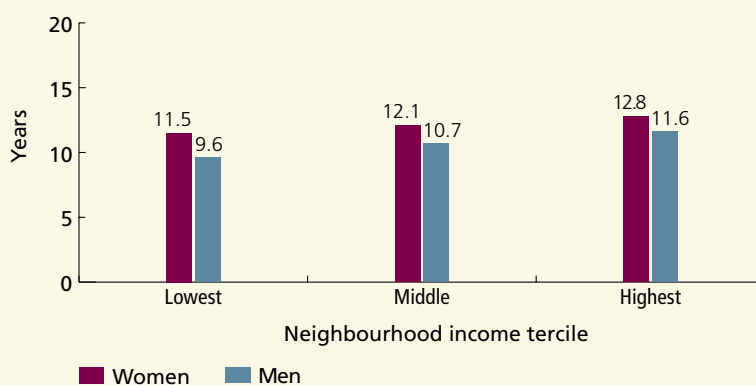
FINDINGS

- Disability-free life expectancy (DFLE) at birth and at age 65 was higher for women than for men across neighbourhood income terciles.
- DFLE at birth increased with neighbourhood income tercile by 5.6 years for women (66.2 vs. 71.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and seven years for men (62.5 vs. 69.5 years in the lowest vs. highest income tercile, respectively).
- The difference in DFLE at birth between women and men was 3.7 years among those in the lowest income tercile and 2.3 years among those in the highest income tercile.
- The same pattern was seen in DFLE at age 65 for both women (11.5 vs. 12.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and men (9.6 vs. 11.6 years in the lowest vs. highest neighbourhood income tercile, respectively).
- The difference in DFLE at age 65 between men and women was 1.9 years among those in the lowest income tercile and 1.2 years among those in the highest income tercile.
- A similar pattern was observed for education level (data not shown).

At birth



At age 65



DATA SOURCE: Statistics Canada's Canadian Mortality Database and 1996 Census of Canada

NOTE: See [Appendix 3.3](#) for details about neighbourhood income tercile calculation

POWER Study

Section 3E

SUMMARY OF FINDINGS

Low-income women and men had higher mortality rates both overall and for specific causes of death, including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher income. For most measures, an income gradient was seen across neighbourhood income quintiles. In the lowest neighbourhood income quintile, 26 percent of women and 41 percent of men did not live to 75 years of age. If all Ontarians had the same mortality rate as Ontarians living in the highest income neighbourhoods, there would be 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas. Men had higher all-cause mortality rates than women, as well as higher rates of mortality for all causes examined—including falls, which were more prevalent in women. Women had longer life expectancies than men, both at birth and at age 65. Use of area level to measure income may result in a greater underestimate in income gaps for women than for men, thus income differences among women based upon individual income may be larger than those reported here. Findings for the indicators reported in this section are summarized below.

All-Cause and Premature Mortality

In both women and men, the total number of deaths in 2001 per 100,000 population increased as income level decreased. All-cause mortality rates in men were 30 to 40 percent higher than in women, regardless of income level. The percentage of the population that died before age 75 increased as income level decreased. Forty-one percent of men and 26 percent of women in

the lowest neighbourhood income quintile did not live to 75 years of age in 2001 (compared with 28 percent of men and 19 percent of women in the highest neighbourhood income quintile). Across all neighbourhood income quintiles, men were more likely than women to die prematurely. Differences between men and women were greatest among those in the lower-income quintiles. Men also lost more potential years of life than women. Women in the lowest neighbourhood income quintile lost 36,118 years of potential life before age 75 compared to 25,336 potential years of life lost for women in the highest neighbourhood income quintile. Men in the lowest neighbourhood income quintile lost 56,914 years of potential life before age 75 compared to 38,892 potential years of life lost for men in the highest neighbourhood income quintile.

Disease-Specific Mortality

Men were much more likely than women to die from ischemic heart disease, cerebrovascular disease, other circulatory diseases, diabetes and chronic obstructive pulmonary disease in 2001. Mortality rates for these conditions among women and men were highest in the lowest income quintile. Men were also more likely than women to die from pneumonia across all income quintiles. Across all income quintiles, men were more likely than women to die from road traffic accidents, injuries (intentional and non-intentional) and falls. The highest rate of deaths from motor vehicle accidents occurred in the highest income quintile for both men (10.1 per 100,000 population) and women (4.5 per 100,000 population). Conversely, deaths from injuries and falls were highest in low-income men.

Life Expectancy and Disability-Free Life Expectancy

Life expectancies at birth and at age 65 were both greater for women than for men, across all neighbourhood income quintiles. Women residing in lower-income neighbourhoods had a life expectancy at birth that was 1.5 years less than women residing in the highest income neighbourhoods (81.0 vs. 82.5 years). Men residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that was 3.5 years less than men residing in neighbourhoods with the highest income quintile (75.4 vs. 78.9 years). Across income quintiles women at age 65 could expect to live an additional 20 to 21 years.

Disability-free life expectancy was two to three years longer at birth, across neighbourhood income terciles, in women compared to men and one to two years longer at age 65, regardless of neighbourhood income level. DFLE at birth increased with neighbourhood income tercile by 5.6 years for women (66.2 vs. 71.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and seven years for men (62.5 vs. 69.5 years in the lowest vs. highest income tercile, respectively). The difference in DFLE at birth between women and men was 3.7 years among those in the lowest income tercile and 2.3 years among those in the highest income tercile. The same pattern was seen in disability-free life expectancy at age 65. A similar pattern was observed for education level.



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Chapter Summary of Findings

In this chapter we paint a picture of the burden of illness experienced by the women and men of Ontario by reporting on the presence and magnitude of health inequities in five key areas:

- A. Health and functional status
- B. Chronic disease risk factors
- C. Chronic conditions
- D. Sexually-transmitted infections
- E. Mortality

A summary of the key findings from the five chapter sections follows:

Health and Functional Status

Low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest-income group ([Exhibit 3A.1](#)). They were also more likely to report having two or more chronic conditions and that their activities were limited by a chronic health condition ([Exhibit 3A.9](#)).

Aboriginal women and men were more likely to report fair or poor health, multiple chronic conditions and activity limitations than women and men in other ethnic groups. Forty-five percent of women who self-identified as Aboriginal reported that their activities were limited by a chronic health condition ([Exhibit 3A.10](#)).

Ontarians who spoke French only or who did not speak French or English were more likely to report that their health was fair or poor than those who spoke English only or who were bilingual in French and English ([Exhibit 3A.5](#)).

Low-income Ontarians were much more likely to report that at least some of their activities were prevented due to pain or discomfort than those with higher income. ([Exhibit 3A.16](#)). One-quarter of low-income women and

men in Ontario reported that their activities were limited by pain or discomfort. Older women were the most likely to report that their activities were limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting activity limitations due to pain or discomfort ([Exhibit 3A.17](#)).

The number of fall-related hospitalizations increased with age, for both women and men, with highest rates observed among individuals aged 80 and older ([Exhibit 3A.18](#)). Overall, 1,483 per 100,000 adults aged 65 and older in Ontario were hospitalized due to fall-related injuries in 2005/06. A total of 1,837 per 100,000 women and 1,026 per 100,000 men in Ontario were hospitalized due to fall-related injuries over the course of that year.

Chronic Disease Risk Factors

Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. Forty-four percent of women aged 65-79 and 52 percent of those aged 80 and older reported living in a lower-income household compared to 33 percent and 35 percent of men in these age groups, respectively ([Exhibit 3B.1](#)).

Recent immigrants, members of racial and ethnic minority groups, and Francophones who spoke French only were also more likely to live in lower-income households than the overall Ontario population ([Exhibit 3B.1](#)).

The proportion of Ontarians who reported four major risk factors that increase the risk for chronic diseases and their associated morbidity and premature mortality (physical inactivity, inadequate fruit and vegetable intake, being overweight or obese and smoking) was high across all levels of education and income ([Exhibit 3B.5](#)).

Lower levels of education and income were associated with a higher prevalence of these risk factors. For example,

women and men with lower levels of education were more likely to smoke; 28 percent of women and 40 percent of men with less than a secondary school education compared to eight percent of women and 13 percent of men who had a Bachelor's degree or higher ([Exhibit 3B.5](#)).

Women were more likely to report that they were physically inactive but less likely to report inadequate fruit and vegetable intake, being overweight or obese and smoking than men.

While five percent of Ontarians overall reported food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods desired due to a lack of money ([Exhibit 3B.4](#)).

Chronic Conditions

The majority of women and men in Ontario were living with at least one chronic condition. Nearly one in three women and one in four men reported having two or more chronic conditions ([Exhibit 3C.7](#)).

There was an income gradient in the prevalence of common chronic diseases among both women and men and a similar pattern was seen for education. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression) as well as having multiple chronic conditions (comorbidity) ([Exhibit 3C.1](#)).

The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women ([Exhibit 3C.10](#)).

Women were more likely to report having arthritis, depression, and multiple chronic conditions than men.

Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in five

reported having diabetes, and one in four reported having heart disease or stroke ([Exhibit 3C.2](#)).

Sexually-transmitted Infections

Chlamydia infection and its consequences primarily affects adolescent and young adult women (aged 15–24) ([Exhibit 3D.1](#)).

Reported incidence rates of gonorrhea infection among women aged 15–19 were more than twice as high as rates reported for adolescent men. For those aged 20 and older, rates were higher among men than women; however, this difference was small among those aged 20–24 ([Exhibit 3D.2](#)).

While men were more likely than women to be infected with HIV, one-fourth of new HIV infections occurred in women. Risk factors for HIV infection differed greatly for women and men. Among women in Ontario most infections were due to heterosexual transmission, whereas homosexual transmission was more common for men ([Exhibit 3D.4](#)).

Mortality

Low-income women and men had higher mortality rates both overall ([Exhibit 3E.1](#)) and for specific causes of death—including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher income.

For most measures of mortality, an income gradient was observed across neighbourhood income quintiles. In addition, sex differences in mortality rates tended to be greatest among low-income women and men indicating a marked survival disadvantage for low-income men.

Forty-one percent of men and 26 percent of women in the lowest income quintile died before age 75 (premature mortality), compared to 28 percent of men and 19 percent of women in the highest income quintile ([Exhibit 3E.2](#)).

Discussion

We found sizable and modifiable inequities in health in Ontario associated with gender, income, education, ethnicity and geography. Ontarians of lower socioeconomic position experienced much higher levels of chronic disease and disability than those who were more advantaged.

They were also more likely to die prematurely. We identify many opportunities for improvement, present objective evidence to inform priority setting and provide a baseline from which to measure progress.

The impact of these inequities was substantial.

If all Ontarians had the same health as Ontarians with higher income, an estimated 318,000 fewer people (166,000 women and 152,000 men) would be in fair or poor health, an estimated 231,000 fewer people (110,000 women and 121,000 men) would be disabled and there would be an estimated 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas.

Gender matters. There were large differences in health associated with income, education and ethnicity among both women and men. The differences between subgroups of women associated with income, education and ethnicity were often larger than the overall differences between women and men. For example, while 13 percent of women and men in Ontario reported their health as being fair or poor, 26 percent of low-income women versus only eight percent of higher-income women reported their health as fair or poor. The social determinants of health influenced women and men differently. For example, disadvantaged women (i.e., low-income) were particularly at risk for disability and chronic pain and disadvantaged men were particularly at risk for early death. Women were more likely to report comorbidity and disability than men, and men

had higher rates of potentially avoidable mortality and premature death. In addition, women were more likely to be poor than men, adding greatly to the high burden of illness that they experienced.

Ethnicity and language were also associated with health and functional status. In particular Aboriginal women and men (living off-reserve) were more likely to report fair or poor health and activity limitations than other ethnic groups. Aboriginal women were more likely to report fair or poor health and activity limitations than Aboriginal men. Ontarians who spoke French only or who spoke neither French nor English also reported worse health than those who spoke English only or were bilingual (French and English).

Geography also matters. There were important differences across Ontario Local Health Integration Networks (LHINs) in the health and functional status of their residents, as well as the distribution of risk factors for chronic disease (smoking, obesity, and sedentary lifestyles).

It is not surprising that we found health inequities in the province—health inequities associated with socioeconomic position have been well-documented in many societies. **What is surprising and of great concern is the size of these health inequalities.** This may be a reflection of growing income inequality and rates of poverty. In the mid 1990's in Canada, levels of income inequality and poverty began to climb (following a period of two decades when these levels were on the decline). In fact, inequality and poverty rates in Canada

were recently reported to exceed the average of the member countries of the Organization for Economic Co-operation and Development (OECD) countries.¹⁰⁸

The good news is that there is a lot we can do to close these gaps in health equity. There is growing evidence for the effectiveness of interventions to reduce overall population risk, improve health outcomes and close the health gaps between the less advantaged and more advantaged members of society.^{25, 109-111} Many of these objectives were detailed in the Ottawa Charter over two decades ago.¹¹² There are now several decades of international experience in developing and implementing strategies for health equity. Addressing health inequities is a policy priority and explicit objective for many international organizations (e.g., European Union (EU), the OECD, the World Health Organization (WHO))¹¹³ and many nations (the United Kingdom, Sweden, the Netherlands, New Zealand and Finland).¹¹⁴ Lessons learned from their efforts can help inform interventions in Ontario. The WHO Commission on the Social Determinants of Health recently concluded that through a concerted effort, it is possible to close these gaps in a generation.²⁵

There are many innovative models to draw upon in Ontario, across Canada and internationally by communities, health care providers, health systems, public health systems and organizations to effect improvement. For example, Community Health Centres in Ontario have developed models of care that address the social determinants of health and foster cultural and linguistic access to services. British Columbia has implemented both a provincial chronic disease management program and ActNow, BC¹¹⁵ involving multiple sectors in health promotion. In the United Kingdom, improvements in health equity have been achieved through quality improvements in primary care.

Our findings highlight the need to ensure that efforts to reduce population risk factors for chronic disease reach those who are at the greatest risk. For example, through Ontario's Smoke-Free Strategy success has been achieved by reducing the number of Ontarians

who smoke.^{58,116} Nevertheless, we found that 40% of men and 28% of women with less than a secondary school education, as well as 39% of Aboriginal women and 43% of Aboriginal men currently smoke. Thus, to be most effective, prevention and improvement efforts must also target vulnerable population subgroups. See the "Reducing the Burden of Illness: Different Approaches" Section for a description of Ontario's Smoke-Free Strategy as well as other examples of successful intervention models we can draw from.

With a commitment to achieving health equity, and a concerted coordinated effort to tackle the problems identified in this chapter, much progress can be made. This can be accomplished through incorporating determinants of health, as well as focusing on and emphasizing chronic disease prevention and management as described below. Ongoing measurement, monitoring and evaluation are essential elements for accomplishing desired change.

Determinants of Health and Constrained Choices

Common modifiable risk factors such as smoking, overweight and obesity are responsible for much of the chronic illness present in both women and men. For example, a recent study found that more than half (55 percent) of deaths in women can be attributed to the combination of smoking, being overweight, lack of physical activity and a low-quality diet.³⁸ However, the degree to which each of these risk factors contribute to chronic disease differs by gender.¹¹⁷ Thus, gender-sensitive interventions are needed to reduce risk. Also, to be successful these interventions need to address factors that influence health behaviours,¹ including social factors (e.g., living and working conditions, income, education, culture) as well as individual choices.

Good nutrition promotes health, reduces the risk of illness and chronic disease and improves health outcomes among individuals with chronic conditions. Food insecurity, or inadequate access to a healthy diet constrains food choices and is associated with worse

health status including diabetes and obesity.^{42, 53, 54} In 2005, five percent of Ontarians reported food insecurity. However, there was a large income gradient in the percentage of adults who reported food insecurity, with one-quarter of low-income men and women reporting that they “did not have enough to eat, worried about there not being enough to eat or did not eat the quality or variety of foods desired due to a lack of money.” In Ontario, neighbourhood characteristics have been shown to be linked to the prevalence of diabetes both through less access to a healthy diet and neighbourhood conditions that make it more difficult to make healthy choices, such as limited (and unsafe) green spaces for physical activity.⁴³

Bird and Rieker¹¹⁸ have developed a model of constrained choice that explains how the social determinants of health influence health behaviors. The model addresses how policy decisions can have unintended and cumulative effects by discouraging or preventing healthy choices. Constrained choice can result from national-level social policy, community decisions about neighbourhoods that limit opportunities for walking and exercise or workplace actions that limit employees’ autonomy over their work and schedule.¹¹⁸ Therefore, reducing population risk requires addressing those factors that result in constrained choices.

Chronic Disease Prevention and Management

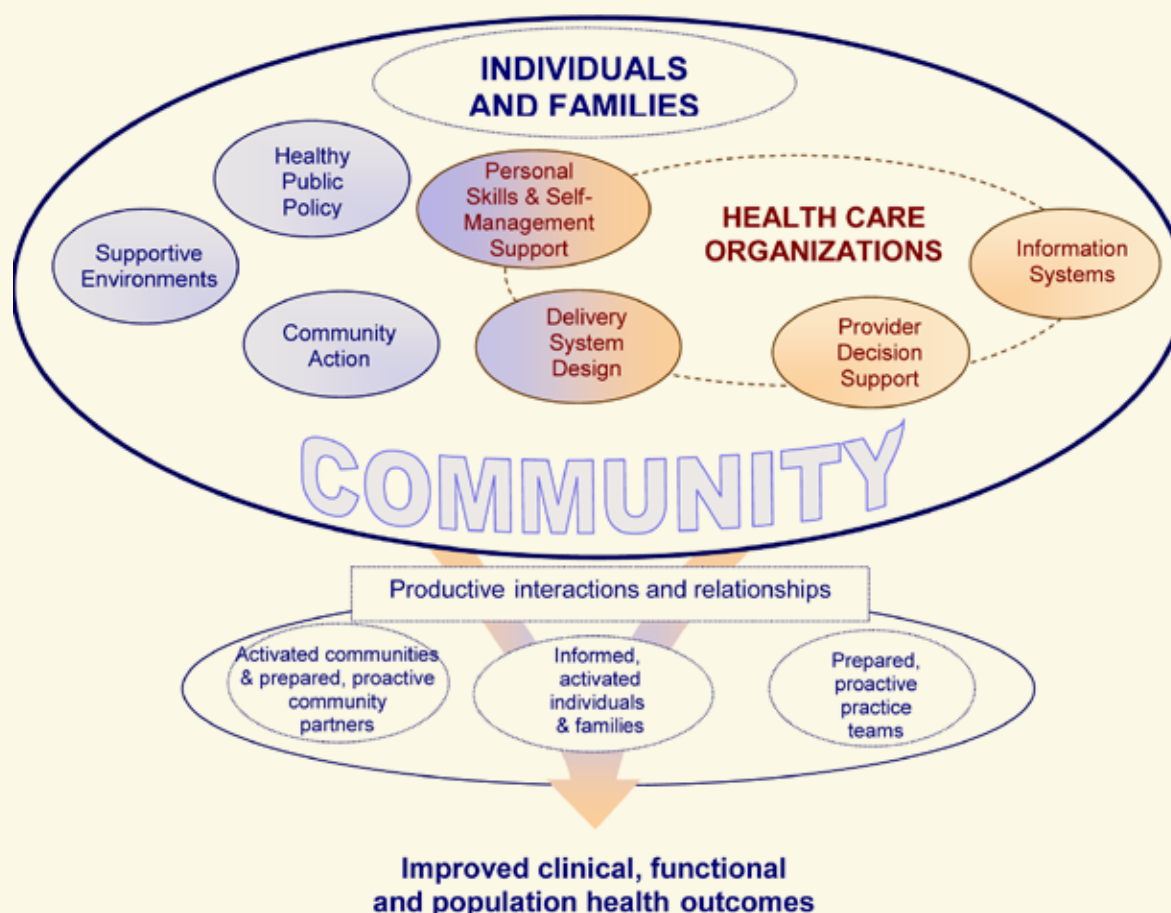
Much of the illness burden that we report is attributable to chronic illness. The current health care system is ill-suited to meet the needs of individuals with chronic illness and disability. Moreover, insufficient attention is paid to prevention and there is typically little coordination between community-based and health sector interventions. Because women and socioeconomically disadvantaged persons are more likely to have multiple chronic conditions and disability, they are affected disproportionately by the mismatch between the way care is currently organized and the needs of persons with chronic illness.^{119, 120}

This in turn leads to worse health status and thus contributes to health inequities. Health system redesign that supports chronic illness care and fosters patient empowerment and community partnership is an important strategy for achieving health equity.¹¹⁴

In order to improve chronic disease prevention and management in the province, the Ontario Ministry of Health and Long-Term Care (MOHLTC) has adopted the Chronic Disease Prevention and Management Framework (Figure 4). This framework provides a roadmap for creating a patient-centred delivery system that meets the needs of individuals with chronic illness. The Framework is based upon the Chronic Care Model (CCM) developed by Wagner and colleagues.¹²¹ The CCM, which has guided efforts to improve healthcare quality using a health systems approach, includes the role of community resources and policy in improving health outcomes. It has been used to improve the quality of care in diverse practice settings in many countries.⁶⁷ The CCM recognizes that good health outcomes are dependent upon productive interactions between an individual and a proactive health care team and empowers patients to take an active role in their care.

Subsequent iterations of the CCM expand upon the role of both communities and the policy environment in fostering health, providing a framework that can be used to address the social determinants of health in the context of system redesign and improvement.⁶⁶ In Canada, the province of British Columbia is using the “Expanded Chronic Care Model” which emphasizes the role of an activated community as a partner and incorporates a focus on disease prevention and health promotion.⁶⁶ This has led to innovations and improvements in chronic disease care management.

More widespread implementation of Ontario’s Chronic Disease Prevention and Management Framework would foster needed improvements in the province to reduce the burden of chronic disease and disability.

FIGURE 4 | Ontario's Chronic Disease Prevention and Management Framework

SOURCE: Ontario Ministry of Health and Long Term Care-Chronic Disease Prevention and Management Framework

Measurement, Monitoring, Improvement, and Evaluation

Measurement, monitoring, improvement and evaluation are critical elements for tackling health inequities.^{122, 123} The WHO Commission on the Social Determinants of Health concluded “Goals and targets can redirect policy, improve resource allocation and improve development outcomes. Regular public reporting and the development of data systems, globally and nationally, ensure that the world can see which targets are being met and where further efforts are needed.”²⁵

We report on a set of indicators, currently measurable using data available in the province, to inform priority setting, development of goals and targets and the

identification and development of interventions for improvement. By presenting data at the level of the LHIN, we provide important information needed by providers and policymakers to tackle and reduce health inequities across the province. Monitoring these indicators over time will allow us to evaluate the effectiveness of efforts to improve population health and whether progress is being made in both reducing the gap between those who are least and most advantaged and reducing the gradient across all levels of income and education.

A number of tools have been developed to help guide policymakers, providers and communities in designing, implementing and evaluating interventions to reduce

health inequities.¹²³ Health Equity Audits (HEAs) are used to assess the cause of health inequities in a defined population and to develop and implement programs to address them.^{124, 125} Health Impact Assessments (HIAs) are used to assess the impact of policy on population health and health equity. The Equity Gauge, recently adapted for the Canadian context, is a model that incorporates community empowerment and has been primarily used in the developing world.^{123, 126} Tugwell and colleagues have proposed a “health equity loop” that recognizes the need for an iterative learning process for health equity policies and interventions.¹²⁷ Use of these tools provincially, regionally and locally can contribute to accelerating progress.

Coordinating a Response

There are many important, ongoing activities aimed at improving health in the province that can lead to improvements in population health. However, they are not always coordinated. Efforts to integrate and coordinate these activities, including those outside the health sector, could produce synergies that could accelerate progress in improving health and reducing health inequities among Ontarians.

The MOHLTC has a number of strategies aimed at reducing the burden of illness among Ontarians. For example, its Diabetes Strategy incorporates the Chronic Disease Model to improve the quality and outcomes of diabetes care. The Aging in Place Strategy seeks to keep older Ontarians in their homes. Improved chronic disease prevention and management, pain management and falls prevention would all support this objective. Primary care reform and expansion of Family Health Teams can also contribute to improving the health of the population. Many providers have implemented efforts to improve the quality of care provided for chronic disease.

Two efforts of the Ontario Ministry of Health Promotion—the Healthy Eating and Active Living Action Plan⁵⁹ and the Healthy School's Recognition Program¹²⁸—are

focused on modifying important risk factors for chronic disease. The new Ontario Public Health Standards include identifying, reporting and using information about health inequities and tailoring strategies to inform actions that meet the needs of priority populations. Poverty reduction strategies address the social determinants of health.

Many LHINs have identified equity as a priority issue. For example, the Toronto Central LHIN created a Health Equity Task Force and has developed a plan for improving health equity in the LHIN.^{129, 130} Efforts to integrate and coordinate these efforts could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

Limitations

Our study has a number of limitations. Many of the indicators are measured using the Canadian Community Health Survey (CCHS) and are based upon self-report. Self-report of chronic disease prevalence is widely used for reporting and has been well-validated as a measure.¹³¹ Nevertheless, it is subject to reporting error. Importantly, many chronic conditions such as hypertension or diabetes can be present for years without causing symptoms. If persons who are socioeconomically disadvantaged encounter more barriers to access to care and therefore are not diagnosed, this would result in an underestimate of prevalence in this population, as well as an underestimate of the differences between the most and least advantaged groups. The way a question is asked can also influence the accuracy of response. For example, rates of urinary incontinence from the CCHS are lower than those of other population health surveys which may be due to the way the question is asked.⁷³

Some indicators are more subject to measurement error than others. For example, the indicator for being overweight or obese is particularly subject to measurement error as people may under- or over-report their height and weight. The indicator of depression prevalence measures the percentage of adults who—based on their scores in the Composite

International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD) questionnaire⁷⁴—had a high probability of having major depression. Many more Ontarians have milder forms of depression. The CIDI-SFMD was never fully validated so that the percentages reported here may differ from actual population prevalence.

In other circumstances, important questions may not be asked. The measure of disability we used assesses the proportion of the population who need the assistance of another person to carry out Instrumental Activities of Daily Living and/or Activities of Daily Living. Survey respondents were not asked whether they received this assistance. We therefore were not able to assess unmet need for assistance with these activities.

The CCHS includes only self-identified, off-reserve, Aboriginal adults (North American Indian, Métis, Inuit). Thus, our measures of Aboriginal health excluded those living on reserves and are not representative of the overall Aboriginal population in Ontario. If Aboriginal people living on reserves have worse health than those living off-reserves then the health gap between Aboriginal people and those of other ethnic groups would be larger than reported here.

For indicators using administrative data, income level was assessed using neighbourhood income quintiles. This measure captures the impact on health of living in a low-income neighbourhood. This measure has been well-validated as a proxy for individual income, but it is subject to measurement error in neighbourhoods where households with a mix of income levels reside. Mortality indicators were analyzed by Statistics Canada and are limited to residents of Census Metropolitan Areas (CMAs).

Most of the indicators we report are from 2005. We have provided a baseline from which to monitor progress that can be updated as newer data become available.

What We Can't Measure

Due to data limitations, there are a number of important aspects of burden of illness that we were unable to measure. Limited data are available in the province on ethnicity. The data that are available come from the CCHS, and sample sizes are not large enough to report on all indicators for the diverse ethnic groups that comprise the Ontario population. It was not possible to assess whether the health of ethnic minorities differed across the LHINs. Likewise, similar limitations apply to assessing the health of Francophones in the province or those who did not speak one of the official languages. We were also unable to provide a full picture of Aboriginal health across the province.

Better data on ethnicity and language can be obtained through oversampling specific populations in surveys to increase sample size, targeting surveys to specifically assess the health of populations of interest, collecting data on ethnicity and language in administrative data or linking datasets containing this information to health data.

Data quality and completeness also limit our measurement ability. Due to missing postal codes in the iPHIS database, we were unable to assess rates of sexually-transmitted infections (STIs) by income or at the LHIN-level. This limitation is being addressed and it is anticipated that it will be possible to report variation in rates of STIs by region and income in the future.

We do not have data on important factors that influence women's health such as caregiving responsibilities or exposure to domestic violence. Importantly, income, education, ethnicity, language and geography do not operate alone to influence health and well-being. Rather they operate together and interact to shape the health of women and men. We were only able to examine these factors separately. Thus, we do not capture the impact of their intersectionality.

KEY MESSAGES

There are enormous opportunities to improve overall population health while reducing health inequities in Ontario. It is not surprising that we identified health inequities, as these are common in all societies and are well-documented in Canada. However, the large size of the identified inequities is of concern. There is growing evidence for interventions to reduce overall population risk and to close the health gaps between the less and more advantaged members of society.¹⁰⁹

The following four key actions can accelerate progress in improving the health of and reducing inequities among all Ontarians:

1. Prioritize chronic disease prevention and management;
2. Coordinate population health, community and clinical responses for improving health;
3. Address the broader social determinants of health and
4. Routinely include gender and equity analysis in health indicator monitoring and reporting.

Prioritize Chronic Disease Prevention and Management

- Because chronic diseases and their risk factors contribute greatly to health inequities, the implementation of a comprehensive and coordinated chronic disease prevention and management strategy—that addresses the needs of at-risk populations—is the key to improving population health and achieving health equity.
- It is especially important to identify specific opportunities to improve quality of life and functional status through both community-based and health care interventions. For example, improved pain management and falls prevention interventions can reduce illness burden and contribute to the goal of helping older Ontarians remain active and independent.

Coordinate Population Health, Community and Clinical Responses

- There are many important ongoing activities aimed at improving health in the province including: targeting population-based health promotion, enhancing the quality and capacity of community-based services and improving the quality of care delivered in clinical settings. Efforts to integrate and coordinate these activities could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

Address the Broader Social Determinants of Health

- There is a need to address the broader social determinants of health (i.e., income, education, food security, housing and environment) and to integrate these efforts with health policy. Cross-sectoral partnerships are needed to accomplish this goal.
- To guide these efforts, tools such as Health Impact Assessments (HIAs) are available to assess the health impact of policy—including those in non-health sectors such as education, housing and environment—on both population health and health inequities. The results of HIAs in key priority areas in Ontario could help to support efforts to achieve health equity.

Routinely Include Gender and Equity Analysis in Health Indicator Monitoring

- A gender and equity focus should be routinely incorporated into health indicator reporting and monitoring. This provides the needed information to effectively target gender, socioeconomic and ethnic inequities in health. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities.
- Improvements in data quality, availability, and timeliness are needed to support monitoring and reporting strategies. There is a particular need for data on ethnicity to improve the capacity to measure, monitor and improve health for Ontario's diverse communities.

Reducing Burden of Illness: Different Approaches

There are many models to draw upon, including innovations in Ontario, across Canada and internationally by communities, providers, health systems and public health organizations to effect improvement.

Chronic Disease Management in British Columbia

The Ministry of Health in British Columbia developed a chronic disease management (CDM) program with initiatives that focus on prevention, early detection and management of chronic conditions.¹³² The multi-disciplinary program involves the collaborative efforts of medical and health care professionals, health authorities, researchers and organizations across all sectors of the health care system. The program was based upon the Expanded Chronic Care Model.^{133, 134}

This strategy led to provincial and local interventions designed to improve quality and outcomes of care. A province-wide congestive heart failure collaborative led to substantial improvements in adherence to evidence-based guidelines for patients with heart failure.¹³⁵ A chronic disease management toolkit was developed and made available to practitioners that included electronic access to guidelines, patient flow sheets and the ability to generate clinical and administrative reports on quality of care provided.¹³⁶

Reducing Population Risk: The Ontario Smoke-Free Strategy

The Government of Ontario developed the Smoke-Free Strategy—a comprehensive tobacco control program—with the goal of reducing tobacco consumption by 20 percent by the end of 2007. This was achieved with a

31.8 percent decline in tobacco consumption between 2003 and 2006. The program's main initiatives aimed to: prevent children and youth from starting to smoke; help current smokers to quit and reduce involuntary exposure to second-hand smoke. Central to the strategy is the *Smoke-Free Ontario Act*, which came into force on May 31, 2006. The Act bans smoking in enclosed public places and enclosed work places, strengthens laws on tobacco sales to minors and restricts the display of tobacco products in retail outlets in order to reduce population risk from exposure to tobacco smoke in the province.^{58, 116}

Community Health Centres-Crossing Boundaries

Many Community Health Centres in Ontario have implemented programs that cross boundaries to address the social determinants of health in order to improve health outcomes among the at-risk populations that they serve.

In response to community need, *The London InterCommunity Health Centre* developed the *Latin American Diabetes Program* targeting the special needs of the large Latin American community in the region. The program addresses both prevention and chronic disease management. The centre provides a multi-disciplinary screening and treatment program, using electronic patient records to monitor patients and assess program

effectiveness. In addition to the medical program, community health workers and social workers address the socioeconomic status of their patients such as housing and employment issues. The program has substantially improved diabetes control, resulted in risk factor reduction through weight loss, increased physical activity, blood pressure and cholesterol control and proved to be cost saving by reducing health care costs associated with diabetes and its complications.^{137, 138, 139}

Access to an affordable and healthy diet is essential to reducing the risk of developing chronic diseases such as diabetes, heart disease and high blood pressure, improving health outcomes and reducing the risk of complications among those who develop these conditions. Unfortunately, many low-income Ontarians report food insecurity. The *Barrie Good Food Box* is a buying club sponsored by the *Barrie Community Health Centre* that provides nutritious fruits and vegetables at wholesale prices to participants.¹⁴⁰

Performance Measurement and Quality Improvement

Structured performance measurement and quality improvement initiatives can lead to better prevention and care for chronic conditions¹⁴¹ and can result in increased equity.^{142, 143} In the United Kingdom, the Quality and Outcomes Framework provides financial incentives to primary care physicians to improve quality of care measured by performance on a standard set of quality indicators.¹⁴⁴ The implementation of this framework has led to overall improvement in chronic disease management (e.g., control of hypertension) with narrowing of inequities in performance between practices serving the most- and the least-deprived communities.

Cultural and Linguistic Access to Care

Women's Health in Women's Hands [WHIWH] Community Health Centre provides community, mental and clinical care, health promotion and support to Black women and women of colour from the Caribbean, African, Latin American and South Asian communities in Metropolitan Toronto and surrounding municipalities.¹⁴⁵ They use a multidisciplinary model of care that is based on an understanding that women's health issues are personal, cultural, social, racial and economic as well as medical. WHIWH employs multilingual and culturally aware staff (speaking 21 languages and 4 dialects). They have adopted several strategies designed to overcome the challenges and barriers encountered by women of colour in accessing care. These include involving marginalized groups in decision-making at all levels of the organization including the Board of Directors; ensuring that healthcare providers are representative of their various client populations and offering integrated multidisciplinary services where clients make one visit for more than a single purpose. WHIWH has a diabetes program that includes a Diabetes Nurse Educator who engages with the community in their familiar surroundings, and community dietitians who offer nutritional information that incorporates a cultural understanding of food and nutrition.

Tackling Root Causes: Poverty Reduction

In 2002, the Province of Québec enacted a law to combat poverty and social exclusion. The goals of the Act to Combat Poverty and Social Exclusion are: "to promote respect for and protection of the dignity of persons living in poverty and combat prejudices in their regard; to improve the economic and social situation of persons and families living in poverty and social exclusion;

to reduce the inequalities that may be detrimental to social cohesion; to encourage persons and families living in poverty to participate in community life and social development and to develop and reinforce the sense of solidarity throughout Québec, so that society as a whole may participate in the fight against poverty and social exclusion." The government developed a multi-pronged action plan titled *Reconciling Freedom and Social Justice: A Challenge for Tomorrow*, to achieve these goals.⁷ As a result, Quebec has had a steady decline in the number of adults and children living in poverty, as well as a reduction in the number of persons requiring social assistance.⁷

Bridging Population Health and Clinical Practice

The Norsjo Community Intervention Program in Sweden is an example of a successful model that combines population health and health sector interventions. The program was able to reduce cardiovascular disease risk

in the population by creating a local health promotion collaboration between healthcare providers, grocery stores, schools and municipal authorities. Primary care physicians contacted patients for systematic risk factor screening and counseling aimed at cardiovascular risk reduction. Community interventions included changes in food labeling to make it easier to adhere to dietary recommendations. As a result of this collaboration, the predicted coronary heart disease mortality was reduced by 36 percent in the intervention area compared to one percent in a control community. Socially less-privileged groups benefited the most from the program.¹⁴⁶⁻¹⁴⁸



Appendix 3.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

APPENDIX 3.1 | Burden of illness indicators: links to the *Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System* and the *Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives*

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section A – Health and Functional Status		
Self-rated Health (Global Health)	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians
Self-rated Mental Health (Global Mental Health)	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians
Activity Limitations	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians
Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians
Activities Prevented by Pain or Discomfort	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes • Improve health status of Ontarians
Hospitalization Rate Due to Fall-related Injury Among Seniors	<ul style="list-style-type: none"> • Effective • Patient-centred • Integrated • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes • Increase sustainability of the health system

APPENDIX 3.1 | Burden of illness indicators: links to the *Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System* and the *Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives*

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section B – Chronic Disease Risk Factors		
Social Determinants of Health <ul style="list-style-type: none"> • Low income • Low education • Food insecurity 	<ul style="list-style-type: none"> • Equitable • Focused on population health 	<ul style="list-style-type: none"> • Influence broader determinants of health • Improve clinical and population health outcomes • Improve health status of Ontarians
Health Behaviours <ul style="list-style-type: none"> • Physical inactivity • Inadequate fruit and vegetable intake • Being overweight or obese • Smoking 	<ul style="list-style-type: none"> • Focused on population health 	<ul style="list-style-type: none"> • Improve healthy behaviours, health promotion and disease prevention • Improve clinical and population health outcomes • Improve health status of Ontarians
Section C – Chronic Conditions		
Prevalence of Chronic Conditions <ul style="list-style-type: none"> • Arthritis • Obstructive lung disease (Asthma, chronic bronchitis, emphysema or COPD) • Diabetes • Heart disease or stroke • Hypertension • Urinary incontinence 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve healthy behaviours, health promotion and disease prevention • Improve health status of Ontarians • Influence broader determinants of health • Increase sustainability of the health system
Prevalence of Depression	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health
Prevalence of Comorbidity <ul style="list-style-type: none"> • Two or more chronic conditions** 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve health status of Ontarians • Influence broader determinants of health • Increase sustainability of the health system

APPENDIX 3.1 | Burden of illness indicators: links to the *Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System* and the *Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives*

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section D – Sexually-transmitted Infections		
Incidence of Sexually-transmitted Infections <ul style="list-style-type: none"> Chlamydia Gonorrhea 	<ul style="list-style-type: none"> Effective Focused on population health 	<ul style="list-style-type: none"> Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes Improve health status of Ontarians Influence broader determinants of health
HIV/AIDS <ul style="list-style-type: none"> HIV prevalence HIV risk factors (exposure categories) AIDS incidence Prenatal HIV testing 	<ul style="list-style-type: none"> Effective Focused on population health 	<ul style="list-style-type: none"> Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes Improve health status of Ontarians Influence broader determinants of health
Section E – Mortality		
All-cause Mortality Rate	<ul style="list-style-type: none"> Effective Focused on population health 	<ul style="list-style-type: none"> Improve clinical and population health outcomes Improve health status of Ontarians Influence broader determinants of health
Premature Mortality <ul style="list-style-type: none"> Deaths before age 75 Excess deaths before age 75 Potential years of life lost (PYLL) before age 75 	<ul style="list-style-type: none"> Effective Focused on population health 	<ul style="list-style-type: none"> Improve clinical and population health outcomes Improve health status of Ontarians Influence broader determinants of health
Chronic Disease Mortality Rates <ul style="list-style-type: none"> Circulatory diseases Diabetes Chronic obstructive pulmonary disease (COPD) 	<ul style="list-style-type: none"> Effective Focused on population health 	<ul style="list-style-type: none"> Improve clinical and population health outcomes Improve health status of Ontarians Influence broader determinants of health

APPENDIX 3.1 | Burden of illness indicators: links to the *Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System* and the *Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives*

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section E – Mortality		
Infectious Disease Mortality Rate <ul style="list-style-type: none"> • Pneumonia 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health
Mortality from Trauma and Injury <ul style="list-style-type: none"> • Road traffic accidents (RTA) • Intentional and non-intentional injuries (homicide, fire, drowning and poisoning) • Fall-related mortality rate 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health
Life Expectancy <ul style="list-style-type: none"> • At birth • At age 65 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health
Disability-free Life Expectancy <ul style="list-style-type: none"> • At birth • At age 65 	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health

** Chronic conditions included in this list are: Alzheimer's disease or other dementia; bowel disorders (Crohn's disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, or back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia

Appendix 3.2

INDICATORS AND THEIR SOURCES*

APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

Indicator	Indicator Source	Data Source
Section A – Health and Functional Status		
Self-rated Health (Global Health)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario. Australia. Report of New South Wales Chief Health Officer: Burden of Disease 	Canadian Community Health Survey (CCHS), Cycle 3.1
Self-rated Mental Health (Global Mental Health)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001 	CCHS 3.1
Activity Limitations	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 Association of Public Health Epidemiologists of Ontario (APHEO) 	CCHS 3.1
Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	CCHS 3.1
Activities Prevented by Pain or Discomfort	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001. 	CCHS 1.1
Hospitalization Rate Due to Fall-related Injury Among Seniors	<ul style="list-style-type: none"> Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	Canadian Institute for Health Information — Discharge Abstract Database (CIHI-DAD)

APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

Indicator	Indicator Source	Data Source
Section B – Chronic Disease Risk Factors		
Social Determinants of Health <ul style="list-style-type: none"> • Low income • Low education • Food insecurity 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) 	CCHS 3.1
Health Behaviours <ul style="list-style-type: none"> • Physical inactivity • Inadequate fruit and vegetable intake • Being overweight or obese • Smoking 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) 	CCHS 3.1
Section C – Chronic Conditions		
Prevalence of Chronic Conditions <ul style="list-style-type: none"> • Arthritis • Obstructive lung disease (Asthma, chronic bronchitis, emphysema or COPD) • Diabetes • Heart disease or stroke • Hypertension • Urinary incontinence 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) • Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	CCHS 3.1
Prevalence of Depression	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) • Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	CCHS 2.1
Prevalence of Comorbidity <ul style="list-style-type: none"> • Two or more chronic conditions** 	<ul style="list-style-type: none"> • Association of Public Health Epidemiologist in Ontario (APHEO) • Australian Institute of Health and Welfare. Burden of Disease and Injury in Australia, 1999 	CCHS 3.1

APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

Indicator	Indicator Source	Data Source
Section D – Sexually transmitted Infections		
Incidence of Sexually — transmitted Infections	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 	Integrated Public Health Information System (iPHIS)
<ul style="list-style-type: none"> Chlamydia Gonorrhea 	<ul style="list-style-type: none"> Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	
HIV/AIDS	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 	HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care
<ul style="list-style-type: none"> HIV prevalence HIV risk factors (exposure categories) AIDS incidence Prenatal testing 	<ul style="list-style-type: none"> Ontario HIV Epidemiologic Monitoring Unit 	
Section E – Mortality		
All-cause Mortality Rate	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	Statistics Canada's Canadian Mortality Database and 2001 Census.
Premature Mortality	<ul style="list-style-type: none"> Organisation for Economic Co-Operation and Development, Health at a Glance, 2007 	Statistics Canada's Canadian Mortality Database and 2001 Census.
<ul style="list-style-type: none"> Deaths before age 75 Excess deaths before age 75 	<ul style="list-style-type: none"> The Conference Board of Canada: Insights You Can Count On, Health: Premature Mortality 	
<ul style="list-style-type: none"> Potential Years of Life Lost (PYLL) before age 75 	<ul style="list-style-type: none"> Association of Public Health Epidemiologist in Ontario (APHEO) 	
Chronic Disease Mortality Rates	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 	Statistics Canada's Canadian Mortality Database and 2001 Census.
<ul style="list-style-type: none"> Circulatory diseases Diabetes Chronic obstructive pulmonary disease (COPD) 	<ul style="list-style-type: none"> Association of Public Health Epidemiologist in Ontario (APHEO) Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	

APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

Indicator	Indicator Source	Data Source
Section E – Mortality		
Infectious Disease Mortality Rate <ul style="list-style-type: none"> • Pneumonia 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) • Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	Statistics Canada's Canadian Mortality Database and 2001 Census.
Mortality from Trauma and Injury <ul style="list-style-type: none"> • Road traffic accident (RTA) • Intentional and non-intentional injuries (homicide, fire, drowning and poisoning) • Fall-related mortality rate 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) • Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario 	Statistics Canada's Canadian Mortality Database and 2001 Census.
Life Expectancy <ul style="list-style-type: none"> • At birth • At age 65 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) • ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001. 	Statistics Canada's Canadian Mortality Database and 2001 Census.
Disability-Free Life Expectancy <ul style="list-style-type: none"> • At birth • At age 65 	<ul style="list-style-type: none"> • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004 • Association of Public Health Epidemiologist in Ontario (APHEO) 	Statistics Canada's Canadian Mortality Database and 2001 Census.

* There may be small differences in the indicator reported compared to the indicator source(s) listed here.

** Chronic conditions included in this list are: Alzheimer's disease or other dementia; bowel disorders (Crohn's disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, or back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia

Appendix 3.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators we report are the result of a rigorous selection process which included an extensive literature review of peer-reviewed and grey literature (see Chapter 1 for a more detailed description of the indicator selection process). The review of literature identified approximately 200 indicators. The working group reviewed the indicators using the defined indicator selection criteria and prepared a list containing potential indicators for inclusion for review by a Technical Expert Panel (TEP). Indicators were then selected through a modified Delphi process by the TEP using a two step process—first through an online questionnaire and then at a face-to-face meeting on December 12, 2006. The final list included 44 burden of illness indicators (see [Appendix 3.1](#) or [3.2](#) for a complete indicator list).

All indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level, when sample size allowed. At the provincial level, these indicators were first stratified by sex and then by age, and then further stratified by socioeconomic variables (income, education, ethnicity, immigration status and languages spoken) as allowed by sample size and data availability. At the LHIN level, indicators were stratified by sex, and then by age, income, and education as allowed by sample size and data availability. Age adjustment was done using indirect standardization.

2. Data Sources and Measures

Data from various sources were used to produce this report. See [Appendix 3.2](#) for data sources for individual indicators.

2.1 Canadian Community Health Survey (CCHS)

The analyses for many of the indicators in this chapter were based on data from the Canadian Community Health Survey (CCHS) Cycles 1.1, 2.1 and 3.1. The CCHS is a nationally representative, cross-sectional survey of the Canadian community-dwelling population conducted by Statistics Canada. The survey collects self-reported information on health and functional status, access to health care and health determinants. Residents living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded. The Ontario share files for the survey were used for all analyses.

For all the CCHS-based indicators, we included all respondents aged 25 and older. Using this inclusion criterion for age allowed us to assess the relationship between education and illness burden because respondents were more likely to have finished their education. Cycle 1.1 (2000/01), was used to assess self-reported data regarding activities prevented by pain. Cycle 3.1 (2005), was used to assess: self-rated health status; self-rated mental health status; activity limitations (any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities); limitations in Instrumental Activities of Daily Living (IADL) or Activities of Daily Living (ADL); self-reported chronic disease risk factors; food insecurity; selected chronic conditions and multiple chronic conditions.

The prevalence of depression was assessed using CCHS Cycle 2.1 (2003), which included the Composite

International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD). The CIDI-SFMD consists of a series of questions used to calculate the predicted probability of major depressive episodes occurring within the year preceding the CCHS interview.⁷⁴ Those who had a CIDI-SFMD predicted probability score of ≥ 0.9 were considered to have probable depression. However, since this scale was never fully validated, percentages reported here may differ from actual population prevalence.

In analyses that use the CCHS, income levels are based on information collected about annual household income, a variable derived by Statistics Canada that accounts for total household income and household size. Income data were missing for nine percent of the sample. Definitions of annual household income categories, as well as descriptions of other socioeconomic categories from CCHS analyses are found in [Table 3.1](#).

Analysis

Bivariate analyses using data from the CCHS were used to estimate the burden of chronic illness and disability in Ontario, as well as differences in the prevalence of chronic conditions, comorbidity, and functional status, by sex and socioeconomic status (SES). The data were weighted to represent the demographic makeup of the Ontario population in the respective cycle years. The proportions were calculated at both provincial and Local Health Integration Network (LHIN) levels whenever feasible. Indirect age-standardization to the provincial cohort was used. Indirect standardization was used to overcome the problem of small cell sizes.

At the provincial level, descriptive analyses were conducted by the socio-demographic characteristics of sex and by age and then by income, education, ethnicity, immigration status and languages spoken. At the LHIN level, due to small cell sizes, the analyses were done by sex, age, income and education.

The Studentized range test was used to assess the statistical significance of differences in the rates. The standard errors of the rates and 95 percent confidence intervals were calculated using 500 bootstrap weights provided by Statistics Canada. In addition, relative rates were calculated for women to men, lowest to highest income groups and lowest to highest education groups.

Statistics Canada rules were followed in the reporting of estimates using the Ontario share file as follows:

- Estimates should not be reported if the unweighted sample is less than 10;
- Estimates are adequate and can be reported if the coefficient of variation is 16.5 or less;
- Estimates should be reported with caution if the coefficient of variation is between 16.6 and 33.3;
- Estimates should be suppressed if the coefficient of variation is greater than 33.3.

All estimates, with the exception of numbers less than ten, were rounded to the nearest integer for presentation of exhibits. As such, proportional distributions may not add up to 100 percent.

Limitations

The results based on CCHS data should be interpreted with caution for the following reasons:

- The survey relies on self-report and voluntary participation of randomly selected participants, and thus the data reflect individuals' interpretation of questions and how they perceive their own health. Hence, results may be an under- or over-estimation of the prevalence of some conditions.
- The CCHS does not survey Aboriginal people living on reserves. Thus the numbers reported may be an underestimate of the burden of illness among Aboriginal people in Ontario.

- The ethno-cultural populations captured in the CCHS include recent immigrants, immigrants living in Canada for more than 10 years and those born in Canada. Hence the lower rates of functional limitations observed in some cultural groups may be due to “the healthy immigrant effect” which is the observation that immigrants tend to be in better health than their native population. In addition, depending on the level of acculturation, the self-rated health questions may be interpreted differently.
- The CCHS survey was conducted before LHINs were created and there was inadequate sample size for some measures for some LHINs. This prevented comparative analysis of some indicators.
- Income information was missing for nine percent of Ontario survey respondents.
- Lack of adequate sample size for some variables prevented comprehensive analysis (e.g., length of immigration, ethnicity and knowledge of official languages).

TABLE 3.1 | Stratifying variables for CCHS indicators

Sex

- Female
- Male

Age (years)

- 25–44
- 45–64
- 65–79
- 80+

Household income – Provincial-level analyses

- | | |
|-----------------------|---|
| • Low income | < \$15,000 if 1 or 2 people
< \$20,000 if 3 or 4 people
< \$30,000 if 5+ people |
| • Lower middle income | \$15,000 to \$29,999 if 1 or 2 people
\$20,000 to \$39,999 if 3 or 4 people
\$30,000 to \$59,999 if 5+ people |
| • Upper middle income | \$30,000 to \$59,999 if 1 or 2 people
\$40,000 to \$79,999 if 3 or 4 people
\$60,000 to \$79,999 if 5+ people |
| • Higher income | ≥ \$60,000 if 1 or 2 people
≥ \$80,000 if 3+ people |

Household income – LHIN-level analyses

- | | |
|---------------------------------------|---|
| • Lower income (Low/Lower Middle) | < \$30,000 if 1 or 2 people
< \$40,000 if 3 or 4 people
< \$60,000 if 5+ people |
| • Higher income (Upper Middle/Higher) | ≥ \$30,000 if 1 or 2 people
≥ \$40,000 if 3 or 4 people
≥ \$60,000 if 5+ people |

TABLE 3.1 | Stratifying variables for CCHS indicators**Education** – Provincial level analyses (highest level of education attained)

- Less than secondary school graduation
- Secondary school graduation
- At least some post-secondary school
- Bachelor's degree or higher

Education – LHIN level analyses (highest level of education attained)

- | | |
|--------------------|-------------------------------------|
| • Lower education | Secondary school graduation or less |
| • Higher education | At least some post-secondary school |

Immigration

- | | |
|-------------------------|--|
| • Recent immigrants | 0–9 years of residency in Canada |
| • Non-recent immigrants | 10+ years of residency in Canada |
| • Non-immigrants | Born in Canada or born with Canadian citizenship |

Ethnicity

- | | |
|------------------------------|---|
| • White | |
| • Black | |
| • East and Southeast Asian | Filipino, Japanese, Korean, Chinese, Southeast Asian |
| • Arab, West and South Asian | South Asian, Arab, and West Asian |
| • Other | Latin American, other racial or cultural origins, multiple racial origins |
| • Aboriginal | North American Indian, Métis or Inuit |

Knowledge of official languages

- English only
- French only
- English and French only
- English and/or French with other languages
- Neither English nor French

2.2 Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

The 2005/06 Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), held at the Institute for Clinical Evaluative Sciences (ICES), was used to identify hospitalizations for fall-related injuries in seniors aged 65 and older. The CIHI-DAD is a national database of information on all acute care institution separations (i.e., discharges, deaths, sign-outs, transfers).

How the analysis was done

Age-standardized rates of fall-related hospitalizations were calculated using indirect standardization method. The denominators were from the 2006 provincial estimates obtained from the Registered Persons Database (RPDB), also held at ICES. The RPDB overestimates the number of people living in Ontario. This overestimate was corrected by using a methodology that adjusts the RPDB so that population counts by age and sex match estimates from Statistics Canada. Analyses were conducted at the provincial- and LHIN-level by sex,

age and income. Since CIHI-DAD does not contain socioeconomic variables, it was linked to the 2001 Census of Canada to allow for ecological analyses of SES.

Income was calculated using the neighbourhood income per person equivalent (IPPE). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (quintiles), ranked from poorest to wealthiest, where Q1 is the poorest and Q5 is the wealthiest. These income quintiles are used as proxy for overall SES, which has been shown to be related to population health status and levels of health care utilization. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to Enumerations Areas (EAs) or Dissemination Areas (DAs) (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. EAs and DAs are small adjacent geographic areas, designated for collection of census data. DAs replaced EAs in 2001 and have a population of 400–700 persons.^{151, 152}

For crude rates, p-values were calculated for non-ordinal groups using the chi-square test and for ordinal groups using the trend test. For indirectly standardized rates, p-values were calculated using the chi-square test. In addition, relative rates were calculated for women to men; and lowest to highest income groups. Ninety-five percent confidence intervals were calculated for all rates.

Limitations

There are coding variations in CIHI-DAD data due to differences in the interpretation of coding/reporting guidelines and varying documentation practices.

2.3 Integrated Public Health Information System (iPHIS)

The analyses for the two sexually-transmitted infection (STI) indicators (chlamydia and gonorrhea) were based on preliminary data of confirmed cases of

these reportable diseases with onset dates in 2006 as reported in the integrated Public Health Information System (iPHIS). The iPHIS database is administered and supported by the Infectious Diseases Surveillance Section of the Ontario Ministry of Health and Long-Term Care (MOHLTC). The Surveillance Section collects information on all cases of reportable diseases in Ontario from public health units; it conducted data extraction and analysis for these two indicators.

Analysis

Cross-tabulations of iPHIS data were used to describe the incidence of chlamydia and gonorrhea in Ontario. Descriptive analyses were conducted at the provincial and health region level by sex and age. Crude incidence rates were calculated using population denominators from the 2006 provincial estimates obtained from the Profile for Age and Sex for Canada, Provinces, Territories, Census Divisions and Census Subdivisions, 2006 Census.¹⁵³

Limitations

The results based on iPHIS data should be interpreted with caution for the following reasons:

- Data are preliminary and are subject to change in the future;
- Forty-five percent of chlamydia and 34 percent of gonorrhea cases were reported in iPHIS with missing postal codes. Because differences in incidence rates observed across regions may be due to differences in reporting postal code across regions these indicators were not reported at the LHIN level;
- The higher rates of chlamydia observed in women compared to men may be due to differences in manifestation of symptoms which may lead to fewer men being tested as well as much higher rates of routine screening in women;
- While this is reported as incidence, it is prone to reporting biases.

2.4 HIV/AIDS data

Data for HIV and AIDS indicators were obtained from the Report on HIV/AIDS in Ontario 2005.⁹²

The report includes:

- HIV diagnosis data from Ontario's voluntary HIV testing system;
- Data on reported AIDS cases from the Ontario notifiable disease system;
- Data on mother-infant HIV infection from the Canadian Pediatric AIDS Research Group and
- Estimates of HIV infection in Ontario based on statistical modelling.

Analysis

Serodiagnostic data from 1985 to 2005 were obtained from the HIV Laboratory, Central Public Health Laboratory (CPHL) of Ontario. Cumulative incidence rates for HIV and AIDS were calculated with the 1996 census population as the denominator. The number and proportion of first-time HIV diagnoses were calculated according to sex, age group at time of first HIV-positive test, exposure category and year of diagnosis. Analyses were performed by major Ontario health region and annual population estimates were used to calculate rates of HIV testing according to health region from 1992 to 2005.

The Public Health Division of the Ontario MOHLTC provided data on AIDS cases diagnosed to December 31, 2005 and reported to September 2006. The Reportable Disease Information System (RDIS) of the MOHLTC maintained AIDS data until April 2005, after which point the RDIS was replaced by iPHIS. Cumulative incidence rates (1981 to 2005) were calculated using the 1996 population as the denominator. The number of AIDS cases and cumulative incidence rate were calculated according to sex, age at AIDS diagnosis, exposure category, health region and year of AIDS diagnosis. The date of diagnosis was defined as the date of the earliest AIDS-defining illness, if available, or the reported date of diagnosis otherwise.

Data for prenatal testing (including HIV results) were extracted from LAByRinth, an information system which links CPHL to the regional laboratories, using the pregnancy (not the subject or test) as the unit of analysis. Current tests for HIV (during a given pregnancy) or prior tests (before pregnancy) were also examined. Records of women receiving prenatal care from January 1999 to December 2005 were used to quantify the number and proportion of pregnant women tested for HIV (prior or current), by quarter and health region. The number and rate of HIV-positive results were also calculated by quarter and health region using the number of pregnancies with at least one prenatal test as the denominator. If a woman had both a prior test and a current one, the current test was used to classify the pregnancy.

Modeled estimates were calculated using data from a variety of sources in order to estimate the incidence of HIV infection from 1997 to 2005 with greater precision.

For more details, see The Report on HIV/AIDS in Ontario in 2005.⁹²

Limitations

- Incidence of HIV may be underestimated because Ontario residents have been tested outside of Ontario; persons may have either tested elsewhere before establishing residence in Ontario or traveled out of province to have an HIV test.
- HIV diagnoses may not be representative of all persons infected with HIV due to the following data quality problems:
 - Not all HIV-infected persons have been tested.
 - The date of diagnosis does not reflect the date of infection as some persons are diagnosed many years after infection.
 - The methodology used to assign exposure categories to cases without risk factors or reassign risk factors initially misclassified may be imprecise due to the

small number of respondents in the Laboratory Enhancement Study in some exposure categories.

- The transition from RDIS to iPHIS has posed several challenges to the AIDS surveillance database. The proportion of cases without information on risk factors increased from 6.7 percent of cases in RDIS to 69.4 percent of cases in iPHIS. Although cases with missing data in several analyses are based on the distribution among cases with known exposure category stratified by sex, health region and year of diagnosis, this method may not represent the true exposure category for those cases.
- The increase in HIV diagnoses in some categories observed since 2001 may be due to changes in testing policy for immigrants and refugees.
- The inability to ensure 100 percent matching between the prenatal and the diagnostic databases may lead to a slight underestimation of the percentage of pregnant women tested for HIV.
- The increasing proportion of HIV infection for women may be partly due to policy changes at Citizenship and Immigration Canada and the provincial HIV prenatal screening program.

2.5 Vital Statistics

The analyses for the mortality indicators were based on death registration data from 2001 Vital Statistics assembled by Statistics Canada (including deaths of Ontario residents occurring in other parts of Canada and the United States) and population data from the 2001 Census of Canada. The Vital Statistics registries across Canada and the United States provide information on deaths of Canadian residents as well as selected demographic characteristics and place of residence. The findings by neighbourhood income quintile presented in this section were provided by the Health Information and Research Division of Statistics Canada. However, their selection, presentation and interpretation were the responsibility of the POWER study authors. The findings by neighbourhood income tercile were extracted from tables presented in the Technical Report to the

Performance Indicators Reporting Committee (PIRC) of the Federal-Provincial-Territorial Conference of Deputy Ministers of Health.²⁴ For more details, see the report by Wilkens and colleagues.⁹⁷

Analysis

These indicators were calculated using death data from the Canadian Mortality Database which was linked to census data to determine neighbourhood income quintile. The 2001 Vital Statistics data were used to estimate the mortality rates for the population living in Ontario's 11 Census Metropolitan Areas (CMAs). Those CMAs, which account for 74% of the total Ontario population, were used because neighbourhoods are more clearly defined and residential segregation by income is more pronounced in big cities than in small towns and rural areas. Descriptive analyses were conducted by sex, age group and neighbourhood income quintile. Since the Vital Statistics database does not contain SES variables, it was linked to 2001 census profile data at the census tract (CT) level to allow for analyses of mortality by neighbourhood income quintile. CTs are small, relatively stable areas that usually have a population of 2,500 to 8,000.¹⁵⁴ Neighbourhood income quintiles were defined within each CMA, based on census tract percentage of population under the Statistics Canada low-income cut-off (LICO) applicable at the time of the 2001 census. Causes of death were coded according to the 10th revision of the International Classification of Diseases¹⁵² and were analyzed according to ICD chapter and by common groupings of specific causes within chapters.

Death rates per 100,000 population by sex and neighbourhood income quintile in CMAs were calculated using denominators from the 2001 census. Age-standardized mortality rates (ASMRs) for each sex, neighbourhood income quintile and cause of death group were calculated using a direct standardization method. The 1986 CMA population of Canada, including both sexes together, was used as the standard population. ASMRs for both sexes together were standardized by sex as well as by age. Standard errors for the ASMRs

were calculated as described by Spiegelman¹⁵⁵ and Brillinger.¹⁵⁶ Asymmetric confidence intervals for the ASMRs were calculated by the method of Carriere and Roos.¹⁵⁷ Excess mortality was defined as the ASMR for the total population less the ASMR of the richest quintile. Age-specific mortality rates were calculated by sex for each income quintile. Mortality rates were calculated for: all cause; selected chronic diseases; infectious diseases; trauma and injury.

Potential years of life lost (PYLL) were calculated for the population less than 75 years by the method described by Romeder and McWhinnie,¹⁵⁸ except that infant deaths and deaths from age 70 to 74 were included by age group. PYLL were calculated for each age group (< 1, 1–4, 5–9, ..., and 70–74) by multiplying the number of deaths by the difference between age 75 and the midpoint of each age group at which the deaths occurred. PYLL correspond to the sum of the products obtained for each age group. The rate was obtained by dividing total potential years of life lost by the total population under age 75. Excess PYLL was defined as the difference between observed and expected PYLL, where expected PYLL was that which would have occurred if the age- and sex-specific mortality rates in the richest quintile applied to the total population.

Life expectancy: Abridged life tables for 2001 and corresponding standard errors for life expectancy and the probability of survival to each age were calculated for each income quintile and sex according to the method of Chiang.¹⁵⁹

Limitations

The results based on the Vital Statistics data should be interpreted with caution for the following reasons:

- Only deaths in the CMAs, which represent 74 percent of Ontario's population, were included in the analysis. Hence we have no information for people living in smaller urban and rural areas whose mortality patterns may differ from those living in CMAs.
- The Statistics Canada data were unable to completely identify usual residents of health related institutions, so usual residents of institutions were included in both the deaths and populations at risk. This may affect the results because ideally, deaths of residents of long-term care facilities should be excluded as the income level of the CT in which an institution is located might be unrelated to the income of its residents.
- Ontario CMAs have the highest proportion of immigrants compared to other provinces. This may confound the results. Because of the lower mortality of immigrants overall, combined with a higher proportion of immigrants in the lower-income quintiles, the higher mortality of non-immigrants in the lower-income quintiles is at least partly obscured.

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ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Cancer

Chapter 4

AUTHORS

Monika K. Krzyzanowska, MD, MPH, FRCPC
Lisa Barbera, MD, MPA, FRCPC
Laurie Elit, MD, MSc FRCSC(C)
Janice KWON, MD, MPH, FRCSC(C)
Aisha Lofters, MD, CCFP
Refik Saskin, MSc
Naira Yeritsyan, MD, MPH
Arlene S. Bierman, MD, MS, FRCPC

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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.toronto.on.ca

www.powerstudy.ca

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Executive Summary

ISSUE

Cancer is a leading cause of illness and death among the women and men of Ontario. In this chapter, we look at the two most common cancers affecting both sexes; lung and colorectal as well as the common cancers that occur only in women; breast, cervical, ovarian and uterine.

The indicators in this chapter explore the continuum of cancer care from screening, through treatment, surveillance and end of life care. We identify where performance on these indicators differed for women and men and look at whether the experience of cancer care was different for women and men, by income and where they live.

ABOUT THIS CHAPTER

The chapter has seven sections:

- A. General Indicators
- B. Cancer Screening
- C. Colorectal Cancer
- D. Lung Cancer
- E. Breast Cancer
- F. Gynecological Cancers
- G. End of Life Care

In the first section, we report on the incidence of and survival associated with the six cancers considered in this chapter. These indicators tell us about the burden of disease in the population in relation to these cancers. We also report on wait times for surgery for some of the surgical procedures required for treatment of these cancers, which gives us an idea about the capacity of the healthcare system to care for these patients. The second section measures compliance with screening recommendations for breast, colorectal and cervical cancers. This section also reports on follow-up of abnormal cervical cancer screening results. The next four sections report on treatment and surveillance indicators for the different cancers considered in this chapter. These indicators reflect the quality of care received following a cancer diagnosis. The last section examines the quality of end of life care for patients who died of cancer.

STUDY

The indicators we report on were derived from a systematic review of the scientific literature and a rigorous selection process by a Technical Expert Panel using a modified Delphi process ([see Chapter 1](#)). At the provincial level, these indicators were first stratified by sex (where applicable), and then further stratified by socioeconomic variables (age and income) as allowed by sample size and data availability. At the Local Health Integration Network (LHIN) level, indicators were

stratified by sex (where applicable), and then by age and income as allowed by sample size and data availability. All incidence rates were standardized to the population of Canada as of July 1, 1991 using the direct method of standardization. All other indicators were standardized to the study cohort using the indirect method. Data from several sources were used to produce this section. These include: Ontario Cancer Registry (OCR); Canadian

Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); National Ambulatory Care Reporting System (NACRS); CytoBase; Ontario Breast Screening Program (OBSP); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB); Statistics Canada 2001 Census and the ICES Physicians Database (IPDB).

KEY FINDINGS

- There were gaps in cancer screening both overall and in relation to income. The rates of screening for breast, colorectal and cervical cancer in Ontario remained below set provincial targets of 70% for breast cancer screening, 55% for colorectal cancer screening using fecal occult blood testing and 85% for cervical cancer screening. The rates were especially low for colorectal cancer screening. There were significant inequities in cancer screening in relation to income. Individuals from lower-income neighbourhoods consistently had lower rates of screening for breast ([Exhibit 4B.1](#)), colorectal ([Exhibit 4B.3](#)) and cervical cancer ([Exhibit 4B.5](#)) than individuals living in higher-income neighbourhoods.
- Large gaps existed in follow-up of abnormal or inadequate Papanicolaou (Pap) tests with less than half of women with such results receiving recommended follow-up care. Very young women were the least likely to have Pap tests and were also less likely to have appropriate follow-up of abnormal test results ([Exhibits 4B.7 and 4B.10](#)) whereas post-menopausal women were the least likely to have a repeat test after an unsatisfactory test result ([Exhibit 4B.12](#)).
- Age is an extremely important factor in oncology. Cancer becomes more common as people age, survival is reduced and the quality of care differs in relation to age. For all treatment-related indicators considered in this chapter, older patients were less likely to receive therapy than younger patients. These differences were seen across all treatment modalities including surgery, radiation therapy and chemotherapy as well as across the continuum of care from treatment for early stage disease through end of life care.
- Lung cancer places a heavy burden on the population and the healthcare system. The incidence of lung cancer was high, but the outcomes were very poor with only 13 percent of patients alive five years following diagnosis. Furthermore, there were inequities in lung cancer in relation to age and income. Lung cancer was more common in people from lower-income neighbourhoods ([Exhibit 4A.4](#)). These individuals were also less likely to have surgery ([Exhibit 4D.1](#)) and had worse survival ([Exhibit 4A.14](#)). Similarly, lung cancer was more common in older individuals, but older patients with non-small cell lung cancer were less likely to undergo surgery ([Exhibit 4D.2](#)) and chemotherapy ([Exhibit 4D.5](#)). Older adults with small cell lung cancer were also less likely to undergo chemotherapy ([Exhibit 4D.7](#)) than younger patients.
- There were gaps in the quality of data available for evaluating the performance of the cancer system at the population level. Information on cancer stage and patient reported outcomes and preferences were especially limited.

KEY MESSAGES

We took a broad look at cancer and cancer care in the province, focusing on gender, socioeconomic and regional variations in cancer burden and health system performance. Our findings point to a number of key areas for intervention and improvement. For many indicators there was sizable variation across the LHINs. Cancer Care Ontario is working to reduce regional variations in cancer care. The results of our analyses are available for the LHINs to use in their priority setting, planning and quality improvement activities. The following five actions can help accelerate progress in reducing the burden of cancer, improving health outcomes among cancer patients and reducing cancer-related health inequities. Successful adoption of these actions needs to take into account gender and socioeconomic differences in cancer incidence and experiences with care.

Reduce Cancer-Related Health Inequities by Focusing on Prevention and Screening

- Increased emphasis on cancer prevention—integrating population health, community and clinical approaches—is essential to reduce the burden of illness due to cancer in Ontario. Many of the risk factors for cancer are the same as for the development of other chronic diseases such as cardiovascular disease—smoking, physical inactivity, obesity, and poor diets (see [Burden of Illness, Chapter 3](#)). Prevention interventions need to address the social determinants of health, be gender sensitive and target those who are socioeconomically disadvantaged and therefore at greatest risk.
- There is a need to improve screening initiatives for all Ontarians and make special efforts to reach people who live in low-income communities, where screening rates are the lowest.

Screening Programs are Not Enough. A System for Ensuring Follow-Up of Abnormal Screening Tests is Necessary

- As we work to reach cancer screening targets we need a system to ensure that abnormal screening tests

are followed up. Cervical cancer follow up could be improved by making the reporting system database easily accessible to practitioners, labs and even patients, or by using the database to call patients back for both regular screening and assessment of abnormal tests. Rapid assessment units may also facilitate work-up of abnormal screening tests.

- Data development to assess follow up of abnormal mammograms for breast cancer screening and fecal occult blood tests (FOBT) for colorectal cancer screening will be required to extend this objective beyond cervical cancer screening.

Address the Unique Needs of an Aging Population in Cancer Care Delivery

- The elderly represent a unique subgroup of cancer patients with a high burden of disease, competing health problems and often lack direct evidence for treatment benefit. Importantly, the incidence of cancer is highest in this age group. Specific strategies for managing cancer in the elderly are needed to ensure elderly individuals are being treated appropriately, reflecting existing evidence and patient wishes.
- The unique needs of older women, who comprise the majority of the elderly population, and who have higher levels of comorbidity, disability, and poverty, need to be addressed within this strategy.

Focus on Prevention and End of Life Issues for Lung Cancer as Prognosis is Poor and Much Lung Cancer is Preventable

- Continue to develop lung cancer specific strategies for decreasing burden relating to this diagnosis. Since the natural history of the disease is short, a focus on prevention by targeting smoking is key and is the goal of the Ontario Tobacco Strategy. However, interventions to meet the needs of those affected by the disease, ensuring timely access to investigations and treatment and addressing the unique end of life issues particular to this patient population are also very important.

Improve Quality, Availability, and Timeliness of Data to Assess Cancer and Cancer Care in the Province

- While data quality and availability to assess cancer and cancer care in the province have improved, there is still much to be done to improve the quality, availability, and timeliness of data.

KEY FINDINGS BY SECTION

In this chapter, we presented results pertaining to the performance of Ontario's cancer system. We focused on several specific cancers that are important causes of morbidity and mortality in women in Ontario and looked at the entire trajectory of care from screening through to the end of life. [Figure 4](#) in the Chapter Summary of Findings provides a summary of where sex, age, income, or regional differences were observed.

A Summary of the Key Findings by Section Follows:

SECTION A | General Indicators

- The incidence of cancer increased with age and survival was worse in older individuals. Worse survival is likely due to competing risks for death although possible undertreatment of older individuals cannot be ruled out.
- In both colorectal and lung cancer, the incidence rate was higher in men than in women ([Exhibit 4A.2](#)). This is likely due to a combination of biologic differences as well as differences in risk factors such as smoking.
- Income was an important factor associated with incidence of certain cancers. Lower-income individuals were more likely to be diagnosed with lung cancer ([Exhibit 4A.4](#)) whereas breast and uterine cancer were more likely to be diagnosed in higher-income women ([Exhibit 4A.6](#)).
- Although some regional differences existed in cancer incidence, the differences in survival were much less pronounced.
- Where one lives was the major factor associated with time to surgery suggesting that availability of resources in different regions of the province may vary. Among women

- Knowing the stage of cancer determines treatment and outcomes and would significantly improve our ability to evaluate how the cancer system is performing; data on how patients feel about their care would help improve the assessment of patient experiences with care and data on ethnicity would allow us to better assess whether the cancer system is performing equitably for all Ontarians.

who underwent hysterectomy, wait times for surgery varied depending on indication for surgery—women with cervical cancer waited the longest time while women with ovarian cancer had shorter wait times ([Exhibit 4A.16](#)). Lower-income women had longer median wait times for hysterectomy for gynecological cancers but not for bowel resection for colorectal cancer or mastectomy for breast cancer ([Exhibit 4A.17](#)).

SECTION B | Cancer Screening

- We found that the rates of screening for breast, colorectal and cervical cancer in Ontario were below set provincial targets of 70% for breast cancer screening, 55% for colorectal cancer screening using FOBT and 85% for cervical cancer screening. The rates were especially low for colorectal cancer screening.
- Income was significantly associated with all three screening indicators. Individuals from lower-income neighbourhoods had lower rates of screening for breast ([Exhibit 4B.1](#)), colorectal ([Exhibit 4B.3](#)) and cervical cancer ([Exhibit 4B.5](#)) than individuals living in higher-income neighbourhoods.
- We found that women were slightly more likely to be screened using FOBT than men. While the absolute difference in screening between women and men using FOBT was only 1-2 percent, the population eligible for screening was approximately 2.8 million people, which means that 39,000 more women were screened than men using FOBT. Of note, other modalities such as colonoscopy can also be used for colorectal cancer screening so the difference seen may be due to differential use of screening modalities between women and men.

- We identified large gaps in follow up of abnormal or inadequate Pap tests with less than half of women with such results receiving recommended follow up care. Very young women were the least likely to have Pap tests and were also less likely to have appropriate follow up of an abnormal test results ([Exhibits 4B.7 and 4B.10](#)) whereas post-menopausal women were the least likely to have a repeat test after an unsatisfactory sample ([Exhibit 4B.12](#)).
- There was geographic variation in screening rates across all three cancers ([Exhibits 4B.2, 4B.4 and 4B.7](#)) and in follow up of abnormal Pap results across the province ([Exhibit 4B.9](#)).

SECTION C | Colorectal Cancer

- Age was the factor most consistently associated with processes of care for colorectal cancer. Older patients were less likely to have a consultation with a medical or radiation oncologist regardless of sex ([Exhibits 4C.2 and 4C.3](#)). Age differences in consultation rates were largest for radiation oncology. Age was associated with the use of sphincter-sparing rectal cancer surgeries among women but not men—older women had the lowest rates of sphincter-sparing procedures and younger women had the highest rates ([Exhibit 4C.1](#)).
- There were sex differences in referral to radiation oncology among patients with rectal cancer—women were less likely to be seen by a radiation oncologist than men. Taken together with the age differences in surgery among women with rectal cancer, this suggests that management of rectal cancer may differ between men and women.
- Income was not associated with treatment of colorectal cancer.
- There were regional differences in referral to medical oncology among patients with colon cancer ([Exhibit 4C.4](#)), but few regional differences otherwise among indicators examined in this section.

SECTION D | Lung Cancer

- Only 20 percent of Ontario patients diagnosed with non-small cell lung cancer underwent lung resection.

- Age was the factor most strongly and consistently associated with treatment for lung cancer; older patients were less likely to receive surgery ([Exhibit 4D.2](#)) or chemotherapy ([Exhibit 4D.5](#)). This observation may reflect a higher burden of comorbidity or different preferences for treatment with increasing age, but undertreatment cannot be ruled out.
- There has been uptake of new recommendations regarding adjuvant chemotherapy for non-small cell lung cancer ([Exhibit 4D.4](#)), which was most pronounced in the younger age group.
- Women with non-small cell lung cancer were more likely to undergo surgery for their cancer than men but there were minimal sex differences in receipt of chemotherapy.
- Among patients with non-small cell lung cancer, living in a higher-income neighbourhood was associated with a slightly higher lung cancer resection rate, but was not associated with the use of chemotherapy ([Exhibit 4D.1](#)).
- There were some regional differences in care which were most pronounced for uptake of chemotherapy for non-small cell lung cancer ([Exhibit 4D.5](#)).

SECTION E | Breast Cancer

- Age was the factor most consistently associated with utilization of various treatment modalities for breast cancer. Older women, especially the very elderly (aged 80 and older), were the least likely to undergo breast-conserving surgery ([Exhibit 4E.1](#)), axillary lymph node dissection ([Exhibit 4E.3](#)), receive radiation ([Exhibit 4E.5](#)) or have a consultation with a medical oncologist ([Exhibit 4E.7](#)). While some of these differences may be medically appropriate or reflect patient preference, further work is necessary to make sure that these patterns do not reflect bias against treatment among this patient group.
- We did not find income-related differences in breast cancer care among the indicators evaluated.
- There were some regional differences in care. Rates of breast-conserving surgery ([Exhibit 4E.2](#)), radiation

after breast-conserving surgery and consultation with a medical oncologist ([Exhibit 4E.8](#)) varied significantly across the LHINS.

- Most women with a history of breast cancer received follow up mammography with the exception of the very elderly (aged 80 and older) ([Exhibit 4E.9](#)). However, there is a need to ensure that all women receive this follow up when indicated.

SECTION F | Gynecological Cancers

- Age was the factor that was most strongly and consistently associated with treatment for ovarian cancer. In ovarian cancer, older women were less likely to undergo surgery by a gynecologic oncologist and less likely to have adjuvant chemotherapy ([Exhibit 4F.3](#)).
- Where a patient lives appeared to influence which type of physician provided the initial surgery for ovarian cancer ([Exhibit 4F.2](#)) and the use of adjuvant chemotherapy. Although some of these findings were not significant due to small sample size, they illustrate that ovarian cancer care delivered in Ontario varied depending on where you live.
- Income was not associated with ovarian cancer care.
- Overall, there was evidence of improvement of care on all three indicators. The percentage of women receiving surgery by a gynecologic oncologist for ovarian cancer has increased since 1996-1998. There was an increase in the use of adjuvant therapy compared to 1996-2002. There has also been a decrease in the rate of reoperations.
- The surgical care delivered to women with high-risk histology uterine cancer varied by age and where one lived in the province. However, due to small number of cases, a meaningful stratified analysis was not possible.
- There was no variation by income quintile.
- Age was the only factor associated with all the end of life indicators evaluated. Older patients were less likely to receive any of the health care services studied. This may reflect patient preference, a limitation of the methods used (e.g. not capturing care provided in long-term care, where older patients may be more likely to reside) or some other factor.
- Region was associated with almost every indicator. The regional variation likely reflected the variation in resources available across regions. It may also be reflective of local/regional management approaches. Home care was the only service where no regional variation was seen.
- Most of the indicators did not vary by sex, except for visits to the emergency department in the last two weeks of life. Women with both lung and colorectal cancer were less likely to visit an emergency department than men. Again, this may reflect patient preference or be related to some other factor.
- Neighbourhood income was associated only with physician house calls, where those living in higher-income neighbourhoods were more likely to receive a house call ([Exhibit 4G.12](#)). This may reflect an increased ability of this group to advocate for care or navigate the system or less availability of these services in lower-income communities. Alternatively, perhaps only wealthier patients can afford to support a home death and are in a position to receive house calls.
- Lung cancer patients were more likely to die in hospital ([Exhibit 4G.1](#)) and visit the emergency department ([Exhibit 4G.4](#)) and were less likely to receive home care ([Exhibit 4G.10](#)) or house calls ([Exhibit 4G.11](#)) than patients with other types of cancers. The data do not provide a clear idea of why this is happening. It may be a reflection of the challenge this patient population poses with respect to symptom management; it may also reflect the aggressive natural history of lung cancer with an associated decrease in time to plan ahead.

SECTION G | End of Life Care

- Over half of patients dying of cancer died in an acute care bed.

Introduction

Cancer is a leading cause of illness and death among the women and men of Ontario. In this chapter, we look at the two most common cancers affecting both sexes—lung and colorectal as well as the common cancers that occur only in women—breast, cervical, ovarian and uterine.

Indicators in this chapter explore the continuum of cancer care—screening, diagnosis, treatment, surveillance or follow-up and end of life care. We identify where performance on these indicators differed for women and men and look at whether the experience of cancer care was different for women and men, by income and where they lived. Where feasible and relevant, we chose indicators that looked at different types of recommended cancer treatment including surgery, radiation and chemotherapy selecting indicators that are amenable to change.

The chapter has seven sections:

- General Indicators
- Cancer Screening
- Colorectal Cancer
- Lung Cancer
- Breast Cancer
- Gynecological Cancers
- End of Life Care

Much cancer can be prevented by modifying risks. Smoking, obesity, physical inactivity and not eating enough fruit and vegetables all increase the risk of cancer (They are also risk factors for developing other diseases, including cardiovascular disease. There is more detail on their prevalence and how they vary for different population subgroups in the [Burden of Illness, Chapter 3](#)). Environmental and occupational exposures

are also associated with an increased risk of cancer, but analysis of those factors was beyond the scope of this report.

Disparities in access to cancer services have been found between women and men and among different subgroups of both sexes. Colorectal cancer screening rates, for example, have been shown to be lower among women than men.^{1, 2} Various studies have suggested different reasons for this, from a misconception that colorectal cancer is a man's disease, to differences in how women and men get information about health² and to gender preferences for types of tests for colorectal cancer.³

Although obese women are at higher risk for colorectal cancer, they have been shown to be less likely to have access to colorectal screening than other eligible women and men.⁴ Significant differences in rates of screening for breast and cervical cancer are associated with income, ethnicity and immigration. In the US, lower rates of cancer screening have been found to be associated with ethnicity. Asian Americans had significantly lower rates of colorectal screening than other ethnic groups⁵ and in California, Asian American women were found to have the lowest rates of both breast and cervical cancer screening.^{6, 7} Similarly in Canada, immigrant women and those from certain ethnic groups have been found to have lower rates of breast and cervical cancer screening.⁸⁻¹⁰

Access to cancer treatment also varies—older age, lower socioeconomic status, race, ethnicity and gender have all been associated with lower rates of treatment.¹¹⁻¹³

Cancer incidence increases with increasing age. Cancer diagnosis and management in older adults presents unique challenges. Health, functional status and other illnesses influence decisions about who should be screened^{14, 15} and what treatment should be used.¹⁶ There is often a paucity of evidence on the effectiveness of different treatment options in complex and older patients.¹⁷ In the fastest growing group of older patients, those aged 80 and older, evidence is even more limited, but there is some evidence that older cancer patients are at risk for not receiving treatments at least in part because of age bias.¹⁸⁻²⁰ Furthermore, older women and men have different levels of other illnesses and disability that influence decision making, as well as different experiences in the health care system.^{21, 22}

Men and women have been found to have different experiences with cancer care, with women making greater use of support services than men.^{23, 24} Women feel less satisfied than men with the emotional support that they receive^{25, 26} and the pain management they receive.²⁵ Women and men with colorectal cancer were found to use care differently in the last year of their lives; women use home health and hospice services more.^{25, 27} Female cancer patients also reported lower quality of life and fewer financial and social resources than their male counterparts.^{25, 28}

Ontario's cancer care delivery system has improved,²⁹ in part through performance measurement and reporting. In 2005, Cancer Care Ontario launched the Cancer System Quality Index (CSQI), which reports on the quality of cancer services in the province. This annual web-based report tracks the quality of cancer services from prevention to end of life care, and across the quality domains of prevention, access, efficiency, evidence, outcomes and measurement capacity. Some of its indicators are stratified by sex or Aboriginal status,



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but mainly it compares geographic regions (Local Health Integration Networks/regional cancer programs).

The quality of cancer services for women were explored in a joint report released in 2006 by the Ontario Women's Health Council, the Cancer Quality Council of Ontario and Cancer Care Ontario.²⁵ The report analyzed findings in the CSQI by gender. Some of its findings included:

- Gender made no significant difference in wait times for treatment.
- Women appeared to have slightly better access to desirable end of life care services.
- Women were less likely to die in an acute-care hospital or to visit emergency in their last two weeks of life.
- There was no significant gender difference in the quality of care received in the treatment of cancer.
- Women reported lower satisfaction with cancer services than men, including pain management.

The 2006 report provided a baseline for monitoring sex and equity in cancer services in Ontario. We are building on that report by measuring quality based on multiple dimensions of equity: sex, income, age and residence. We hope this chapter will help ensure the needs of all Ontarians are addressed, including improving access to health promotion and cancer screening information, as well as to care and services. This information should also help ensure that as new cancer care programs are introduced, such as Ontario's new Colon Cancer Check program, their benefits reach everyone equally.

We used multiple data sources in this report including the Ontario Cancer Registry (OCR), Registered Persons Database (RPDB), Canadian Institute of Health Information Discharge Abstracts Database (CIHI-DAD), Ontario Health Insurance Plan (OHIP) database and CytoBase. The majority of measures we looked at relate to processes, rather than outcomes of care. All analyses

were stratified by sex (where applicable), and then by age, or income and at the provincial level and the Local Health Integration Network level whenever possible.

We chose the indicators in this chapter to reflect the overarching objectives of the Ontario Ministry of Health and Long-Term Care (MOHLTC)—to improve the health status of Ontarians and increase equity ([see Exhibit 2.3, Chapter 2](#)). Achieving specific goals for cancer care—such as ensuring timely access to diagnosis and high-quality care, increasing cancer screening, preventing disease and improving health outcomes for cancer patients—ultimately can result in improving the health of Ontarians. A focus on equity will help ensure that these benefits are experienced by all the women and men in the province. Our indicators also align with Cancer Care Ontario's goals for improving the performance and integration of the cancer care system ([Appendix 4.1](#)).

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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 1, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 2, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

Figure 1: Example of a Two Bar Map

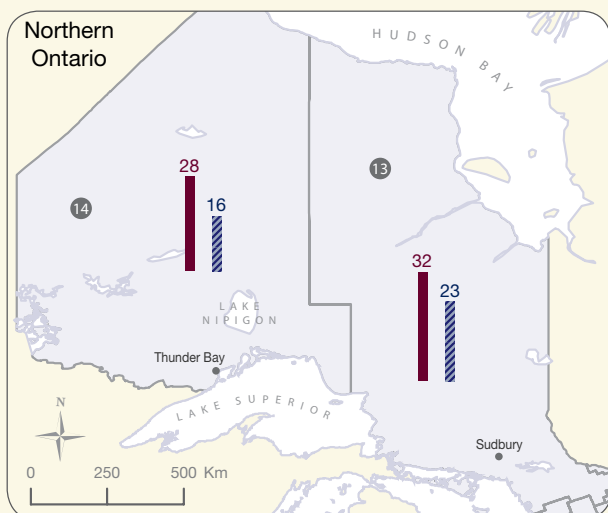
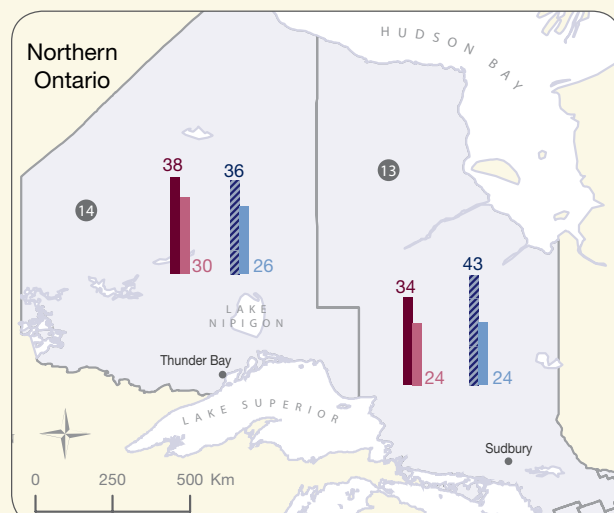


Figure 2: Example of a Four Bar Map

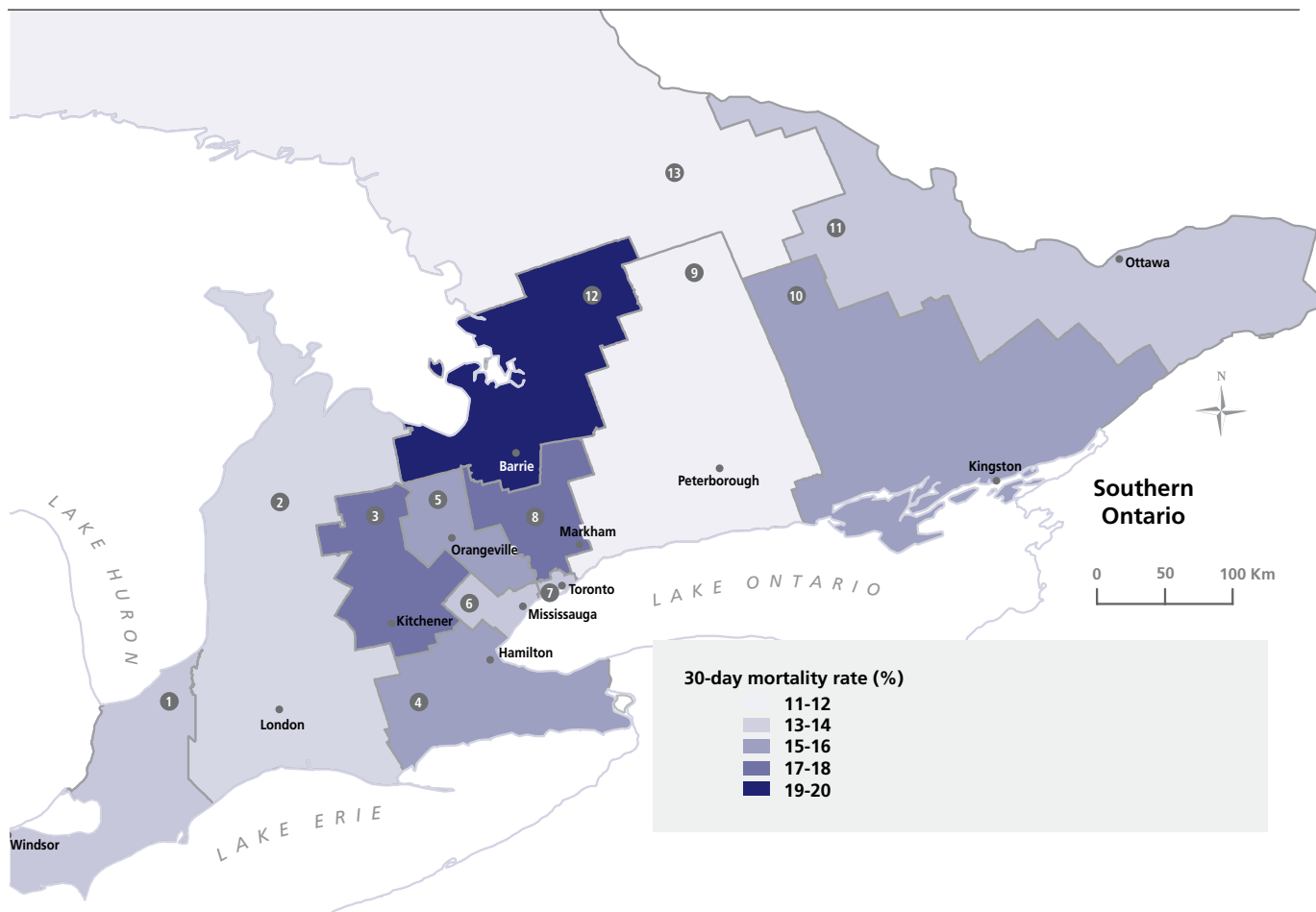


CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 3: Example of a Choropleth Map





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Section 4A

General Indicators

INTRODUCTION

This section reports incidence and five-year survival for cancers of the colon, rectum, lung, breast, ovary, uterus and cervix and also reports how long people wait for some common cancer surgeries in Ontario.

Incidence and survival data give insight into the burden of cancer—the associated sickness, death and use of health services. Looking at wait times for surgery gives us an idea about how efficiently the cancer system manages patients. Recent Ontario studies found wait times for cancer surgery here are longer than recommended and have increased significantly in the last 20 years.³⁰⁻³² Because cancer incidence increases with age and the population is aging, we can expect more older adults to be diagnosed with cancer, which will challenge the health care system. As well, the needs of older cancer patients may differ by sex, so we also examined differences in incidence, survival and surgical wait times for women and men by age group.

Colorectal cancer is the third most common cancer diagnosed in Canadians.³³ In women, it is the third most common cause of death by cancer; in men it is the second most common. Survival has been improving steadily, likely because of earlier diagnosis and more effective chemotherapy.³⁴

Lung cancer is the most common cancer and the number one cause of cancer-related deaths. The incidence in men has been decreasing and was thought to have reached a plateau in women,^{33, 35, 36} but the 2008 Canadian Cancer Statistics show both incidence and death from lung cancer are on the rise among women.³⁴ The differences in incidence between women and men are narrowing and women account for many

more lung cancer cases in younger people,³⁵ primarily because more women are smoking.³⁷ Women appear to be more susceptible to tobacco carcinogens, but less likely to die from lung cancer than men.³⁸ Ontario data suggest people who live in lower-income neighbourhoods are more likely to develop lung cancer, and this difference is greater among women.³⁹ Lung cancer is aggressive and its outcome is usually bad—overall survival is between 10 and 15 percent.^{33, 40-42} Survival is better among younger patients.^{40, 41}

Breast cancer is the most common cancer diagnosed in Canadian women.³³ The incidence of breast cancer has stabilized, but fewer women are dying from it, probably because of more screening leading to earlier diagnosis and advances in treatment, especially adjuvant therapy after surgery.

Gynecological cancers include cancers in the ovaries, fallopian tubes, uterus, cervix, vagina and vulva. Uterine cancer is the most common, affecting 4,200 women in Canada annually. Nineteen of every 100,000 women develop uterine cancer and three die of it. Ovarian cancer is the leading cause of death from gynecologic malignancies, affecting approximately 2,500 women annually. For every 100,000 women, 11 will develop ovarian cancer and seven will die of it. Cervical cancer affects 1,300 Canadian women annually. For every 100,000 women, seven will develop disease and two will die of disease.³⁴

EXHIBITS AND FINDINGS

CANCER INCIDENCE

Indicator: This indicator measures the incidence of new cancers per 100,000 population per year. The rates for colorectal and lung cancers are reported per 100,000 population, while rates of breast, ovarian, uterine and cervical cancers are reported per 100,000 women.

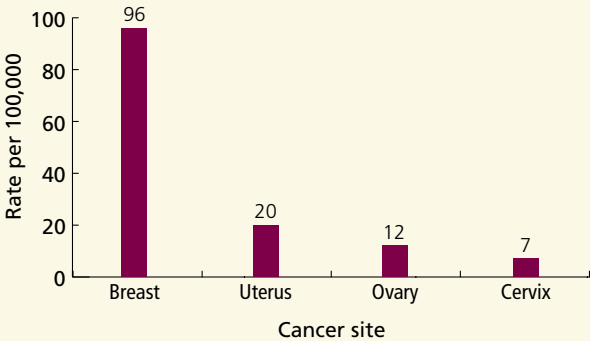
Background: To understand the burden of disease in the population, we looked at incidence and how it differs by sex and income. Changes in incidence may reflect trends in risk factors or better detection and diagnosis. Lung, breast and colorectal cancers have the highest incidence and are most responsible for premature deaths.

Finding: Overall in Ontario in 2004/05, the age-standardized incidence rates were: 47 per 100,000 for colorectal cancer, 49 per 100,000 for lung cancer, 96 per 100,000 women for breast cancer, 20 per 100,000 women for uterine cancer, 12 per 100,000 women for ovarian cancer and seven per 100,000 women for cervical cancer.

EXHIBIT 4A.1 | Age-standardized incidence of breast, uterine, ovarian and cervical cancers per 100,000 women, in Ontario, 2004/05

FINDINGS

- Breast cancer was the most commonly diagnosed cancer of those that predominantly affect women (96 per 100,000 women).
- Uterine, ovarian, and cervical cancers had an incidence of 20, 12 and seven per 100,000, respectively.
- The incidence rates of uterine, ovarian and cervical cancers did not vary by income (data not shown).



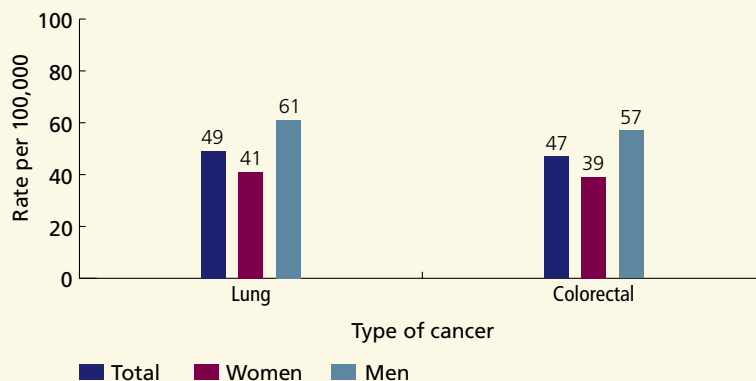
DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

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EXHIBIT 4A.2 | Age-standardized incidence per 100,000 population, of lung and colorectal cancers, in Ontario, 2004/05

FINDINGS

- The incidence of both lung and colorectal cancer was lower in women than in men.
- The incidence of colorectal cancer was much higher in older adults (262 per 100,000 in those aged 65 to 79 and 368 per 100,000 in those aged 80 and older) as compared to adults under age 65 (21 per 100,000) (data not shown).
- Lung cancer was also much higher among older adults (298 per 100,000 in those aged 65 to 79 and 305 per 100,000 in those aged 80 and older) compared to those under age 65 (21 per 100,000) (data not shown).



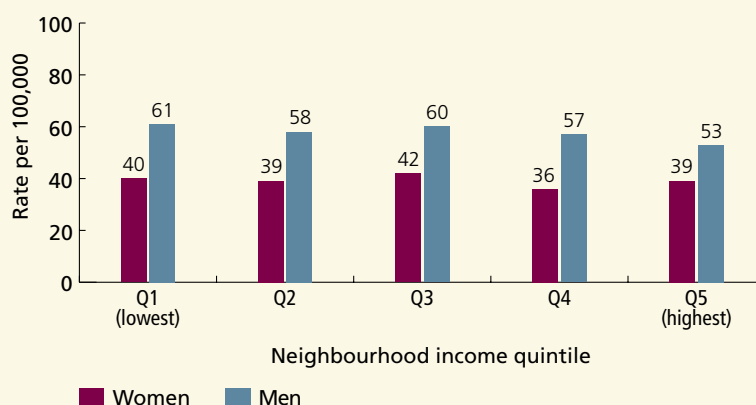
DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

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EXHIBIT 4A.3 | Age-standardized incidence of colorectal cancer per 100,000 population, by sex and neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Neighbourhood income was not associated with colorectal cancer incidence among women.
- Men living in the lowest-income neighbourhoods had a higher incidence of colorectal cancer; 61 per 100,000 compared to 53 per 100,000 among men living in the highest-income neighbourhoods.
- The incidence of colorectal cancer varied across the province, ranging from 39 per 100,000 population (Central West LHIN) to 55 per 100,000 population (North East and North West LHINs) (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

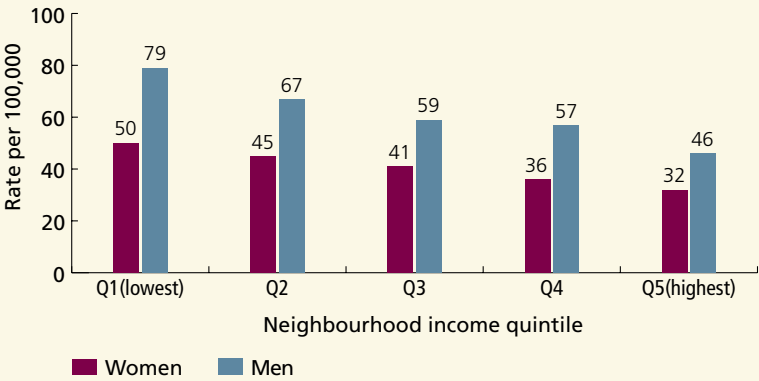
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 4A.4 | Age-standardized incidence of lung cancer per 100,000 population, by sex and neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Regardless of income, the incidence of lung cancer was lower in women than men.
- Women who lived in the lowest-income neighbourhoods had a higher incidence of lung cancer (50 per 100,000) than women from the highest-income neighbourhoods (32 per 100,000), who had the lowest incidence.
- The incidence of lung cancer in men living in the lowest-income neighbourhoods was 79 per 100,000 compared to 46 per 100,000 in men living in the highest-income neighbourhoods.
- The incidence of lung cancer also varied by location, ranging from 37 per 100,000 in the Central West LHIN to 65 per 100,000 in the North East LHIN (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 4A.5 | Age-standardized incidence of lung cancer per 100,000 population, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

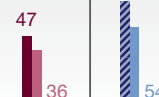
FINDINGS

- Across the province, women and men living in lower-income neighbourhoods had much higher incidence of lung cancer (47 per 100,000 for women and 73 per 100,000 for men) than women and men living in higher-income neighbourhoods (36 per 100,000 in women and 54 per 100,000 in men).
- The incidence of lung cancer in women ranged from 32 per 100,000 (Central and Central West LHINs) to 73 per 100,000 (North East LHIN) among lower-income women; and from 25 per 100,000 (Central West LHIN) to 50 per 100,000 (North East LHIN) among higher-income women.
- Lung cancer incidence in men ranged from 43 per 100,000 (Central West LHIN) to 88 per 100,000 (Erie St. Clair and Hamilton Niagara Haldimand Brant LHINs) among lower-income men; and from 42 per 100,000 (Toronto Central and Central LHINs) to 77 per 100,000 (Erie St. Clair LHIN) among higher-income men.

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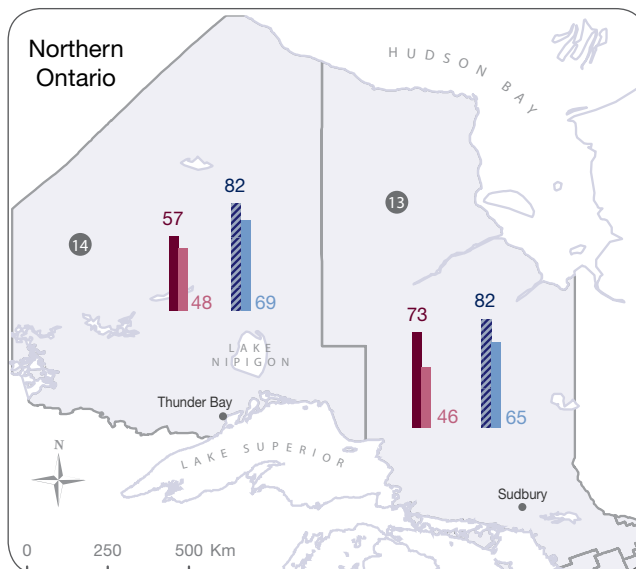
Overall Ontario

In Ontario, the incidence rate of lung cancer was 47 per 100,000 in lower-income women, 36 per 100,000 in higher-income women, 73 per 100,000 in lower-income men and 54 per 100,000 in higher-income men.



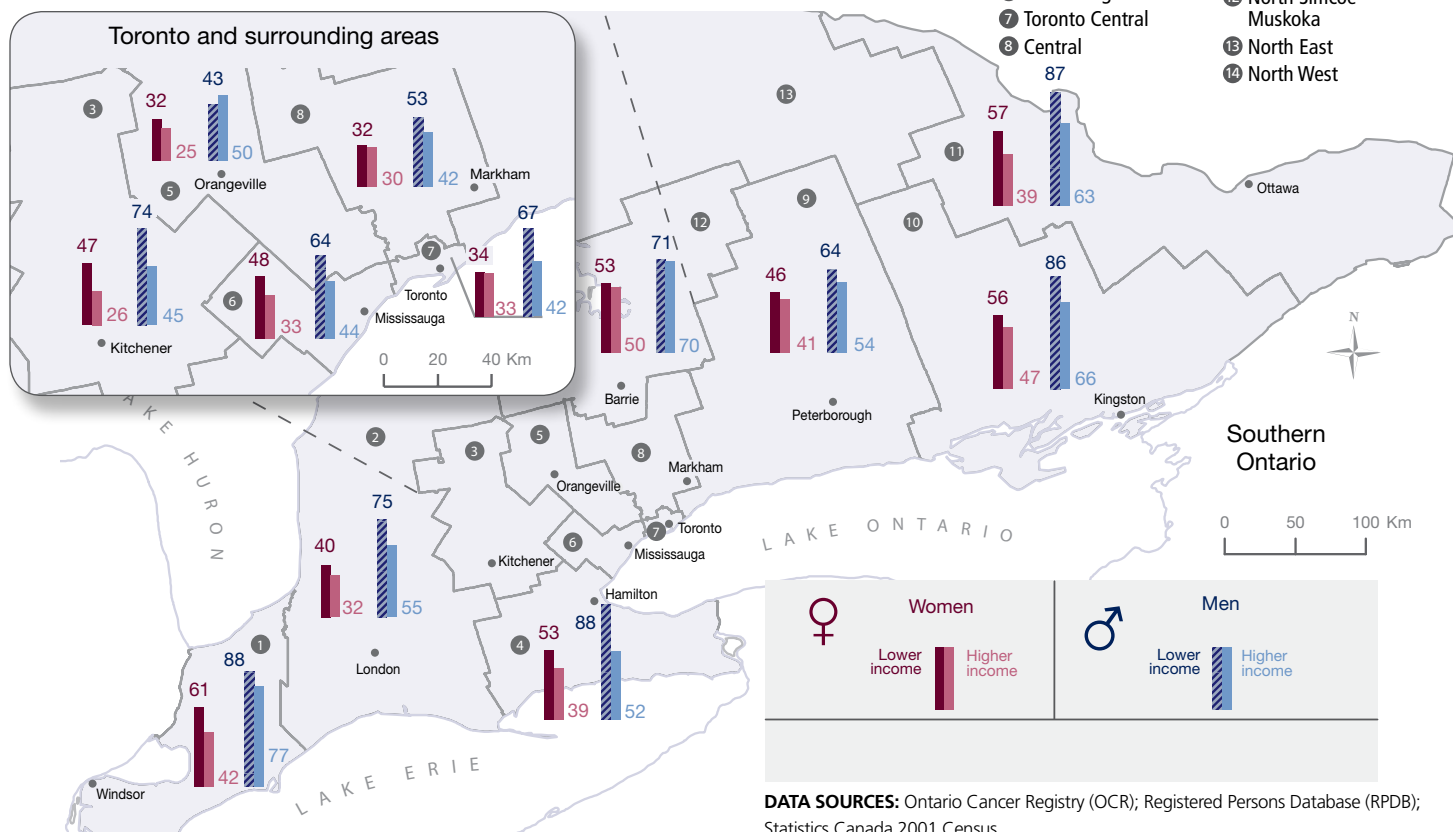
Note: See Appendix 4.3 for details about neighbourhood income quintile calculation.

Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |

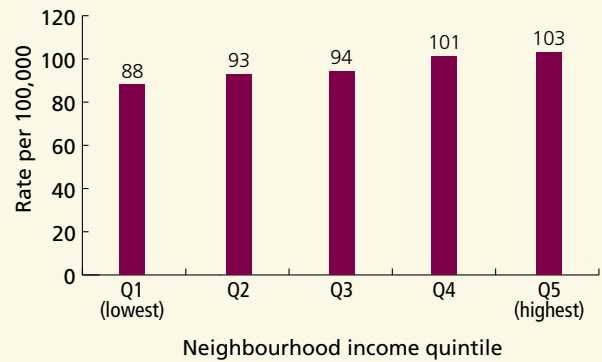


DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

EXHIBIT 4A.6 | Age-standardized incidence of breast cancer per 100,000 women, by neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Breast cancer incidence varied by neighbourhood income; ranging from 88 per 100,000 women in the lowest-income neighbourhoods to 103 per 100,000 in the highest-income neighbourhoods.
- Breast cancer incidence increased with age, ranging from 81 per 100,000 in women under age 65, to 329 per 100,000 in women aged 65-79 and 331 per 100,000 in women aged 80 and older (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 4A.7 | Age-standardized incidence of breast cancer per 100,000 women, by neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

FINDINGS

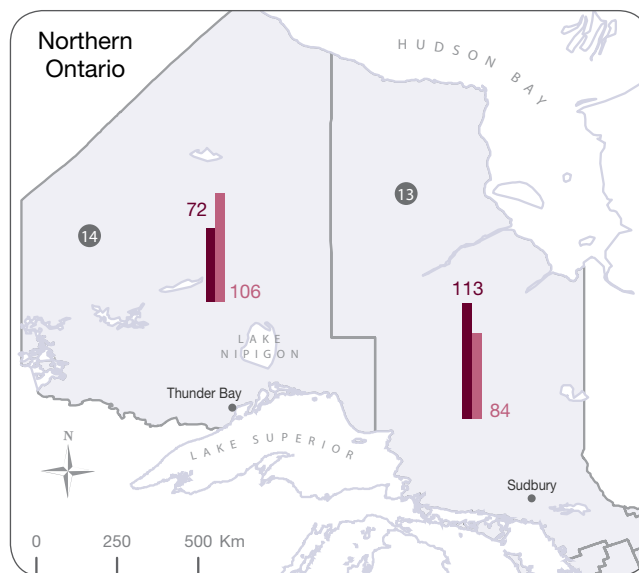
- Breast cancer incidence varied with geography, from 79 per 100,000 women in the Central West LHIN to 105 per 100,000 women in the Erie St. Clair LHIN (data not shown).
- Breast cancer incidence ranged from 59 per 100,000 (Central West LHIN) to 113 per 100,000 (North East LHIN) among lower-income women; and from 79 per 100,000 (North Simcoe Muskoka LHIN) to 110 per 100,000 (Central East LHIN) among higher-income women.

Overall Ontario

In Ontario, the incidence rate of breast cancer was 90 per 100,000 in lower-income women and 99 per 100,000 in higher-income women.

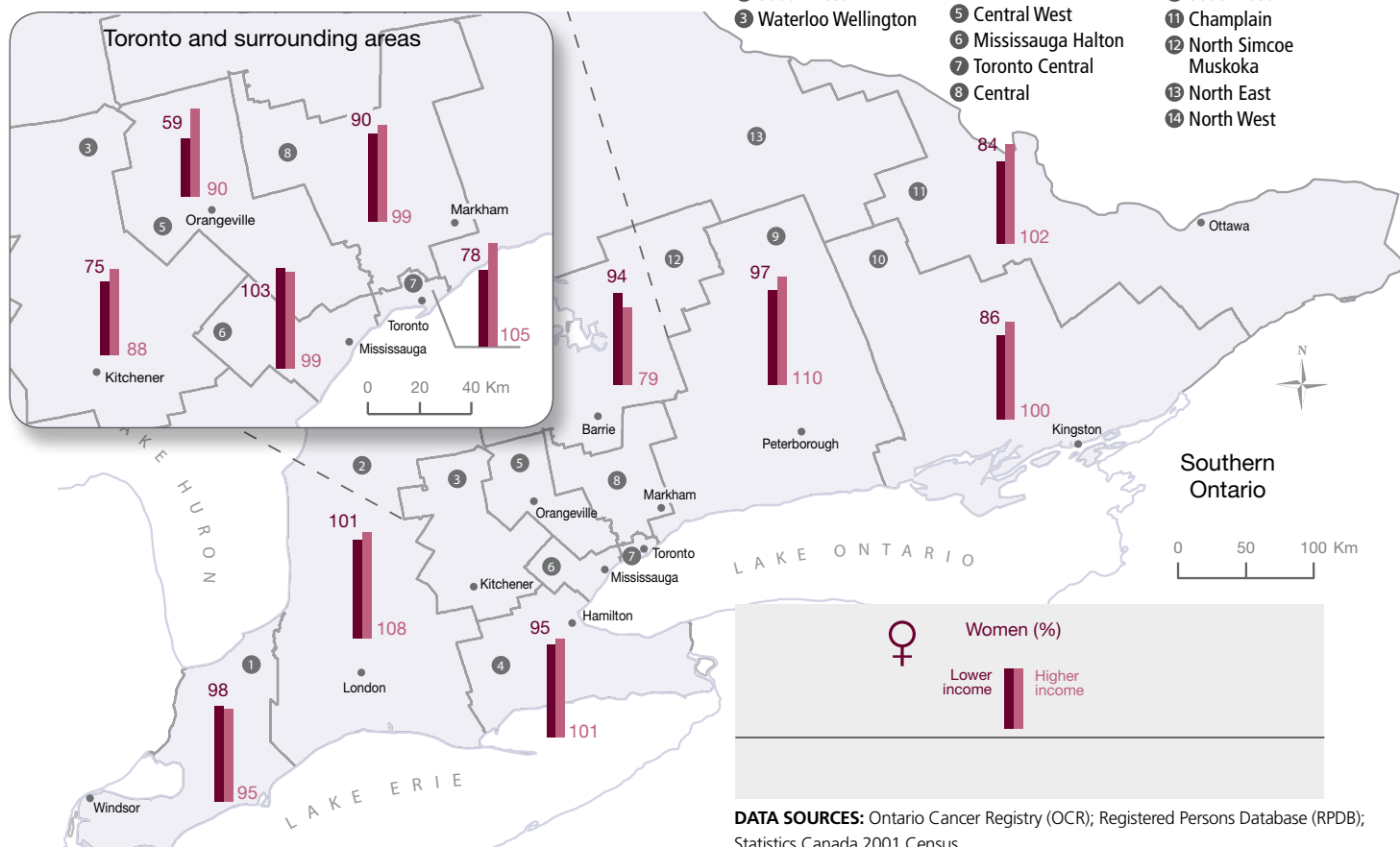


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |

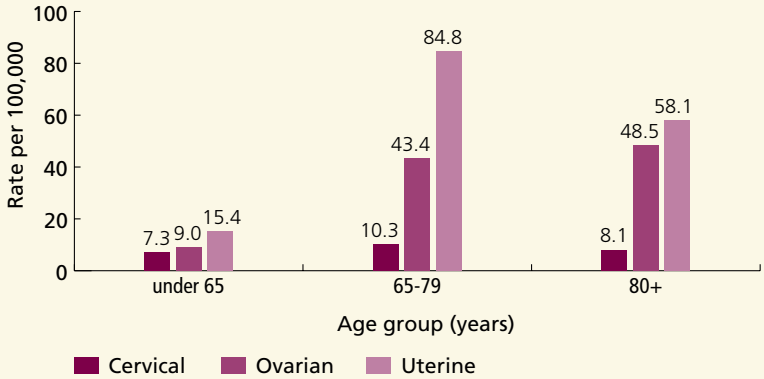


DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

EXHIBIT 4A.8 | Incidence of cervical, ovarian and uterine cancers per 100,000 women, by age, in Ontario, 2004/05

FINDINGS

- The incidence of cervical cancer did not vary with age.
- The incidence of ovarian cancer was significantly higher in older women (43 per 100,000 in women aged 65-79 and 49 per 100,000 in women aged 80 and older) than in women under age 65 (nine per 100,000).
- The incidence of uterine cancer varied with age. It was higher in women aged 65 and older (85 per 100,000 in women aged 65-79 and 58 per 100,000 in women aged 80 and older) compared to those under age 65 (15 per 100,000).



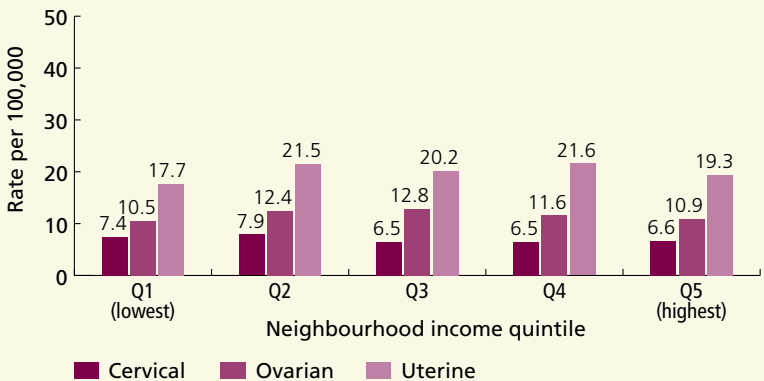
DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

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EXHIBIT 4A.9 | Age-standardized incidence of cervical, ovarian and uterine cancers per 100,000 women, by neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- The incidence of cervical, ovarian and uterine cancers did not vary by income.
- The incidence of these three cancers showed little variation across the province (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

FIVE-YEAR SURVIVAL RATE

Indicator: This indicator measures the percentage of cancer patients who were alive five years after their diagnosis.

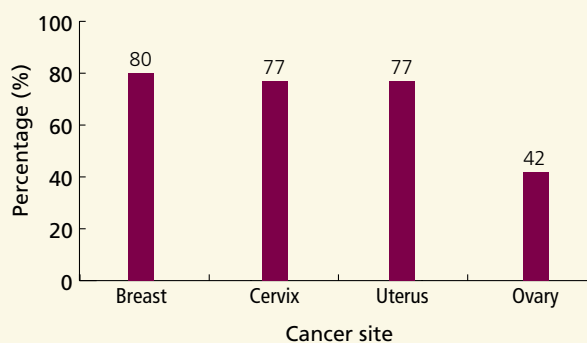
Background: Measuring how long people with different types of cancer live helps us understand differences in severity among types of cancer and learn about the effectiveness of treatments, early detection and screening. Since survival is influenced by a number of factors, including the timing of the diagnosis, other illnesses, accessibility and quality of health care services, there can be variations in survival across different groups and regions. This indicator reports absolute survival rates—the percentage of people in a study or treatment group who are alive five years after diagnosis or treatment. A similar Cancer System Quality Index (CSQI) measure is of relative survival rates: the proportion of people alive five years after their diagnosis, adjusted for mortality expected for people of the same age in the general population of Ontario. Our measure is patient-centred, because it includes other causes of death and competing risks for death, which vary by age and sex and can influence treatment choices.

Finding: Overall in Ontario the five-year survival rate was 50 percent for colorectal cancer, 13 percent for lung cancer, 80 percent for breast cancer, 77 percent for uterine cancer, 42 percent for ovarian cancer and 77 percent for cervical cancer.

EXHIBIT 4A.10 | Five-year survival rate (percentage) among women with breast, cervical, uterine and ovarian cancer, in Ontario[^]

FINDINGS

- Among women diagnosed with breast, cervical and uterine cancer, four out of five will be alive after five years.
- Women with ovarian cancer had the worst five-year survival of these cancers; two out of five were alive five years after diagnosis.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

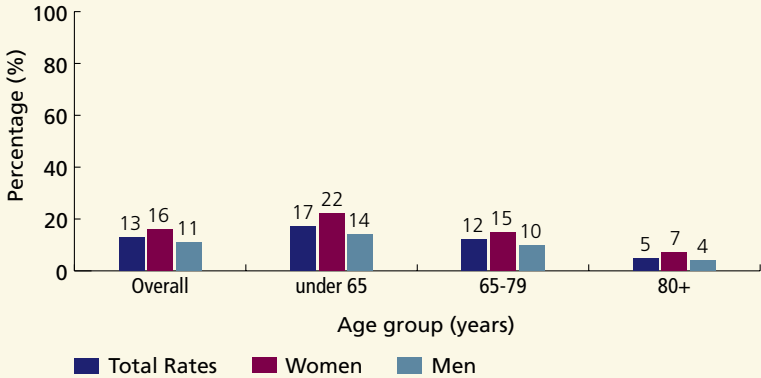
[^] For cases diagnosed in 2000/01

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EXHIBIT 4A.11 | Five-year survival rate (percentage) among lung cancer patients, by sex and age, in Ontario^

FINDINGS

- More women with lung cancer (16 percent) than men (11 percent) were alive five years after their diagnosis.
- Age decreased the five-year survival rate for lung cancer patients: 17 percent of patients under age 65 were alive five years after diagnosis, compared to 5 percent of patients aged 80 and older.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

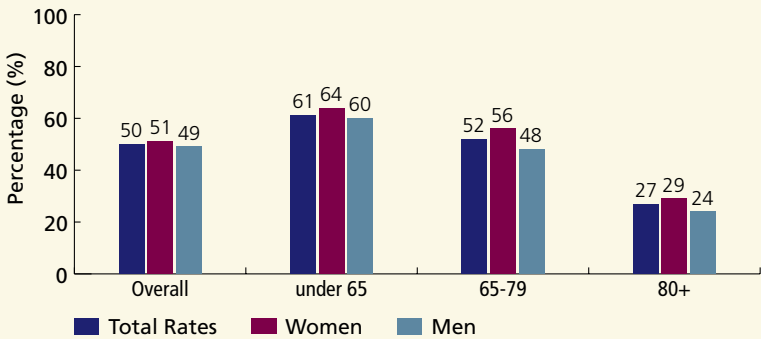
^ For cases diagnosed in 2000/01

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EXHIBIT 4A.12 | Five year survival rate (percentage) among colorectal cancer patients, by sex and age, in Ontario^

FINDINGS

- There were no significant sex differences in five-year survival for colorectal cancer.
- Overall for women and men, survival was worst in the oldest age group and best in the youngest.
- Among women, 64 percent of women under age 65 were alive five years after a diagnosis of colorectal cancer, compared to 56 percent of women aged 65-79 and 29 percent of women aged 80 and older.
- Sixty percent of men under age 65 were alive five years after diagnosis, compared to 48 percent of men aged 65-79 and 24 percent of men aged 80 and older.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

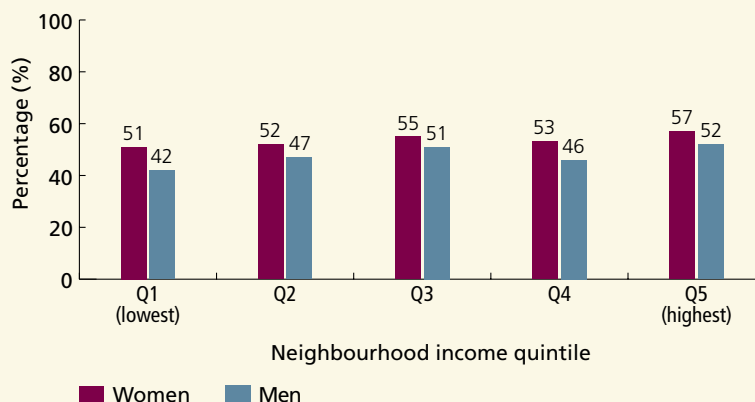
^ For cases diagnosed in 2000/01

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EXHIBIT 4A.13 | Age-standardized five-year survival rate (percentage) among patients with colorectal cancer, by sex and neighbourhood income quintile, in Ontario[^]

FINDINGS

- Five-year colorectal cancer survival varied by neighbourhood income. Patients in the lowest-income neighbourhoods had the worst five-year survival (46 percent), while 55 percent of patients from the highest-income neighbourhoods were alive five years after diagnosis (data not shown).
- Income differences in colorectal cancer survival rates were significant among men but not among women. Forty-two percent of men living in the lowest-income neighbourhoods were alive five years after diagnosis compared to 52 percent of men living in the highest-income neighbourhoods.
- There was some geographic variation in the unadjusted five-year survival rate. After adjusting for age, the rates ranged from 46 percent in the Central West LHIN to 55 percent in the North East LHIN, but the difference was not significant (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

[^] For cases diagnosed in 2000/01

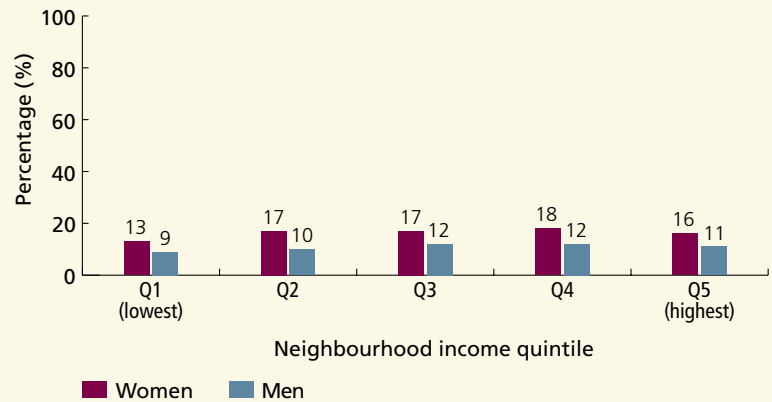
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4A.14 | Age-standardized five-year survival rate (percentage) among lung cancer patients, by sex and neighbourhood income quintile, in Ontario^

FINDINGS

- Five-year survival rates for lung cancer varied slightly by neighbourhood income. People in the lowest-income neighbourhoods had slightly worse survival (11 percent) than people in higher-income neighbourhoods (13 percent) (data not shown).
- Women had better survival rates than men across all neighbourhood income quintiles.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

^ For cases diagnosed in 2000/01

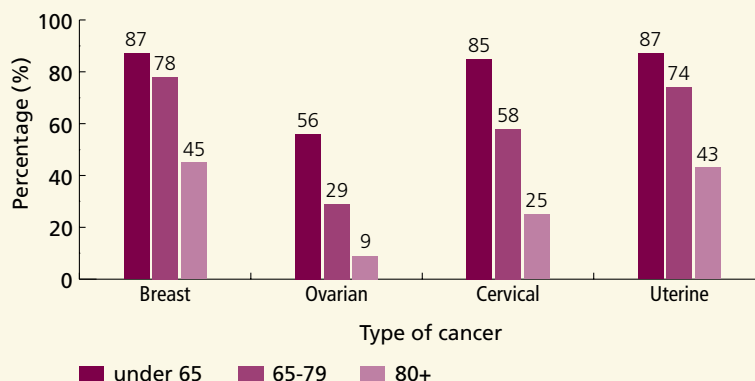
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4A.15 | Five-year survival rate (percentage) among women with breast, ovarian, cervical and uterine cancer, by age and type of cancer, in Ontario[^]

FINDINGS

- Older women were less likely to be alive five years after a diagnosis of any of these cancers, but that is partly because of competing risks for death in the elderly.
- The five-year survival rate for breast cancer for women under age 65 was 87 percent compared to 45 percent in women aged 80 and older.
- Five-year survival did not vary by income for breast, uterine or ovarian cancer (data not shown).
- Geography had minimal impact on five-year survival for breast cancer (data not shown).
- We found regional variations in five-year survival after ovarian and uterine cancer diagnosis, but the findings were not significant, perhaps because of the small sample size (data not shown).
- The absolute number of cervical cancer cases in Ontario was not large enough for reliable analysis by income or LHIN.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)

[^] For cases diagnosed in 2000/01

POWER Study

WAIT TIMES FOR SURGERY (BREAST, COLORECTAL, OVARIAN, UTERINE AND CERVICAL CANCERS)

Indicator: Here we look at how long patients wait for cancer surgery, measuring the time between the initial consultation with the surgeon and the date the surgery was done. We report both the median (the time by which 50 percent of patients underwent surgery) and the 90th percentile (the time by which 90 percent of patients underwent surgery).

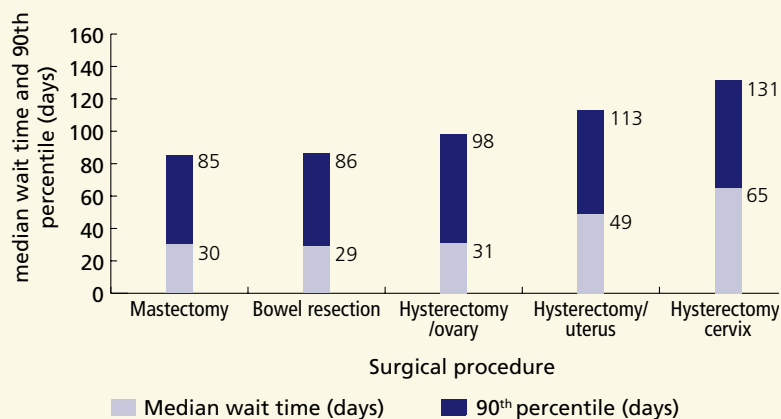
Background: About 80 percent of cancer patients have surgery, which is usually the first step in their treatment. As we have noted, some data indicate wait times for cancer surgery may be too long and were previously increasing in Ontario.^{30, 43} We don't know what effect waiting for care may have on a patient's health, but patients should be treated within an appropriate time to ensure the best outcome, taking into account the type and severity of their cancer. Looking at how long people wait is an important measure of the cancer system's accessibility and capacity to meet all patients' needs and helps in managing services and planning for new services. Waits for cancer surgery are being tracked in Ontario as part of the Ontario Wait Times Strategy.⁴⁴ Our data go further by looking at the issue of equity in wait times. We assessed whether wait times differed by sex and income. However, our results are not directly comparable to the Ontario Wait Times Strategy because of the nature of our data, the time periods we looked at, how we present our data and our focus on differences in population subgroups. Also, we measured wait times slightly differently. The Wait Time Strategy measures wait times for surgery from when a patient and surgeon decide to proceed with the operation to when the procedure is done. In contrast, we measured the time between the initial consultation with the surgeon and the date of surgery.

Finding: Overall, in Ontario in 2004/05 to 2005/06, the median and 90th percentile wait times for surgery by type of procedure were: 30 and 85 days for mastectomy, 29 and 86 days for bowel resection, 31 and 98 days for hysterectomy for ovarian cancer, 49 and 113 days for hysterectomy for uterine cancer and 65 and 131 days for hysterectomy for cervical cancer.

EXHIBIT 4A.16 | Median wait time (days) and 90th percentile (days) to surgery, by type of surgical procedure among patients with breast, colon, ovarian, uterine or cervical cancer, in Ontario, 2004/05 to 2005/06

FINDINGS

- There was variation in the median and 90th percentile wait times depending on type of surgery. The wait times for hysterectomies varied for the different gynecologic cancers.
- There was no sex difference in the wait times for bowel resection surgery (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4A.17 | Median wait time and 90th percentile in days, by type of procedure and neighbourhood income quintile, in Ontario, 2004/05 to 2005/06

Types of procedure/ Income	Q1 (Lowest) Median wait time (90 th percentile) days	Q2 Median wait time (90 th percentile) days	Q3 Median wait time (90 th percentile) days	Q4 Median wait time (90 th percentile) days	Q5 (Highest) Median wait time (90 th percentile) days
Mastectomy	31 (85)	29 (83)	33 (88)	29 (88)	29 (85)
Hysterectomy/uterus	53 (117)	48 (108)	48 (112)	48 (117)	47 (113)
Hysterectomy/cervix*	62 (105)	97 (128)	57 (138)	91 (157)	51 (125)
Hysterectomy/ovary*	37 (114)	35 (99)	31 (79)	36 (116)	27 (79)
Bowel resection	29 (86)	30 (89)	29 (85)	29 (89)	27 (82)

DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Statistics Canada 2001 Census

* Interpret with caution due to small numbers

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

FINDINGS

- Neighbourhood income was not associated with large differences in median wait times for mastectomy or bowel resection.
- Women with uterine, ovarian or cervical cancer living in the lowest-income neighbourhoods had longer median wait times for hysterectomy than women living in the highest-income neighbourhoods. The number of cases of cervical and ovarian cancer was small and the results should be viewed with caution.
- There was regional variation in median wait times for all the surgeries. Wait times ranged from 22-40 days for mastectomy, 36-58 days for hysterectomy for uterine cancer and 25-38 days for bowel resection (data not shown). The numbers of cases of cervical and ovarian cancer were not large enough to allow reliable regional analysis.

POWER Study

Section 4A

SUMMARY OF FINDINGS

As we have seen, older people were more likely to develop cancer and had less chance of being alive five years after they were diagnosed. While that is certainly due in part to the other risks of death they face, it is also possible that older patients are under-treated. We looked at two cancers, colorectal and lung, which affect both sexes (men can get breast cancer, but it is rare and was not included in our work) and in both cases, the incidence was higher in men. This is likely due to a combination of differences in both biology and risk factors, such as smoking (see *Burden of Illness, Chapter 3*).

Income was an important factor in incidence and survival for some of the cancers we examined. People who lived in lower-income neighbourhoods were more likely to be diagnosed with lung cancer, but breast cancer was more common in higher-income neighbourhoods. People in more affluent areas had better survival after colorectal cancer. Income (and, in the case of colorectal cancer, sex) was not associated with an appreciable difference in how long people waited for bowel resection, or mastectomy. However, living in a lower-income neighbourhood was associated with longer wait times for hysterectomy and length of the wait for hysterectomy varied by diagnosis.

Although some regional differences existed in cancer incidence, the differences in survival after diagnosis were not significant across Local Health Integration Networks (LHINs). Geography influenced how long patients wait for surgery: where one lives was the predominant factor affecting time to surgery, which suggests variation in the availability of resources across the province.

Cancer Incidence

The incidence of cancer increased markedly with age for all the types of cancers included. Women had lower rates of both colorectal and lung cancer. There was a higher incidence of lung cancer among women and men living in

lower-income neighbourhoods compared to those living in higher-income neighbourhoods. For breast cancer, incidence was somewhat higher in women living in higher-income neighbourhoods compared to those living in lower-income neighbourhoods.

Cancer incidence varied across the province for lung, breast and colorectal cancer but not for gynecological cancers. The different rates of lung cancer probably reflect smoking patterns across Ontario.

Five-year Survival

Older patients had worse five-year survival rates, probably because of competing causes of death, but it is also possible they were offered different treatment for their cancer. Women with lung cancer fared better than men with lung cancer, but in colorectal cancer, sex made no difference in survival. Income, however, did. Colorectal cancer patients living in lower-income neighbourhoods had worse survival than those living in higher-income neighbourhoods. We don't know whether that was because they were diagnosed later or received different treatment. Survival rates did not vary by region.

Wait Times for Surgery

Differences in wait times for surgery were mostly linked to the type of cancer or where the patient lived. There were large regional variations in wait times for all three surgical procedures examined. The median time to hysterectomy varied by cancer type—women with ovarian cancer waited the shortest amount of time. There were small age differences in wait times for some types of surgery. Income was not associated with an appreciable difference in wait times for bowel resection, or mastectomy. However, living in a lower-income neighbourhood was associated with longer wait times for hysterectomy.



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Section 4B

Cancer Screening

INTRODUCTION

In this section, we look at indicators of screening for breast, colorectal and cervical cancer. Screening allows cancer to be identified earlier, which can improve outcomes.

Screening is recommended by all provincial and national agencies, whether done through routine primary care or as part of an organized program, such as the Ontario Breast Screening Program (launched in 1990), Colon Cancer Check (launched in 2007) or the Ontario Cervical Screening Program (launched in 2000). Looking at whether individuals are screened according to guidelines is the first step in assessing screening. How abnormal results are handled is another important aspect of quality, so we have also included a number of measures on follow-up for abnormal results of cervical cancer screening.

Breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer-related deaths among Canadian women.³³ Screening rates are increasing across the country but none of the provinces have reached the national target of 70 percent participation.³³ Certain groups are less likely to get screened, including women with chronic illnesses—women with diabetes in Ontario were significantly less likely to have had a mammogram within a two-year period, for example.^{45, 46} Mammogram rates were higher for individuals and regions with higher levels of education^{46, 47} and in the city of Toronto, underhoused women, women who are mentally ill and women who live in low-income or high-immigration areas had especially low rates.^{46, 48, 49}

Colorectal cancer affects both women and men, but Canadian women at average risk for colorectal cancer

reported lower screening rates than men,^{50, 51} though women had more contact with family physicians than men.⁵¹ Self-reported fecal occult blood testing was higher among men in several Canadian provinces, including Ontario.⁵² We have little specific information about sex differences in screening, but a gender bias has been found in follow-up after positive fecal occult blood testing—women's median time to endoscopy was nearly three months longer than men's.⁵³ Ontario has a very low rate of screening eligible women and men—less than 25 percent, but it is increasing.^{30, 50, 54}

Widespread use of Papanicolaou (Pap) tests to screen for **cervical cancer** has led to a steady decline in both incidence and death from the disease over the past few decades.⁵⁵ The majority of women who are diagnosed with cervical cancer have been inadequately screened or never screened at all.⁵⁶ Some groups of women, including foreign-born Canadians, especially recent immigrants, have been found to have lower rates of screening.^{57, 58} Screening rates have been found to rise with the length of time immigrants have lived in Canada.⁵⁷ Ontario women with more education or higher income reported a higher likelihood of having Pap tests⁵⁹ and living in an urban area has also been associated with higher rates of cancer screening.^{56, 59} In the city of Toronto, women living in areas with a high concentration of immigrants, low income or low education had lower rates of screening for cervical cancer.⁶⁰

EXHIBITS AND FINDINGS

BREAST CANCER SCREENING

Indicator: This indicator measures the percentage of women aged 50-69 with no history of breast cancer who had a mammogram in the last two years.

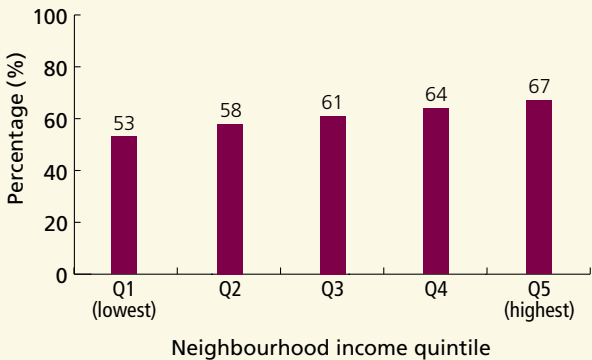
Background: Breast cancer screening can detect cancer early, when a woman is asymptomatic, which allows more effective treatment and increased survival. The Canadian Task Force on Preventive Health Care recommends all women aged 50-69 have a mammogram every one to two years.

Finding: Overall in Ontario in 2005/06, 61 percent of eligible women had a mammogram in the last two years.

EXHIBIT 4B.1 | Age-standardized percentage of screen-eligible^ women who had a mammogram in the last two years, by neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Women living in lower-income neighborhoods were less likely to have a mammogram than those living in higher-income neighborhoods.
- Only 53 percent of women living in the lowest-income neighbourhoods had a mammogram compared to 67 percent of women living in the highest-income neighbourhoods.



DATA SOURCES: Ontario Breast Screening Program (OBSP); Ontario Health Insurance Plan (OHIP); Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

^ Women aged 50-69 with no history of breast cancer

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4B.2 | Age-standardized percentage of screen-eligible[^] women who had a mammogram in the last two years, by neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

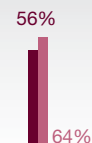
FINDINGS

- Women from lower-income neighbourhoods had lower screening rates across all LHINs than women from higher-income neighbourhoods. Rates among women from lower-income neighbourhoods ranged from 49 percent in the Central West LHIN to 61 percent in the North West and North East LHINs.
- In higher-income neighbourhoods, the rates ranged from 58 percent (Central West LHIN) to 70 percent (North West LHIN).

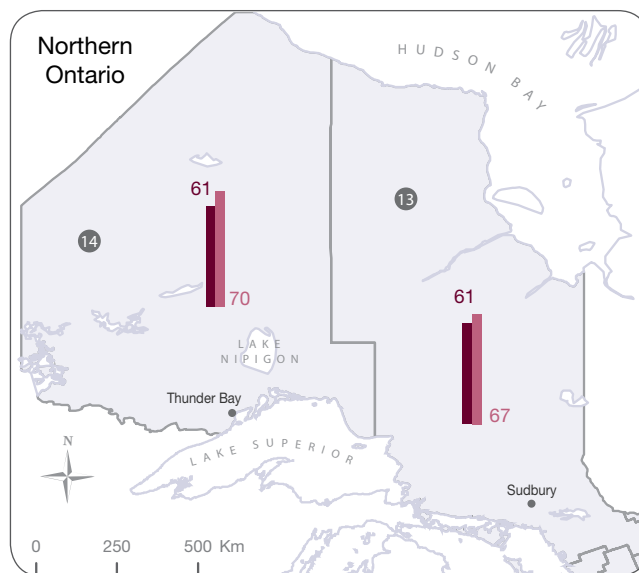
POWER Study

Overall Ontario

In Ontario, 56% of lower-income women and 64% of higher-income women received a mammogram in the last two years.

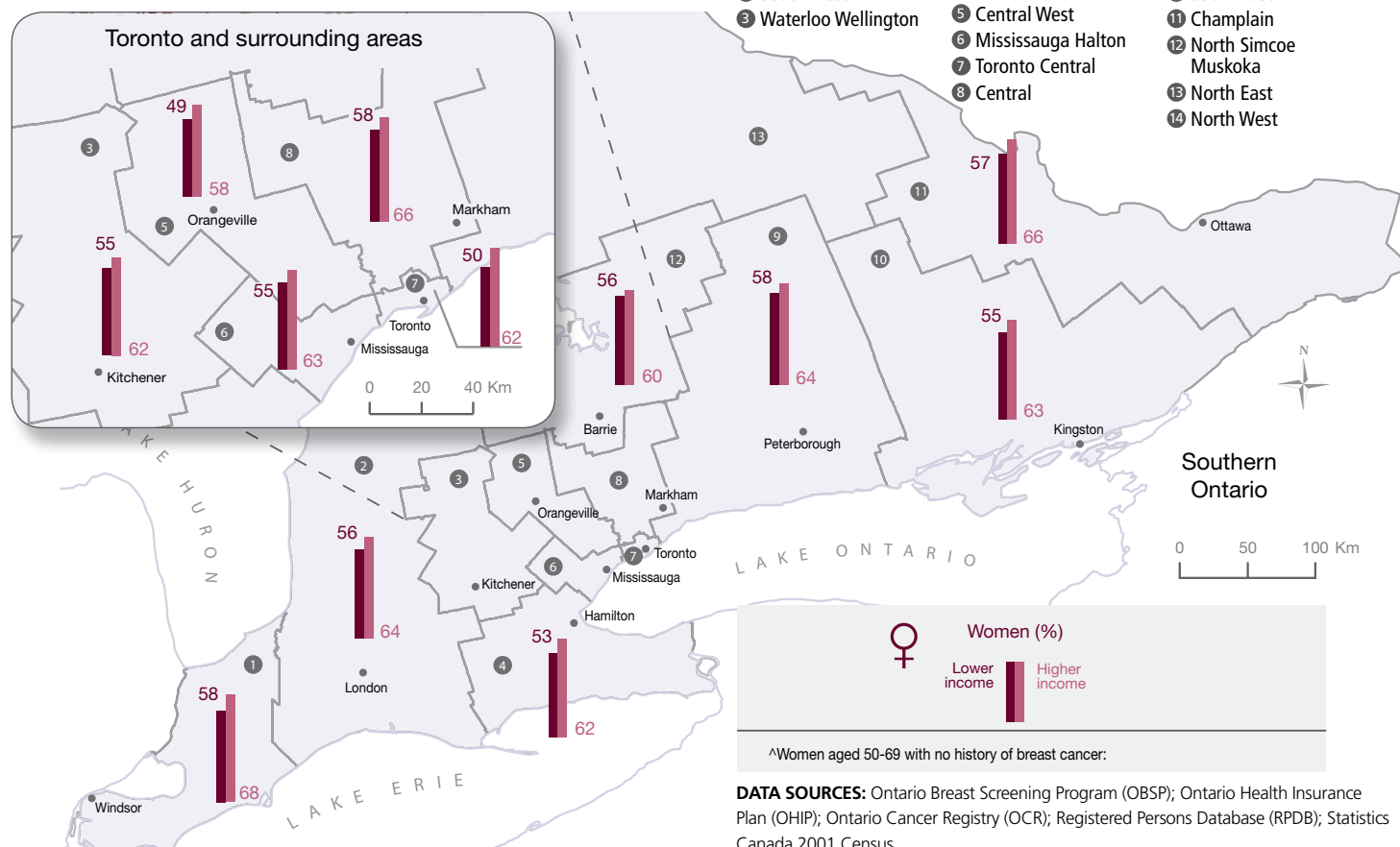


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |



DATA SOURCES: Ontario Breast Screening Program (OBSP); Ontario Health Insurance Plan (OHIP); Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Statistics Canada 2001 Census

COLORECTAL CANCER SCREENING

Indicator: This indicator measures the percentage of adults aged 50-74, with no history of colorectal cancer who had one or more fecal occult blood tests (FOBT) in the last two years.

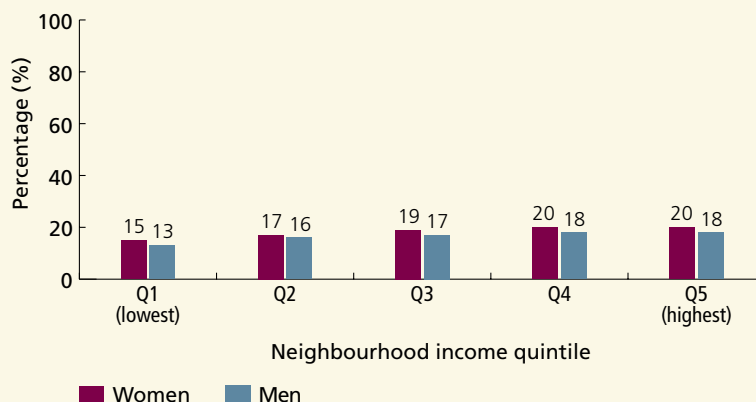
Background: Colorectal cancer is one of the four most common cancers diagnosed in Ontario, and among non-smokers, is the most common cause of cancer death. Since 2001, population screening has been recommended nationwide for everyone aged 50 and older.^{51, 61} FOBTs are the recommended screen for people at average risk for colorectal cancer. Studies show that the colorectal cancer death rate would be reduced by 15 to 33 percent if everyone eligible had a test every one or two years, followed by colonoscopy for people who tested positive. At the same time, the number of people diagnosed with colorectal cancer would be reduced by 18 percent as more people would be diagnosed at the polyp stage, which is a pre-cancerous state. The probability of a cure is 90 percent when colorectal cancer is detected early.

Finding: Ontario has not come close to reaching the recommended rates for colorectal cancer screening. In 2005/06, 17 percent of screen-eligible adults—18 percent of women and 16 percent of men—had at least one FOBT in the last two years.

EXHIBIT 4B.3 | Age-standardized percentage of screen-eligible[^] adults who had one or more fecal occult blood tests (FOBT) in the last two years, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Just 17 percent of eligible adults had at least one FOBT in the two years prior to 2005/06, a slight increase from 2004/05 rates (15 percent in 2004/05, data not shown).
- The likelihood of being screened decreased with neighbourhood income for both sexes.
- Women were slightly more likely than men to be screened across all income quintiles.
- This was also the case across age groups, except in the oldest group (aged 70-74) where women were less likely than men to be screened (data not shown). We do not have data on colonoscopy screening, so we cannot say whether women were more likely to get screened overall.



DATA SOURCES: Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Statistics Canada 2001 Census

[^] Adults aged 50-74 with no history of colorectal cancer

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4B.4 | Age-standardized percentage of screen-eligible^ adults who received one or more fecal occult blood tests (FOBT) in the last two years, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

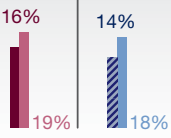
FINDINGS

- Where one lives makes a difference—screening rates varied from 11 to 19 percent across LHINs (data not shown).
- Men were consistently slightly less likely to be screened than women.
- Fecal occult blood testing ranged from 13 percent (Hamilton Niagara Haldimand Brant, Toronto Central and South East LHINs) to 20 percent (Central East LHIN) among women living in lower-income neighbourhoods. Among women living in higher-income neighbourhoods, rates ranged from 14 percent (Toronto Central LHIN) to 23 percent (Champlain LHIN).
- FOBT rates among men living in lower-income neighbourhoods ranged from 11 percent (South East LHIN) to 18 percent (Central East LHIN). The rates for men living in higher-income neighbourhoods ranged from 13 percent (Toronto Central LHIN) to 20 percent (Waterloo Wellington, Central, Champlain and Central East LHINs).

POWER Study

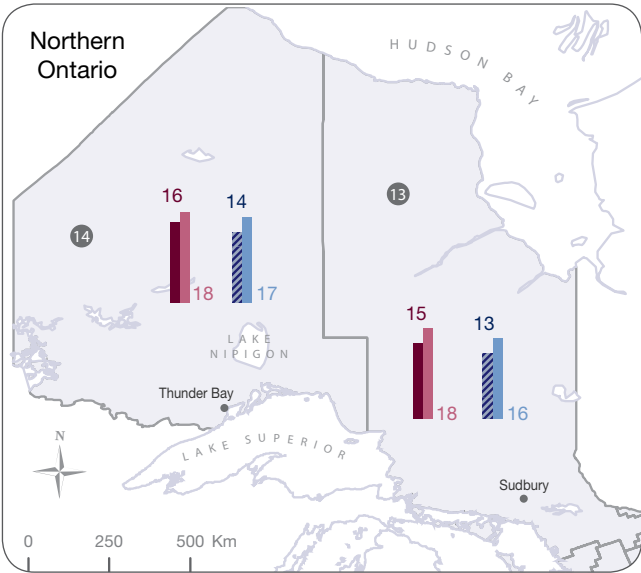
Overall Ontario

In Ontario, 16% of lower-income women, 19% of higher-income women, 14% of lower-income men and 18% of higher-income men had at least one FOBT in the last two years.



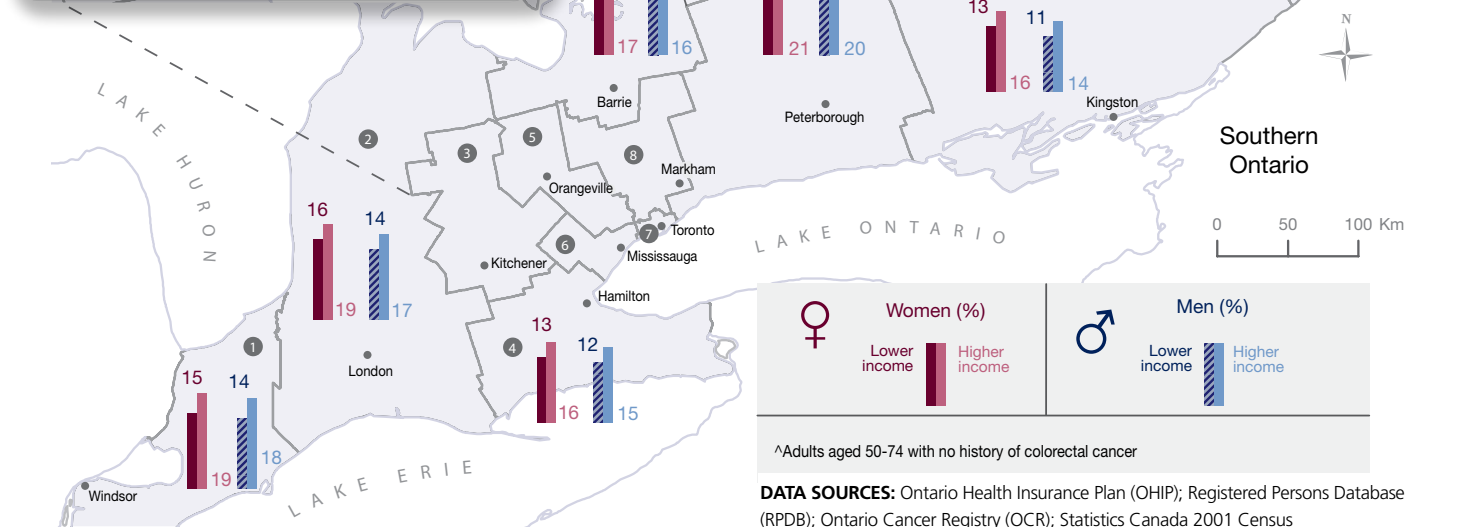
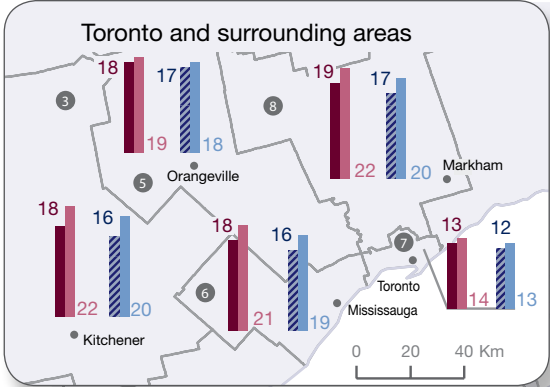
Note: See Appendix 4.3 for details about neighbourhood income quintile calculation

Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



Women (%)

Lower income Higher income



Men (%)

Lower income Higher income

^Adults aged 50-74 with no history of colorectal cancer

DATA SOURCES: Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Statistics Canada 2001 Census

CERVICAL CANCER SCREENING

Indicator: This indicator measures the percentage of women aged 18-70 with no history of cervical cancer, and who have not had a hysterectomy, who had at least one Papanicolaou (Pap) test in the last three years.

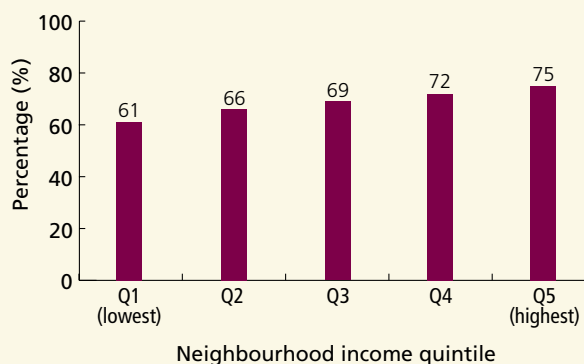
Background: Pap tests screen for early changes in the cervix. The guidelines for using them vary on how often testing should be done. The most conservative say eligible patients need to be screened only every three years after two consecutive years of negative screens, but recommend annual screening if there isn't a system for monitoring follow-up. Previous studies have found Pap test rates vary by socioeconomic status and ethnicity.^{58, 62-64} The main database that we used to track Pap tests (CytoBase) does not capture tests done in hospital. While a minority of Pap tests are done in hospitals, our results for this indicator may somewhat underestimate actual screening rates because of this reason.

Finding: Overall in Ontario, in 2004/05, 69 percent of women with no history of cervical cancer or prior hysterectomy had at least one Pap test in the last three years.

EXHIBIT 4B.5 | Age-standardized percentage of screen-eligible[^] women who had at least one Papanicolaou (Pap) test in the last three years, by neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- There was a significant income gradient in cervical cancer screening rates ranging from 61 percent among women living in the lowest-income neighbourhoods to 75 percent among those in the highest-income neighbourhoods.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

[^] Women aged 18-70 with no history of cervical cancer or prior hysterectomy

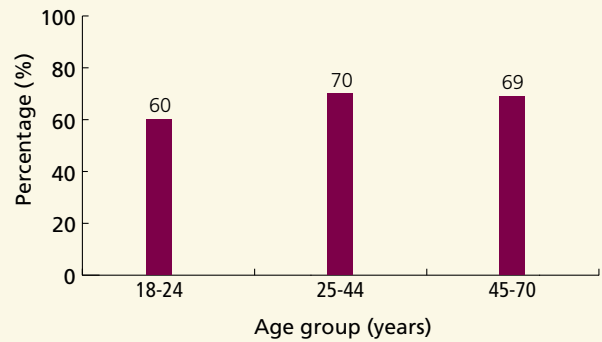
NOTE: See Appendix 4.3 for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4B.6 | Percentage of screen-eligible^ women who had at least one Papanicolaou (PAP) test in the last three years, by age, in Ontario, 2004/05

FINDINGS

- Younger women (aged 18-24) were less likely to have had a Pap test than women aged 25-70.
- The age variation was consistent across all regions (data not shown).



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

^ Women aged 18-70 with no history of cervical cancer or prior hysterectomy

POWER Study

EXHIBIT 4B.7 | Age-standardized percentage of screen-eligible[^] women who had at least one Papanicolaou (Pap) test in the last three years, by neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

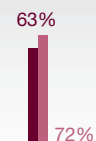
FINDINGS

- Across all LHINs, women living in lower-income neighbourhoods were less likely to have had at least one Pap test in the previous three years as compared to women living in higher-income neighbourhoods.
- The rates also varied by region, ranging from 59 percent (Erie St. Clair and Central West LHINs) to 68 percent (South East LHIN) for lower-income women. The range for higher-income women was from 68 percent (Erie St. Clair LHIN) to 77 percent (Champlain LHIN).

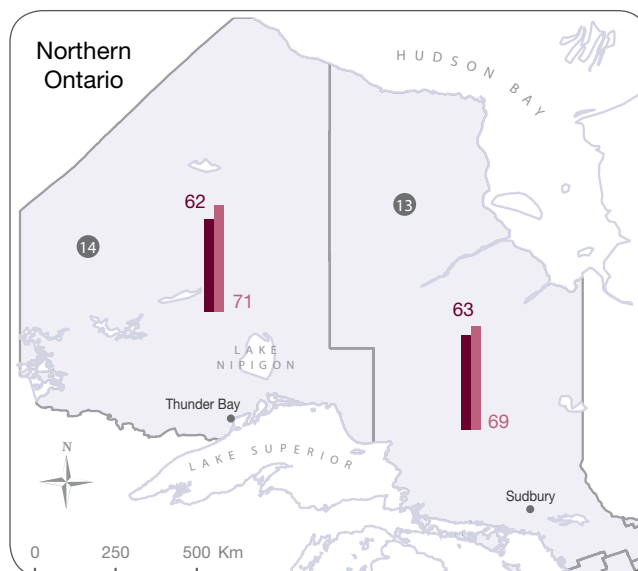
POWER Study

Overall Ontario

In Ontario, 63% of lower-income women, and 72% of higher-income women, with no history of cervical cancer or hysterectomy had at least one Pap test in the last three years.

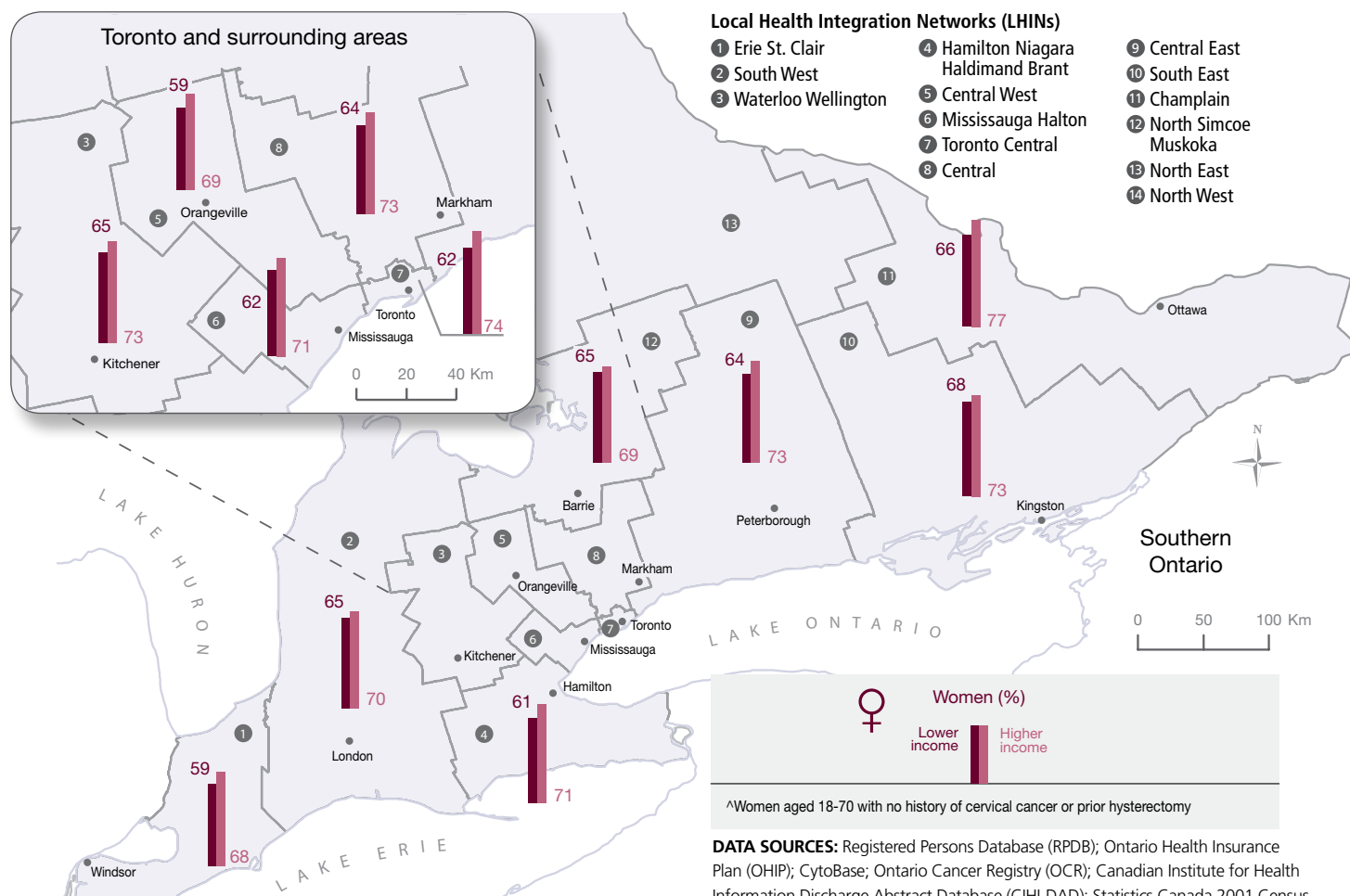


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



♀ Women (%)
Lower income Higher income

[^]Women aged 18-70 with no history of cervical cancer or prior hysterectomy

DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

CERVICAL CANCER SCREENING FOLLOW-UP AFTER A LOW-GRADE LESION ON PAPANICULAOU (PAP) TEST

Indicator: This indicator measures percentage of patients whose Papanicolaou (Pap) test showed a low-grade lesion (Atypical Squamous Cells of Undetermined Significance—[ASCUS] or Low-Grade Squamous Intraepithelial Lesion [LGSIL]) and who had either a repeat Pap test or colposcopy within six months of the initial Pap test.

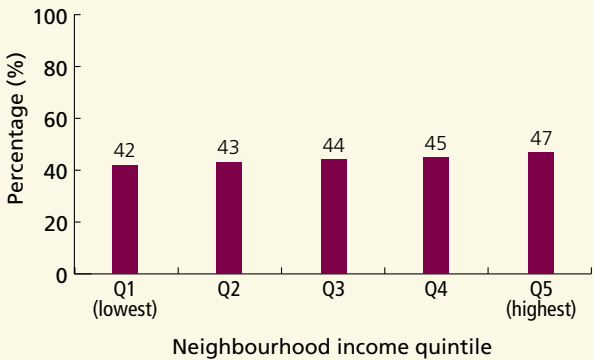
Background: Low-grade lesions are intermediate findings from Pap tests that require close monitoring. In many cases, they resolve spontaneously, but they can also progress and require treatment. Either a repeat Pap test or colposcopy is an appropriate method of follow-up.⁶⁵ For cervical cancer screening to be effective there must be adequate follow-up of low-grade lesions, so we looked at how well this guideline is followed overall, and by age, income and geographic region.

Finding: Overall in Ontario, in 2004/05, 44 percent of women who had a Pap test that showed a low-grade lesion (ASCUS or LGSIL) had either a repeat Pap test or colposcopy within six months of the initial test.

EXHIBIT 4B.8 | Age-standardized percentage of women who had a Papanicolaou (Pap) test that showed a low grade lesion (ASCUS or LGSIL) who had a repeat Pap test or colposcopy within six months of the initial abnormal test, by neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Regardless of neighbourhood income, fewer than half of women who had a Pap test that showed a low-grade lesion had appropriate follow-up (either a repeat Pap test or colposcopy).
- Women who lived in higher-income neighbourhoods were more likely to get follow-up testing; the percentage increased from 42 percent for women living in the lowest-income neighbourhoods to 47 percent for women living in the highest-income neighbourhoods.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Canadian Institute for Health Information District Abstract Database (CIHI-DAD); Ontario Cancer Registry (OCR); Statistics Canada 2001 Census

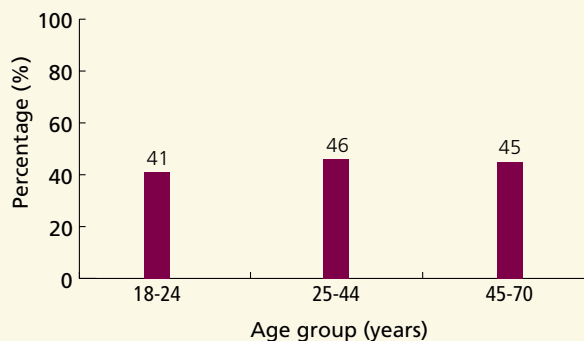
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4B.9 | Percentage of women who had a Papanicolaou (Pap) test that showed a low grade lesion (ASCUS or LGSIL) who had a repeat Pap test or colposcopy within six months, by age, in Ontario, 2004/05

FINDINGS

- Younger women, aged 18-24, with an abnormal Pap test were less likely than older women to get follow-up: 41 percent compared to 46 percent of women aged 25-44 and 45 percent of women aged 45-70.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 4B.10 | Age-standardized percentage of women who had a Papanicolaou (Pap) test that showed a low grade lesion (ASCUS or LGSIL) who had a repeat Pap test or colposcopy within six months, by neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

FINDINGS

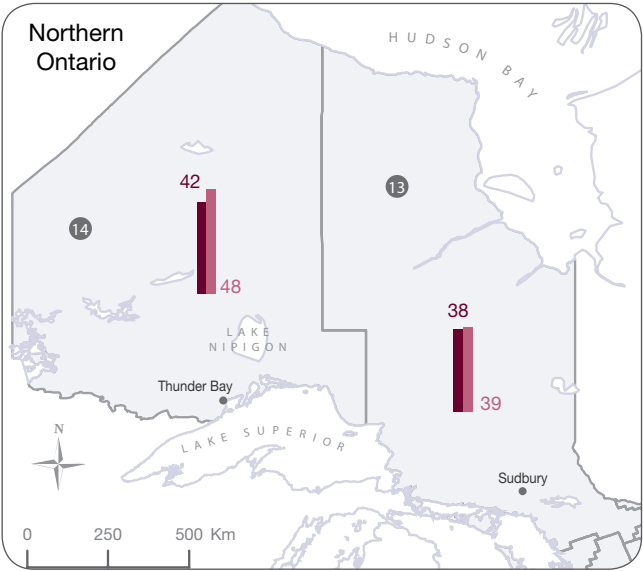
- The rates of repeat Pap test or colposcopy varied across LHINs among women from both lower-income and higher-income neighbourhoods.
- Rates of follow-up testing varied from a low of 32 percent (South East LHIN) to 53 percent (Erie St. Clair LHIN) (data not shown).

Overall Ontario

In Ontario, 42% of lower-income women and 45% of higher-income women who had a Pap test that showed a low grade lesion (ASCUS or LGSIL), had either a repeat Pap test or colposcopy within six months of the initial Pap test.

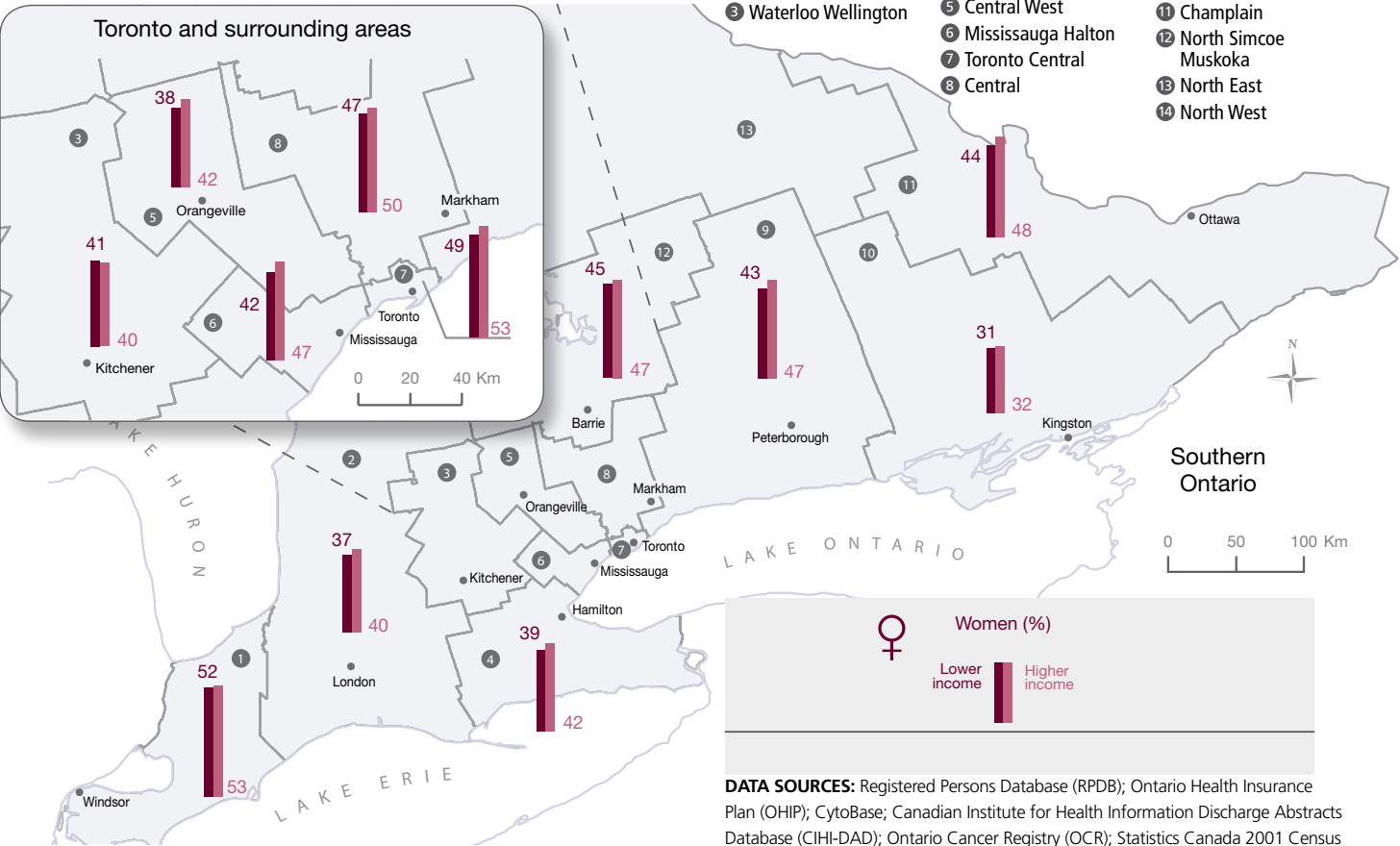


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD); Ontario Cancer Registry (OCR); Statistics Canada 2001 Census

CERVICAL CANCER SCREENING—FOLLOW-UP AFTER AN “UNSATISFACTORY” PAPANICULAOU (PAP) TEST RESULT

Indicator: This indicator measures the percentage of women with an “unsatisfactory” Papanicolaou (Pap) test result who had another Pap test within four months of the original.

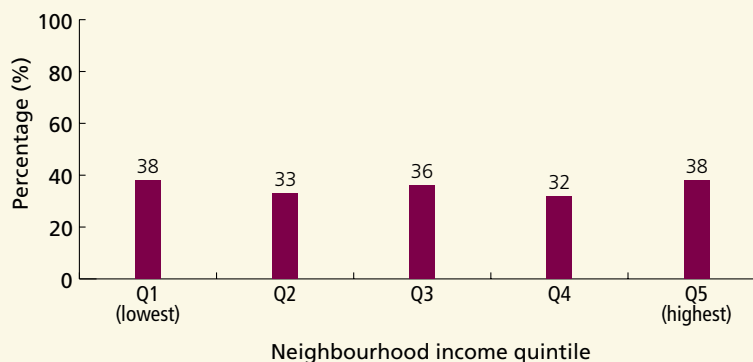
Background: Guidelines say a woman who gets an “unsatisfactory” Pap test result must have a repeat test within four months.⁶⁵ We establish baseline information for adherence to this recommendation for women as a whole and also by age, income and region.

Finding: Overall in Ontario in 2004/05, 35 percent of women who had an “unsatisfactory” Pap test result had a repeat Pap test within four months.

EXHIBIT 4B.11 | Age-standardized percentage of women who had a repeat Papanicolaou (Pap) test within four months after an “unsatisfactory” test result, by neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Regardless of income, less than 40 percent of women who had an ‘unsatisfactory’ sample underwent a repeat Pap test within four months of the initial test.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

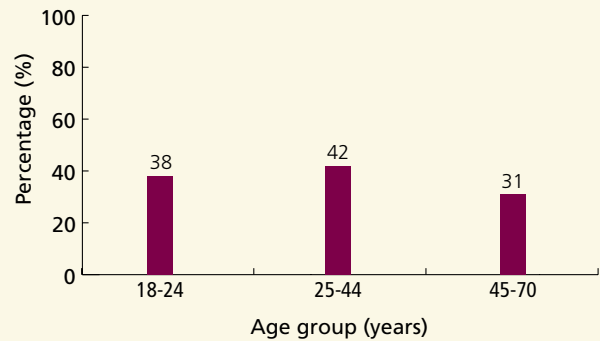
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4B.12 | Percentage of women who had a repeat Papanicolaou (Pap) test within four months after an "unsatisfactory" test result, by age, in Ontario, 2004/05

FINDINGS

- Women aged 45-70 were less likely than younger women to have a repeat Pap test; 31 percent versus 42 percent in women aged 25-44 and 38 percent in women aged 18-24.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 4B.13 | Age-standardized percentage of women who had a repeat Papanicolaou (Pap) test within four months after an "unsatisfactory" test result, by Local Health Integration Network (LHIN), in Ontario, 2004/05

LHIN Name	Percentage (%)
1. Erie St. Clair	32
2. South West	36
3. Waterloo Wellington	35
4. Hamilton Niagara Haldimand Brant	35
5. Central West	25
6. Mississauga Halton	36
7. Toronto Central	42
8. Central	36
9. Central East	33
10. South East	32
11. Champlain	34
12. North Simcoe Muskoka	41
13. North East	41
14. North West	36

DATA SOURCES: Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

FINDINGS

- There was geographic variation in rates of repeat Pap test for an "unsatisfactory" initial sample ranging from 25 percent (Central West LHIN) to 42 percent (Toronto Central LHIN), but this was not significant.

POWER Study

Section 4B

SUMMARY OF FINDINGS

This section shows that the rates of screening for breast, colorectal and cervical cancer in Ontario remain below set provincial targets. Only 61 percent of eligible women were screened for breast cancer and only 17 percent of eligible adults had fecal occult blood testing for colorectal cancer. Screening for cervical cancer was a little better at 69 percent.

Income was significantly associated with screening behaviour; people from lower-income neighbourhoods had the lowest screening rates and these were especially low for colorectal cancer screening. We also identified very low follow-up rates for abnormal or "unsatisfactory" Papanicolaou (Pap) tests. Less than half of women who should receive follow-up got the care they needed for abnormal or unsatisfactory Pap tests. Very young women were the least likely to have Pap tests and least likely to receive follow-up of an abnormal result, but post-menopausal women were the least likely to have a repeat test after an "unsatisfactory" sample. There was also geographic variation in Pap screening and follow-up of abnormal results.

Screening Mammography

The overall rate of breast cancer screening in Ontario in 2005 was 61 percent, below the target rate of 70 percent; women from lower-income neighbourhoods had the lowest rates of screening. There was some geographic variation in screening mammography across Ontario but the effect of income was similar across all regions—the absolute difference between lower- and higher-income women was about 10 percent in all LHINs.

Colorectal Cancer Screening with Fecal Occult Blood Tests

Although screening rates for colorectal cancer using fecal occult blood tests (FOBT) have increased over

time,²⁹ they remain very low. Our data suggest that women were slightly more likely to get an FOBT. While the absolute difference between women and men was only one to two percent, the target population was approximately 2.8 million people, so approximately 39,000 more women than men received an FOBT. Because there are other screening options, rates for men may be higher than our data show. Rates vary with geography and income—residents of lower-income neighbourhoods, especially men, had the lowest screening rates. Fourteen percent of men in lower-income neighbourhoods compared to 19 percent of women in higher-income neighbourhoods had an FOBT.

Older people had a higher rate of FOBT screening, but since we do not have data on the other types of screening, we cannot comment on whether older people are more likely to be screened for colorectal cancer overall or more likely to have an FOBT. We also don't know whether older people are getting an FOBT for screening or diagnosis (all Ontario residents aged 50-74 with no prior diagnosis of colorectal cancer were considered as eligible) so the higher rate may potentially be due to older people having more symptoms.

Cervical Cancer Screening

The overall rate of screening for cervical cancer in Ontario in 2005/2006 was 69 percent, which is below target. Ontario's Cancer Plan aims for screening rates of 85 percent by 2010 and 95 percent by 2020. There was geographic variation across LHINs in screening rates and women living in lower-income neighbourhoods were significantly less likely to be screened. Young women also had lower rates of screening. However, that may be in part because guidelines recommend that a woman commence cervical cancer screening after the onset of sexual activity which varies between women.



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Follow-up of Abnormal Pap Tests

Less than half of women who had a Pap test that showed a low-grade lesion (ASCUS or LGSIL) had the recommended follow-up and this varied across LHINs. Very young women and those from lower-income neighbourhoods were slightly less likely to have appropriate follow-up of an abnormal Pap test but the magnitude of differences based on age and income was less than the differences across LHINs.

The rates of repeat Pap tests after an "unsatisfactory" test were also low—only one third of women had a repeat screen within four months and older women were less likely to be rescreened in that time. Income and region did not affect repeat screening after an "unsatisfactory" test.



Section 4C

Colorectal Cancer

INTRODUCTION

Colorectal cancer is the third most commonly diagnosed cancer among Canadians and the second most common cause of cancer death, but if it is diagnosed at an early stage, colorectal cancer can be cured.

Management of early stage colorectal cancer usually involves surgery. In some cases surgery is followed by adjuvant chemotherapy, which decreases recurrence and improves survival. For early stage rectal cancer, treatment also often includes radiation therapy, which decreases recurrence. Because patients who have had one colorectal cancer have a higher risk of a second colorectal malignancy, colonoscopy is usually recommended as part of surveillance after treatment.

A number of studies have evaluated the impact of demographic factors such as age and sex on colorectal cancer care. Age has not been a strong predictor of who will get surgery, but older patients with both colon and rectal cancer consistently have lower rates of radiation or chemotherapy,⁶⁶⁻⁷¹ despite the fact that evidence suggests older patients receive similar benefits as their younger counterparts.^{72, 73}

Much less is known about the impact of sex or income on treatment of colorectal cancer. The majority of studies have suggested sex is not a strong predictor of treatment⁶⁷ but some sex-based differences in care have been documented.^{66, 67, 69, 74, 75} There is not much

research on the influence of socioeconomic status on colorectal cancer care.^{67, 75} Most data focus on survival rather than processes of care and show that people with low socioeconomic status do not live as long as other patients. It is not clear whether that is because they are diagnosed later, receive less aggressive treatment or for some other reason.

In this section we look at health services use by women and men with colorectal cancer including:

- use of sphincter-sparing procedures in rectal cancer;
- referral to radiation oncology in patients with resectable rectal cancer;
- referral to medical oncology following resection of colon cancer and
- follow up colonoscopy after resection of colon or rectal cancer.

All indicators were stratified by sex and then by age, income and Local Health Integration Network (LHIN), which allowed us to identify subgroups of patients who received substantially different care.

EXHIBITS AND FINDINGS

USE OF SPHINCTER-SPARING PROCEDURES FOR RECTAL CANCER

Indicator: This indicator measures the percentage of patients with rectal cancer who received a sphincter-sparing procedure at the time of surgery.

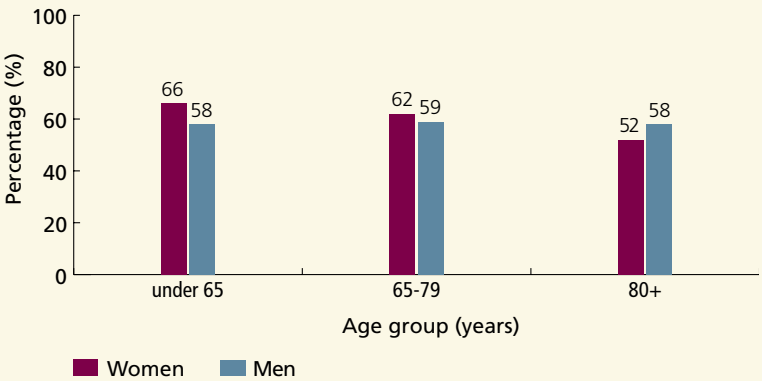
Background: Preserving the sphincter is an important goal in surgery for rectal cancer. Otherwise patients must live with a permanent colostomy. Whether it is feasible however, depends on where the tumour is in the rectum, its size and other characteristics. This information is frequently not available in administrative data, but it is important to know differences in rates of sphincter preservation among subgroups to determine where patterns and outcomes of care may differ.

Finding: From 2002/03 to 2003/04, 59 percent of patients with rectal cancer—62 percent of women and 58 percent of men—had sphincter-sparing surgery.

EXHIBIT 4C.1 | Percentage of patients with rectal cancer who received a sphincter-sparing procedure at the time of surgery, by sex and age, in Ontario, 2002/03 to 2003/04

FINDINGS

- There was no significant difference in the use of sphincter-sparing procedures between women and men.
- There was little variation in the use of sphincter-sparing procedures with respect to age among men, but older women were less likely to have a sphincter-sparing procedure than younger women.
- Women under age 65 were more likely than similarly aged men to retain their sphincters (66 percent in women versus 58 percent in men), but older women (aged 80 and older) were less likely to retain their sphincters (52 percent of women versus 58 percent of men).
- Neighbourhood income was not associated with differences in rates of sphincter-sparing procedures (data not shown).
- Some geographic variation in rates of sphincter sparing surgery was observed, but the overall sample size was too small to determine significance (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

POWER Study

REFERRAL TO RADIATION ONCOLOGY IN PATIENTS WITH RESECTABLE RECTAL CANCER

Indicator: This indicator measures the percentage of patients with rectal cancer who had a consultation with a radiation oncologist within six months of diagnosis.

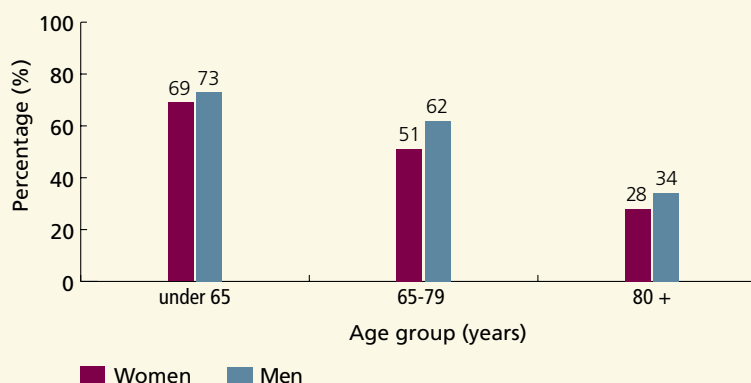
Background: The addition of radiation to surgery in stage 2 and 3 rectal cancer improves control of the cancer. To get radiation therapy, patients must first be assessed by a radiation oncologist. Measuring these visits allows us to assess how we are doing ensuring the proper standard of care for rectal cancer patients. Since detailed data on the stage at which cancer is diagnosed are not available in Ontario, all patients who had surgery and no evidence of distant disease were considered eligible, including stage 1 patients. That could mean the true rate of radiation in stage 2 and 3 patients is higher than we report.

Finding: Overall in Ontario, 60 percent of patients who had surgery for rectal cancer from 2002/03 to 2003/04—53 percent of women and 64 percent of men—had a consultation with a radiation oncologist.

EXHIBIT 4C.2 | Percentage of patients who underwent surgery for rectal cancer who had a consultation with a radiation oncologist within six months of diagnosis, by sex and age, in Ontario, 2002/03 to 2003/04

FINDINGS

- Women of all ages were less likely to be assessed for radiation therapy than men.
- Age was associated with having a consultation with a radiation oncologist, with older patients less likely to be assessed. Patients aged 80 and older had the lowest rates (28 percent in women and 34 percent in men). Among those under age 65, the rates were 69 percent for women and 73 percent for men.
- Neighbourhood income was not associated with consultation rates (data not shown).
- There was some geographic variation in consultation rates but the sample sizes were too small to determine whether this was significant (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB); Registered Persons Database (RPDB)

POWER Study

REFERRAL TO MEDICAL ONCOLOGY FOLLOWING RESECTION OF COLON CANCER

Indicator: This indicator measures the percentage of patients with colon cancer who had a consultation to consider adjuvant chemotherapy with a medical oncologist in the four months following surgery.

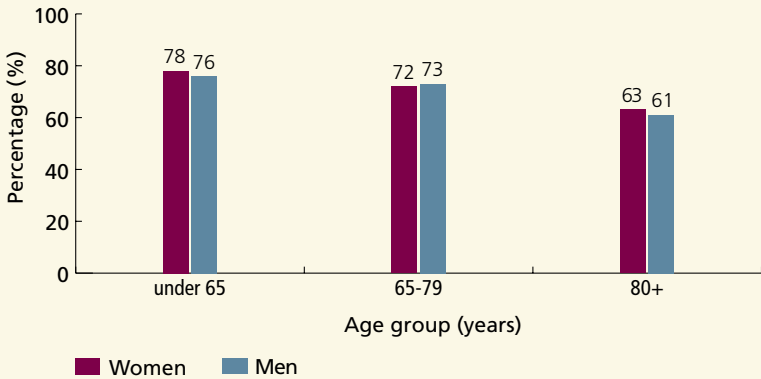
Background: This is an intermediate process measure, which is indirectly based on a 1990 National Institutes of Health Consensus Statement.⁷⁶ Adjuvant chemotherapy is routinely recommended in all stage 3 colon cancer patients and high-risk, stage 2 patients. Since medical oncologists usually administer chemotherapy, "referral to a medical oncologist" is a first step toward ensuring this guideline is followed. For this indicator we used consultation as a proxy for referral, assuming all referred patients were seen. Also, since detailed staging data are not available in Ontario, all patients with colon cancer who had surgery and no evidence of distant disease were considered eligible. Therefore, we may somewhat underestimate true referral rates.

Finding: Overall in Ontario from 2002/03 to 2003/04, 71 percent of patients diagnosed with colon cancer—71 percent of women and 72 percent of men—had a consultation with a medical oncologist after surgery.

EXHIBIT 4C.3 | Percentage of patients with colon cancer who had a consultation with a medical oncologist in the four months following surgery, by sex and age, in Ontario, 2002/03 to 2003/04

FINDINGS

- There was no significant difference in the proportion of women (71 percent) and men (72 percent) who saw a medical oncologist (data not shown).
- The proportion of patients who had consultations decreased with age, especially among those aged 80 and older.
- Neighbourhood income was not associated with receiving an assessment by a medical oncologist (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); ICES Physician Database (IPDB)

POWER Study

EXHIBIT 4C.4 | Age-standardized percentage of colon cancer patients who had a consultation with a medical oncologist in the four months following surgery, by sex and Local Health Integration Network (LHIN), in Ontario, 2002/03 to 2003/04

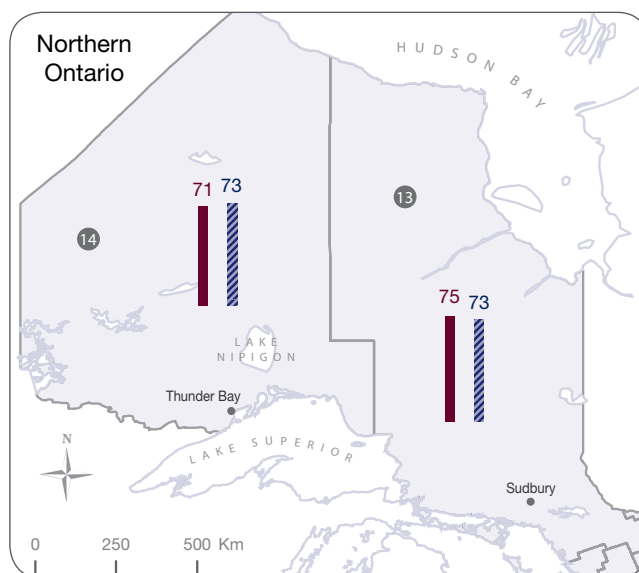
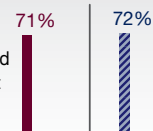
FINDINGS

- There was significant regional variation in the proportion of patients who had a consultation with a medical oncologist from a low of 53 percent in the South East LHIN to a high of 81 percent in the Erie St. Clair LHIN (data not shown).
- The regional variation in the proportion of patients who saw a medical oncologist was wider among men (46 percent in the South East LHIN to 82 percent in the Erie St. Clair LHIN) than among women (57 percent in the South East LHIN to 81 percent in the Erie St. Clair LHIN).

POWER Study

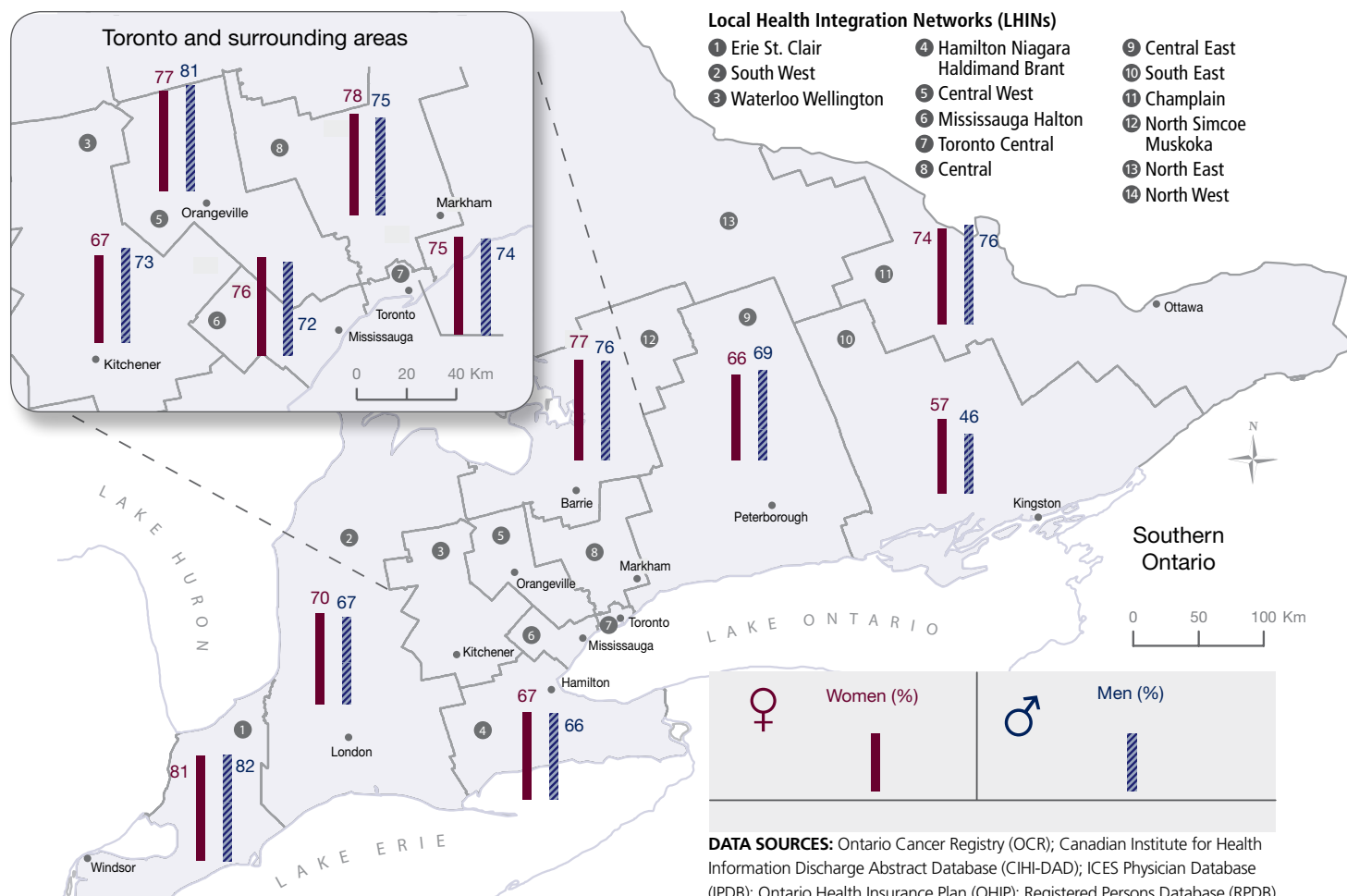
Overall Ontario

In Ontario, 71% of women and 72% of men diagnosed with colon cancer were referred to medical oncologist for consideration of adjuvant chemotherapy.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

SURVEILLANCE COLONOSCOPY AFTER RESECTION OF COLORECTAL CANCER

Indicator: This indicator measures the percentage of colorectal cancer patients who received follow-up colonoscopy within 36 months of surgical treatment.

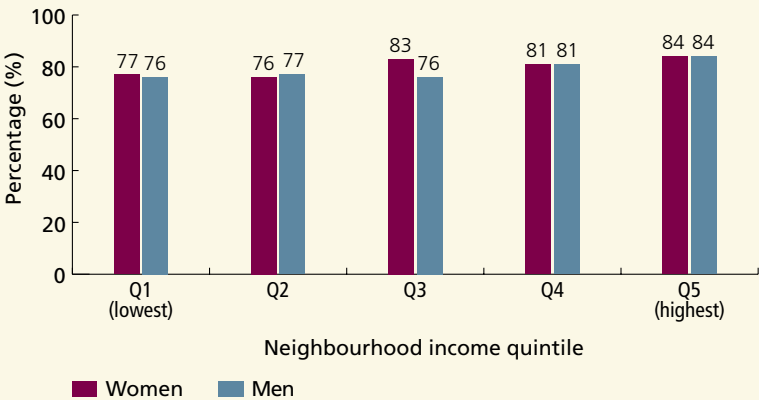
Background: Surveillance is the ongoing follow-up of those at increased risk for disease. It decreases the incidence of colorectal cancer and improves outcomes.⁷⁷ This indicator gives a good measure of quality of care because it tracks only colonoscopies and specifies the surveillance interval in the definition. However, administrative data do not tell us whether the colonoscopy was for screening or because of symptoms, so all colonoscopies in the timeframe were counted as surveillance procedures.

Finding: Overall, in Ontario from 2002/03 to 2003/04, 79 percent of patients diagnosed with colorectal cancer—79 percent of women and 80 percent of men—had at least one colonoscopy in the 36 months after surgery.

EXHIBIT 4C.5 | Age-standardized percentage of colorectal cancer patients who received follow-up colonoscopy within 36 months following surgery, by sex and neighbourhood income quintile, in Ontario, 2002/03 to 2003/04

FINDINGS

- There were no differences in surveillance colonoscopy rates between women and men.
- The proportion of patients who had follow-up colonoscopies after surgery increased with neighbourhood income, but this was not significant after adjusting for age.
- Patients aged 80 and older were significantly less likely to receive a follow-up colonoscopy than younger patients (data not shown).
- There was no significant geographic variation in follow-up colonoscopy rates (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

Section 4C

SUMMARY OF FINDINGS

Age seemed to be the most important factor accounting for differences in care for colorectal cancer. Older patients were less likely to have a consultation with a medical or radiation oncologist, regardless of sex. Being older was associated with the type of rectal cancer surgery women—but not men—received and older women had the lowest rates of sphincter-sparing procedures. Women diagnosed with rectal cancer were also less likely to be seen by a radiation oncologist, which suggests rectal cancer was managed differently for men and women. Several of the measures we examined differed across Local Health Integration Networks (LHIN). Differences across LHINs were largest for referral to a medical oncologist among those diagnosed with colon cancer.

Use of Sphincter-sparing Procedures for Rectal Cancer

Overall, approximately 60 percent of patients with rectal cancer had a sphincter-sparing procedure. Age was related to the use of sphincter-sparing procedures among women—those under age 65 had the highest rates of sphincter-sparing procedures while very elderly women had the lowest rates. Age was not a factor for men. Neither location in the province nor neighbourhood income were factors in the use of sphincter-sparing procedures. It should be noted that data limitations mean we can only comment on type of surgery; we cannot judge its appropriateness for the patient or disease characteristics.

Referral to Radiation Oncology in Patients with Resectable Rectal Cancer

Overall, 60 percent of patients with resectable rectal cancer were seen by a radiation oncologist within six months of diagnosis, but women and older patients (especially those aged 80 and older) were less likely to have a consultation. Age and sex made more difference in referrals for radiation than for medical oncology.

Neighbourhood income and LHIN accounted for minimal differences. Because precise staging data are not available, we used surgery as a proxy for early stage disease, which may underestimate the true rate because stage 1 patients are also included. This indicator also does not address actual receipt of radiation or its timing.

Referral to Medical Oncology Following Resection of Colon Cancer

Seventy-one percent of patients with colon cancer were seen by a medical oncologist in the four months following surgery. Older patients, especially those aged 80 and older, were less likely to be referred, but administrative data do not let us judge whether this is because of patient preference, clinical factors, or referral bias. There was minimal variation in rates of referral by sex but rates did vary significantly by region. This measure does not address whether people actually received adjuvant chemotherapy or its timeliness and here again, we had to use receipt of surgery as a proxy for early stage disease.

Surveillance Colonoscopy after Resection of Colorectal Cancer

Close to 80 percent of patients who had surgery for cancer of the colon or rectum and with no evidence of recurrence had at least one surveillance colonoscopy in the 36 months after surgery. But this means more than 20 percent did not receive this important follow-up care. Sex and location in the province made no difference in follow-up colonoscopy, but there was an income gradient in follow-up rates, which was less pronounced once age was taken into account. Older patients were less likely to get colonoscopy after surgery. This indicator, however, does not distinguish whether the colonoscopy was performed for surveillance or for symptoms, which may overestimate the reach of follow-up surveillance.



Section 4D

Lung Cancer

INTRODUCTION

Lung cancer is the second most common cancer in men and women and is the most common cause of cancer deaths in Canada.³³

The disease is divided into non-small cell lung cancer and small cell lung cancer. Both types of lung cancer are aggressive and outcomes are generally poor. The management of non-small cell lung cancer may involve surgery, radiation therapy, chemotherapy or a combination of them. In small cell lung cancer, chemotherapy with or without radiation is the mainstay of treatment; surgery has a limited role. Patterns of lung cancer care provide some insight into the stage of disease at presentation and degree of compliance with generally recommended therapy.

In the United States, it has been suggested that only 52 percent of lung cancer patients receive recommended therapies.⁷⁸ Some studies report women are more likely to get surgery⁷⁹ but others have found sex is not a factor in treatment.^{78, 80} Many other studies of patterns of lung cancer care did not examine sex differences in care.⁸¹⁻⁸⁴

Age influences use of health services in treating lung cancer. Generally, older patients receive fewer or less-aggressive treatments.^{78, 79, 83-85} Low socioeconomic status has also been associated with less active therapy.⁸¹

This section looks at health services used by women and men diagnosed with both non-small cell and small cell lung cancer in Ontario, including:

- Surgery for non-small cell lung cancer;
- Percentage of non-small cell patients who get systemic therapy within six months of surgery and
- Use of chemotherapy for small cell lung cancer.

All indicators were stratified by sex and then by age, income and Local Health Integration Network (LHIN), which allowed us to identify subgroups of patients who received substantially different care.

EXHIBITS AND FINDINGS

SURGERY FOR NON-SMALL CELL LUNG CANCER

Indicator: This indicator measures the percentage of patients diagnosed with non-small cell lung cancer who underwent lung resection surgery.

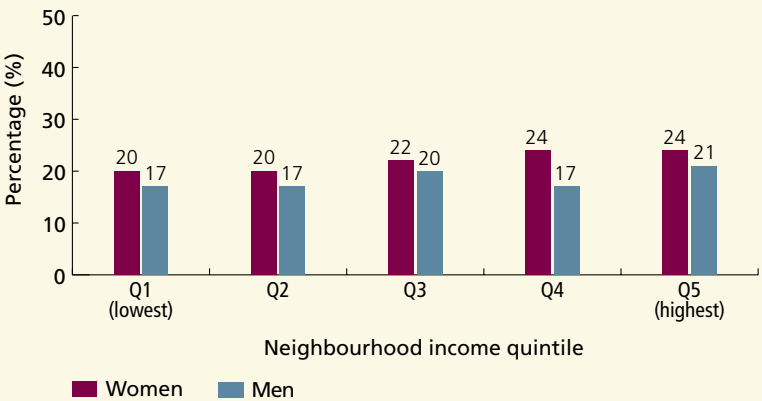
Background: The optimal treatment for non-small cell lung cancer is surgical resection but it should be done in an early stage of the disease and most patients are ineligible because their cancer has progressed too far. Even among those with early stage tumours, many do not get surgery because they have impaired lung function or other illnesses that preclude an operation. Lung resection rates in other countries are between 9 percent and 30 percent.^{79, 81, 86, 87} We use the percentage of patients going for surgery as a surrogate measure of how many people have early stage tumours and can undergo surgery when there is the highest chance of cure.

Finding: Overall in Ontario from 2003/04 to 2004/05, 20 percent of patients with non-small cell lung cancer—22 percent of women and 18 percent of men—underwent surgical resection of their cancer.

EXHIBIT 4D.1 | Age-standardized percentage of patients with non-small cell lung cancer who underwent lung resection, by sex and neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- Women were slightly more likely than men to have lung resection surgery, across all income quintiles.
- There was a slightly higher use of surgery in both women and men from higher-income neighbourhoods as compared to those from lower-income neighbourhoods.



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

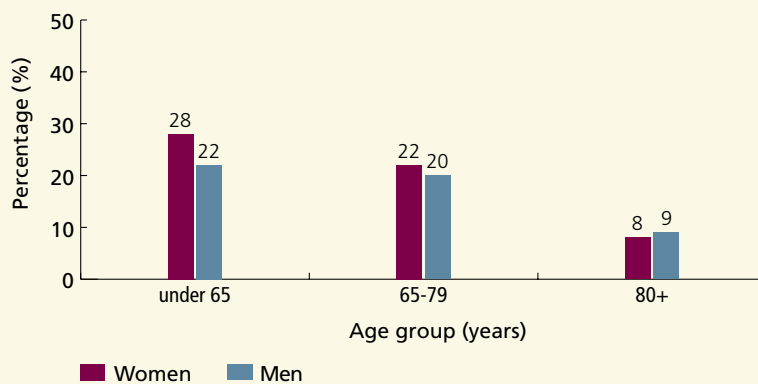
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4D.2 | Percentage of patients with non-small cell lung cancer who underwent lung resection, by sex and age, in Ontario, 2003/04 to 2004/05

FINDINGS

- Women under age 80 were slightly more likely to have surgery than similarly aged men.
- In those under age 65, 28 percent of women and 22 percent of men had lung resection compared to 8 percent of women and 9 percent of men aged 80 and older.



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4D.3 | Age-standardized percentage of patients with non-small cell lung cancer who underwent lung resection, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2003/04 to 2004/05

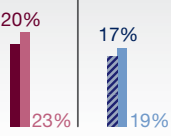
FINDINGS

- Among women, rates of lung cancer surgery varied for those living in lower-income neighbourhoods from 12 percent (South East LHIN) to 28 percent (Mississauga Halton LHIN) and for those living in higher-income neighbourhoods from 17 percent (Erie St. Clair LHIN) to 26 percent (Central West and Waterloo Wellington LHINs).
- Among men living in lower-income neighbourhoods, surgery rates ranged from 9 percent (South East LHIN) to 26 percent (North East LHIN), while for those living in higher-income neighbourhoods the range for men was from 11 percent (South East LHIN) to 26 percent (Waterloo Wellington LHIN).
- These differences appear large, but we caution there were small numbers in the sub-groups, so these estimates are imprecise.

POWER Study

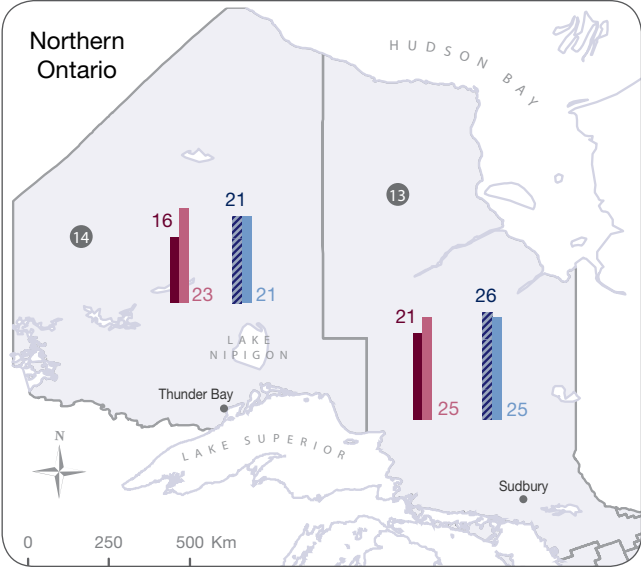
Overall Ontario

In Ontario, 20% of lower-income women, 23% of higher-income women, 17% of lower-income men and 19% of higher-income men with non-small cell lung cancer underwent lung resection.

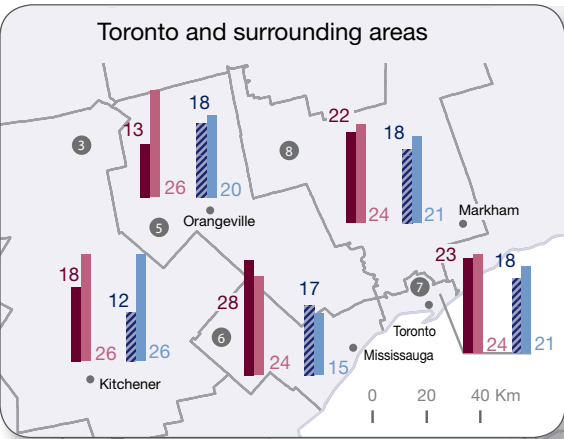


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation

Northern Ontario

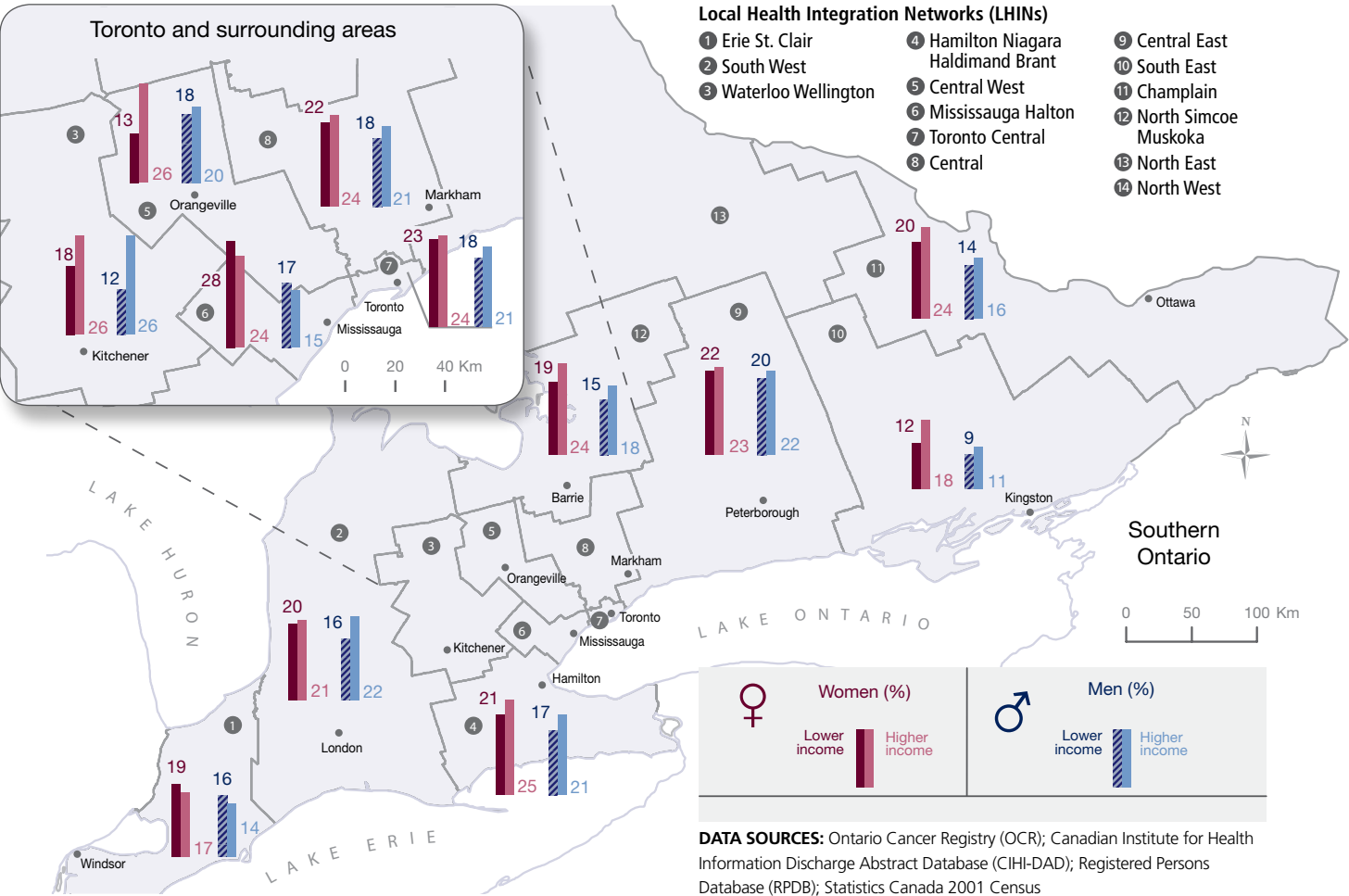


Toronto and surrounding areas



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

PERCENTAGE OF NON-SMALL CELL LUNG CANCER PATIENTS TREATED WITH SYSTEMIC THERAPY WITHIN SIX MONTHS OF SURGERY

Indicator: This indicator measures the percentage of patients with non-small cell lung cancer who received chemotherapy within six months of lung resection.

Background: Recent evidence suggests chemotherapy after resection improves survival for lung cancer patients.⁸⁸ New guidelines have been developed in Ontario for the use of adjuvant chemotherapy.⁸⁹ Complying with these guidelines should lead to improved outcomes for patients and improve the quality of cancer care overall. Evidence on how well this new guideline is being followed is still emerging, but a review of one institution found the number of referrals for adjuvant chemotherapy doubled after the evidence supporting it was published.⁹⁰ The Ontario Cancer System Quality Index reports 52 percent of stage II or IIIA patients diagnosed between 2005 and 2007 and treated at a regional cancer centre received adjuvant chemotherapy.²⁹

Finding: Overall in Ontario, in 2004/05, 33 percent of patients with non-small cell lung cancer—31 percent of women and 34 percent of men—received chemotherapy within six months of lung resection.

EXHIBIT 4D.4 | Percentage of non-small cell lung cancer patients who received chemotherapy within six months after lung resection, by sex and year, in Ontario, 2003/04 to 2004/05

FINDINGS

- Rates of chemotherapy use doubled from 2003/04 to 2004/05 suggesting the new evidence was changing treatment.
- Sex was not associated with chemotherapy use in either year.
- Neighbourhood income was not associated with chemotherapy use (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

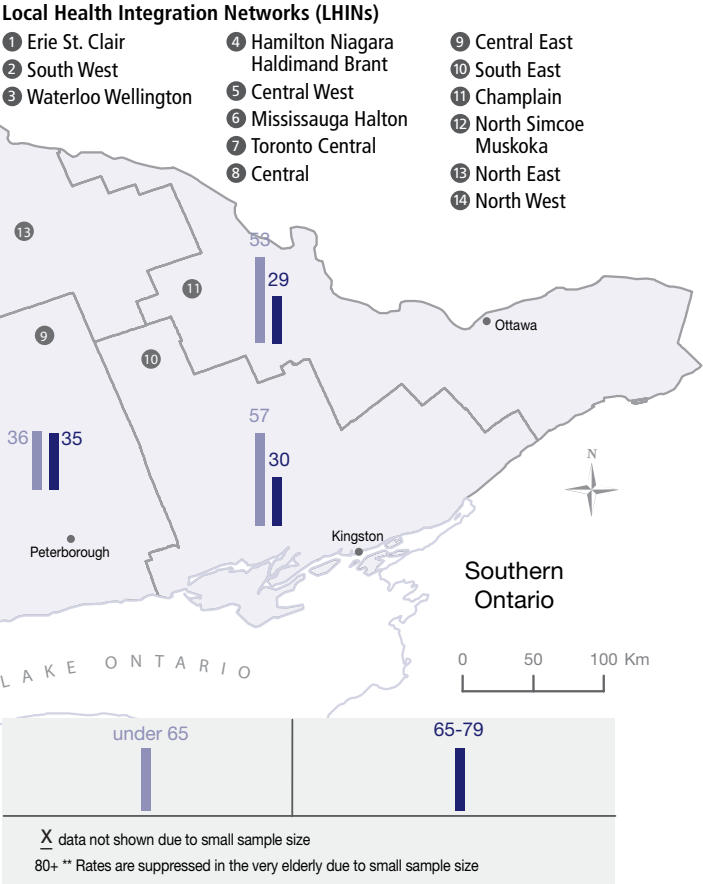
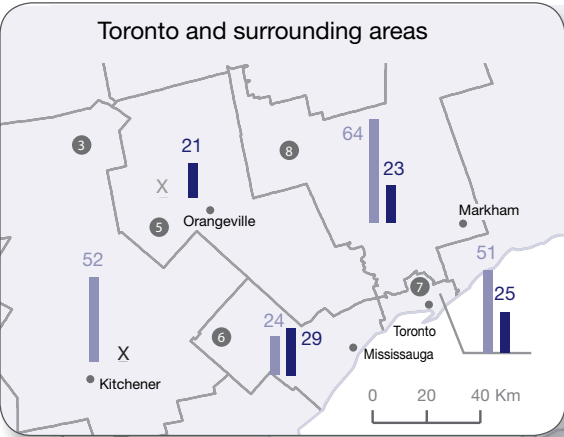
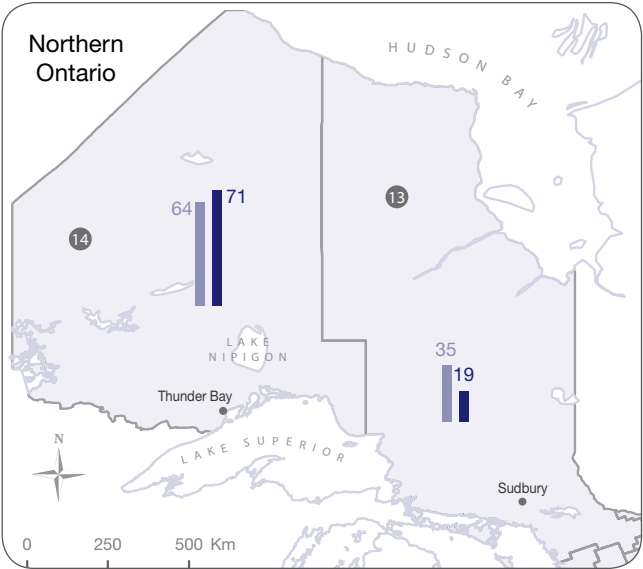
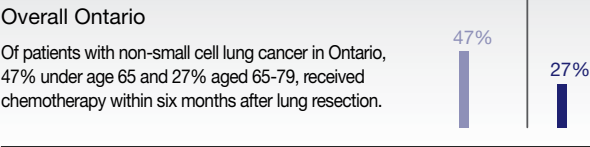
POWER Study

EXHIBIT 4D.5 | Percentage of patients with non-small cell lung cancer who received chemotherapy within six months after lung resection, by age and Local Health Integration Network (LHIN), in Ontario, 2004/05

FINDINGS

- For people under age 65, the rate of chemotherapy use across LHINs ranged from 24 percent in the Mississauga Halton LHIN to 70 percent in the North Simcoe Muskoka LHIN.
- For those aged 65-79, it ranged from 18 percent in the Hamilton Niagara Haldimand Brant LHIN to 71 percent in the North West LHIN.
- Although these differences appear large, we caution there were small numbers in the sub-groups and these estimates lack precision.

POWER Study



DATA SOURCES: Ontario Cancer Registry (OCR), Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

USE OF CHEMOTHERAPY FOR SMALL CELL LUNG CANCER

Indicator: This indicator measures the percentage of patients diagnosed with small cell lung cancer who received chemotherapy within six months of diagnosis.

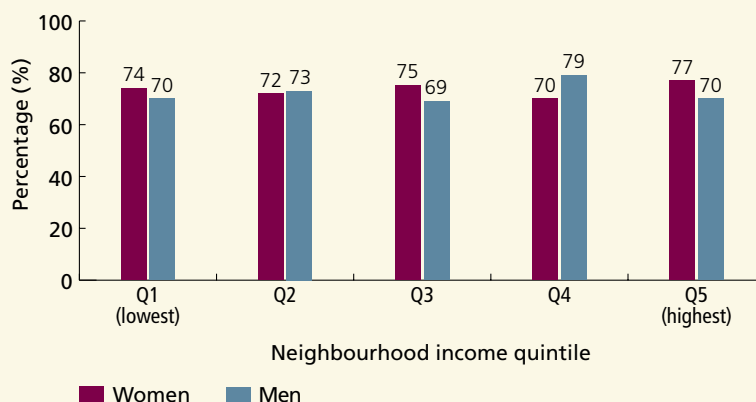
Background: Chemotherapy is the mainstay of treatment for small cell lung cancer, regardless of stage; an approach that has not changed for years. We looked at treatment rates after diagnosis to see how many patients are getting this standard care. Other studies report rates between 52 percent and 95 percent.^{80, 81, 84, 91}

Finding: Overall in Ontario, from 2003/04 to 2004/05, 73 percent of patients with small cell lung cancer—73 percent of women and 72 percent of men—received chemotherapy within six months of diagnosis.

EXHIBIT 4D.6 | Age-standardized percentage of patients with small cell lung cancer who received chemotherapy within six month after diagnosis, by sex and neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- The use of chemotherapy in patients with small cell lung cancer was similar in women and men.
- Neighbourhood income was not associated with the use of chemotherapy.



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4D.7 | Percentage of patients with small cell lung cancer who received chemotherapy within six months after diagnosis, by age and Local Health Integration Network (LHIN), in Ontario, 2003/04 to 2004/05

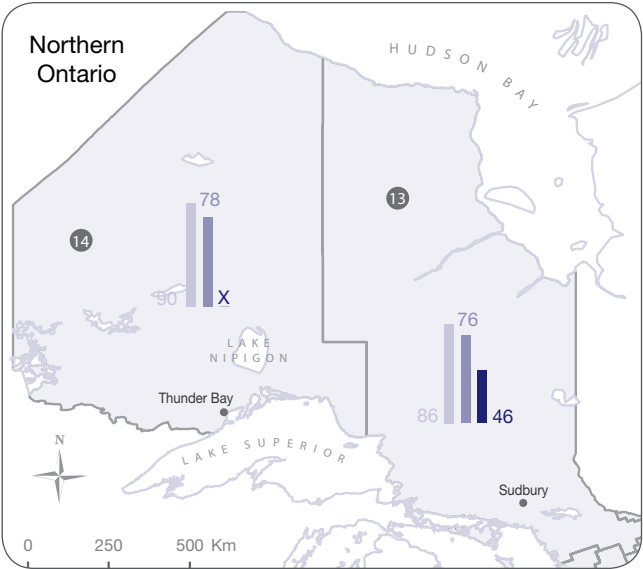
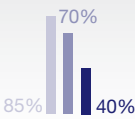
FINDINGS

- Chemotherapy use decreased with age; from 85 percent in people under age 65, to 70 percent in those aged 65-79 and 40 percent in those aged 80 and older.
- There was some regional variation. Among those under age 65, chemotherapy use ranged from 80 percent in the Central East LHIN to 100 percent in the Central West LHIN.
- For those aged 80 and older, the range was from 32 percent in the Central LHIN to 55 percent in the South East LHIN.

POWER Study

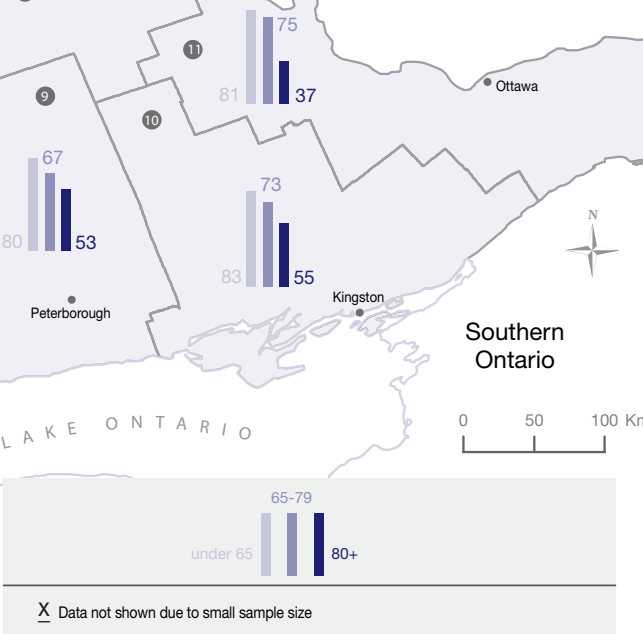
Overall Ontario

Of patients with small cell lung cancer in Ontario, 85% of those under age 65, 70% of those aged 65-79 and 40% of those aged 80 and older, received chemotherapy within six months after diagnosis.



Local Health Integration Networks (LHINs)

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|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
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| | | 14 North West |



DATA SOURCES: Ontario Cancer registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

Section 4D

SUMMARY OF FINDINGS

Age was the factor most strongly and consistently associated with treatment for lung cancer; older patients were least likely to receive either surgery or chemotherapy. This could be because older people have multiple illnesses, or possibly because treatment preferences change with age. However, it could also mean older people were under treated.

New guidelines for adjuvant therapy for non-small cell lung cancer significantly increased use of chemotherapy after resection between 2003/2004 and 2004/2005. The change was most pronounced in the younger age group. Use of chemotherapy to manage lung cancer after surgery also showed the largest regional variation. Women with non-small cell lung cancer were more likely to have surgery than men, but there were minimal sex differences in who underwent chemotherapy. Living in a higher-income neighbourhood was associated with a slightly higher surgery rate, but was not associated with use of chemotherapy.

Surgery for Non-small Cell Lung Cancer

Only 20 percent of Ontario patients diagnosed with non-small cell lung cancer underwent lung resection. This is in the middle of the range of other reports (9 percent - 30 percent).^{79, 81, 82, 86, 87} Women were more likely to have surgery than men, which suggests their cancer is diagnosed earlier, or possibly women have fewer other illnesses that would preclude surgery. Older patients were much less likely to have surgery. While patients from lower-income neighbourhoods were slightly less likely to undergo surgery, the absolute difference in rates was small and may be reflective of stage at presentation or worse overall health. There was regional variation in surgery rates and it was more pronounced among men.

Adjuvant Chemotherapy After Resection of Non-small Cell Lung Cancer

The increase in chemotherapy rates from 18 percent in 2003/2004 to 33 percent in 2004/2005 suggests new evidence had considerable impact on chemotherapy treatment after surgery. However, no target rate for the use of adjuvant chemotherapy has been set. The most recent Cancer System Quality Index report suggests the rate is continuing to increase,²⁹ but observations will have to continue to track uptake and effect. Rate increases for chemotherapy after surgery were similar in women and men, but rates were much lower among the older age groups, which should be studied further. There was also large regional variation in use of chemotherapy in women and men. There was no evidence of income variation in receipt of chemotherapy for non-small cell lung cancer.

Use of Chemotherapy for Small Cell Lung Cancer

Approximately 73 percent of patients with small cell lung cancer received chemotherapy within six months of diagnosis, which is consistent with other research. Use of chemotherapy decreased with age, but sex, neighbourhood income and region made little or no difference. We do not know what a desirable rate for this indicator should be, but approximately 16 percent of small cell lung cancer patients present with poor functional status and might not be candidates for chemotherapy.⁹²



Section 4E

Breast Cancer

INTRODUCTION

Breast cancer is the second most common malignancy diagnosed in Canadian women and the third most common cause of cancer deaths.³³

The mainstay of treatment for early stage disease is surgery, either mastectomy or breast-conserving surgery (“lumpectomy”), both of which should also include assessment of axillary lymph nodes. Radiation therapy is recommended for some women after surgery, especially breast-conserving surgery. Following local management, many women also receive adjuvant, or additional therapy to further decrease the risk of recurrence.

Previous studies suggest demographic factors such as age, income and where a woman lives are important determinants of the kind of treatment she will receive and the results. Older women are more likely to have a mastectomy, younger women more likely to have breast-conserving surgery.⁹³ When older women do have breast-conserving surgery, they are less likely than younger women to get follow-up radiation therapy.^{85, 94, 95} Older women are also less likely to have their axillary lymph nodes assessed.⁹⁶ Age is also an important factor in the choice of adjuvant systemic treatments. Some of this variation may be appropriate, because there are differences in hormone receptor status and prognosis, depending on age at diagnosis,^{97, 98} and treatment guidelines often take into account age and (more often) menopausal status.^{99, 100} Nevertheless, population-based studies indicate that even after taking these factors into account, older women are more likely to get treatment that does not follow the guidelines for the stage of their disease²⁰ and this may be associated with worse outcomes.¹⁸

We know less about the impact of socioeconomic status on breast cancer treatment, but data suggest lower-income women diagnosed with breast cancer may have lower survival rates.¹⁰¹ This may be because they are diagnosed later, which leads to worse prognosis or because there are differences in treatment. Lower-income women are less likely to use breast cancer screening, which could be why they are diagnosed later.¹⁰²

Geographic variation in the treatment of breast cancer has been found in Canada and other countries.^{95, 103-105} In Ontario, two studies from more than a decade ago found regional differences in the use of breast-conserving surgery¹⁰⁶ and use of radiation therapy in the first year following diagnosis,¹⁰⁵ however the situation may have changed.

In this section we look at health services use by women with breast cancer. These include:

- breast-conserving surgery;
- axillary lymph node dissection;
- receipt of radiation therapy following breast-conserving surgery;
- assessment by medical oncology and
- follow-up mammography among breast cancer survivors.

All indicators are stratified by age, income and Local Health Integration Network (LHIN).

EXHIBITS AND FINDINGS

BREAST-CONSERVING SURGERY

Indicator: This indicator measures the percentage of women diagnosed with breast cancer who had breast surgery, who had breast-conserving surgery.

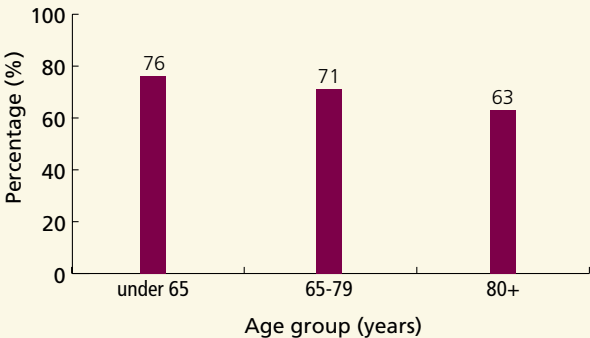
Background: Breast-conserving surgery followed by radiation has similar results as mastectomy, but is less invasive and often preferred by patients. The majority of surgeries for breast cancer are breast-conserving but considerable variation by age and geography has been reported.^{104, 106}

Finding: Overall in Ontario, 73 percent of women who had breast-cancer surgery between 2003/04 and 2004/05 had breast-conserving surgery.

EXHIBIT 4E.1 | Percentage of women who were diagnosed with breast cancer and had breast surgery, who received breast-conserving surgery, by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- Older women were less likely to receive breast-conserving surgery; 63 percent of women aged 80 or older as compared to 76 percent of women under age 65.
- There was a small, but not significant trend towards higher rates of breast-conserving surgery in women who lived in higher-income neighbourhoods (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4E.2 | Age-standardized percentage of women who were diagnosed with breast cancer and had breast surgery, who received breast-conserving surgery, by neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2003/04 to 2004/05

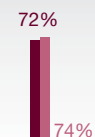
FINDINGS

- The percentage of women who underwent breast-conserving surgery varied significantly by region, from 61 percent in the South West LHIN to 83 percent in the Central West LHIN (data not shown).
- There was regional variation in the percentage of women living in lower-income neighbourhoods who had breast-conserving surgery. The rates ranged from 60 percent in the South West LHIN to 81 percent in the Central West LHIN. There was also regional variation in rates among women living in higher-income neighbourhoods; from 61 percent in the South West LHIN to 84 percent in the Central West LHINs.

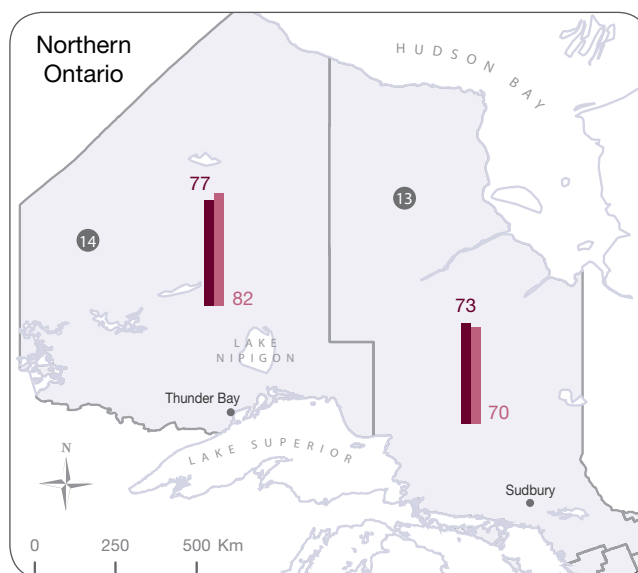
POWER Study

Overall Ontario

In Ontario, 72% of lower-income women and 74% of higher-income women with breast cancer who had breast surgery received breast-conserving surgery.

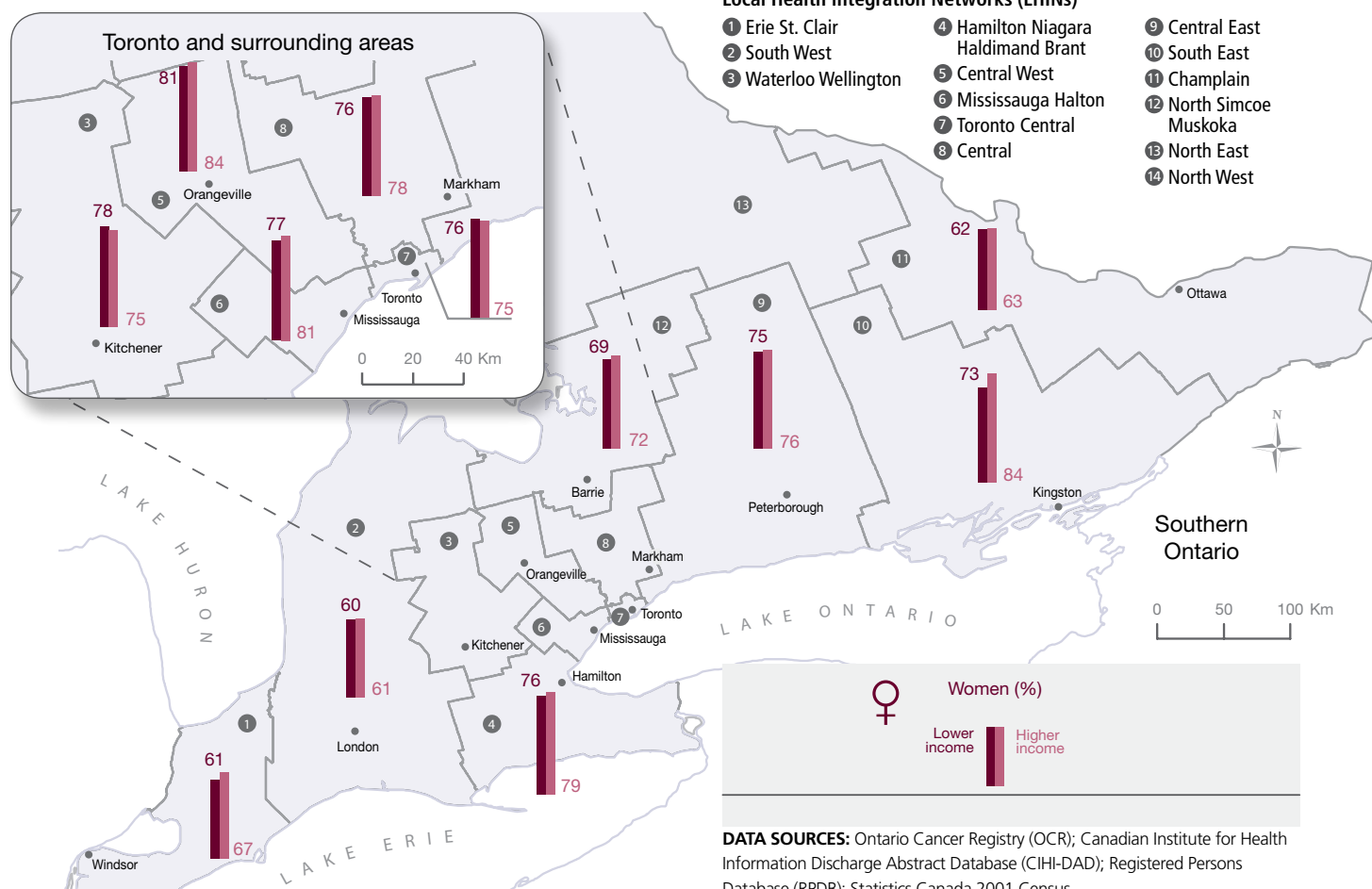


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation



Local Health Integration Networks (LHINs)

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| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
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DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

AXILLARY LYMPH NODE DISSECTION

Indicator: This indicator measures the percentage of women who had an axillary lymph node dissection with their primary breast cancer surgery.

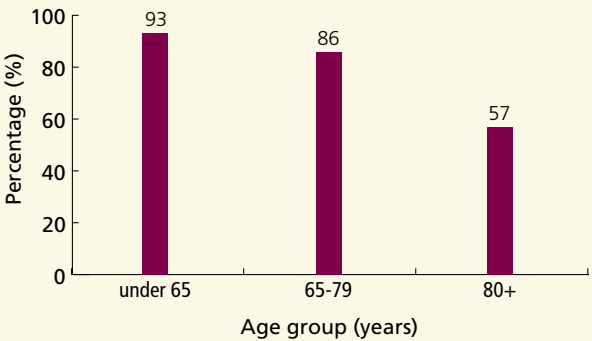
Background: Whether cancer has spread to the axillary lymph nodes is one of the most important factors in breast cancer prognosis. Previous studies have shown that this indicator varies by age but less is known about how it varies in relation to geography and income.^{96, 107} This indicator only addresses whether axillary lymph node dissection was done. Other aspects of surgical quality, such as how many nodes were removed, are not measured.

Finding: Overall in Ontario, 87 percent of patients who had breast cancer surgery between 2003/04 and 2004/05 had an axillary lymph node dissection.

EXHIBIT 4E.3 | Percentage of patients who had breast cancer surgery who had an axillary lymph node dissection, by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- Older women were significantly less likely to undergo axillary lymph node dissection; 93 percent of women under age 65 had an axillary lymph node dissection, as compared to only 57 percent of women aged 80 or older.
- The proportion of women undergoing axillary lymph node dissection did not vary by neighbourhood income or region after adjusting for age (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

POWER Study

RADIATION THERAPY AFTER BREAST-CONSERVING SURGERY

Indicator: This indicator measures the percentage of women who had radiation therapy after breast-conserving surgery.

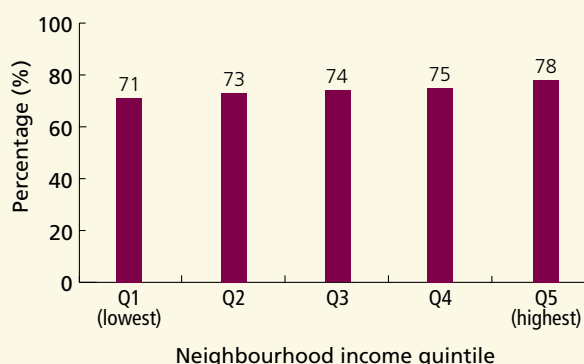
Background: Evidence from randomized trials has shown that radiation therapy after breast-conserving surgery can reduce local recurrence rates and prolong survival.¹⁰⁸ Based on this evidence, for over a decade Ontario practice guidelines have routinely recommended radiation therapy after breast-conserving surgery.¹⁰⁹ However, previous studies from Ontario suggest variations in this indicator related to a patient's age and where she lives.^{85, 105}

Finding: Seventy-four percent of women who underwent breast-conserving surgery from 2003/04 to 2004/05 had follow-up radiation therapy.

EXHIBIT 4E.4 | Age-standardized percentage of women who received radiation therapy after breast-conserving surgery, by neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- There was a small but not significant income gradient in radiation therapy rates. Women from lower-income neighbourhoods were less likely to receive radiation therapy—the percentage ranged from 71 percent in the lowest-income neighbourhoods to 78 percent in the highest-income neighbourhoods.
- There was minimal geographic variation in radiation therapy, once the data were adjusted for age (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

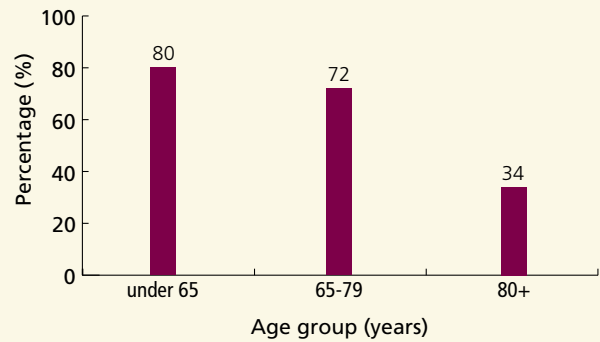
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4E.5 | Percentage of women who received radiation therapy after breast-conserving surgery, by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- Women aged 80 or older had lower rates of radiation therapy (34 percent) than women under age 65 (80 percent).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

POWER Study

ASSESSMENT BY MEDICAL ONCOLOGIST

Indicator: This indicator measures the percentage of breast cancer patients seen by a medical oncologist in the three months following diagnosis.

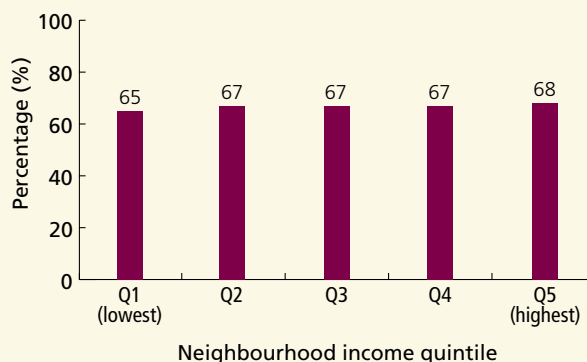
Background: There is a role for systemic therapy (either hormonal treatment or chemotherapy) in most women with breast cancer. Since systemic therapy is usually prescribed by a medical oncologist, referrals are an indirect measure of access to systemic therapy.

Finding: Overall in Ontario, 67 percent of women diagnosed with breast cancer between 2003/04 and 2004/05 were seen by a medical oncologist within three months following diagnosis.

EXHIBIT 4E.6 | Age-standardized percentage of breast cancer patients seen by medical oncologist within three months of diagnosis, by neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- Approximately two-thirds of women treated for breast cancer had a consultation with a medical oncologist.
- Assessment by a medical oncologist did not vary by income.



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB); Statistics Canada 2001 Census

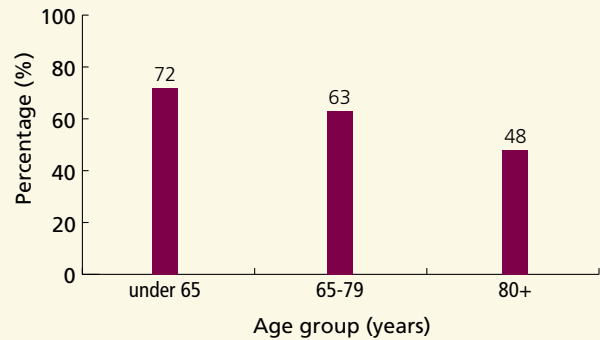
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4E.7 | Percentage of breast cancer patients seen by medical oncologist within three months of diagnosis, by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- The percentage of women assessed by a radiation oncologist was highest among women under age 65 (72 percent) and lowest for those aged 80 and older (48 percent).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)

POWER Study

EXHIBIT 4E.8 | Percentage of breast cancer patients seen by a medical oncologist within three months of diagnosis, by age and Local Health Integration Network (LHIN), in Ontario, 2003/04 to 2004/05

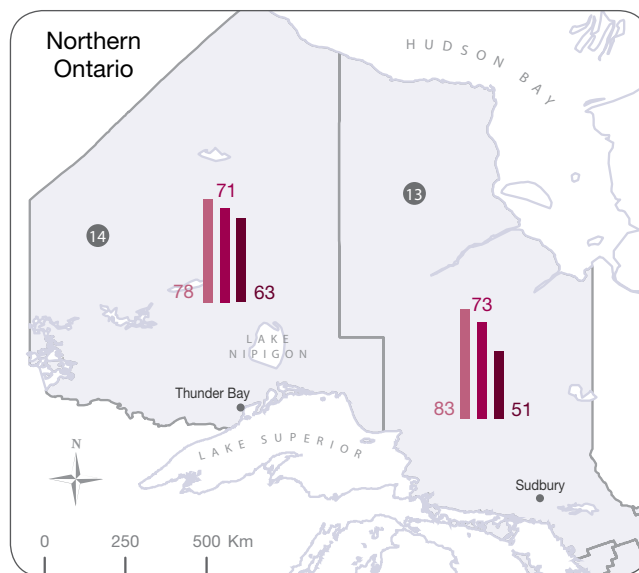
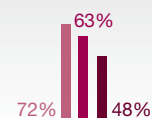
FINDINGS

- Both at the provincial level (see [Exhibit 4E.7](#)) and in most LHINs, the proportion of women with breast cancer who saw a medical oncologist decreased with age.
- The proportion of women who saw a medical oncologist showed regional variation; ranging from a low of 51 percent in the South West LHIN to a high of 83 percent in the Central West LHIN (data not shown).
- There was regional variation in the percentage of patients seen by a medical oncologist by age. It ranged from 56 percent (South West LHIN) to 87 percent (Central West LHIN) among women under age 65 and from 37 percent (South West LHIN) to 66 percent (Mississauga Halton LHIN) in women aged 80 and older.

POWER Study

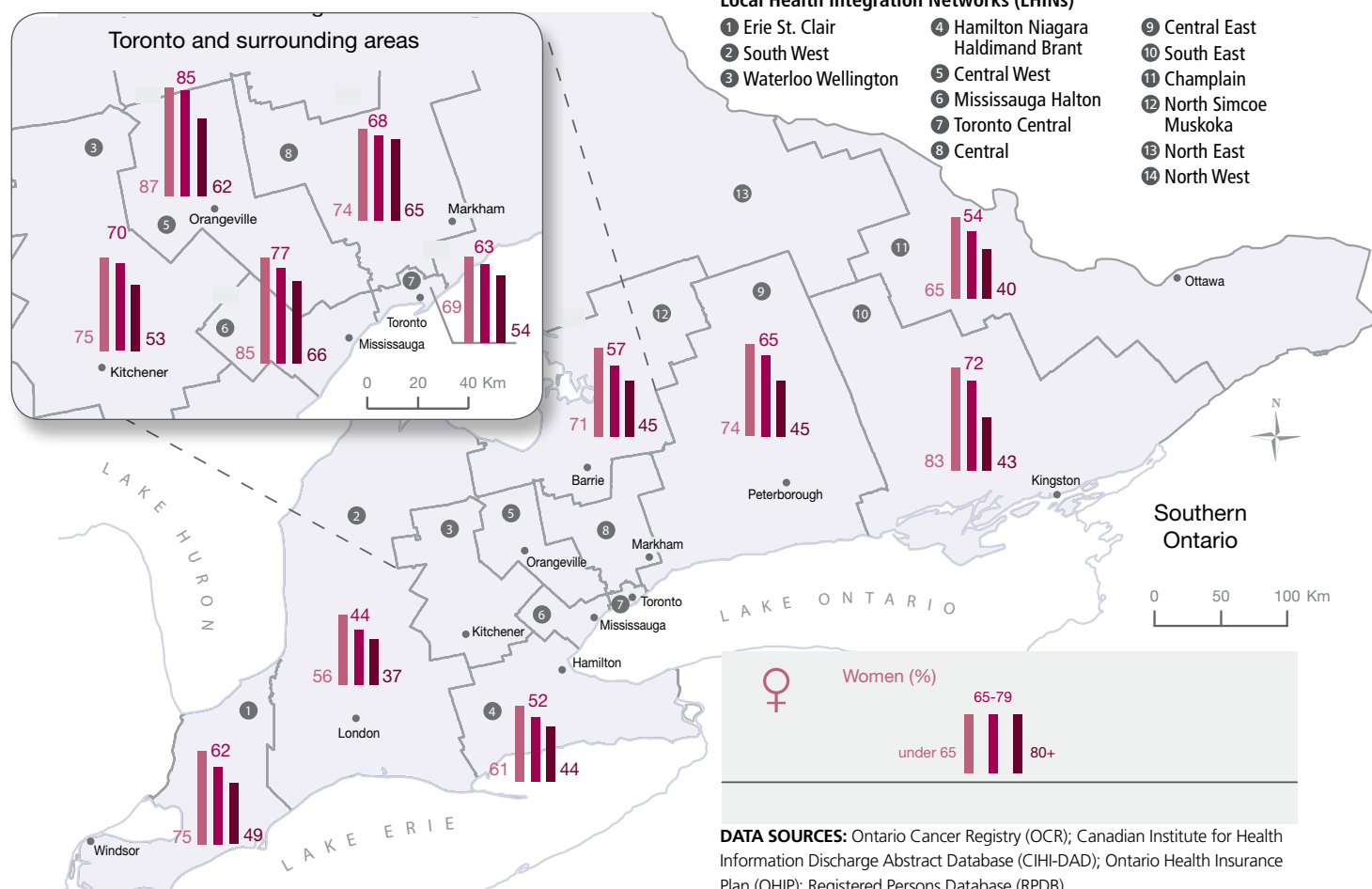
Overall Ontario

Among breast cancer patients in Ontario, 72% of those under age 65, 63% of those aged 65-79 and 48% of those aged 80 and older were seen by a medical oncologist within three months of diagnosis.

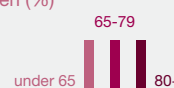


Local Health Integration Networks (LHINs)

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|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
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| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



Women (%)



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

ANNUAL SURVEILLANCE MAMMOGRAPHY AMONG BREAST CANCER SURVIVORS

Indicator: This indicator measures the percentage of women with a history of non-metastatic breast cancer that had a surveillance mammogram in each of the first two years after their treatment was completed.

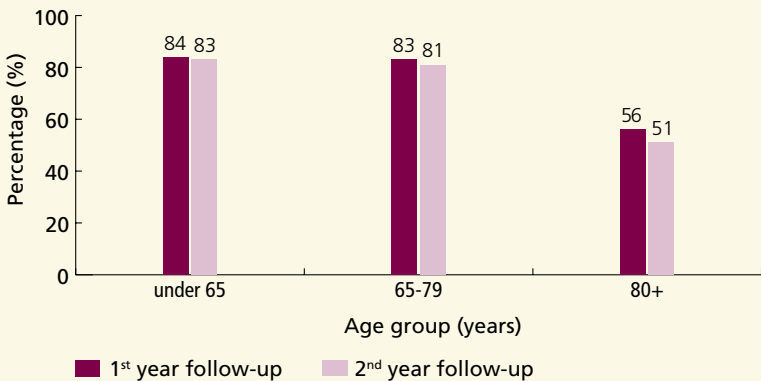
Background: This indicator was one of 439 indicators measured in a study by McGlynn and colleagues derived from RAND's Quality Assessment Tool system.¹¹⁰ RAND staff members looked at the leading causes of illness, death and use of health care in each age group and preventive care related to them. This is one of the nine breast cancer indicators that resulted from this process. Annual surveillance mammography is important for detecting cancer recurrence or a new primary cancer. It is not known whether this indicator varies by geography or subgroup. This indicator uses surgery as a proxy for early stage disease and starts measuring surveillance mammography six months after diagnosis to allow for treatment to be completed. Because it is difficult to determine from administrative data whether a mammogram was for follow-up or to investigate new symptoms, all mammograms in the timeframe were counted.

Finding: After breast cancer surgery, 81 percent of women had a mammogram in the first year and 79 percent in the second year.

EXHIBIT 4E.9 | Percentage of women with a history of breast cancer who had yearly surveillance mammography, by year of follow-up[¥] and age, in Ontario[^]

FINDINGS

- Most women (except for those aged 80 and older) had follow-up mammograms in each of the first two years after diagnosis but at least 15 percent in each age group did not.
- The results did not change significantly when the data were analyzed to show how many had at least one mammogram in the two years following diagnosis—the overall proportion increased to 85 percent (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

[¥] Assessment period for surveillance mammography started after six months following diagnosis to allow time for treatment

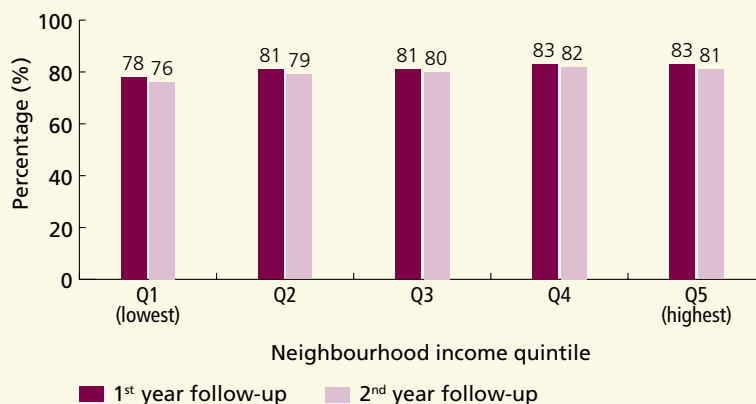
[^] For cases diagnosed in 2003/04 and 2004/05

POWER Study

EXHIBIT 4E.10 | Percentage of women with a history of breast cancer who had yearly surveillance mammography, by year of follow-up[¥] and neighbourhood income quintile, in Ontario[^]

FINDINGS

- The crude rates of surveillance mammography varied by income.
- After age adjustment, the income variation was no longer significant (data not shown).
- There was minimal regional variation in surveillance mammography, once adjusted for age (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

[¥] Assessment period for surveillance mammography started after six months following diagnosis to allow time for treatment

[^] For cases diagnosed in 2003/04 and 2004/05

POWER Study

Section 4E

SUMMARY OF FINDINGS

Like other cancers considered in this chapter, age was the factor most consistently associated with how treatment for breast cancer varied. Women aged 80 and older were the least likely to undergo breast-conserving surgery, have their axillary lymph nodes dissected, receive radiation therapy or be assessed by a medical oncologist. Some of these differences may be medically appropriate—especially among older women with small, hormone sensitive tumours,^{108, 111} or a result of patient preference, but there should be further work to ensure the differences are not because of bias against treating older women as aggressively as younger women. There were some regional and income-related differences, but they were not consistent across indicators.

Breast-conserving Surgery

Most women (73 percent) who had surgery in Ontario between 2003/04 and 2004/05 had a breast-conserving procedure. Older women were less likely to have this type of procedure. Administrative data do not tell us whether that is because of patient or physician factors. Older patients may prefer mastectomy or may have bigger tumours, which would not be appropriate for breast-conserving surgery. There was evidence of geographic variation in use of the procedure. This could be because breast-conserving surgery should be followed by five weeks of radiation, making mastectomy an easier option for women in rural or remote areas who would have to be away from home for weeks at a time.

Axillary Lymph Node Dissection

Overall, most women had axillary lymph node dissection, but there was significant variation related to age—93 percent of women under age 65 had their lymph nodes dissected, but only 57 percent of women aged 80 and older did. There was minimal variation by income or geography.

The data do not yet allow us to reliably assess differences in use of evolving procedures such as sentinel lymph node biopsy, which is associated with less morbidity than standard dissection, and how it varies by age, income or geography. We were also not able to assess the quality of the dissection procedures used.¹⁰⁴

Radiation Therapy After Breast-conserving Surgery

Approximately 74 percent of women had their breast-conserving surgery followed by radiation therapy within a year. This rate was higher than previously reported in the literature,^{85, 105} but similar to the rates the Cancer System Quality Index reports.²⁹ Older women were less likely to undergo radiation therapy, but since some trials suggest older women with small, hormone sensitive tumours may not benefit from radiation, this may be appropriate.¹⁰⁸ Women from lower-income neighbourhoods were less likely to get follow-up radiation but the difference was not significant once age was taken into account. Income-related differences have been reported previously,¹⁰⁵ but our results suggest that gap is closing. This indicator shows whether radiation therapy was received within one year of surgery, but does not

tell us about the timeliness of radiation. The Cancer System Quality Index indicator, which is similar to this one, measures whether radiation begins within 270 days of surgery and a different source of data is used for identifying radiation treatment. We used radiation planning claims data from the Ontario Health Insurance Plan (OHIP) as a proxy for undergoing radiation therapy.

Assessment by Medical Oncology

Two-thirds of women with breast cancer were assessed by a medical oncologist within three months of diagnosis, but older women and those living in certain regions were significantly less likely to undergo this assessment. Neighbourhood income did not affect assessment rates. This indicator only looks at whether women were assessed; it does not measure actual treatment. Some women may also be assessed after more than three months.

Surveillance Mammography Among Breast Cancer Survivors

Most women with a history of breast cancer received annual surveillance mammograms, except the very elderly. Follow-up mammography rates among breast cancer survivors are much better than screening in the general population. After age-standardization, there is minimal variation in surveillance mammography related to neighbourhood income or geography.



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Section 4F

Gynecological Cancers

INTRODUCTION

Gynecological cancers are the fourth leading cause of cancer in Canadian women and the fifth most common cause of cancer death.

Gynecological cancers can affect the vulva, vagina, cervix, uterus, fallopian tubes and ovaries. In this section we look at health services used by women diagnosed with two gynecological cancers: ovarian and uterine. Our indicators are based on clinical practice guidelines and assess whether patients are getting the quality of care those guidelines recommend.

Ovarian cancer usually affects women in their perimenopausal years and all too often is not identified until the disease is widespread. Treatment with surgery and chemotherapy can help the patient live longer but ability to cure the disease is limited. Risks for ovarian cancer include childlessness, obesity, environmental exposure to cancer-causing agents (including talc) and family history of ovarian, breast or hereditary non-polyposis colon cancer. Ontario has evidence-based guidelines that recommend treatment with surgery and adjuvant therapy.¹¹²⁻¹¹⁶

Uterine cancer is the most common gynecological cancer in wealthy countries like Canada. The risks for uterine cancer include obesity, age, exposure to unopposed estrogen, medications such as tamoxifen and certain genetic syndromes. Obesity is often related to low socioeconomic status and research from the United States shows that low socioeconomic status is a predictor of worse outcomes for uterine cancer.^{117, 118}

For women whose uterine cancer is considered high-risk (with high grade and aggressive histologic cell types),

surgical staging is an important part of the evaluation. In surgical staging, a gynecologic oncologist checks lymph nodes and organs throughout the abdomen, and does biopsies, looking for spread of the disease. One study of women in Ontario from 1996-2000 found women of higher socioeconomic status who lived in urban areas were more likely to get surgical staging.¹¹⁹ The study also found that among women in the intermediate risk group with stage 1 or 2 uterine cancer, being older and having other health problems reduced survival. Women with stage 1 or 2 disease and with high-risk uterine cancer who were older, of low socioeconomic status or who had lymphovascular invasion had lower survival rates.¹¹⁹

In this section we look at these indicators for ovarian and uterine cancer:

- primary ovarian cancer surgery by a gynecologic oncologist;
- postoperative use of chemotherapy for ovarian cancer;
- rate of reoperation among patients with ovarian cancer and
- rate of referral to a gynecologic oncologist for staging procedure.

Because of data limitations, we could not use some important indicators, such as the rate of chemotherapy in chemoradiation therapy in cervical cancer, or use of pre-operative ultrasound for ovarian cancer. We stratified the indicators by age, neighbourhood income and where patients lived in the province.

EXHIBITS AND FINDINGS

PRIMARY OVARIAN CANCER SURGERY BY A GYNECOLOGIC ONCOLOGIST

Indicator: This indicator measures the percentage of patients whose first surgery for ovarian cancer was done by a gynecologic oncologist, within six months of diagnosis.

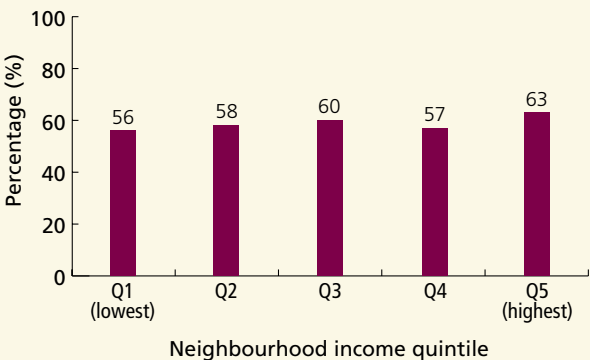
Background: Primary surgery conducted by a gynecologic oncologist enhances a woman's chances of survival in two ways. First, it is more thorough and better defines which women have early disease and do not need adjuvant therapy. Second, in the case of widespread disease, a gynecologic oncologist is more likely to remove as much disease as possible, which is associated with longer survival.¹²⁰⁻¹²⁷ Data from 1996-1998 shows gynecologic oncologists only conducted 36 percent of the ovarian cancer surgeries in Ontario.^{128, 129}

Finding: There has been progress on this indicator. From 2003/04 to 2004/05, 59 percent of women had their primary ovarian cancer surgery done by a gynecologist oncologist, a clear improvement from the rate of 36 percent in 1996-1998.^{128, 129}

EXHIBIT 4F.1 | Age-standardized percentage of women who underwent primary ovarian cancer surgery by a gynecologic oncologist, by neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- Rates of primary ovarian cancer surgery by a gynecologic oncologist did not vary significantly by neighbourhood income or age (age data are not shown). However, due to small sample size the ability to assess these differences was limited.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

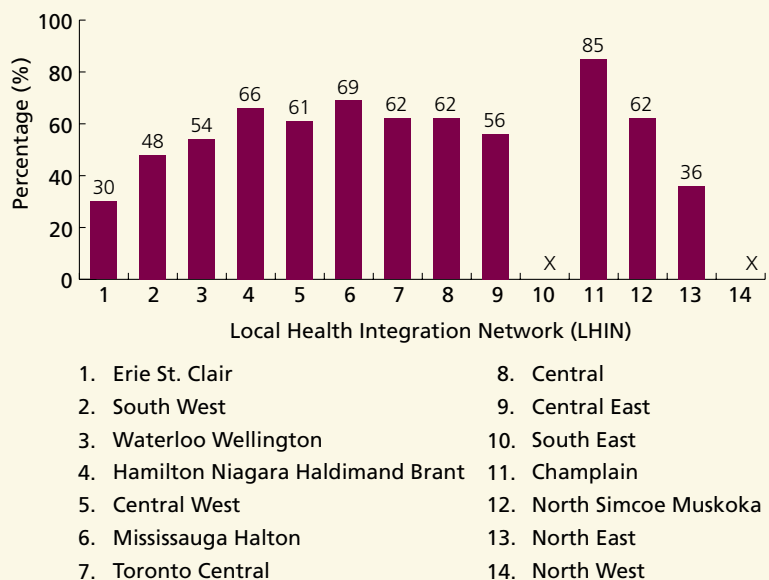
NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 4F.2 | Age-standardized percentage of women who underwent primary ovarian cancer surgery by a gynecologic oncologist, by Local Health Integration Network (LHIN), in Ontario, 2003/04 to 2004/05

FINDINGS

- The rates of surgery by a gynecologic oncologist varied across LHINs, ranging from 30 percent in the Erie St. Clair LHIN to 85 percent in the Champlain LHIN, but the data were from a small sample and estimates lack precision.



DATA SOURCES: Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP)

x Data not shown due to small sample size

POWER Study

POSTOPERATIVE CHEMOTHERAPY FOR OVARIAN CANCER

Indicator: This indicator measures the percentage of women with ovarian cancer who received postoperative chemotherapy within four months of surgery.

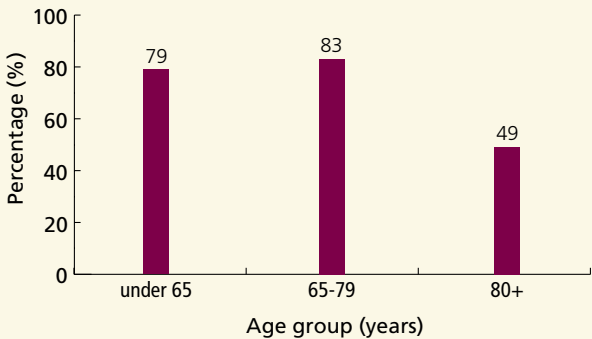
Background: The Program in Evidence Based Medicine has guidelines for using chemotherapy to treat ovarian cancer.¹³⁰⁻¹³² A 1996-1998 review showed factors that lowered survival rates included advancing age, inadequate surgery and lack of adjuvant chemotherapy.¹³³ Another review from 1996-2002 found the rate of surgery followed by chemotherapy was 64.9 percent in Ontario.¹³³

Finding: Overall in Ontario from 2003/04 to 2004/05, 79 percent of women with ovarian cancer had chemotherapy within four months of surgery.

EXHIBIT 4F.3 | Percentage of women with ovarian cancer who received postoperative chemotherapy within four months after surgery by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- Eighty percent of women under age 80 who had surgery, received chemotherapy within four months of their operations.
- Just 49 percent of women aged 80 or older received postoperative chemotherapy.



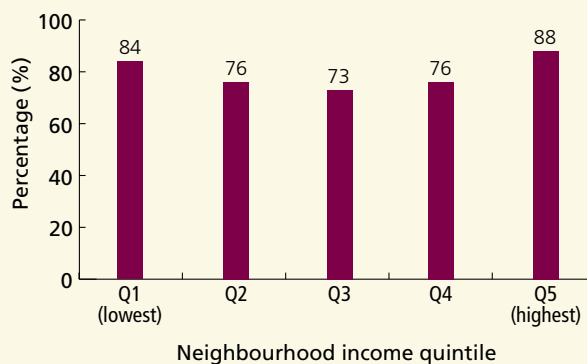
DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4F.4 | Age-standardized percentage of women with ovarian cancer who received postoperative chemotherapy within four months of surgery, by neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- Rates of postoperative chemotherapy did not vary by neighbourhood income.
- There was some regional variation in postoperative chemotherapy but the variation was not significant, possibly due to small numbers (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

RATE OF REOPERATION

Indicator: This indicator measures the percentage of women who had a follow-up operation within three months of their first ovarian cancer surgery.

Background: If initial ovarian cancer surgery did not provide adequate information for staging or did not remove as many cancer cells as possible, surgery is sometimes repeated. The 1996-1998 Ontario review of women with ovarian cancer showed 6.3 percent of patients had repeat operations.¹²⁸ Hospitals or surgeons who did not do much surgery for ovarian cancer had higher rates of reoperation. Reoperation rates were higher when the original surgeon was not a gynecologic oncologist.^{128, 129}

Finding:

- The percentage of patients in Ontario who had a reoperation for ovarian cancer within three months of their initial surgery was low at 3.4 percent.
- Reoperation was most likely in younger patients - the rate is 4.7 percent in women under age 65.
- The sample was too small to report on variations on rates of reoperation by neighbourhood income or Local Health Integration Network (LHIN).



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UTERINE CANCER: PATIENTS REFERRED TO A GYNECOLOGIC ONCOLOGIST FOR A STAGING PROCEDURE

Indicator: This indicator measures the percentage of uterine cancer patients with high-risk histologies (serous and clear cell) on biopsy who are referred to a gynecologic oncologist for a staging procedure.

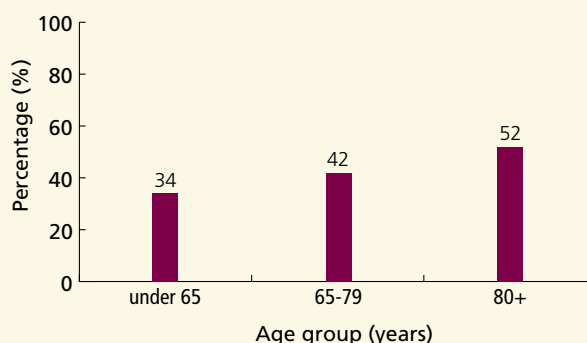
Background: Patients whose cancer cells are of certain high-risk types have a poorer chance of survival. Usually women with these types of uterine cancer are found to have more advanced stage of disease at the time of diagnosis, which can only be detected if they have surgical staging by a gynecologic oncologist.

Finding: Forty-one percent of uterine cancer patients with high-risk histologies were referred to a gynecologic oncologist for a staging procedure in Ontario between 2003/04 and 2004/05.

EXHIBIT 4F.5 | Percentage of patients with certain high-risk histologies (serous and clear cell) on biopsy who were referred to a gynecologic oncologist for staging procedure, by age, in Ontario, 2003/04 to 2004/05

FINDINGS

- The proportion of women with high-risk types of uterine cancer who saw a gynecologic oncologist increased with age, but the variation was not significant possibly due to small sample size.
- There was some difference in who saw a gynecologic oncologist by geography, but because many areas have very few of these high-risk patients, it is difficult to determine if the differences are significant (data not shown).



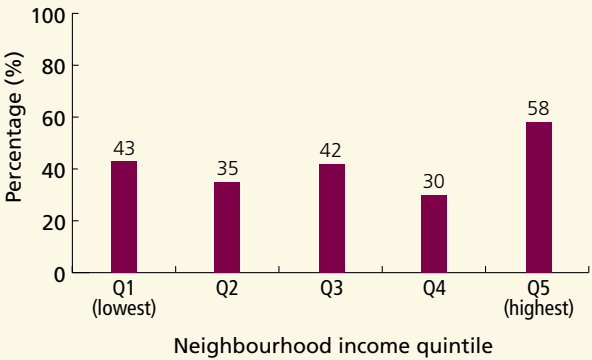
DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 4F.6 | Age-standardized percentage of women with certain high-risk histologies (serous and clear cell) on biopsy who were referred to a gynecologic oncologist for staging procedure, by neighbourhood income quintile, in Ontario, 2003/04 to 2004/05

FINDINGS

- Neighbourhood income was not a factor in who saw a gynecologic oncologist.



DATA SOURCES: Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

POWER Study

Section 4F

SUMMARY OF FINDINGS

Ovarian Cancer

Some progress has been made in treatment for ovarian cancer. The proportion of women having their surgery done by a gynecologic oncologist has increased since 1996-1998.^{128, 129} There has been an increase in the use of adjuvant therapy compared to 1996-2002¹³³ and a decrease in the rate of reoperation.¹²⁸ We found older women with ovarian cancer were slightly less likely to have their surgery done by a gynecologic oncologist and less likely to have adjuvant chemotherapy, but the differences were not significant. Not many women had reoperations, but those who did were generally younger. Overall, neighbourhood income was not associated with having surgery done by a gynecologic oncologist, getting adjuvant chemotherapy or having a reoperation. Whether surgery was done by a gynecologic oncologist varied by where patients lived.

Primary Ovarian Cancer Surgery by a Gynecologic Oncologist

Overall, 59 percent of women with ovarian cancer in 2003-2005 had their surgery done by a gynecologic oncologist, up by 25 percent since 1996.^{128, 129} Age and neighbourhood income did not influence access to gynecologic oncologists but where a patient lived in the province did appear to influence what kind of surgeon did the initial surgery. Because of limitations in our data, we cannot comment on the quality of the initial operations, such as whether there was appropriate staging or optimal removal of cancer cells.

Postoperative Use of Chemotherapy for Ovarian Cancer

There has been a clear rise in the rate of chemotherapy delivered to women with ovarian cancer since 1996; our data showed 79 percent of women got chemotherapy within four months of surgery.¹³³ Only half of the very elderly received chemotherapy, but that variation was not significant, possibly because the sample size was small. It is not possible to

determine from administrative data whether the difference was because of patient preference or bias against treating on the part of the healthcare team. There was minimal geographic variation in delivery of postoperative chemotherapy. However, the Champlain LHIN, which covers a large rural area as well as Ottawa, performed very well on both of these indicators, suggesting it has an effective approach to handling referrals for women with ovarian cancer.

Rate of Reoperation

Overall, the rate of reoperation for a staging or debulking procedure was low at 3.4 percent and the rate has decreased since 1996.¹²⁸ When reoperations were done, it was usually on women under age 65. This suggests a larger proportion of initial operations are providing enough information to make adjuvant treatment decisions. Alternatively, it may be chemotherapy is being used instead of reoperation (with or without chemotherapy). We could not assess variations in reoperation rates by neighbourhood income or region because of the small number of cases.

Uterine Cancer

Older women with high-risk types (serous or clear cell) of uterine cancer were more likely to be referred to a gynecologic oncologist for a staging procedure. There was no income variation in this indicator, but where a woman lived in the province did seem to make a difference. However because of the small number of cases, it is difficult to determine whether this difference was meaningful.

Referrals to a Gynecologic Oncologist for Staging

Overall, 41 percent of women whose endometrial biopsy showed high-risk cancer cells were referred to a gynecologic oncologist for a staging procedure. Older women were more likely to be referred for staging to a gynecologic oncologist, but the difference was not significant. There was also regional variation in the referral rates but again, the small number of affected women in some of the Local Health Integration Networks meant we could not do a meaningful analysis.



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Section 4G

End of Life Care

INTRODUCTION

Quality of life is very important for cancer patients as their deaths draw near.

Ideally, the services they use near the end of life minimize invasive or aggressive interventions and focus instead on maximum control of symptoms and supportive care. Ideally, patients are in a setting of their choice, where their wishes are respected. A strong palliative care program is a crucial part of making that happen. Randomized trials have shown that comprehensive, home-based, palliative care programs benefit patients and may decrease emergency room visits or hospitalizations at the end of life.¹³⁴⁻¹⁴⁰

In Ontario, a new initiative began in 2007 that uses standardized tools to assess the symptoms and performance status of all cancer patients in the province. The aim of this project is to improve symptom control, do a better job of integrating and coordinating services and decrease wait times for palliative services.¹⁴¹

This section describes health care services used near the end of life by patients who died of cancer. We looked at the same six cancers as reported in the other sections—some that occur exclusively in women (breast and gynecological) and two very common cancers for both sexes (lung and colorectal). The services we looked at were:

- death in an acute care bed;
- emergency department visits in the last two weeks of life;
- chemotherapy in the last two weeks of life;
- home care visits in the last six months of life and
- physician house calls in the last two weeks of life.

All indicators were stratified by sex (where applicable) and then by age, income and Local Health Integration Network (LHIN), which allowed us to identify subgroups of patients who received substantially different care.

Studies have found end of life care to be similar for men and women on some measures and different on others. Many studies have looked at the association between sex and location of death, and a recent review of literature suggests there is no difference between men and women in whether they died in an acute care hospital or at home.¹⁴²

There are fewer studies on the other indicators we are looking at in this section. The data that exist on aggressive care such as chemotherapy or emergency department visits suggest women were less likely than men to receive such treatments at the end of life.¹⁴³⁻¹⁴⁵ However, women may be more likely to receive supportive care in the community.^{146, 147}

One review found consistent evidence that people with higher socioeconomic status were more likely to die at home, while death in hospital was more frequent among ethnic minorities.¹⁴² There are fewer studies looking at how socioeconomic status or ethnicity might influence the use of other services at the end of life and the results are conflicting. The Ontario Cancer System Quality Index showed significant variation across regions in the use of services at the end of life. Benchmarks for high quality end of life care have been suggested, based on Medicare data from the United States, but they are not necessarily applicable to the Canadian health care system.¹⁴⁵

EXHIBITS AND FINDINGS

DEATH IN AN ACUTE CARE BED

Indicator: This indicator measures the percentage of patients with cancer who died in an acute care bed in hospital.

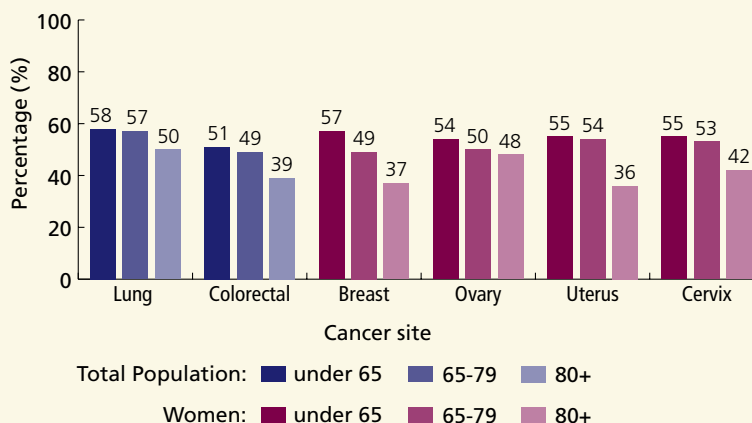
Background: Looking at patterns in end of life care can provide valuable information about how patients dying of cancer are cared for in their last few months of life. Acute care hospitals are generally not designed to provide optimal palliative care and research indicates most patients prefer not to die in hospital. Research also suggests sex does not influence location of death.¹⁴²

Finding: Overall, in Ontario the percentage of patients who died in an acute care bed was 56 percent for lung cancer, 47 percent for colorectal cancer, 49 percent for breast cancer and 51 percent for gynecological cancers (51 percent for ovarian, 49 percent for uterine and 53 percent for cervical).

EXHIBIT 4G.1 | Percentage of patients with cancer who died in acute care beds by age and cancer site, in Ontario, 2003 to 2004

FINDINGS

- Lung cancer patients, irrespective of age, were somewhat more likely to die in hospital than those with colorectal, breast or gynecological cancer (ovarian, uterine or cervical), though the difference was most striking for those aged 65 and older.
- The likelihood of dying in hospital decreased with age for all types of examined cancers. It is possible that older patients may get care elsewhere, such as in long-term care facilities.
- Neighbourhood income had no effect on whether people died in hospital (data not shown).
- About the same proportion of women and men with colorectal cancer died in an acute care bed; 45 percent and 48 percent, respectively (data not shown).
- Slightly fewer women with lung cancer died in an acute care bed than men; 53 percent versus 58 percent, respectively (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4G.2 | Age-standardized percentage of patients with colorectal cancer who died in acute care beds, by sex and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

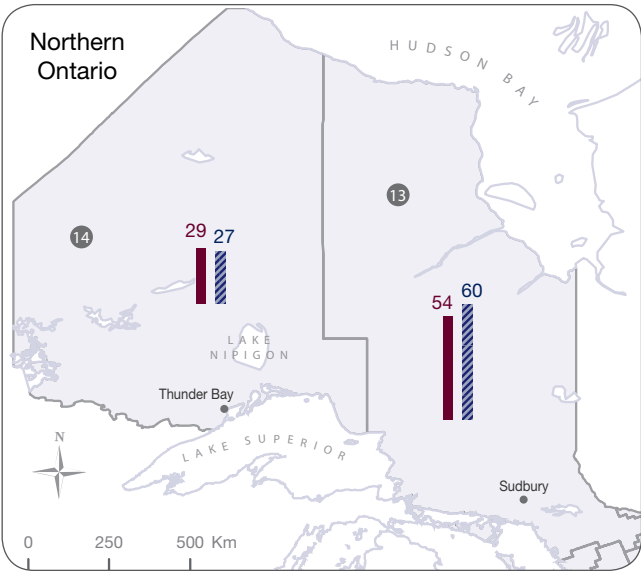
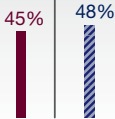
FINDINGS

- The proportion of patients with colorectal cancer who died in an acute care bed varied from 26 percent in the Central West LHIN to 57 percent in the Central East LHIN for women and from 27 percent in the Central West and North West LHINs to 60 percent in the North East LHIN for men.

POWER Study

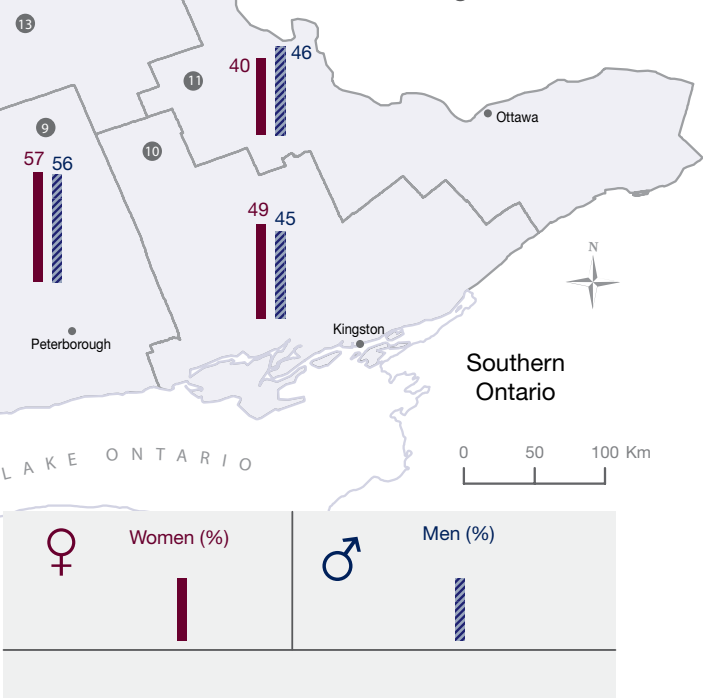
Overall Ontario

In Ontario, 45% of women and 48% of men with colorectal cancer died in acute care beds.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

EXHIBIT 4G.3 | Age-standardized percentage of patients with lung cancer who died in acute care beds, by sex and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

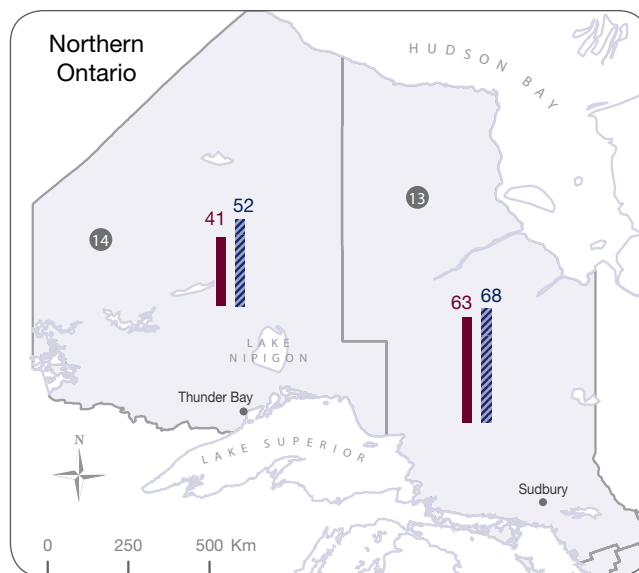
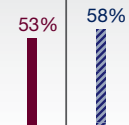
FINDINGS

- The proportion of patients with lung cancer who died in an acute care bed varied across LHINs ranging from 38 percent in the Central West LHIN to 63 percent in the North East LHIN among women and from 37 percent in the Central West LHIN to 69 percent in the Mississauga Halton LHIN among men.

POWER Study

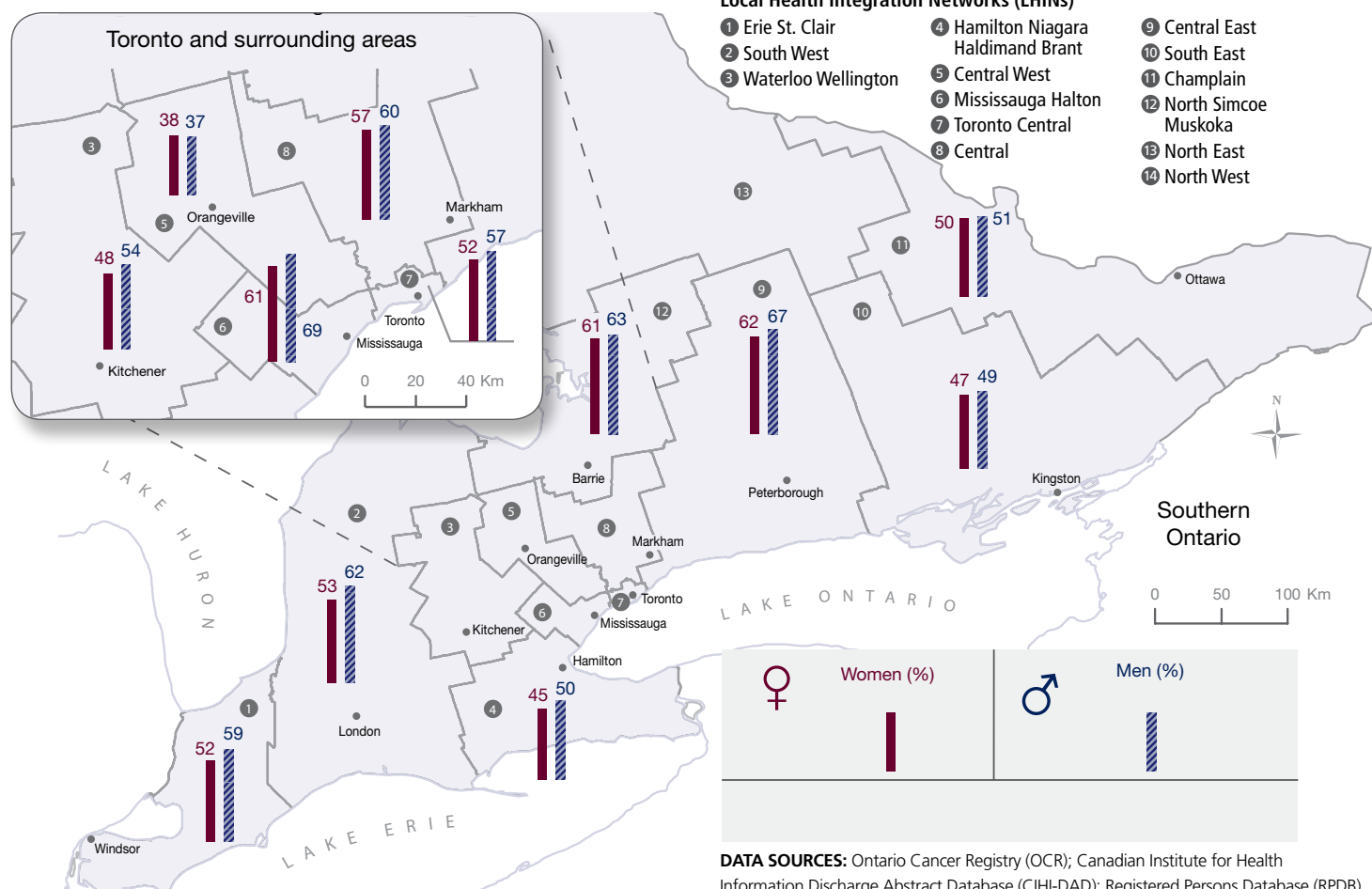
Overall Ontario

In Ontario, 53% of women and 58% of men with lung cancer died in acute care beds.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

EMERGENCY DEPARTMENT (ED) VISIT IN THE LAST TWO WEEKS OF LIFE

Indicator: This indicator measures the proportion of patients who died of cancer who had at least one ED visit in the last two weeks of life.

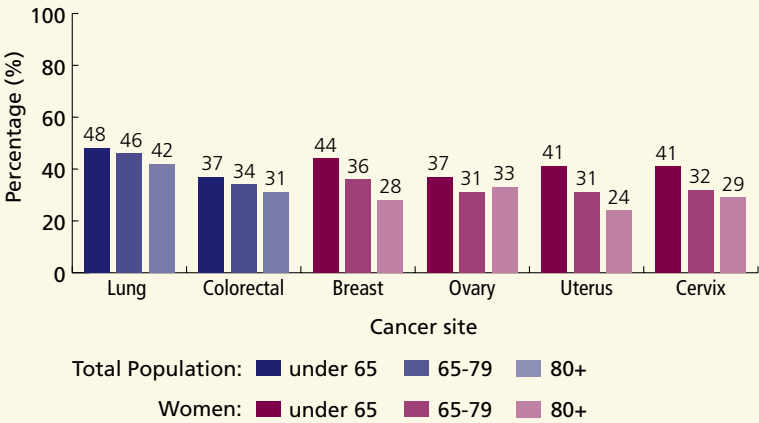
Background: Patients going to the ED in their last two weeks of life is often indicative of a lack of access to effective community and outpatient services to adequately support patients at home. Preliminary evidence indicates that women are less likely than men to visit the ED. However, it is not clear whether this is true for all subgroups of women.

Finding: The percentage of Ontario patients who died of cancer who visited the ED at least once in the last two weeks of life was 46 percent for lung cancer, 34 percent for colorectal cancer, 37 percent for breast cancer and 33 percent for gynecological cancers (34 percent for ovarian, 31 percent for uterine and 37 percent for cervical).

EXHIBIT 4G.4 | Percentage of patients who died of cancer who had at least one emergency department (ED) visit in the last two weeks of life, by age and cancer site, in Ontario, 2003 to 2004

FINDINGS

- Across all age groups, ED visits were more likely for patients with lung cancer than for patients with any of the other types of cancer examined.
- ED visits in the last two weeks of life decreased with age for all types of cancer examined.
- Neighbourhood income made little difference in ED utilization for patients near the end of their lives (data not shown).
- Women with colorectal cancer were less likely to visit an ED in their last two weeks of life than men; 31 percent versus 36 percent, respectively (data not shown).
- Forty-two percent of women with lung cancer visited an ED in their last two weeks of life as compared to 49 percent of men (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 4G.5 | Age-standardized percentage of patients who died of colorectal cancer who had at least one emergency department (ED) visit in the last two weeks of life, by sex and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

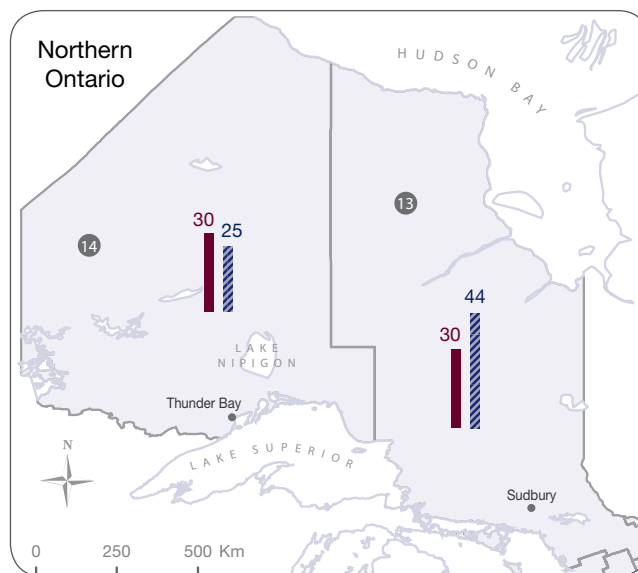
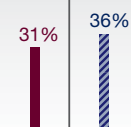
FINDINGS

- There were regional differences in the proportion of colorectal cancer patients who visited an ED in the last two weeks of their lives, ranging for women from 25 percent in the South West LHIN to 37 percent in the South East LHIN and from 25 percent in the South West and North West LHINs to 44 percent in the North East LHIN for men.
- The proportion of women dying of breast cancer who visited an ED in their last two weeks of life ranged from 31 percent in the South West and North West LHINs to 46 percent in the Central West LHIN (data not shown).

POWER Study

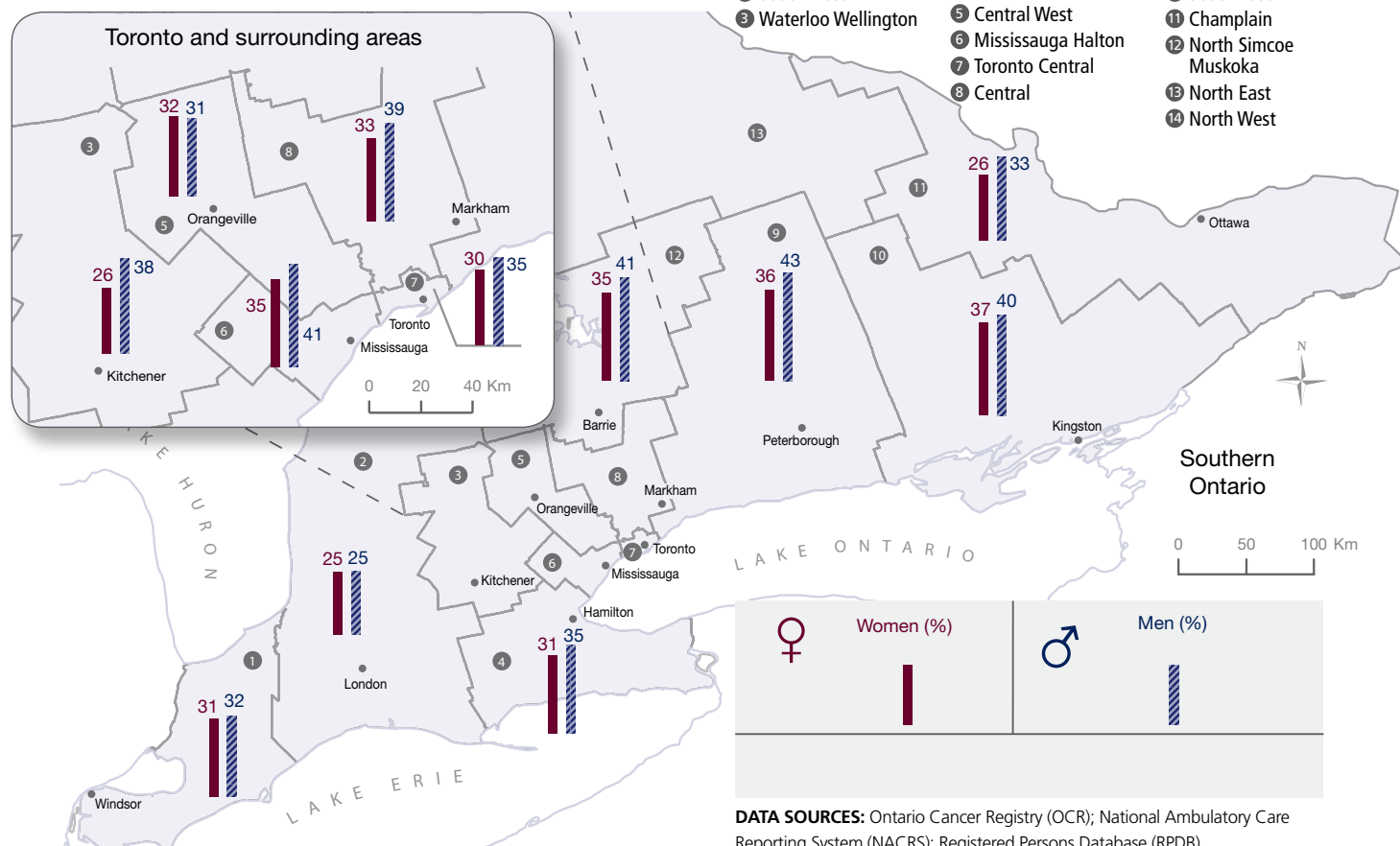
Overall Ontario

In Ontario, 31% of women and 36% of men who died of colorectal cancer had at least one ED visit in the last two weeks of life.



Local Health Integration Networks (LHINs)

-
- A map of Ontario, Canada, divided into 14 numbered regions. The regions are listed in three columns:
- 1 Erie St. Clair
 - 2 South West
 - 3 Waterloo Wellington
 - 4 Hamilton Niagara Haldimand Brant
 - 5 Central West
 - 6 Mississauga Halton
 - 7 Toronto Central
 - 8 Central
 - 9 Central East
 - 10 South East
 - 11 Champlain
 - 12 North Simcoe Muskoka
 - 13 North East
 - 14 North West



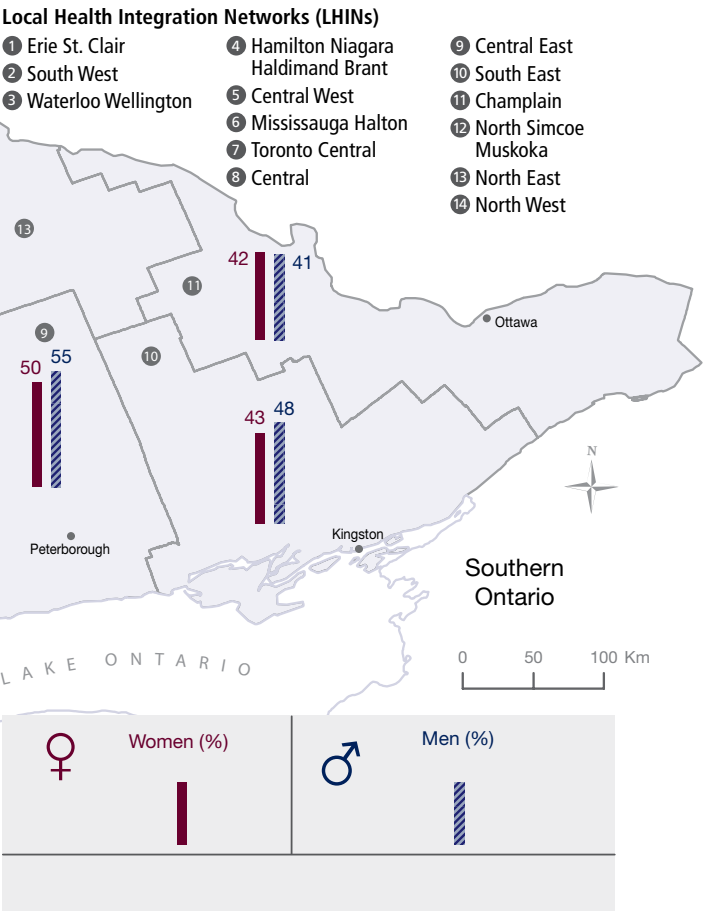
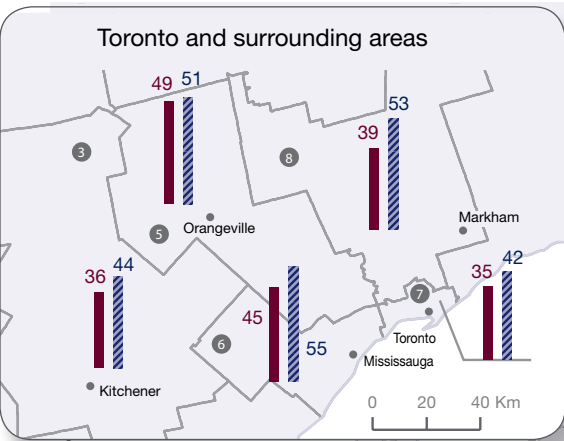
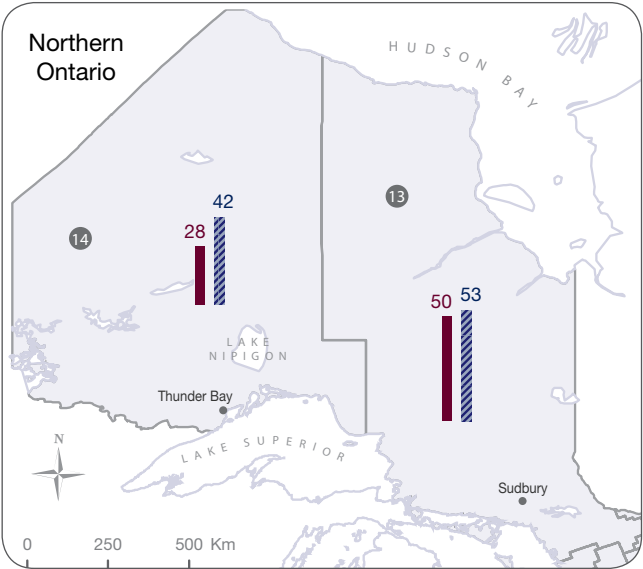
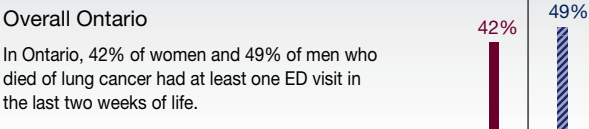
DATA SOURCES: Ontario Cancer Registry (OCR); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

EXHIBIT 4G.6 | Age-standardized percentage of patients who died of lung cancer who had at least one emergency department (ED) visit in the last two weeks of life, by sex and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

FINDINGS

- More men than women visited an ED in their last two weeks of life before dying of lung cancer, but the proportion varied regionally. Among women, the proportions ranged from 28 percent in the North West LHIN to 50 percent in the Central East and North East LHINs and for men the proportions ranged from 41 percent in the Champlain LHIN to 55 percent in the North Simcoe Muskoka, Central East and Mississauga Halton LHINs.

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DATA SOURCES: Ontario Cancer Registry (OCR); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

CHEMOTHERAPY IN THE LAST TWO WEEKS OF LIFE

Indicator: This indicator measures the percentage of cancer patients who received chemotherapy in the two weeks before they died.

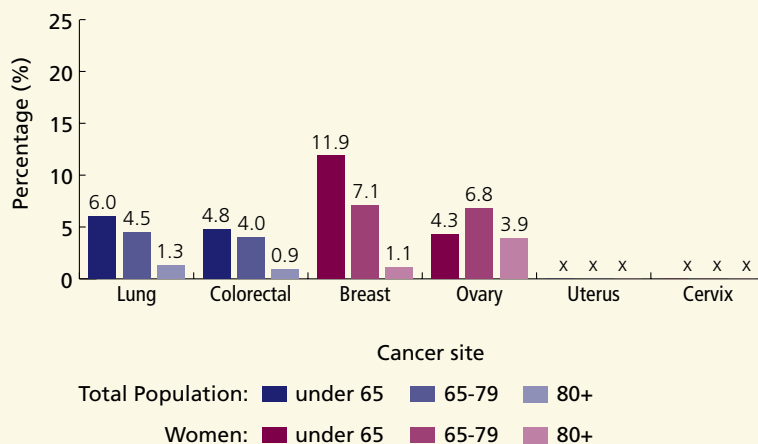
Background: Chemotherapy close to the end of life is unlikely to offer any benefit but can cause side effects. Giving chemotherapy so late suggests care is too aggressive, rather than focused on palliative goals such as symptom management and patient support. Since some patients die unexpectedly, this indicator is never expected to be zero.

Finding: Overall in Ontario the percentage of cancer patients who received chemotherapy in their last two weeks of life was low - 4.3 percent for lung cancer, 3.2 percent for colorectal cancer, 7.5 percent for breast cancer and 3.8 percent for gynecological cancers (5 percent for ovarian, 1 percent for uterine and 3 percent for cervical).

EXHIBIT 4G.7 | Percentage of cancer patients who died who received chemotherapy in the last two weeks of life, by age and cancer site, in Ontario, 2003 to 2004

FINDINGS

- Women who died of breast cancer had higher rates of chemotherapy in their last two weeks of life than patients who died of any of the other types of cancers examined.
- Use of chemotherapy in the last two weeks of life decreased with age for patients who died of lung, breast and colorectal cancers (but not ovarian), but the age variation was not significant among colorectal cancer patients.
- Neighbourhood income was not associated with the proportion of people who were given chemotherapy in their last two weeks (data not shown).
- Sex made little difference in whether patients dying of lung and colorectal cancers underwent chemotherapy in the last two weeks of their lives. For women, the rates were 3.7 percent and 2.5 percent, respectively and for men the rates were 4.7 percent and 3.8 percent, respectively (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)
x Data not shown due to small sample size

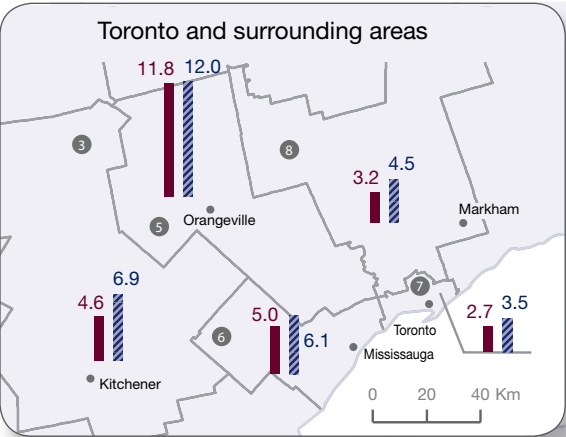
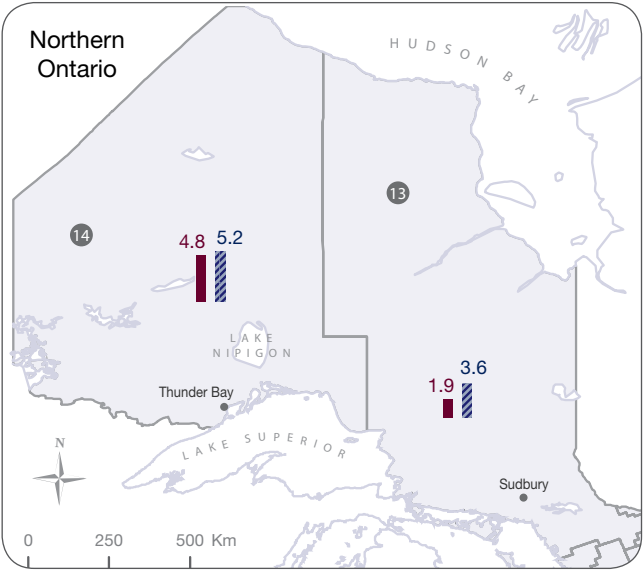
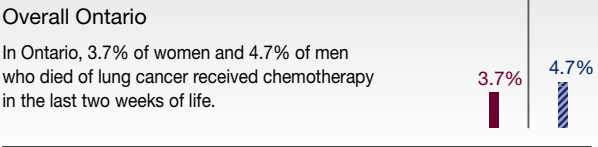
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EXHIBIT 4G.8 | Age-standardized percentage of patients who died of lung cancer who received chemotherapy in the last two weeks of life, by sex and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

FINDINGS

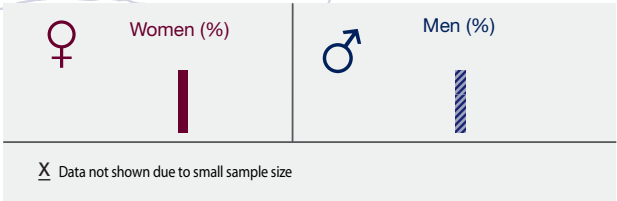
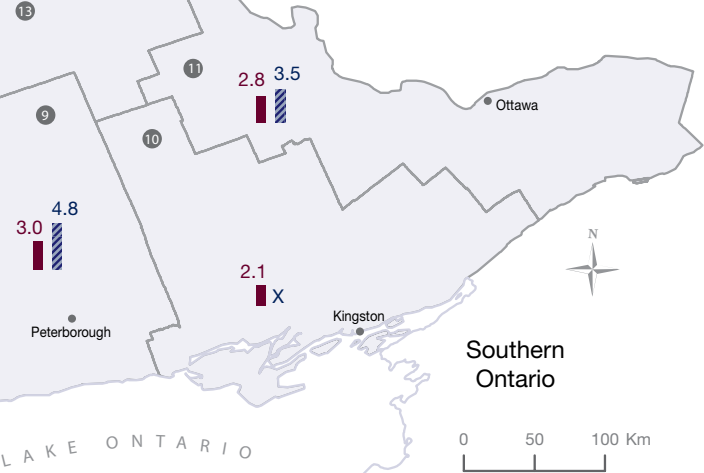
- There was regional variation in the receipt of end of life chemotherapy for people with lung cancer, ranging from 1.9 percent in the North East LHIN to 11.8 percent in the Central West LHIN for women and from 3.1 percent in the Erie St. Clair LHIN to 12.0 percent in the Central West LHIN for men.

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Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

EXHIBIT 4G.9 | Age-standardized percentage of patients who died of gynecological, breast and colorectal cancers who received chemotherapy in the last two weeks of life, by Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

LHIN Name	Gynecological Cancers	Breast Cancer	Colorectal Cancer
1. Erie St. Clair	7.2	5.4	X
2. South West	X	3.8	2.6
3. Waterloo Wellington	X	10.2	4.0
4. Hamilton Niagara Haldimand Brant	4.2	9.5	3.6
5. Central West	6.3	13.1	4.1
6. Mississauga Halton	X	9.6	4.1
7. Toronto Central	3.3	6.9	2.7
8. Central	5.5	7.6	3.8
9. Central East	4.3	5.4	2.0
10. South East	X	6.3	3.0
11. Champlain	X	7.4	1.4
12. North Simcoe Muskoka	X	4.8	6.4
13. North East	X	9.5	4.1
14. North West	X	X	X
Overall Ontario	3.8	7.5	3.2

DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

x Data not shown due to small sample size

FINDINGS

- There was some regional variation in the percentage of women who received chemotherapy at the end of life, ranging from 3.8 percent (South West LHIN) to 13.1 percent (Central West LHIN) for breast cancer patients and from 3.3 percent (Toronto Central LHIN) to 7.2 percent (Erie St. Clair LHIN) for gynecological cancers (but the numbers for those cancers are very low, which makes it difficult to get a precise estimate).
- Use of chemotherapy ranged from 1.4 percent (Champlain LHIN) to 6.4 percent (North Simcoe Muskoka LHIN) among women and men who died of colorectal cancer.

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HOME CARE VISITS IN THE LAST SIX MONTHS OF LIFE

Indicator: This indicator measures the percentage of cancer patients who died who received one or more home care visits in the last six months of life.

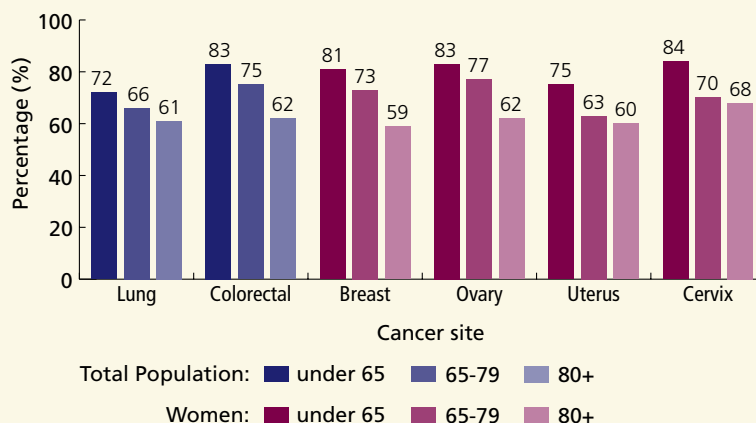
Background: There is evidence that suggests that dedicated, palliative, home care programs increase patient satisfaction and decrease the use of acute care services. Previous analyses indicate that home care use is associated with fewer in-hospital deaths.

Finding: Overall in Ontario, the percentage of cancer patients who died who received one or more home care visits in the last six months of life was 67 percent for lung cancer, 73 percent for colorectal cancer, 73 percent for breast cancer, and 73 percent for gynecological cancers (75 percent for ovarian, 65 percent for uterine and 78 percent for cervical).

EXHIBIT 4G.10 | Percentage of patients who died of cancer who received one or more home care services in the last six months of life, by age and cancer site, in Ontario, 2003 to 2004

FINDINGS

- Approximately two-thirds of patients who died of lung, colorectal, breast or gynecologic cancer received at least one home care visit in the last six months of life.
- Patients with lung cancer were a little less likely than others to get home care.
- Home care use decreased with age for all types of cancer, but that could be because some older patients may be living in long-term care settings.
- Women and men with colorectal cancer used home care about equally (72 percent and 74 percent, respectively) but women with lung cancer were slightly more likely to get home care than men (69 percent and 65 percent, respectively) (data not shown).
- Neighbourhood income did not make a difference in the use of home care (data not shown).
- There was no significant regional variation in home care use (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB)

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PHYSICIAN HOUSE CALLS IN THE LAST TWO WEEKS OF LIFE

Indicator: This indicator measures the percentage of cancer patients who had one or more physician house calls in the last two weeks of their lives.

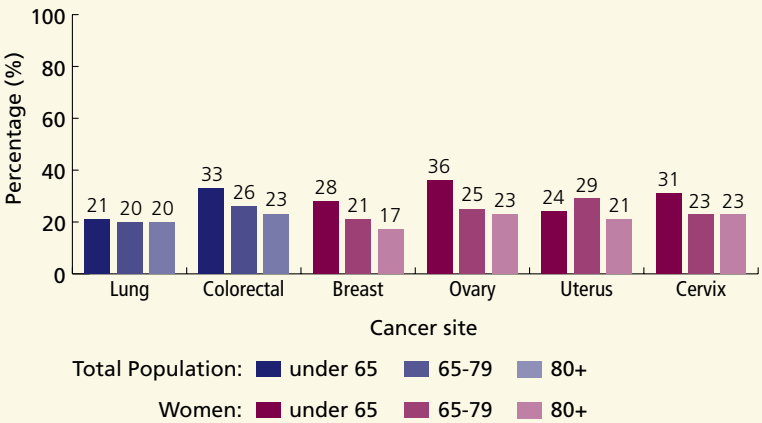
Background: Studies suggest home visits by physicians should be part of programs aimed at reducing hospital admissions and visits to emergency departments by patients dying of cancer. Preliminary evidence indicates that women receive less aggressive care at the end of life than men. However, it is not clear whether that is true for all women, regardless of socioeconomic status, age, ethnicity and region.

Finding: The percentage of cancer patients who had one or more physician house calls in the last two weeks of life was 20 percent for lung cancer, 27 percent for colorectal cancer, 23 percent for breast cancer, and 27 percent for gynecological cancers (28 percent for ovarian, 25 percent for uterine and 27 percent for cervical).

EXHIBIT 4G.11 | Percentage of patients who died of cancer who had one or more physician house calls in the last two weeks of life, by age and cancer site, in Ontario, 2003 to 2004

FINDINGS

- Patients who died of lung cancer were less likely to receive a physician house call in the last two weeks of life than patients who died of colorectal, breast or gynecological cancers.
- Older patients were less likely to have a house call than younger patients for all types of cancer except lung cancer.
- A similar proportion of women and men received house calls for lung cancer (20 percent in both) and colorectal cancer (28 percent and 26 percent, respectively) (data not shown).



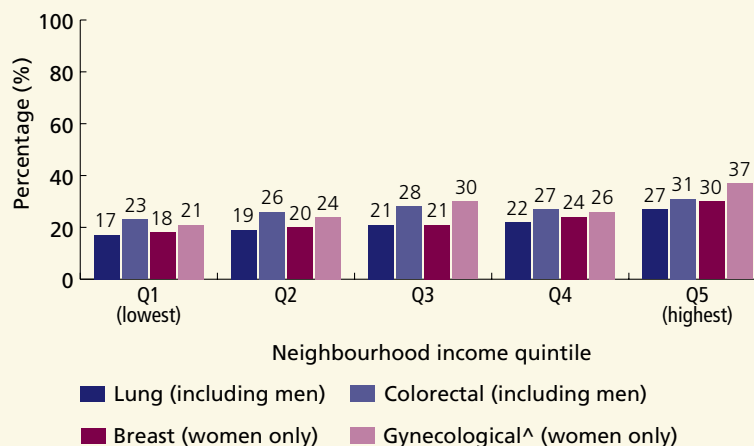
DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

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EXHIBIT 4G.12 | Age-standardized percentage of patients who died of cancer who had one or more physician house calls in the last two weeks of life, by neighbourhood income quintile, in Ontario, 2003 to 2004

FINDINGS

- Patients who died of any cancer who were residing in lower-income neighbourhoods were less likely to receive house calls compared with those living in higher-income neighbourhoods.
- This effect was seen in both women and men dying of lung and colorectal cancer (data not shown).



DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB); Ontario health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 4.3](#) for details about neighbourhood income quintile calculation

^ Includes cancers of the ovary, uterus and cervix

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EXHIBIT 4G.13 | Age-standardized percentage of patients who died of lung cancer who had one or more physician house calls in the last two weeks of life, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

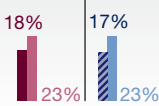
FINDINGS

- House call rates varied regionally. The percentage of lower-income women with lung cancer who had one or more physician house calls in the last two weeks of life ranged from 11 percent in the North East LHIN to 27 percent in the Waterloo Wellington LHIN. Among women living in higher-income neighbourhoods the percentage ranged from 8 percent in the North East LHIN to 41 percent in the Central LHIN.
- Among men living in lower-income neighbourhoods, the range was from 10 percent in the North East LHIN to 31 percent in the Central LHIN. Among men living in higher-income neighbourhoods the range was from 9 percent in the North East LHIN to 37 percent in the Central LHIN.

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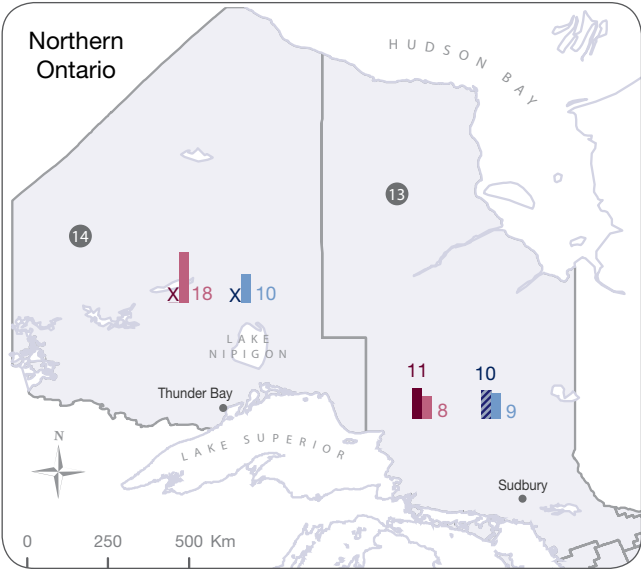
Overall Ontario

Of patients who died of lung cancer in Ontario, 18% of lower-income women, 23% of higher-income women, 17% of lower-income men and 23% of higher-income men had one or more physician house calls in the last two weeks of life.



Note: See Appendix 4.3 for details about neighbourhood income quintile calculation

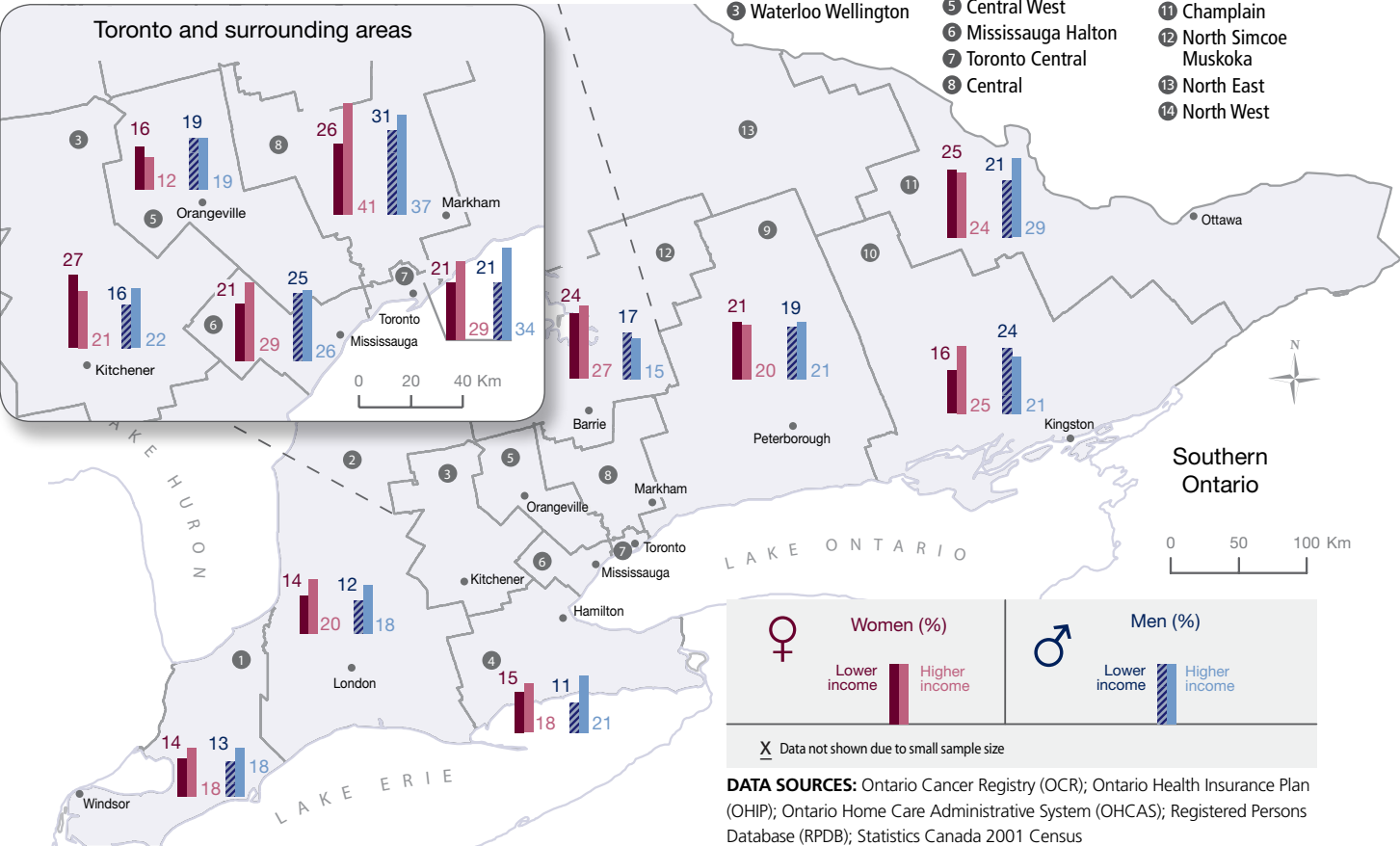
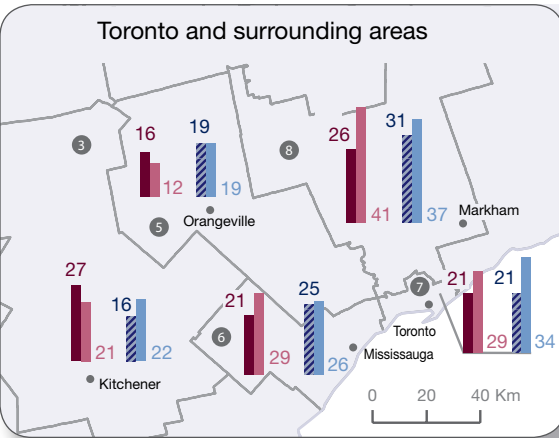
Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |

Toronto and surrounding areas



Women (%)

Lower income Higher income



Men (%)

Lower income Higher income

X Data not shown due to small sample size

DATA SOURCES: Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB); Statistics Canada 2001 Census

EXHIBIT 4G.14 | Age-standardized percentage of patients who died of colorectal cancer who had one or more physician house calls in the last two weeks of life, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2003 to 2004

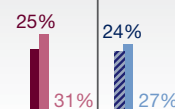
FINDINGS

- Women with colorectal cancer living in lower-income neighbourhoods were less likely to receive house calls in their last two weeks of life than those living in higher-income areas, but this variation was not seen among men.
- The proportion of lower-income women who received a house call ranged from 14 percent in the Hamilton Niagara Haldimand Brant LHIN to 43 percent in the Central LHIN and from 18 percent in the Erie St. Clair LHIN to 48 percent in the Central LHIN among higher-income women.
- For lower-income men with colorectal cancer, the percentage who received a house call in their last two weeks of life ranged from 9 percent in the North East LHIN to 42 percent in the Central LHIN. The percentage ranged from 16 percent in the South West LHIN to 41 percent in the Central LHIN for higher-income men.

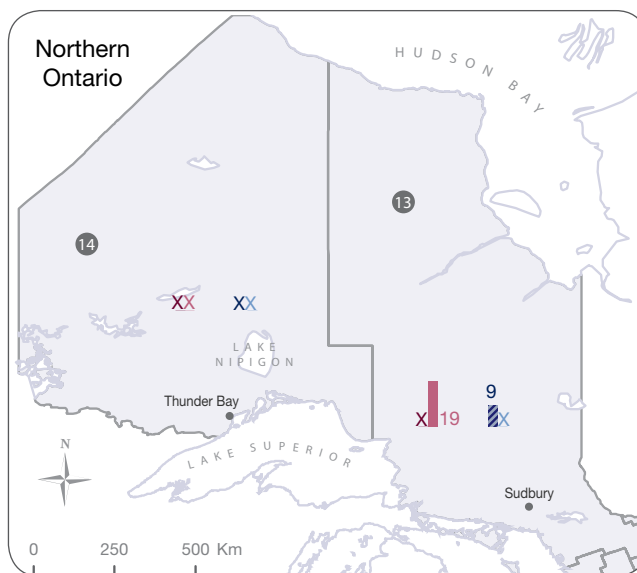
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Overall Ontario

Of patients who died of colorectal cancer in Ontario, 25% of lower-income women, 31% of higher-income women, 24% of lower-income men and 27% of higher-income men had one or more physician house calls in the last two weeks of life.

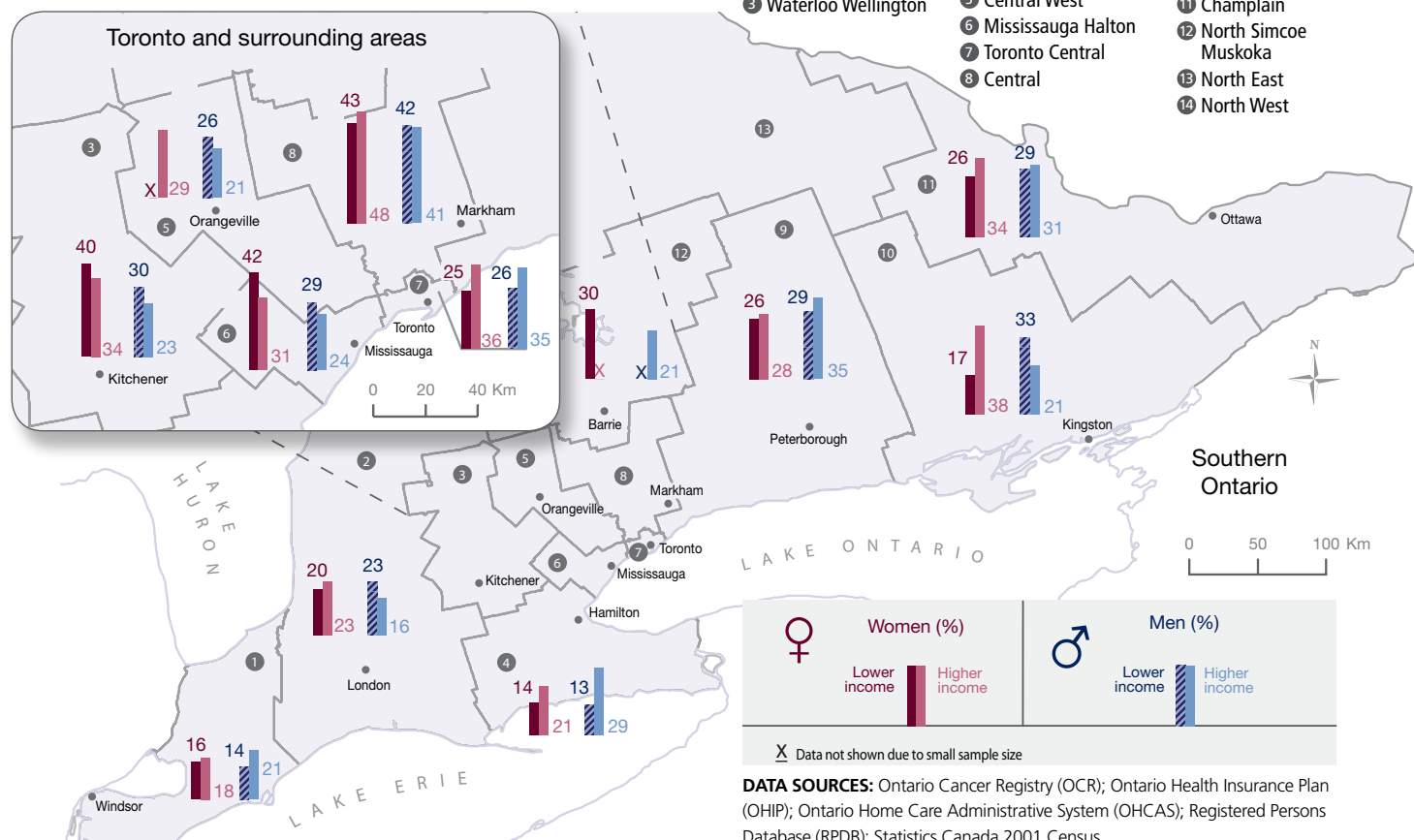


Note: See Appendix 4.3 for details about neighbourhood income quintile calculation



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |



Section 4G

SUMMARY OF FINDINGS

Age was the only factor associated with all the outcomes - older patients were less likely to receive any of the health care services studied. This may be due to a limitation of the methods used - for example, we could not capture care provided in long-term care facilities. Alternatively, the variation could be due to patient preference or a genuine difference in care. More research is needed to understand end of life cancer care in the elderly.

Variation across Local Health Integration Networks (LHIN) were also common and are likely the result of availability of resources, but could also reflect local and regional approaches to care. Only home care services showed no regional variations.

Most of the indicators did not vary by sex, except for visits to the emergency department (ED) in the last two weeks of life; women with lung or colorectal cancer were less likely to visit the ED in the last two weeks of life than men. Again, this may reflect patient preference or a genuine difference in care.

Neighbourhood income was associated only with physician house calls; those living in higher-income neighbourhoods were more likely to receive house calls, perhaps because of a greater ability to advocate for care or navigate the system. It is also possible only wealthier patients can afford the support needed for a home death and thus need house calls. It is also possible physicians may be less likely to perform house calls in certain neighbourhoods or that physicians practicing in lower-income neighbourhoods may be less likely to make house calls.

These indicators give us some important insight into palliative care in Ontario, although lack of appropriate

benchmarks for these indicators limit our interpretation of what they mean. Information about patients' preferences or their thoughts on the quality of care they receive when dying would help us understand the importance of what the indicators show us. Although the data for these indicators are older, they are unlikely to have changed substantially in recent years. The analyses by subgroups are relevant and of value.

Death in an Acute Care Bed

Ideally we would have an indicator that told us if patients died in the setting of their choice. The literature suggests most patients would prefer not to die in hospital. The data also cannot tell us about the quality of death and dying.

Over half of Ontario patients who died of cancer did so in an acute care hospital. This was lower than other provinces^{144, 148} but higher than rates reported in the United States.¹⁴⁹ Sex was not a significant factor in who died in hospital among patients with lung or colorectal cancer but there were regional variations for both sexes. Older patients were less likely to die in an acute care bed, perhaps because they die in other institutions, such as long-term care facilities. The proportion of patients dying in hospital did not vary by neighbourhood income.

Emergency Department (ED) Visit in the Last Two Weeks of Life

Approximately one-third to one-half of the cancer patients we studied visited the ED in their last two weeks of life, which is a large proportion. We do not expect this indicator to be zero, but the number should be as low as possible. Findings of similar indicators have

been published but comparisons are difficult because of differences in definitions. Women were less likely than men to visit an ED, which is consistent with other research. There was regional variation, which was similar for men and women. Older patients were less likely to visit an ED. There was no difference in ED use by neighbourhood income.

Chemotherapy in the Last Two Weeks of Life

The proportion of patients who received chemotherapy in the last two weeks of life was relatively low, except for breast cancer, which may be because there are many systemic agents for treating advanced breast cancer. Chemotherapy use was similar in women and men with lung or colorectal cancer but declined with age. There was variation by region, but no association with neighbourhood income. Medical oncologists in the Central West LHIN are the only ones still paid by fee-for-service in Ontario. It could be the higher rates there are because of more complete data in OHIP, or they may also use more chemotherapy. Other medical oncologists in the province are salaried and submit “shadow billings,” which reflect activity levels but are not directly tied to services and may be incomplete. Decreasing the use of chemotherapy near the end of life suggests a shift in the focus of care from active treatment to symptom control and supportive care.

Home Care Services in the Last Six Months of Life

The majority of cancer patients received some home care. There was no significant variation by sex, neighbourhood income or LHIN. This was the only indicator with no regional variation, probably because Ontario

has a province-wide home care program. Home care use decreased with age, which may be because many older patients live in long-term care. Although many patients received home care, many also used the ED or were admitted to hospital, which raises questions about whether the system has the expertise and hours of service available to adequately support patients at home. Research indicates that patients who receive comprehensive, palliative care services at home are less likely to use acute care services.^{134, 138}

Physician House Calls in the Last Two Weeks of Life

About a quarter of patients received at least one house call in the last two weeks of life. This was the only indicator associated with neighbourhood income. Sex was not a factor in house calls but age was; older patients were less likely to receive house calls. There was regional variation seen in the use of house calls. Other studies from Quebec¹⁴⁸ and Nova Scotia¹⁴⁷ have reported on house calls, but differences in definitions preclude direct comparisons. The association with neighbourhood income has been previously observed.¹⁴⁷ Physician support is a key feature of enabling patients to die at home.

Chapter Summary of Findings

In this chapter, we present results pertaining to the performance of Ontario's cancer system. We focused on several specific cancers that are important causes of morbidity and mortality in women in Ontario and looked at the entire trajectory of care from screening through end of life. Figure 4 provides a summary of where sex, age, income, or regional differences were observed.

The Chapter Includes the Following Seven Sections:

- A. General Indicators
- B. Cancer Screening
- C. Colorectal Cancer
- D. Lung Cancer
- E. Breast Cancer
- F. Gynecological Cancers
- G. End of Life Care

Figure 4 | Factors associated with differences in cancer care.

Indicator	Overall Result	Stratification Factor			
		Sex	Age	Income	Region
General Indicators (3 indicators)					
Cancer incidence^	7-96#	Y	Y	Y	Y
Five-year survival^	13-80%	Y	Y	N	N
Surgical wait times^	29-65 days	N	N	Y	Y
Screening (5 indicators)					
Screening mammography	61%	•	Y	Y	Y
Screening FOBT	17%	Y	Y	Y	Y
Screening Pap tests	69%	•	Y	Y	Y
Follow-up of abnormal Pap results	44%	•	Y	Y	Y
Follow-up of inadequate Pap test	35%	•	Y	N	N
Colorectal Cancer (4 indicators)					
Sphincter-sparing surgery in rectal cancer	59%	Y	Y	N	N
Referral to radiation oncology in early stage rectal cancer	60%	Y	Y	N	N
Referral to medical oncology in early stage colon cancer	71%	N	Y	N	Y
Surveillance colonoscopy	79%	N	Y	N	N

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Indicator (continued)	Overall Result	Stratification Factor			
		Sex	Age	Income	Region
Lung Cancer (3 indicators)					
Surgery for non-small cell lung cancer	20%	Y	Y	Y	Y
Adjuvant chemotherapy for non-small cell lung cancer	33%	Y	Y	N	Y
Chemotherapy use in small cell lung cancer	73%	N	Y	N	N
Breast Cancer (5 indicators)					
Breast-conserving surgery	73%	•	Y	N	Y
Axillary node dissection	87%	•	Y	N	N
Radiation after breast-conserving surgery	74%	•	Y	N	Y
Referral to medical oncology in early stage breast cancer	67%	•	Y	N	Y
Surveillance mammography	81%	•	Y	N	N
Gynecological Cancers (4 indicators)					
Primary ovarian surgery by gynecologic oncologist	59%	•	N	N	Y
Postoperative chemotherapy in ovarian cancer	79%	•	N	N	N
Rate of reoperation in ovarian cancer	3.40%	•	N	N	N
Staging procedure by gyne oncologist in uterine cancer	41%	•	N	N	N
End of Life Care (5 indicators)					
Death in acute bed^	47-56%	N	Y	N	Y
Emergency visits in last 2 weeks of life^	31-46%	Y	Y	N	Y
Chemotherapy in last 2 weeks of life^	1.0-7.5%	N	Y	N	Y
Homecare visits in last 6 months of life^	67-78%	N	Y	N	N
Physician housecalls in last 2 weeks of life^	20-28%	N	Y	Y	Y

^ Range is presented across all types of cancers examined

Incidence per 100,000 population

• Not applicable

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A summary of the key findings from the five chapter sections follows (For a summary of overall chapter key findings [click here](#)).

General Indicators

- The incidence of cancer increased with age and survival was worse in older individuals. Worse survival is likely

due to competing risks for death although possible undertreatment of older individuals cannot be ruled out.

- In both colorectal and lung cancer, the incidence rate was higher in men than in women. This is likely due to combination of biologic differences as well as differences in risk factors such as smoking.

- Income was an important factor associated with incidence of certain cancers. Lower-income individuals were more likely to be diagnosed with lung cancer whereas breast and uterine cancer were more likely to be diagnosed in higher-income women.
- Although some regional differences existed in cancer incidence, the differences in survival were much less pronounced.
- Where one lives was the major factor associated with time to surgery suggesting that availability of resources in different regions of the Province may vary. Among women who underwent hysterectomy, wait times for surgery varied depending on indication for surgery—women with cervical cancer waited the longest time while women with ovarian cancer had shorter wait times. Lower-income women had longer median wait times for hysterectomy for gynecological cancers but not for bowel resection for colorectal cancer or mastectomy for breast cancer.

Cancer Screening

- We found that the rates of screening for breast, colorectal and cervical cancer in Ontario were below set provincial targets of 70% for breast cancer screening, 55% for colorectal cancer screening using fecal occult blood testing and 85% for cervical cancer screening. The rates were especially low for colorectal cancer screening.
- Income was significantly associated with all three screening indicators. Individuals from lower-income neighbourhoods had lower screening rates for breast, cervical, and colorectal cancer than those living in higher-income neighbourhoods.
- We found that women were slightly more likely to be screened using fecal occult blood tests (FOBT) than men. While the absolute difference in screening between women and men using FOBT was only 1-2 percent, the population eligible for screening was approximately 2.8 million people, which means that 39,000 more women were screened than men using

FOBT. Of note, other modalities such as colonoscopy can also be used for colorectal cancer screening so the difference seen may be due to differential use of screening modalities between women and men.

- We identified large gaps in follow up of abnormal or inadequate Pap tests with less than half of women with such results receiving recommended follow up care. Very young women were the least likely to have Pap tests and they were also less likely to have appropriate follow up of an abnormal result, whereas post-menopausal women were the least likely to have a repeat test after an unsatisfactory sample.
- There was geographic variation in screening rates across all three cancers and in follow up of abnormal Pap results across the province.

Colorectal Cancer

- Age was the factor most consistently associated with processes of care for colorectal cancer. Older patients were less likely to have a consultation with a medical or radiation oncologist regardless of sex. Age differences in consultation rates were largest for radiation oncology. Age was associated with the use of sphincter-sparing rectal cancer surgeries among women but not men—older women had the lowest rates of sphincter-sparing procedures and younger women had the highest rates.
- There were sex differences in referral to radiation oncology among patients with rectal cancer—women were less likely to be seen by a radiation oncologist than men. Taken together with the age differences in surgery among women with rectal cancer, this suggests that management of rectal cancer may differ between men and women.
- Income was not associated with treatment of colorectal cancer.
- There were regional differences in referral to medical oncology among patients with colon cancer but few regional differences otherwise among indicators examined in this section.

Lung Cancer

- Only 20 percent of Ontario patients diagnosed with non-small cell lung cancer underwent lung resection.
- Age was the factor most strongly and consistently associated with treatment for lung cancer; older patients were less likely to receive surgery or chemotherapy. This observation may reflect a higher burden of comorbidity or different preferences for treatment with increasing age, but undertreatment cannot be ruled out.
- There has been uptake of new recommendations regarding adjuvant chemotherapy for non-small cell lung cancer, which was most pronounced in the younger age group.
- Women with non-small cell lung cancer were more likely to undergo surgery for their cancer than men but there were minimal sex differences in receipt of chemotherapy.
- Living in a higher-income neighbourhood was associated with a slightly higher lung cancer resection rate, but was not associated with use of chemotherapy.
- There were some regional differences in care which were most pronounced for uptake of chemotherapy for non-small cell lung cancer.

Breast Cancer

- Age was the factor most consistently associated with utilization of various treatment modalities for breast cancer. Older women, especially the very elderly (aged 80 and older), were the least likely to undergo breast-conserving surgery, axillary lymph node assessment, receive radiation or have a consultation with a medical oncologist. While some of these differences may be medically appropriate or reflect patient preference, further work is necessary to make sure that these patterns do not reflect bias against treatment among this patient group.
- We did not find income-related differences in breast cancer care among the indicators evaluated.
- There were some regional differences in care. Rates of breast-conserving surgery, radiation after breast-conserving surgery and consultation with a medical oncologist varied significantly across the LHINs.
- Most women with a history of breast cancer received follow up mammography with the exception of the very elderly (aged 80 and older). However, there is a need to ensure that all women receive this follow up when indicated.

Gynecological Cancers

- Age was the factor that was most strongly and consistently associated with treatment for ovarian cancer. In ovarian cancer, older women were less likely to undergo surgery by a gynecologic oncologist and less likely to have adjuvant chemotherapy.
- Where a patient lives appeared to influence which discipline provided the initial surgery for ovarian cancer ([Exhibit 4F.2](#)) and the use of adjuvant chemotherapy. Although some of these findings were not significant due to small sample size, they illustrate that ovarian cancer care delivered in Ontario varied depending on where you live.
- Income was not associated with ovarian cancer care.
- Overall, there was evidence of improvement of care on all three indicators. The percentage of women receiving surgery by a gynecologic oncologist for ovarian cancer has increased since 1996-1998. There was also an increase in the use of adjuvant therapy compared to 1996-2002. There has also been a decrease in the rate of reoperations.
- The surgical care delivered to women with high-risk histology uterine cancer varied by age and where one lived in the province. However, due to small number of cases, a meaningful stratified analysis was not possible.

- There was no variation by income quintile.

End of Life Care

- Over half of patients dying of cancer died in an acute care bed.
- Age was the only factor associated with all the end of life indicators evaluated. Older patients were less likely to receive any of the health care services studied. This may reflect patient preference, a limitation of the methods used (e.g. not capturing care provided in long term care, where older patients may be more likely to reside) or some other factor.
- Region was associated with almost every indicator. The regional variation likely reflected the variation in resources available across regions. It may also be reflective of local/regional management approaches. Home care was the only service where no regional variation was seen.
- Most of the indicators did not vary by sex, except for visits to the emergency department in the last 2 weeks of life. Women with both lung and colorectal cancer were less likely to visit an emergency department than men. Again, this may reflect patient preference or be related to some other factor.
- Neighbourhood income was associated only with physician house calls, where those living in higher-income neighbourhoods were more likely to receive a house call. This may reflect an increased ability of this group to advocate for care or navigate the system or less availability of these services in lower-income communities. Alternatively, perhaps only wealthier patients can afford to support a home death and are in a position to receive house calls.
- Lung cancer patients were more likely to die in hospital and visit the emergency department and were less likely to receive home care or house calls than patients with other types of cancers. The data do not provide a clear idea of why this is happening. It may be a reflection of the challenge this patient population poses with respect to symptom management; it may also reflect the aggressive natural history of lung cancer with an associated decrease in time to plan ahead.

Discussion

In this chapter, we examined the quality of cancer care in Ontario along the entire disease trajectory from screening through end of life care. We assessed differences in quality and outcomes of care between women and men.

We also evaluated how age, income and where one lives affected women and men differently. Stratifying data in this way allowed us to identify where care can be improved for different subgroups of the population. We identified a number of important and potentially modifiable gaps especially pertaining to screening, where clear benchmarks exist. Of concern is that many women who are screened for cervical cancer are not receiving timely follow-up for abnormal or "unsatisfactory" Papanicolaou (Pap) tests. We also found some differences in care by age, sex, income and region across the province (see [Figure 4](#)). The data in this chapter come from administrative records, which do not allow detailed insights into patient experiences with care and treatment decision-making processes, so the picture we developed of Ontario women's cancer care is by no means complete. Nevertheless, we identified many opportunities for improvement, present objective evidence to inform priority setting and provide a baseline from which to measure progress.

Cancer is a significant cause of morbidity and mortality in Ontario. Each year, thousands of Ontario residents are diagnosed with cancer. In this chapter, we focused on cancers that are important causes of morbidity and mortality among women in Ontario. Two of the cancers that we considered affect women and men, namely lung and colorectal cancer. For these two cancers, incidence is greater in men than women though we know that sex differences in lung

cancer incidence are narrowing, due in large part to increased uptake of smoking among women. Income also mattered when it came to incidence and mortality especially in lung cancer; Ontario residents from lower-income neighbourhoods were more likely to be diagnosed with lung cancer and less likely to be alive five years after diagnosis. Not unexpectedly, cancer incidence increased with age reflecting the natural biology of cancer. The chance that a cancer patient survived five years following diagnosis varied significantly between cancer sites and was especially poor for lung cancer. Older individuals were less likely to survive five years following a cancer diagnosis, which may reflect competing risks of death although possible undertreatment of elderly individuals cannot be ruled out.

Screening rates in Ontario for breast and cervical cancers remain below their targets of 70% for breast cancer screening and 85% for cervical cancer screening, despite the existence of long standing, organized screening programs for breast and cervical cancer in Ontario. Women residing in lower-income neighbourhoods were the least likely to be screened. This indicates that some women are falling through the cracks. In 2007, the province introduced a vaccination program for human papilloma virus (HPV), aimed at grade eight girls, but this will not eliminate the need for Pap tests. The vaccine protects against only 70 to 80 percent of cervical cancers caused by the virus, so regular screening by Pap smear once women become

sexually active is still recommended.¹⁵⁰ Furthermore, the majority of women currently eligible for cervical cancer screening have not been vaccinated and thus need to continue regular screening.

Colorectal cancer screening rates are especially low although they are improving as reported in this year's Cancer System Quality Index.²⁹ Women and men residing in lower-income neighbourhoods were less likely to be screened than those residing in higher-income neighbourhoods. ColonCancerCheck, implemented in April 2008, is a recent province-wide initiative to improve screening for colorectal cancer using fecal occult blood testing and may lead to further improvement in screening rates, however, this is a relatively new program that was formally introduced after the years examined this chapter.

One option for increasing the rates of screening is to implement integrated screening programs. Many women are eligible for more than one type of screening program and "one-stop shopping" models could increase compliance by letting women get all the tests they need at one time. We did not look at the proportion of women who received all indicated screening services, but there is evidence that these rates are very low.²⁹ Also, since the data show lower-income women are less likely to be up-to-date on screening, special interventions designed to reduce the barriers they encounter may be worthwhile.

Screening itself is not enough and timely follow up of abnormal results is essential for cancer screening to work appropriately. It is concerning that among women who do undergo cervical cancer screening using a Pap test the **follow up of abnormal or inadequate screening results was suboptimal** with less than half of such women receiving recommended follow up. Additional systems are necessary to facilitate timely and appropriate follow up of abnormal screening results.

Some sex differences existed but these were not pronounced. We found sex differences in incidence and survival for lung and colorectal cancer. These have been previously documented and likely reflect a combination of biologic as well as social factors. For example, although women who smoke have a higher risk of lung cancer than men who smoke, smoking rates are higher in men than women (see *Burden of Illness, Chapter 3*), which may explain the higher incidence of lung cancer in men. When it came to treatment, we identified few sex differences except in the management of rectal cancer. There was no difference between men and women with rectal cancer in the proportion who received an operation which preserved the anal sphincter, but younger women were more likely than younger men to have such a surgery whereas older women were less likely than older men to undergo sphincter-sparing surgery. Women with rectal cancer were less likely to be assessed by radiation oncology than men, regardless of age. Further work is necessary to understand these sex differences in rectal cancer care. At the end of life, women are less likely to receive aggressive or high acuity services and more likely to receive support care services than men, but these differences were small.

Age is a very important determinant of cancer treatment. We identified age-related differences in treatment for all of the cancers evaluated in this chapter and across all treatment types. Age-related treatment differences are well documented in cancer care, especially in giving radiation and chemotherapy, but we know much less about the reasons for those differences. It is likely that some older patients choose not to have aggressive treatment,¹⁵¹ but emerging data also suggest physicians may have a bias toward undertreating the elderly.¹⁶ That could be because of lack of direct evidence that treatment benefits older cancer patients (most clinical trials enroll younger and fitter patients) or out of concern that treatments may

be more toxic for older patients, or it could be doctors do not think it worthwhile to put an older patient through treatment. However, evidence suggests the relative benefits of treatment for the elderly are similar to those seen for cancer patients in general, though decision making for treatment becomes more complex as life expectancy, co-existing illnesses, and functional status all need to be considered.⁷³ With the aging of the population, an increased focus on the needs of older persons with cancer will be needed. Older women are more likely than men to have lower incomes, live alone, be caregivers, and have multiple chronic conditions and comorbidities (see *Burden of Illness, Chapter 3*). Addressing age-related issues in cancer care will require addressing these gender differences in health and social circumstances.

We found that income mattered when it came to incidence, survival and cancer screening but was generally not an important factor when it came to cancer treatment. Since we did not have data on individual patient income, our data are based instead on average neighbourhood income. We found that lung cancer was more commonly diagnosed in people living in lower-income neighbourhoods whereas breast cancer was more commonly diagnosed in women living in higher-income neighbourhoods, which has been previously described by Mackillop and colleagues.³⁹ Other work from this group also found lower rates of survival among people diagnosed with cancer from lower-income neighbourhoods compared to those from higher-income neighbourhoods although the magnitude of the effect was dependent on the type of cancer¹⁰¹ and the difference in survival between the lowest and the highest income groups was less in Ontario than in the United States.¹⁵² Of concern, people who lived in lower-income neighbourhoods had consistently lower screening rates for breast, cervix and colorectal cancer, but fortunately few differences in the treatments they received after diagnosis of cancer. That

suggests they may have less access to the healthcare system when well, but once they are diagnosed with cancer they get care that is similar to better-off individuals.

Where you live in Ontario affected all aspects of cancer care. Rates for all types of medical care from screening to end of life care varied depending on where in the province a patient lived. Regional differences were most consistently seen in surgical care and medical oncology; differences in chemotherapy use across the province were especially pronounced. There were fewer regional differences in delivery of radiation therapy than chemotherapy.

Outcomes for lung cancer were especially poor. Lung cancer is the number one cause of cancer deaths in Ontario. Few patients undergo surgery, which is the only potentially curative option for patients with non-small cell lung cancer. Recent evidence suggests chemotherapy following surgery^{88, 89} can improve survival and our data show this new evidence is being applied and more people are getting adjuvant chemotherapy, which in time we hope will translate into better survival among patients who are eligible for surgery. People with lung cancer also have unique patterns of care at the end of their lives, with much higher use of acute care services but less use of in home care.

We found good news as well. We found few disparities associated with income in cancer treatment for most of the cancer types and indicators that we examined. For some indicators where we had earlier provincial data, we could see cancer care in Ontario was improving. Ovarian cancer has a fairly high death rate, but a higher proportion of women with this type of cancer had their surgery performed by a gynecologic oncologist and more patients underwent adjuvant chemotherapy following surgery. However, we cannot say based on our analysis whether this improved treatment has translated into better outcomes for patients.

Finally, our report illustrates the **importance of looking at subgroups of individuals** when evaluating quality of care. Stratification by age, sex, income or other factors allows us to identify specific subgroups of individuals who are more vulnerable which in turn can identify areas for further study or facilitate targeted improvement efforts.

Reducing Cancer Burden and Improving Cancer Care: Different Approaches

Measurement of quality is only the first step towards improving care. Once gaps in care are found, identification and implementation of interventions to improve care is an essential next step. While a lot of work has been done in recent years in evaluating quality of cancer care around the world^{29, 153-155} the evidence base on interventions that effectively improve cancer care is more limited, underscoring an urgent need for formal evaluation of models of improvement that are specific to oncology. Some emerging examples of cancer specific interventions, some of which have been shown to affect quality of cancer care, can be found in Reducing Cancer Burden and Improving Cancer Care: Different Approaches.

We have reported the results of these analyses so that the findings can be used to inform and guide efforts to reduce cancer burden and improve cancer care. Well-defined strategies, including the Ontario Cancer Plan, Cancer 2020, the Canadian Partnership Against Cancer Strategic Plan, and the Ontario Ministry of Health End of Life Care Strategy lay out a roadmap to doing so. The indicators we report support the objectives of these strategies (Appendix 4.1). While evidence for what works to achieve these goals is limited, there are a number of different approaches that can lead to improvement (see Reducing Cancer Burden and Improving Cancer Care: Different Approaches). Policy interventions can support improvement at both the population and health system level. At the population

level, reducing exposure to occupational and environmental exposure to known carcinogens and reducing the prevalence of cancer risk factors (i.e. smoking, obesity, physical inactivity, poor diet, alcohol abuse) can result in reduced cancer burden.^{156, 157} Interventions aimed at the health system, provider, and patient level can all lead to improvements in cancer care.¹⁵⁸ Many quality improvement initiatives and innovations aimed at improving cancer care are underway in diverse settings. By studying what works (and what doesn't) in which settings and with which populations, we can build the evidence base for effective interventions to improve cancer outcomes and reduce cancer-related health inequities.

Limitations

A number of limitations of our work should be noted. Our biggest challenges were related to data. Because we could not get precise data on cancer stage, many important indicators were not feasible and were excluded. For example, diagnosis of breast, cervical, or colorectal cancer at a late stage can indicate barriers to accessing care for earlier diagnosis. However, Cancer Care Ontario in collaboration with the Canadian Partnership Against Cancer have been working hard to improve stage capture in Ontario. As reported by the 2009 Cancer System Quality Index (CSQI), there has been significant progress in increasing the percentage of cancer cases in Ontario that have valid staging information—achieving the target of 90% for cases seen by regional cancer centres and reaching a 68% valid stage rate for new cancer cases overall.²⁹

In the future the availability of stage data at the time of diagnosis, will allow measurement of these indicators as well as additional and more precise indicators of quality. Some of those indicators we did include were only feasible if we made assumptions to permit analysis.

There were other data limitations, inherent in administrative data, including limited clinical information and

not knowing when patient preference played a role in treatment decisions. That meant we could not judge whether surgical procedures were appropriate or assess the quality of those procedures. Also, the data available did not let us look at differences in use of evolving surgical procedures (such as sentinel lymph node biopsy for breast cancer). Lastly, it is challenging to report on quality in real time because some of the data sources, such as the Ontario Cancer Registry, need time to receive and verify the data.

This chapter is an extensive but not completely comprehensive look at the cancer system. The indicators we used were selected using a rigorous and systematic process, but there were many others we could have used. We focused on six important cancers that cause sickness and death in Ontario women, but many less common cancers were excluded. With some of the less common cancers we did look at, such as uterine cancer, the sample size was too small for us to do reliable stratified analysis.

What Can't be Measured?

Lack of precise staging data was by far the most limiting factor in our choice of indicators, but with the latest improvements in stage capture reported by CSQI, this will greatly facilitate assessment of quality of cancer care in the province in the future. However, we also could not use some of the indicators we originally selected because of data issues. These included: using pre-operative ultrasound as part of staging for ovarian cancer (ultrasounds done in hospitals are covered by global budgets and cannot be reliably captured in administrative data); follow up of abnormal Pap smears among women with high-risk human papilloma virus (the province does not pay to test for the virus); and completion of chemoradiation among women with cervical cancer (because OHIP data do not reliably capture dates of chemotherapy). Lack of data on ethnicity prevented us from assessing health inequities across the continuum of cancer care associated with ethnicity.

KEY MESSAGES

We took a broad look at cancer and cancer care in the province, focusing on gender, socioeconomic and regional variations in cancer burden and health system performance. Our findings point to a number of key areas for intervention and improvement. For many indicators, there were sizable variations across the Local Health Integration Networks (LHINs). Cancer Care Ontario is working to reduce regional variations in cancer care. The results of our analyses are available for the LHINs to use in their priority setting, planning and quality improvement activities. The following five actions can help accelerate progress in reducing the burden of cancer, improving health outcomes among cancer patients and reducing cancer-related health inequities. Successful adoption of these actions needs to take into account gender and socioeconomic

differences in cancer incidence and experiences with care.

Reduce Cancer-Related Health Inequities by Focusing on Prevention and Screening

- Increased emphasis on cancer prevention—integrating population health, community and clinical approaches is essential to reduce the burden of illness due to cancer in Ontario. Many of the risk factors for cancer are the same as for the development of other chronic diseases such as cardiovascular disease—smoking, physical inactivity, obesity, and poor diets ([see Burden of Illness, Chapter 3](#)). Prevention interventions need to address the social determinants of health, be gender sensitive and target those who are socioeconomically disadvantaged and therefore at greatest risk.

- There is a need to improve screening initiatives for all Ontarians and make special efforts to reach people who live in lower-income communities, where screening rates are the lowest.

Screening Programs are Not Enough. A System for Ensuring Follow-Up of Abnormal Screening Tests is Necessary

- As we work to reach cancer screening targets we need a system to ensure that abnormal screening tests are followed up. Cervical cancer follow up could be improved by making the reporting system database easily accessible to practitioners, labs and even patients, or by using the database to call patients back for both regular screening and assessment of abnormal tests. Rapid assessment units may also facilitate work-up of abnormal screening tests.
- Data development to assess follow up of abnormal mammograms and fecal occult blood tests (FOBT) for colorectal cancer screening will be required to extend this objective beyond cervical cancer screening.

Address the Unique Needs of an Aging Population in Cancer Care Delivery

- The elderly represent a unique subgroup of cancer patients with a high burden of disease, competing health problems and lack of direct evidence for treatment benefit. Importantly, the incidence of cancer is highest in this age group. Specific strategies for managing cancer in the elderly are needed to ensure elderly individuals are being treated appropriately, reflecting existing evidence and patient wishes.
- The unique needs of older women, who comprise the majority of the elderly population, and who have higher levels of comorbidity, disability, and poverty, need to be addressed within this strategy.

Focus on Prevention and End of Life Issues for Lung Cancer as Prognosis is Poor and Much Lung Cancer is Preventable

- Continue to develop lung cancer specific strategies for decreasing burden relating to this diagnosis. Since the natural history of the disease is short, a focus on prevention by targeting smoking is key and is the goal of the Ontario Tobacco Strategy. However, interventions to meet the needs of those affected by the disease, ensuring timely access to investigations and treatment and addressing the unique end of life issues particular to this patient population are also very important.

Improve Quality, Availability and Timeliness of Data to Assess Cancer and Cancer Care in the Province

- While data quality and availability to assess cancer and cancer care in the province have improved, there is still much to be done to improve the quality, availability and timeliness of data.
- Knowing the stage of cancer determines treatment and outcomes and will significantly improve our ability to evaluate how the cancer system is performing; data on how patients feel about their care would help improve the assessment of patient experiences with care and data on ethnicity would allow us to better assess whether the cancer system is performing equitably for all Ontarians.

Reducing the Cancer Burden and Improving Cancer Care: Different Approaches

In this chapter we presented results pertaining to quality of cancer care in Ontario with a focus on equity issues.

However, measurement is only the first step towards improving care. Once gaps in care are found, identification and implementation of interventions to improve care are essential next steps. Quality improvement interventions can take many forms, but are usually targeted at one of either the policy, practice, provider or patient levels.¹⁵⁸ While a lot of work has been done in recent years in evaluating quality of cancer care around the world,^{29, 153-155} the evidence base on interventions that effectively improve cancer care is more limited. This underscores an urgent need for formal evaluation of models of improvement that are specific to oncology. Some emerging examples of cancer-specific interventions some of which have been shown to affect quality of cancer care are below.

Reducing Risk—Population Based Health Promotion

Smoking is one of the most important known risk factors for cancer. Smoke-Free Ontario (http://www.mhp.gov.on.ca/english/health/smoke_free/default.asp)¹⁵⁹ is a comprehensive, provincial strategy whose goal is to reduce the health effects of smoking. It is a multi-faceted initiative that combines policy, practice and patient level interventions in order to decrease the burden of tobacco in the Ontario population. Public education on the risks of smoking, support to people wanting to quit smoking and legislation to protect people from exposure to second hand smoke are some of the key aspects of the strategy. Smoke-Free Ontario has had success in reducing overall smoking rates in the

province. However, smoking rates remain high among low-income, less educated, and Aboriginal Ontarians, which over time could widen inequities in lung cancer incidence (see *Burden of Illness*, Chapter 3). Thus, to be most effective, population-based health promotion efforts must also specifically target at-risk population subgroups.

Quality Improvement Collaboratives

The Cancer Collaborative (<http://www.healthdisparities.net/hdc/html/collaboratives.topics.cancer.aspx>)¹⁶⁰ was launched in 2001 to close the gap in cancer screening between the general population and low-income and minority populations in the United States by improving cancer screening rates among patients served by Federally Qualified Health Centers, community health centres that provide a disproportionate amount of care to these disadvantaged populations. The intervention is aimed at the “practice” level of care and focuses on changing delivery of care within the health centres to ensure appropriate and timely cancer screening takes places including follow up of abnormal results. Individual health centres are provided with a toolkit, which allows for the intervention to be tailored to the specific centre, taking into account existing evidence and local practices and environment. A formal evaluation of this model as applied to improvement of colorectal cancer screening in four community health centres in the US has recently been published and shows that it can result in improvement in screening rates.¹⁶¹

Performance Measurement and Reporting

In recent years there has been tremendous interest in including cancer specific measures as part of the process of performance measurement and reporting. In the US, Healthcare Effectiveness Data and Information Set (HEDIS), one of the original nationwide performance measurement initiatives, publicly reports on health plan performance using validated quality indicators.¹⁶² While HEDIS does not specifically report the interventions implemented to improve care, it does track performance over time and includes indicators for breast, cervical, and colorectal cancer screening.

Ontario was the first Canadian province to develop a province wide cancer-specific performance measurement system, the Cancer System Quality Index (CSQI), which was launched in 2005. (<http://www.cancercare.on.ca/ocs/qpi/csqi/>)²⁹ Since its inception, the CSQI has reported annually on various aspects of cancer system quality across the continuum of care. Indicators in the CSQI are targeted for improvement by Cancer Care Ontario through quality improvement initiatives. The Index has provided baseline information on how the cancer system in Ontario is performing at the population level identifying areas where cancer care has improved, where cancer care needs improvement and provides an ongoing metric of how quality of cancer care is changing in the province.

Engaging Physicians

Providers are key players in the delivery of care to cancer patients and therefore a logical target for quality improvement interventions. Although some controversies exist, the number of lymph nodes retrieved at the time of surgery in patients with colon cancer has been a frequently recommended measure of quality in this disease.¹⁶³ Suboptimal lymph node sampling in patients with colon cancer has been identified as a potential quality gap both in Ontario¹⁶⁴ as well as elsewhere.¹⁶⁵ ¹⁶⁶ In response, a number of physician-targeted initiatives have evolved to address this issue. An Ontario-based group performed a randomized trial of 42 hospitals. They

compared an educational lecture about colon cancer lymph node assessment delivered by an expert opinion leader to the same lecture plus a more in depth consultation regarding barriers to lymph node retrieval and solutions for improvement from an expert opinion leader in colon cancer.¹⁶⁷ The researchers found that lymph node assessment improved after the lecture in both arms without additional benefit seen from the consultation. This trial provides evidence that provider-directed interventions can change the processes of care, which will hopefully ultimately result in improved patient outcomes. It also highlights the importance of formally evaluating quality of care initiatives in order to understand what components of the intervention are most likely to improve care.

Engaging and Supporting Patients

Engaging and supporting patients is another potential avenue through which quality of care can be improved. In the setting of cervical cancer screening, patient-directed interventions such as telephone or mail reminders and provision of print educational materials have been shown to increase follow up rates among patients with abnormal results.¹⁵⁸ Another potential mechanism for supporting patients, especially those from vulnerable populations, is the use of patient navigators. To date, there is some evidence that patient navigators can improve screening rates but less is known about how effective they are at improving care after a cancer diagnosis.¹⁶⁸

Need to Build Evidence Base

As mentioned already, there is growing information on how cancer systems around the world are performing, but the literature to guide us how to improve cancer care is much more limited. This discordance between knowing the quality of cancer care versus knowing how to improve it underscores the urgent need to build a strong, valid evidence base of formal research and evaluation of cancer-specific quality improvement interventions and initiatives. In order to create such a base, improvement efforts need to be undertaken in a systematic way with formal evaluation built in from the start.

Appendix 4.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section A – General Indicators			
Cancer incidence (breast, lung, colorectal, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> • Reduce the incidence of cancer (A) • Increase access to cancer prevention services and improve healthy behaviours (B) • To reduce the expected number of new cases of cancer among Canadians (C) 	<ul style="list-style-type: none"> • Effective • Equitable • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health
Five-year survival rate (breast, lung, colorectal, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> • Reduce the impact of cancer through effective screening and earlier detection (A, E) • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To lessen the likelihood of Canadians dying from cancer (C) 	<ul style="list-style-type: none"> • Effective • Equitable • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve access to appropriate health services • Improve safety and effectiveness of health services

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section A – General Indicators			
Wait times for surgery (breast, colon, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high quality cancer care (A) • Improve access to cancer services and reduce waiting times (B) • Make hospital boards accountable for equitable access to services in their organizations and, in the long term, making LHINs accountable for monitoring and ensuring access to services in their areas (D) • Use capacity efficiently and effectively, and providing appropriate resources (D) 	<ul style="list-style-type: none"> • Accessible • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes
Section B – Cancer Screening			
Breast cancer screening	<ul style="list-style-type: none"> • Reduce the impact of cancer through effective screening and earlier detection (A) • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Increased cancer screening rates (E) 	<ul style="list-style-type: none"> • Effective • Focused on Population health • Accessible • Equitable 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve healthy behaviours, health promotion and disease prevention
Colorectal cancer screening	<ul style="list-style-type: none"> • Increased cancer screening rates (E) • Reduce the impact of cancer through effective screening and earlier detection (A) 	<ul style="list-style-type: none"> • Effective • Focused on Population health • Accessible • Equitable 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section B – Cancer Screening			
Colorectal cancer screening (continued)	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Reduce the number of new cases of cancer (A, C) 		<ul style="list-style-type: none"> • Improve healthy behaviours, health promotion and disease prevention
Cervical cancer screening	<ul style="list-style-type: none"> • Increased cancer screening rates (E) • Reduce the impact of cancer through effective screening and earlier detection (A) • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Reduce the number of new cases of cancer (A, C) 	<ul style="list-style-type: none"> • Effective • Focused on Population health • Accessible • Equitable 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve healthy behaviours, health promotion and disease prevention
Cervical cancer screening - follow-up after a low-grade lesion on Papanicolaou (Pap) test	<ul style="list-style-type: none"> • Reduce the incidence of cancer (A, C) • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Integrated 	<ul style="list-style-type: none"> • Improve integration of health service providers, processes, and systems • Improve healthy behaviours, health promotion and disease prevention
Cervical cancer screening - follow-up after an "unsatisfactory" Papanicolaou (Pap) test result	<ul style="list-style-type: none"> • Reduce the incidence of cancer (A, C) • Reduce the impact of cancer through effective screening and earlier detection (A) • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) 	<ul style="list-style-type: none"> • Focused on Population health • Accessible • Effective • Equitable • Integrated 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve integration of health services providers, processes, and systems • Improve healthy behaviours, health promotion and disease prevention

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section C – Colorectal Screening			
Use of sphincter-sparing procedures for rectal cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) • Enhance the quality of life of those living with cancer (C) 	<ul style="list-style-type: none"> • Effective • Equitable • Patient-centred 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve safety and effectiveness of health services • Improve access to appropriate health services
Referral to radiation oncology in patients with resectable rectal cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Accessible • Effective • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve integration of health services providers, processes, and systems
Referral to medical oncology following resection of colon cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Accessible • Effective • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve integration of health services providers, processes, and systems
Surveillance colonoscopy after resection of colorectal cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To lessen the likelihood of Canadians dying from cancer (C) 	<ul style="list-style-type: none"> • Effective • Accessible • Equitable • Integrated 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve integration of health services providers, processes, and systems • Improve clinical and population health outcomes

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section D – Lung Cancer			
Surgery for non-small cell lung cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) 	<ul style="list-style-type: none"> • Effective • Accessible • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve safety and effectiveness of health services
Percentage of non-small cell lung cancer patients treated with systemic therapy within six months of surgery	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve chronic disease management • Improve access to appropriate health services
Use of chemotherapy for small cell lung cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes
Section E – Breast Cancer			
Breast-conserving surgery	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) 	<ul style="list-style-type: none"> • Effective • Patient-centred 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve safety and effectiveness of health services

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section E – Breast Cancer			
Axillary lymph node dissection	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve safety and effectiveness of health services
Radiation therapy after breast-conserving surgery	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve safety and effectiveness of health services
Assessment by medical oncologist	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve safety and effectiveness of health services • Improve integration of health services providers, processes, and systems
Annual surveillance mammography among breast cancer survivors	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To lessen the likelihood of Canadians dying from cancer (C) 	<ul style="list-style-type: none"> • Effective • Accessible • Equitable • Integrated 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes, and systems • Improve access to appropriate health services

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section F – Gynecological Cancers			
Primary ovarian cancer surgery by a gynecologic oncologist	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes, and systems • Improve access to appropriate health services
Postoperative chemotherapy for ovarian cancer	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Improve safety and effectiveness of health services
Rate of reoperation	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Safe • Effective • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services
Patients referred to a gynecologic oncologist for a staging procedure	<ul style="list-style-type: none"> • Ensure timely access to effective diagnosis and high-quality cancer care (A) • Improve the performance of Ontario's cancer system (A) • To increase the use of evidence and innovation in decision-making (B) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes, and systems • Improve safety and effectiveness of health services

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section G – End of Life Care			
Death in an acute-care bed (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> To shift care of the dying from acute care settings to appropriate settings of individual preference (F) To enhance client-centred and interdisciplinary service delivery capacity in the community (F) To improve access, coordination and consistency of services across the province (F) 	<ul style="list-style-type: none"> Effective Accessible Efficient Patient-centred 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve access to appropriate health services
Emergency department visit in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> To shift care of the dying from acute care settings to appropriate settings of individual preference (F) To enhance client-centred and interdisciplinary service delivery capacity in the community (F) To improve access, coordination and consistency of services across the province (F) 	<ul style="list-style-type: none"> Accessible Efficient Integrated Appropriately resourced Patient-Centred 	<ul style="list-style-type: none"> Improve access to appropriate health services Improve safety and effectiveness of health services
Chemotherapy in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> To shift care of the dying from acute care settings to appropriate settings of individual preference (F) To enhance client-centred and interdisciplinary service delivery capacity in the community (F) To improve access, coordination and consistency of services across the province (F) 	<ul style="list-style-type: none"> Safe Effective Efficient Patient-Centred 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Increase productive use and appropriate distribution of resources across the system

APPENDIX 4.1 | Indicators and their links to provincial strategic objectives including Cancer Control Strategies, Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cancer Control Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section G – End of Life Care			
Home care visits in the last six months of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> • To shift care of the dying from acute care settings to appropriate settings of individual preference (F) • To enhance client-centred and interdisciplinary service delivery capacity in the community (F) • To improve access, coordination and consistency of services across the province (F) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Accessible • Integrated • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient centeredness
Physician house calls in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> • To shift care of the dying from acute care settings to appropriate settings of individual preference (F) • To enhance client-centred and interdisciplinary service delivery capacity in the community (F) • To improve access, coordination and consistency of services across the province (F) 	<ul style="list-style-type: none"> • Effective • Accessible • Integrated • Appropriately resourced • Patient-Centred 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient centeredness

- A. Ontario Cancer Plan - 2008-2011. Cancer Care Ontario. Accessed July 6, 2009 at <http://www.cancercare.on.ca/common/pages/UserFile.aspx?fileId=13808>¹⁶⁹
- B. Cancer Care Ontario. Cancer System Quality Index (CSQI) 2009. Accessed July 19, 2009 at <http://csqi.cancercare.on.ca>²⁹
- C. Strategic Plan 2008 - 2012. Canadian Partnership Against Cancer. Accessed July 19, 2009 at http://www.partnershipagainstcancer.ca/sites/default/files/documents/reports/Strategic_Plan_2008_2012_Feb2008.pdf¹⁷⁰
- D. The Wait Time Strategy. Ontario Ministry of Health and Long-Term Care. Accessed July 6, 2009 at http://www.health.gov.on.ca/transformation/wait_times/providers/wt_strategy.html¹⁷¹
- E. Report on Cancer 2020. A Call for Renewed Action on Cancer Prevention and Detection in Ontario. Cancer Care Ontario. Accessed July 7, 2009 at <http://www.cancercare.on.ca/about/initiatives/cancer2020/>¹⁵⁶
- F. Ontario's End of Life Care Strategy. Ministry of Health and Long-Term Care. Accessed July 7, 2009 at <rgps.on.ca/slides/ohavida2005.ppt>¹⁷²

Appendix 4.2

INDICATORS AND THEIR SOURCES

APPENDIX 4.2 | Indicators and Their Sources

Indicator	Indicator Source(s)	Data Source(s)
Section A – General Indicators		
Cancer incidence (breast, lung, colorectal, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> Association of Public Health Epidemiologists of Ontario (APHEO) Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)
Five-year survival rate (breast, lung, colorectal, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) Women's Health Surveillance Report - Health Canada, 2003¹⁷³ 	Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)
Wait times for surgery (breast, colon, ovary, uterus, and cervical cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR), Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)
Section B – Cancer screening		
Breast cancer screening	<ul style="list-style-type: none"> Canadian Task Force on Preventive Health Care Ontario Cancer System Quality Index (CSQI) 	Ontario Breast Screening Program (OBSP); Ontario Health Insurance Plan (OHIP); Ontario Cancer Registry (OCR); Registered Persons Database (RPDB)
Colorectal cancer screening	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); Ontario Cancer Registry (OCR)
Cervical cancer screening	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) Healthcare Effectiveness Data and Information Set (HEDIS) 	Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Cervical cancer screening - follow-up after a low-grade lesion on Papanicolaou (Pap) test	<ul style="list-style-type: none"> RAND Corporation (Research and Development) - Health and Health Care¹⁷⁴ 	Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Canadian Institute for Health Information Distract Abstract Database (CIHI-DAD); Ontario Cancer Registry (OCR)

APPENDIX 4.2 | Indicators and Their Sources

Indicator	Indicator Source(s)	Data Source(s)
Section B – Cancer screening		
Cervical cancer screening - follow-up after an “unsatisfactory” Papanicolaou (Pap) test result	<ul style="list-style-type: none"> American Society for Colposcopy and Cervical Pathology (ASCCP) guidelines¹⁷⁵ 	Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); CytoBase; Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Section C – Colorectal Cancer		
Use of sphincter-sparing procedures for rectal cancer	<ul style="list-style-type: none"> Agency for Healthcare Research and Quality (AHRQ) Cancer Care Quality Measures: Diagnosis and Treatment of Colorectal Cancer⁷⁷ 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)
Referral to radiation oncology in patients with resectable rectal cancer	<ul style="list-style-type: none"> National Initiative for Cancer Care Quality (NICCCQ) National Cancer Policy Board¹⁵⁵ 	Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB); Registered Persons Database (RPDB)
Referral to medical oncology following resection of colon cancer	<ul style="list-style-type: none"> National Initiative for Cancer Care Quality (NICCCQ) Agency for Healthcare Research and Quality (AHRQ) Cancer Care Quality Measures: Diagnosis and Treatment of Colorectal Cancer⁷⁷ 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB); ICES Physician Database (IPDB)
Surveillance colonoscopy after resection of colorectal cancer	<ul style="list-style-type: none"> Agency for Healthcare Research and Quality (AHRQ) Cancer Care Quality Measures: Diagnosis and Treatment of Colorectal Cancer⁷⁷ 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)
Section D – Lung Cancer		
Surgery for non-small cell lung cancer	<ul style="list-style-type: none"> Improving the lung cancer resection rate in the US Department of Veterans Affairs Health System⁸⁷ 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

APPENDIX 4.2 | Indicators and Their Sources

Indicator	Indicator Source(s)	Data Source(s)
Section D – Lung Cancer		
Percentage of non-small cell lung cancer patients treated with systemic therapy within six months of surgery	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB), Ontario Health Insurance Plan (OHIP)
Use of chemotherapy for small cell lung cancer	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) NICE Guideline: The Diagnosis and Treatment of Lung Cancer: Guideline 24¹⁷⁶ 	Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)
Section E – Breast Cancer		
Breast-conserving surgery	<ul style="list-style-type: none"> Agency for Healthcare Research and Quality (AHRQ) Measuring the Quality of Breast Cancer Care in Women¹⁷⁷ 	Ontario Cancer Registry (OCR), Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB)
Axillary lymph node dissection	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) National Initiative for Cancer Care Quality (NICCQ) 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Radiation therapy after breast-conserving surgery	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) National Initiative for Cancer Care Quality (NICCQ) 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)
Assessment by medical oncologist	<ul style="list-style-type: none"> RAND Corporation (Research and Development) Quality Indicators¹⁷⁸ 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)
Annual surveillance mammography among breast cancer survivors	<ul style="list-style-type: none"> RAND Corporation (Research and Development) Quality Indicators¹⁷⁸ 	Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)

APPENDIX 4.2 | Indicators and Their Sources

Indicator	Indicator Source(s)	Data Source(s)
Section F – Gynecological Cancers		
Primary ovarian cancer surgery by a gynecologic oncologist	<ul style="list-style-type: none"> Cancer Care Ontario: Ovarian cancer surgery quality indicators¹⁷⁹ 	Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); ICES Physician Database (IPDB); Ontario Health Insurance Plan (OHIP)
Postoperative chemotherapy for ovarian cancer	<ul style="list-style-type: none"> Outcomes for systemic therapy in women with ovarian cancer¹³³ 	Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Rate of reoperation	<ul style="list-style-type: none"> Outcomes for systemic therapy in women with ovarian cancer¹³³ 	Registered Persons Database (RPDB); Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Patients referred to a gynecologic oncologist for a staging procedure	<ul style="list-style-type: none"> American College of Obstetricians and Gynecologists, practice guideline 65¹⁸⁰ 	Ontario Cancer Registry (OCR); Registered Persons Database (RPDB); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Section G – End of Life Care		
Death in an acute-care bed (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Emergency department visit in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)
Chemotherapy in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Ontario Health Insurance Plan (OHIP); Registered Persons Database (RPDB)
Home care visits in the last six months of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB)
Physician house calls in the last two weeks of life (lung, colorectal, breast or gynecological cancers)	<ul style="list-style-type: none"> Ontario Cancer System Quality Index (CSQI) 	Ontario Cancer Registry (OCR); Ontario Home Care Administrative System (OHCAS); Registered Persons Database (RPDB); Ontario Health Insurance Plan (OHIP)

Appendix 4.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators we report are the result of a rigorous selection process, which included an extensive literature review of peer-reviewed and grey literature (see [Chapter 1](#) for a more detailed description of the indicator selection process).^{77, 87, 133, 155, 173-180} The review of the literature identified approximately 400 indicators. The working group reviewed the indicators using the defined indicator selection criteria and prepared a list containing potential indicators for inclusion for review by a Technical Expert Panel (TEP). Indicators were then selected through a modified Delphi process by the TEP using a two step process - first through an online questionnaire and then at a face-to-face meeting on February 23, 2007. The final list included 31 cancer indicators (See [Appendix 4.1](#) or [4.2](#) for a complete indicator list).

All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators were first stratified by sex, and then further stratified by socioeconomic variables (age, income) as allowed by sample size and data availability. At the LHIN level, indicators were stratified by sex, and then by age and income as allowed by sample size and data availability.

2. Datasets

Registered Persons Database (RPDB)

The RPDB is a historical listing of the unique health numbers issued to each person eligible for Ontario health services. This listing includes corresponding

demographic information such as date of birth, sex, address, date of death (where applicable) and changes in eligibility status. When new RPDB data arrive at ICES, personal information such as name and street address is removed, and each unique health number is converted into an anonymous identifier, ensuring the protection of each individual's privacy. The RPDB overestimates the number of people living in Ontario for several reasons. Although improvements have been made in recent years, the RPDB still contains a substantial number of individuals who are deceased or no longer living in Ontario. To ensure that rates and estimates are correct, a methodology has been developed to adjust the RPDB so that regional population counts by age and sex match estimates from Statistics Canada.¹⁸¹

Ontario Cancer Registry (OCR)

The OCR database includes all Ontario residents who have been diagnosed with cancer or have died from cancer. The OCR collects data from four major sources including: hospital discharge summaries with a diagnosis of cancer; pathology reports that identify cancer; records of patients from regional cancer centres or Princess Margaret Hospital; and/or death certificates that identify cancer as the underlying cause of death. Records are verified and the data are summarized into case records including several variables such as incident site, age at diagnosis and residence at diagnosis. The Ontario Cancer Incidence Database is updated annually, although there is a two-year lag period before the data become available for analysis.

Ontario Health Insurance Plan (OHIP)

The OHIP claims database covers all reimbursement claims to the Ontario Ministry of Health and Long-Term Care, made by fee-for-service physicians, community-based laboratories and radiology facilities. The OHIP database at ICES contains encrypted patient and physician identifiers, code for service provided, date of service and the associated diagnosis and fee paid. Services which are missing from the OHIP claims data include: some lab services; services received in provincial psychiatric hospitals; services provided by health service organizations and other alternate funding plans; diagnostic procedures performed on an inpatient basis and lab services performed at hospitals (both inpatient and same day). Also excluded is remuneration to physicians through Alternate Fee Plans (AFPs). Their concentration in certain specialties or geographic areas could distort an analysis.

ICES Physician Database (IPDB)

The IPDB contains information on physician demographics and specialty training. The IPDB incorporates information from the Corporate Provider Database (CPDB), the Ontario Physician Human Resource Data Centre (OPHRDC) database and the OHIP database of physician billings. The CPDB contains information about physician demographics, specialty training and certification and practice location. This information is validated against the OPHRDC database, which verifies this information through periodic telephone interviews with all physicians practicing in Ontario.

Canadian Institute of Health Information Discharge Abstracts Database (CIHI-DAD)

The CIHI-DAD is a database of information abstracted from hospital records. It includes patient-level data for acute- and chronic care hospitals, rehabilitation

hospitals and day surgery clinics in Ontario. The main data elements of the CIHI-DAD database are encrypted patient identifier, patient demographics (age, sex, geographic location), diagnoses, procedures, and administrative information (institution number, admission category, length of stay).

National Ambulatory Care Reporting System (NACRS)

NACRS is a data collection tool used to capture patient and clinical information on patient visits to hospital and community based ambulatory care: day surgery, outpatient clinics and emergency departments.

CytoBase

The CytoBase database contains records of Papanicolaou (Pap) tests performed on patients in the Province of Ontario. Diagnostic data are provided to the CytoBase system by participating laboratories, hospitals, and clinics performing cervical cytology tests. It contains patient demographic information, provider information and specimen information.

Ontario Breast Screening Program (OBSP)

The OBSP database contains information related to Cancer Care Ontario's breast screening program. The data elements include patient demographics, provider information, assessment history, family history of breast cancer and information on cancers detected during an assessment.

Ontario Home Care Administrative System (OHCAS)

OHCAS contain information on home care visits. Data are collected when an individual applies for home care, as well as at the time of home care visits. The main data elements of OHCAS are encrypted patient

identifier, reason for the application, diagnoses associated with the application for home care, and end date of home care services.

3. Regional and Socioeconomic Variables

Analyses were conducted at the provincial and LHIN level, first by sex (where applicable) and then by age group and income quintile. Where possible, relative rates were calculated for women to men and lowest to highest income groups. Ninety-five percent confidence intervals were calculated for all rates and rate comparisons.

Income

Average neighbourhood income is calculated by Statistics Canada and is updated every five years when new Census data become available. Income was calculated using the neighbourhood income per person equivalent (IPPE), which is a household size adjusted measure of household income based on 2001 census summary data at the dissemination area (DA) and using person-equivalents implied by the 2006 low income cut-offs (LICOs). In 2001, average income estimates were calculated by DA. Ontario neighbourhoods are classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are used as proxy for overall SES, which has been shown to be related to population health status and levels of health care utilizations. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to Enumerations Areas (EAs) or Dissemination Areas (DAs) (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. EAs and DAs are small adjacent geographic areas, designated for collection of census data. DAs replaced EAs in 2001 and have a population of 400-700 persons.

Patients' Residence

For all analyses presented in the report, the definition of "Local Health Integration Network (LHIN) of patient residence" is based on where each person lived when he or she was diagnosed with cancer or in the case of the End of Life indicators, where the patient resided at the time of death.

Standardization

All incidence rates were standardized to the 1991 population of Canada as of July 1, 1991 using the direct method of standardization. All other indicators were standardized to the study cohort using the indirect method.

4. Indicators

Incidence

The OCR was used to calculate the incidence indicators for 2003/04 and 2004/05. We computed the crude and age-standardized rates and 95% confidence intervals of breast, ovarian, uterine and cervical cancers and crude and age-sex standardized rates and 95% confidence intervals of lung and colorectal cancers.

Survival

The OCR was used to identify patients with newly diagnosed breast, ovarian, uterine, cervical, lung and colorectal cancers in 2000/01. The RPDB was used to determine which patients had survived at least 5 years after the date of diagnosis. Age-standardized and age-sex standardized survival rates were calculated using the indirect standardization method.

Wait times to surgery

Time (median and 90th percentile) from a surgical consultation to mastectomy, hysterectomy and bowel resection was calculated. Surgical consultations were based on claims data from OHIP and surgical dates were identified from CIHI-DAD.

Breast Cancer Screening

Age-standardized rates of women receiving a mammogram in a two-year period were calculated using the indirect standardization method. The denominators were from the 2005 provincial estimates obtained from the adjusted RPDB. Women aged 50-69 with no history of breast cancer were included in the denominator. OHIP and OBSP were used to determine which women received a mammogram.

Colorectal Cancer Screening

Age-standardized and age-sex standardized rates of women and men receiving one or more fecal occult blood tests (FOBT) in a two-year period were calculated using the indirect standardization method. The denominators were from the 2005 provincial estimates obtained from the adjusted RPDB. Women and men aged 50-74 with no history of colorectal cancer were included in the denominator. OHIP was used to determine which women and men received one or more FOBTs. Since OHIP does not have information on whether the test was done for screening or to investigate symptoms, all FOBTs identified were counted in the numerator. Fecal occult blood testing is the provincial recommendation for colorectal cancer screening, however other screening modes, including colonoscopy, are also available. These were not included in our data as it is not possible to determine whether colonoscopy was conducted for assessment of symptoms or for screening.

Cervical Cancer Screening

Age-standardized rates of women receiving one or more Papanicolaou (Pap) tests in a three-year period were calculated using the indirect standardization method. The denominators were from the 2005 provincial estimates obtained from the adjusted RPDB. Women aged 18-70 with no history of cervical cancer and who had not undergone a hysterectomy were included in the denominator. OHIP and CytoBase were

used to determine which women received one or more Pap tests. A small percentage of Pap tests are conducted in hospitals and would not be included in our data. CIHI-DAD was used to identify prior hysterectomy. Since the administrative data sources only go back to 1988/89, the rates of hysterectomy prior to 1988/89 were adjusted by the cumulative probability of undergoing a hysterectomy prior to that time.¹⁸¹

Colorectal Cancer

The indicators related to colorectal cancer were: percentage of patients with rectal cancer who received a sphincter sparing procedure at the time of surgery; percentage of patients with colon cancer who were referred to a medical oncologist after surgery; the percentage of rectal cancer patients who had a consultation with a radiation oncologist and the percentage of colorectal cancer patients who received follow-up colonoscopy within 36 months after surgical treatment. The OCR was used to determine people diagnosed with colon or rectal cancer in 2003/04 and 2004/05. The surgical procedures were determined using CIHI-DAD. Receipt of colonoscopy was determined from OHIP billing data, and consultation with a radiation or medical oncologist was determined using OHIP billing data and the IPDB. All age-standardized and age/sex-standardized rates were calculated using the indirect standardization method.

Lung Cancer

Three indicators were calculated related to the treatment of lung cancer: the rate of lung resection in patients with non-small cell lung cancer; the percentage of non-small cell lung cancer patients treated with systemic therapy after surgery, and the percentage of patients with small cell lung cancer who receive chemotherapy. The OCR was used to determine people diagnosed with non-small cell lung cancer and small cell lung cancer in 2003/04 and 2004/05. The percentage of patients who underwent lung resections was obtained from CIHI-DAD. OHIP

billings were used to determine the receipt of chemotherapy. All age-standardized and age/sex-standardized rates were calculated using the indirect standardization method.

Breast Cancer

Five indicators were calculated related to the treatment and surveillance of breast cancer: the percentage of women diagnosed with breast cancer who receive breast conserving surgery; the percentage of women with an axillary lymph node dissection; the percentage of women who receive radiation therapy after breast conserving surgery; the percentage of breast cancer patients who are referred to an oncologist for treatment, and the percentage of women who underwent surgery (either mastectomy or breast-conserving surgery) to treat breast cancer who received a surveillance mammogram in the first and second year following breast cancer diagnosis. The OCR was used to determine women who were diagnosed with breast cancer in 2003/04 and 2004/05. CIHI-DAD was used to determine the breast conserving procedures, mastectomies, and axillary lymph node dissections. Radiation therapy and mammogram referrals were determined from OHIP billing data, and oncologist referrals were determined from OHIP billing data and the IPDB. All age-standardized rates were calculated using the indirect standardization method.

Ovarian Cancer

The following indicators related to ovarian cancer were calculated: the percentage of patients undergoing primary ovarian cancer surgery by a gynecologic oncologist, postoperative use of chemotherapy within four months, and the rate of re-operation. The ovarian cancers were defined using OCR. Borderline or low malignant potential tumors, germ cell tumors and stromal tumors were excluded. The surgical procedures were determined using CIHI-DAD and the procedures performed by a gynecologic oncologist were determined using the IPDB and cross-referenced with

a gynecologic oncologist surgery master list available at ICES. The receipt of chemotherapy was determined using OHIP billing data. All age-standardized rates were calculated using the indirect standardization method.

Endometrial Cancer

The percentage of patients with certain high risk histologies (serous and clear cell) on biopsy who are referred to a gynecologic oncologist for a staging procedure was computed. The endometrial cancers were defined using the OCR. CIHI-DAD was used to determine the staging procedures. The procedures performed by a gynecologic oncologist were determined using the IPDB and cross-referenced with a gynecologic oncologist surgery master list available at ICES. All age-standardized rates were calculated using the indirect standardization method.

End of Life Care

The OCR was used to determine deaths from breast, ovarian, uterine, cervical, lung and colorectal cancers in the calendar years 2003 and 2004. Age-standardized and age-sex standardized rates of acute care bed deaths, one or more emergency room visits in the last two weeks of life, the receipt of chemotherapy in the last two weeks of life, one or more home care visits in the last six months of life and one or more house calls in the last two weeks of life were calculated using the indirect standardization method. CIHI-DAD was used to determine if a person died in an acute care institution. Visits to the emergency room were determined using data from NACRS. A patient must have been an outpatient for at least one of the last 14 days of life to be eligible. OHIP data were used to determine which people received chemotherapy. The OHCAS data were used to determine home care visits. House calls were determined using OHIP data. A patient must have been an outpatient for at least one of the last 14 days of life to be eligible.

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ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Depression

Chapter 5

AUTHORS

Elizabeth Lin, PhD
Natalia Diaz-Granados, MSc
Donna E. Stewart, MD, FRCPC
Anne E. Rhodes, PhD
Naira Yeritsyan, MD, MPH
Ashley Johns, MSc
Minh Duong-Hua, MSc
Arlene S. Bierman, MD, MS, FRCPC

INSIDE

- Background Measures
- Primary and Specialty Outpatient Care
- Acute and Specialty Inpatient Care



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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.toronto.on.ca

www.powerstudy.ca

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Executive Summary

ISSUE

Depression, a common chronic condition, is a tremendous emotional and financial burden for people who suffer from it, their families and society. It is the leading cause of disease-related disability among women, according to the World Health Organization.¹

Depression has a vast economic impact, and is responsible for lost productivity, increased disability claims and greater use of health care services. In this chapter we examine the patterns of depression care in the province and how they differ by gender, income, age and where one lives.

There are effective treatments for depression that can improve quality of life and health outcomes among those with the disease. Many people with depression go untreated²⁻⁵ and some who are treated may receive suboptimal care.^{6, 7} Gender and socioeconomic position are associated both with the risk of developing depression and the type of depression care received.^{11, 23, 28, 103} Quality improvement interventions have been shown to improve quality and outcomes of depression care.⁸⁻¹⁰

Women in developed countries are twice as likely to suffer from depression as men¹¹⁻¹⁴ and research shows numerous differences in how the two sexes experience the disease. Women tend to have onset of depression at a younger age and experience greater severity of illness than men. They also report more functional impairment, poorer social adjustment and worse quality of life.^{15,16} A report using data from the population-based Ontario

Mental Health Supplement (1990) found higher disability among women aged 15-19 compared to men in that age group: women reported 3.4 disability days due to mental health compared to 1.1 days reported by men.¹⁷ In addition, women often report different depressive symptoms than men do, such as having more anxiety, appetite disturbances and sleep changes.¹⁸ Although there is no gender difference in the risk of recurrence of depression,¹² women have longer recurrent episodes. On the other hand, men are more likely to suffer from alcohol and substance dependence¹⁹ and have higher rates of completed suicide.²⁰

Some women are at increased risk of depression and special efforts need to be made to provide care and support for them. There is evidence that some immigrant and ethnic minority women may be at increased risk of depression, therefore cultural sensitivities must be considered in delivering depression services. The need for culturally sensitive depression services in the province may be large since approximately 27 percent of Ontario's population is foreign-born and 40 percent are first- or second-generation immigrants.^{21,22} Rural women and men may be less likely to receive treatment

due to limited availability of services.⁴ Finally, women in lower-income households²³ or who live in low-income neighbourhoods²⁴ were also significantly more likely to have depression than those in higher-income brackets or neighbourhoods. Targeting depression services to those with the highest 'need' is essential to reducing the burden of this treatable disorder and achieving the best possible outcomes.

ABOUT THIS CHAPTER

The chapter has three sections:

A. Background Measures

This section provides a snapshot of the need for, use and supply of mental health care services in Ontario.

B. Primary and Specialty Outpatient Care Indicators

This section presents and discusses indicators of depression care in outpatient settings. Because of data limitations, only care provided by Ontario physicians paid by fee-for-service could be measured.

C. Acute and Specialty Inpatient Care Indicators

This section covers indicators of depression care provided in inpatient settings and on transition back to the community.

STUDY

This chapter uses a set of evidence-based indicators to assess gender, income, age and regional differences in depression care among Ontarians living with depression. Indicators were chosen by a Technical Expert Panel (TEP) using a modified Delphi process (see The POWER Study Framework, [chapter 2](#)). We used the continuum of care ([Figure 1](#)) to guide the identification of important gender gaps in depression care and a review of relevant measures from the published and grey literature (for details see [Appendix 5.3](#)). These indicators are intended to help administrators, policy makers and providers understand where there are sex and sociodemographic disparities in depression care, create new policies and programs for dealing with gender gaps and reduce the barriers that keep both women and men from getting the depression care they need.

We used multiple data sources in this report including the Canadian Community Health Survey (CCHS), Cycle 1.1 (2000/01); Daily Census Summary Report Mental Health Beds online, Ministry of Health and Long-Term Care (MOHLTC) Health Data Branch; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP) physician claims data; National Ambulatory Care Reporting System (NACRS); Ontario Drug Benefit (ODB) database; Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB); ICES Mother-Baby Linked database (MOMBABY) and Statistics Canada 2001 Census. A complete list of the indicators reported in this chapter and their data sources can be found in [Appendix 5.2](#).

All indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. All analyses were stratified by sex (where applicable), and then by age, income or rural/urban residency. Age-adjustment was done using indirect standardization. [Appendix 5.3](#) provides a description of the research methods.

KEY FINDINGS

In this chapter we present background measures of the need, use and supply of depression care in Ontario, as well as indicators of inpatient and outpatient depression care. [Figure 5](#) provides a summary of where sex, income, age and regional differences were found.

Overall, **we found many instances where depression care was suboptimal for everyone.** Less than half of women and men with probable depression had a physician visit for this condition. Many older adults who started on antidepressant therapy did not receive the recommended number of follow up visits for management (i.e., three or more visits within 12 weeks of starting medication). One in three women and men who were hospitalized for depression did not have a follow up physician visit for depression within 30 days of hospital discharge and nearly one in five were seen in the emergency department in this time frame, indicating suboptimal care coordination during care transitions.

We found differences in the prevalence of depression—one of the important markers of need for depression care—across sex, income, age and geography. We also found differences in the use of services for both depression and mental health in general. In some cases, the prevalence patterns were similar to the service use patterns. For example, women had higher rates of both depression and use of Ontario Health Insurance Plan (OHIP) core mental health services ([Exhibit 5A.8](#)). In other cases, however, they were not. Low-income women were more likely to report probable depression ([Exhibit 5A.1](#)) but had similar rates of use of OHIP core mental health services as higher-income women ([Exhibit 5A.5](#)).

There were also differences in which service sectors were used. Women and men from the lowest-income areas were almost twice as likely to be hospitalized for depression but incurred slightly lower average costs for OHIP core mental health services compared to Ontarians living in the highest-income areas ([Exhibit 5A.9](#)). Rural residents were more likely to be hospitalized for depression while urban dwellers accounted for proportionately greater OHIP costs for mental health care ([Exhibit 5A.10](#)).

A comparison of need, use and supply across LHINs suggested that the geographic patterns of use reflected the geographic distribution of supply more than need.

We report results for several indicators of depression care. For some indicators, we found no significant sex differences. Women and men with probable depression had similar rates of having a physician visit for depression within a one-year period ([Exhibit 5B.1](#)). Men and women aged 66 and older, starting on a new course of antidepressants, were equally likely to have had the recommended number of follow up visits ([Exhibit 5B.4](#)). And women and men who were hospitalized for depression were equally likely to be readmitted for depression ([Exhibit 5C.12](#)) or to have visited the emergency department ([Exhibit 5C.8](#)) in the month after they were discharged.

There were some gender differences. Among people who were hospitalized for depression, women were more likely than men to have seen a physician for depression post-discharge ([Exhibit 5C.5](#)). For those who were seen within 30 days of discharge, there was no

difference in how long women and men took to get a follow up visit within the first 30 days after discharge. Beyond 30 days, men took somewhat longer to have a physician visit.

A few indicators showed differences in depression care associated with age. Ontarians with probable depression aged 45-64 were the most likely to visit a physician for depression ([Exhibit 5B.2](#)), although they were not the group with the highest prevalence. Among older Ontarians starting antidepressants, age was associated with a decreasing likelihood of adequate physician follow up (i.e., three or more visits within the 12 weeks after starting medication) for depression ([Exhibit 5B.5](#)) but an increasing likelihood of physician visits for any reason.

Disparities by income were found for several indicators. Among women with probable depression, those with lower annual household incomes were more likely to see a physician for depression than those with higher annual household incomes ([Exhibit 5B.1](#)). Among women aged 66 and older, those from lower-income neighbourhoods who started antidepressants were less likely to have had the recommended number of follow up physician visits than women from higher-income neighbourhoods ([Exhibit 5B.4](#)). Among Ontarians who had been hospitalized for depression, people who lived in higher-income neighbourhoods were more likely to have a post-discharge physician visit for depression (and

to do so more quickly) than those from lower-income neighbourhoods ([Exhibit 5C.1](#)). And, men living in the lowest-income neighbourhoods were more likely than men from the highest-income neighbourhoods to visit an emergency department in the month after a hospital stay for depression ([Exhibit 5C.8](#)).

Some rural/urban differences were found. Urban dwellers were more likely to have a post-discharge physician visit for depression than those from rural areas ([Exhibit 5C.2](#)). Also, men from rural areas were more likely to visit an emergency department after discharge than those from urban areas.

Variations across Local Health Integration Networks (LHINs) were found for a number of indicators, and these represented the largest disparities reported in this chapter. Differences between the highest and lowest LHINs ranged from roughly one-and-a-half times as large (physician visits for depression within 30 days of hospital discharge) ([Exhibit 5C.3](#)) to twice as large (percentage of adults aged 66 and older, starting a new course of antidepressants who had three or more physician visits for depression within 12 weeks of starting medication ([Exhibit 5B.6](#)); 30-day post-discharge rate of emergency department visits ([Exhibit 5C.10](#))) to as high as four times as much (30-day readmission rate for depression ([Exhibit 5C.13](#))).

KEY MESSAGES

Our findings support the need to re-evaluate care for depression in Ontario along several fronts and at several levels. The indicators chosen for this chapter arise from evidence-based recommendations or guidelines for appropriate depression care and suggest specific and immediate aspects of clinical practice that need further examination and improvement. The distribution and organization of existing resources—important elements in supporting the continuity of care envisioned across the decades of mental health reform in Ontario and an obvious focus for the newly organized LHINs—will also play important roles in both improving access and delivering more appropriate and effective courses of care in the immediate and medium term. In particular, a wider adoption of collaborative care models for depression deserves serious consideration.

The following actions could help to improve access to, and the quality of, depression care in Ontario:

- Develop and support collaborative care models in primary care and across depression care sectors;
- Explore developing care models for specific underserved groups (including men, younger people, the elderly, people with low incomes and people who live in rural areas) and evaluate their impact, especially when combined with targeted outreach;
- Implement models to better coordinate care across care transitions between sectors, particularly from hospital to home;
- Coordinate depression care with other types of health care, particularly chronic disease management, so that patients with more than one health problem do not receive fragmented care;
- Evaluate the effectiveness of care through routine gender and equity analyses of indicators of depression care and its outcomes;
- Improve data capacity to better measure access, quality and outcomes of depression care across the care continuum.

KEY FINDINGS BY SECTION

SECTION A | Background Measures

Need

- Women were twice as likely to have probable depression as men in Ontario ([Exhibit 5A.3](#)). This finding is consistent with the evidence from the literature from Canada and from other countries such as the US and UK.¹¹⁻¹⁴
- There were regional and income differences in the prevalence of probable depression. Individuals living in the lowest-income neighbourhoods were more likely to have probable depression than those living in the highest-income neighbourhoods ([Exhibit 5A.1](#)).
- There was no difference in the prevalence of probable depression based on whether people lived in rural or urban areas ([Exhibit 5A.10](#)).
- Women with probable depression were somewhat more likely to report comorbid chronic medical conditions than men. However, there were few differences by sex in self-rated health or self-reported functioning among those with probable depression ([Exhibit 5A.3](#)).

Use

- There were distinct sex differences in use of services for depression. Women were between one and a half to two times more likely than men to use OHIP core mental health services—a pattern consistent with their higher rates of depression ([Exhibit 5A.8](#)).
- Although women from lower-income areas were more likely to have probable depression than those from higher-income areas, they had similar rates of use of OHIP core mental health services ([Exhibit 5A.5](#)). However, women from higher-income neighbourhoods incurred greater OHIP core mental health costs per capita than women from lower-income neighbourhoods ([Exhibit 5A.6](#)).

- Women and men from the lowest-income areas were almost twice as likely to be hospitalized for depression but incurred slightly lower average costs for OHIP mental health services than those from higher-income areas ([Exhibit 5A.9](#)).
- Rural and urban residents used services differently. Rural residents were more likely to be hospitalized for depression while urban dwellers accounted for a greater proportion of OHIP costs per capita for mental health care ([Exhibit 5A.10](#)).

Supply

- Resources such as physician supply and psychiatric hospital beds varied markedly across Local Health Integration Networks (LHINs). The differences between the highest and lowest rates per 100,000 population among LHINs ranged from twice as many general practitioners (GPs) or family physicians (FPs) to three times as many hospital beds and 12 times as many psychiatrists ([Exhibits 5A.11, 5A.12](#)).

Patterns of need, use and supply

- Patterns of service use appeared to reflect supply more than need ([Exhibit 5A.13](#)).

SECTION B | Primary and Specialty Outpatient Care

Care for Ontarians with probable depression

- Sixty percent of Ontarians with probable depression did not have a physician visit for depression care within the year after they were interviewed.
- Among those with probable depression, women and men had similar visit rates of physician visits for depression—41 percent of women and 37 percent of men had at least one physician visit for depression within a year of their survey interview.

- Women with probable depression who had lower annual household incomes were more likely to see a physician for depression than those with higher annual household incomes ([Exhibit 5B.1](#)).
- Ontarians aged 45-64 with probable depression were the most likely to visit a physician for depression ([Exhibit 5B.2](#)), although they were not the age group with the highest disease prevalence.

Care for older Ontarians starting a new course of antidepressant medication

- Older Ontarians who started antidepressant medication had low rates of adequate physician follow up for depression (i.e., three or more visits within 12 weeks of starting medication); 9.5 percent for women and 9.9 percent for men, although roughly 85 percent had at least three physician visits for any reason in the important first 12 weeks after starting antidepressants.
- Among these older Ontarians, increased age was associated with a decreasing likelihood of having had three physician visits for depression after starting antidepressant medication ([Exhibit 5B.5](#)) but an increasing likelihood of physician visits for any reason.
- Older women from lower-income neighbourhoods were less likely to have had the recommended number of follow up physician visits for depression after starting their new antidepressants than women from higher-income neighbourhoods ([Exhibit 5B.4](#)).

Care for postpartum women

- Twenty percent of Ontario women who gave birth had a physician visit for depression within one year following delivery ([Exhibit 5B.7](#)).

SECTION C | Acute and Specialty Inpatient Care

Physician visits for depression after a discharge from a hospital stay for depression

- One in three Ontarians did not have a physician visit for depression within 30 days of discharge after a hospital stay for depression.

- Women were somewhat more likely than men to have seen a physician for depression within 30 days after discharge from hospital (65 percent of women versus 60 percent of men). This pattern held true across neighbourhood income levels ([Exhibit 5C.1](#)), rural/urban residency ([Exhibit 5C.2](#)), and almost all LHINs ([Exhibit 5C.4](#)).
- One year post-discharge, 10 percent of women and 14 percent of men had not seen a physician for depression.
- There was no difference in how long women and men took to get a follow up visit during the first 30 days after discharge. Beyond 30 days men took somewhat longer to have a physician visit ([Exhibit 5C.6](#)).
- People who lived in higher-income neighbourhoods and those who lived in urban areas were more likely to have a post-discharge physician visit for depression than those from lower-income neighbourhoods or rural areas. The largest differences, however, were across LHINs, where the rates ranged from 50 percent to 72 percent ([Exhibit 5C.3](#)).

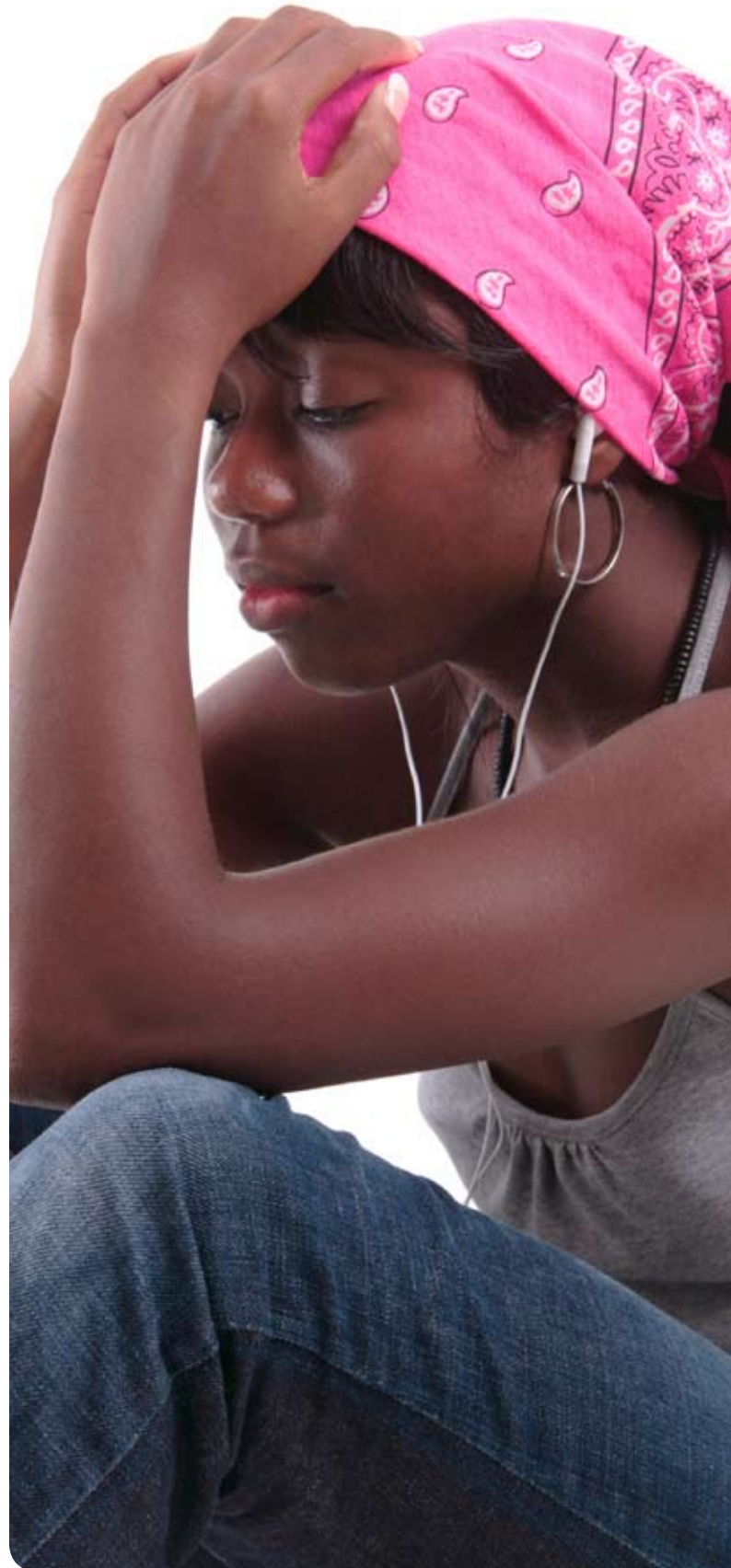
Emergency department visits for depression (not resulting in readmission) after a discharge from a hospital stay for depression

- Women and men were equally likely to have had an emergency department visit within 30 days (17 percent and 18 percent, respectively) of discharge after a hospital stay for depression.
- Men living in the lowest-income neighbourhoods were more likely to visit an emergency department within 30 days of discharge after a hospital stay for depression than men from higher-income neighbourhoods ([Exhibit 5C.8](#)).
- Men from rural areas were more likely to have had an emergency department visit within 30 days of discharge after a hospital stay for depression than those from urban areas.

- Sex disparities occurred within age groups; the youngest women had a higher rate of emergency department visits in the 30 days post-discharge after a hospital stay for depression than men that age, but men aged 45-64 had higher rates of use than women ([Exhibit 5C.9](#)).
- The largest difference in the percentage of women and men who had an emergency department visit in the 30 days post-discharge after a hospital stay for depression was across LHINs. The highest rate (21 percent) was almost double the lowest rate (11 percent) ([Exhibit 5C.10](#)).

Readmission to hospital for depression

- Women and men were equally likely to be readmitted to hospital for depression in the 30 days after a previous hospital stay (7.6 percent for each). There were few differences in 30-day readmission rates across age groups, neighbourhood income levels ([Exhibit 5C.12](#)) and rural/urban residency.
- There were differences across LHINs, however, where 30-day readmission rates ranged from 2.9 percent to 11.9 percent ([Exhibit 5C.13](#)).



Introduction

Depression, a common chronic condition, is a tremendous emotional and financial burden for people who suffer from it, their families and society. It is the leading cause of disease-related disability among women, according to the World Health Organization.¹

Depression has a vast economic impact, and is responsible for lost productivity, increased disability claims and greater use of health care services.

There are effective treatments for depression that can improve quality of life and health outcomes for those with the disease. Many people with depression go untreated²⁻⁵ and some who are treated receive suboptimal care.^{6, 7} Gender and socioeconomic position are associated both with the risk of developing depression and the type of depression care received.^{11, 23, 28, 103} Quality improvement interventions have been shown to improve quality and outcomes of depression care.⁸⁻¹⁰

In Ontario, in a 12-month period, 4.8 percent of the overall population will suffer from depression. However, the problem is not evenly distributed: 6.1 percent of women and 3.5 percent of men report being depressed.²³ Ontario's rates of depression are similar to the rest of Canada.^{25, 26} In this chapter we examine the patterns of depression care in the province and how they differ by gender, income, age and where one lives.

Gender Differences in Depression

Women in developed countries are twice as likely to suffer from depression as men,¹¹⁻¹⁴ and research shows numerous differences in how the two sexes experience the disease. Women tend to have onset of depression at a younger age and experience greater severity of illness than men. They also report more functional

impairment, poorer social adjustment and worse quality of life.^{15, 16} A report using data from the population-based Ontario Mental Health Supplement (1990) found higher disability among women aged 15-19 compared to men in that age group: women reported 3.4 disability days due to mental health compared to 1.1 days reported by men.¹⁷ In addition, women often report different depressive symptoms than men, such as having more anxiety, appetite disturbances and sleep changes.¹⁸ Although there is no gender difference in the risk of recurrence of depression,¹² women have longer recurrent episodes. On the other hand, men are more likely to suffer from alcohol and substance dependence¹⁹ and have higher rates of completed suicide.²⁰

Ideally the supply and use of health care services for depression should reflect need and be related to the prevalence and severity of illness.²⁷ One study found, after adjusting for variation in need, that women, men and women who were single or divorced, those with a higher education and those born in Canada were most likely to report using health services for their mental health problems.²⁸ Another study that used data from the Canadian Community Health Survey, Cycle 1.2 found that more women reported unmet needs for depression care (5.6 percent) than men (3.4 percent).²⁹ They also found that women were two-to-three times more likely than men to experience barriers to accessibility and acceptability of seeking mental health

care. Women's access to care was limited due to cost, transportation, competing responsibilities and language limitations. Attitudes of providers and the health system toward mental illness also affected the acceptability of services.

Some women are at increased risk of depression and special efforts need to be made to provide care and support for them. There is evidence that some immigrant and ethnic minority women may be at increased risk of depression, therefore cultural sensitivities must be considered in delivering depression services. The need for culturally sensitive depression services in the province may be large since approximately 27 percent of Ontario's population is foreign-born and 40 percent are first- or second-generation immigrants.^{21, 22} Rural women and men are also at higher risk of depression and may be less likely to receive treatment due to limited availability of services.⁴ Finally, women in lower-income households²³ or those who live in low-income neighbourhoods²⁴ were also significantly more likely to have depression than those in higher-income brackets or neighbourhoods. Targeting depression services to those with the highest 'need' is essential to reducing the burden of this treatable disorder and achieving the best possible outcomes.

Quality Improvement and Depression Care

Quality improvement programs for depression care have shown that mental health services can be improved for depression, but it is not clear whether they benefit men and women equally.^{9, 30-32} Studies of quality improvement programs for other treatments, including haemodialysis,³³ show that sex disparities can be reduced for some medical outcomes by monitoring patient outcomes, and providing feedback on performance to health care providers. However, few studies have examined whether quality improvement programs for depression care affect the sexes differently, and those that have, have focused mainly on outpatient primary care services. One study found



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quality improvement programs to be equally effective in improving treatment outcomes and quality of life for women and men,³⁴ but sex disparities remained for other outcomes such as unmet need for treatment, burden of depression and quality of life years lost.^{34, 35} These studies also reported that the type of quality improvement intervention—whether it facilitated medication management, psychotherapy or both—may benefit women and men differently.

To reduce the gender inequity in the use of mental health services, we need to examine the quality of mental health care. Ontarians get formal mental health care through family physicians, psychiatrists, general hospitals, specialty and tertiary care hospitals, community mental health programs and mental health provider private practices.³⁶ Although care for depression is also provided by other professionals such as psychologists, social workers and nurses, as well as by self-help and peer-support programs, we

did not include these in the chapter because there are no system-wide, linkable data on these services. The quality of mental health services should be monitored using structural, process and outcome indicators.³⁷⁻⁴⁰ There is specific national and international attention on improving the access to and use of depression care resources.^{111, 194-196} Prior reports, however, have not looked at indicators that assess the broad spectrum of 'behavioural' health care—that is, the care delivered by community mental health workers such as social workers, therapists and psychologists⁴¹ and none have assessed whether gender inequities exist in the process of the delivery of depression services.

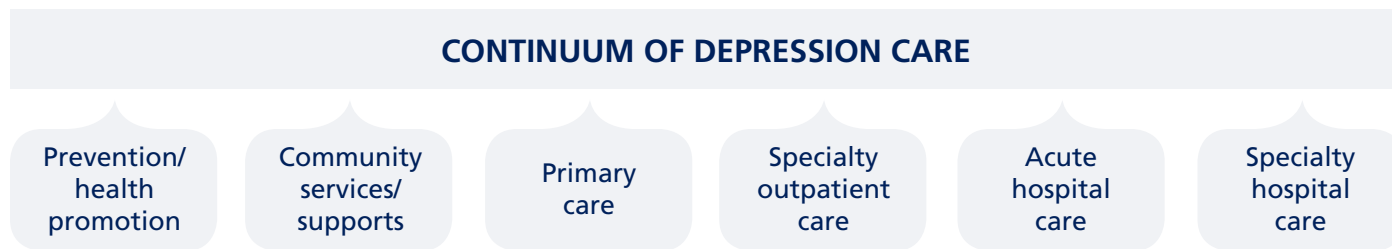
We believe it is vital to consider the impact of gender because of the significant differences in men's and women's needs for depression care and the differences in how they seek health care. The impact of gender inequity on performance of indicators for depression care should be considered along with other factors that influence need and use of care for depression including age, income and other socioeconomic factors.^{42, 43} Gender differences in treatments, other process-related factors and outcomes should be considered by policy makers and program planners in developing services for those with the highest needs and removing barriers that make gender and sociodemographic inequity worse.⁴⁴⁻⁴⁸

Since 1988, when the pivotal Graham report was released, Ontario has made efforts to develop coherent, long-range policies and planning for the mental health system.⁴⁹ Current efforts include the MOHLTC Mental Health System Report Card⁵⁰ and the recently released discussion paper for the province's ten-year strategy for mental health and addictions (Every Door is the Right

Door: Towards a ten-year mental health and addictions strategy).⁵¹ In addition, Echo: Improving Women's Health in Ontario, an agency of the Ontario MOHLTC, has sponsored consultations across the province on improving the health and health care of people with depression. All of these initiatives share a common goal of ensuring equitable access to quality mental health care. The indicators in this chapter were selected based on that same goal with the intent that they will support the move from policy to implementation.

Delivering Depression Care in Ontario

This chapter looks at gender equity in health services for Ontarians living with depression. Indicators were chosen by a Technical Expert Panel (TEP) using a modified Delphi process and an explicit set of indicator selection criteria (see [The POWER Study Framework, chapter 2](#)). We used the continuum of care shown below ([Figure 1](#)) to guide the identification of important gender gaps in depression care and a review of relevant measures from the published and grey literature. These measures were then narrowed down, first by the TEP and then by determining what was feasible to measure using available Ontario data (for details see [Appendix 5.3](#)). These indicators are intended to help administrators, policy makers and providers understand where there are sex disparities in depression care, create new policies and programs for dealing with the worst gender gaps and reduce the barriers that keep both women and men from getting the depression care they need.

Figure 1: Continuum of Depression Care

There is no single cause for depression, which is part of the challenge in providing care for it. Clinicians and researchers believe many factors play a role in determining who develops depression and how the course of their illness runs. These diverse factors include genetics, childhood experiences, lifestyle and social circumstances; several may occur together in people who are clinically depressed. There is no single course for depression. Some people have only one depressive episode in their life while others experience recurring episodes of varying severity.

Ideally, depression should be treated with a range of integrated and coordinated services, along the continuum of care (Figure 1). **Prevention and health promotion** provide information and initiatives to reduce the risk of developing or relapsing into depression. **Community services and supports** help people whose condition is relatively stable to cope with everyday living and to improve their quality of life, by addressing factors such as housing, vocational training, peer support and social activities and by helping to coordinate services. **Primary care** and **specialty outpatient care** providers focus on the diagnosis and clinical treatment of depression, while **acute** and **specialty hospital inpatient services** provide more intensive care in a structured setting, focusing on people whose condition is unstable or highly dysfunc-

tional, to stabilize them to the point where they can benefit from community and outpatient services and then effect a smooth discharge.

Data limitations prevented us from measuring prevention and promotion and community services and supports (see 'What we can't measure' in the Discussion). The results for the remaining indicators are organized into three sections:

- **Background Measures.** The indicator selection process identified a number of measures that were not specifically related to individual treatment of depression. They were, however, important because they described the Ontario context and therefore help in interpreting the indicators. This section provides a snapshot of the need, use and supply of health care services for mental health in Ontario.
- **Primary and Specialty Outpatient Care.** Section 5B presents indicators of depression care in outpatient settings. Because of data limitations, only care provided by Ontario physicians paid on a fee-for-service basis could be measured.
- **Acute and Specialty Inpatient Care.** Section 5C measures indicators of depression care provided in inpatient settings and on the transition back to the community.

We chose the indicators in this chapter to reflect the overarching objectives set by the Ontario MOHLTC (see [Exhibit 2.3 in the POWER Study Framework, chapter 2](#)). [Appendix 5.1](#) indicates which of the Ontario Health Quality Council's nine attributes of a high performing health system each indicator assesses and also which of the strategic objectives included in the Ontario MOHLTC strategy map would be met through improvement on each indicator.

We used multiple data sources in this report including the Canadian Community Health Survey (CCHS), Cycle 1.1 (2000/01); Daily Census Summary Report Mental Health Beds online, MOHLTC Health Data Branch; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance

Plan (OHIP); National Ambulatory Care Reporting System (NACRS); Ontario Drug Benefit (ODB) database; ICES Physician Database (IPDB); ICES Mother-Baby Linked database (MOMBABY) and Statistics Canada 2001 Census. A complete list of the indicators reported in this chapter and their data sources can be found in [Appendix 5.2](#).

All indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. All analyses were stratified by sex (where applicable) and then by income, age or rural/urban residency. Age-adjustment was done using indirect standardization. [Appendix 5.3](#) provides a brief description of the research methods.

MEASURING DEPRESSION

In this chapter, we used population survey data and health administrative data to discover whether there were sex disparities or other disparities in the treatment of depression in Ontario. Since these data were not specifically created to answer our questions and also because they gathered different kinds of information, we had to use different definitions for depression depending on which data were used.

According to the Diagnostic and Statistical Manual Version IV (DSM-IV), a major depressive episode is a period of two weeks or more with persistent depressed mood and loss of interest or pleasure in normal activities, accompanied by symptoms such as decreased energy, changes in sleep and appetite, impaired concentration and feelings of guilt, hopelessness or suicidal thoughts. For this chapter, we used the following definitions:

PROBABLE DEPRESSION:

The Canadian Community Health Survey (CCHS), Cycle 1.1 uses the Composite International Diagnostic Interview-Short Form for Major Depression. This

series of questions is used to calculate the predicted probability of major depressive episodes occurring within the year preceding the interview.⁵² Respondents whose predicted probability score was 0.9 or greater were considered to have probable depression. However, this scale was never fully validated, so rates reported here may differ from actual population prevalence (see [Appendix 5.3](#) for more detail).

PHYSICIAN VISIT FOR DEPRESSION, HOSPITAL STAY (HOSPITALIZATION) FOR DEPRESSION:

We used data routinely collected by the health care system to tell us how many people had a physician visit for depression or a hospital stay for depression. Physician visits for depression included visits with an OHIP diagnostic code for depression (311) or reactive depression (300). Hospital stays for depression were defined as hospitalizations where the most responsible diagnosis was an ICD-10 code for major depression (see [Appendix 5.2](#) and [Appendix 5.3](#) for more detail on the data sources and definitions).

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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 2, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 3, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

Figure 2: Example of a Two Bar Map

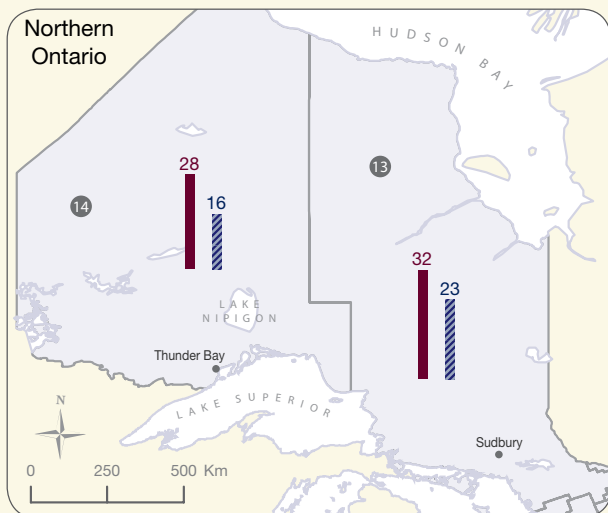
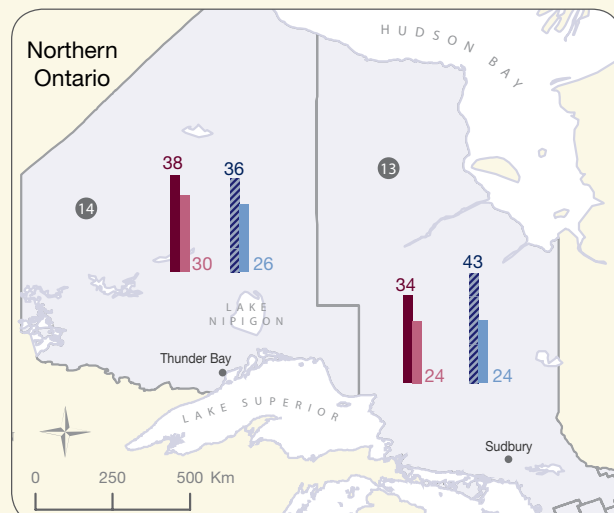


Figure 3: Example of a Four Bar Map

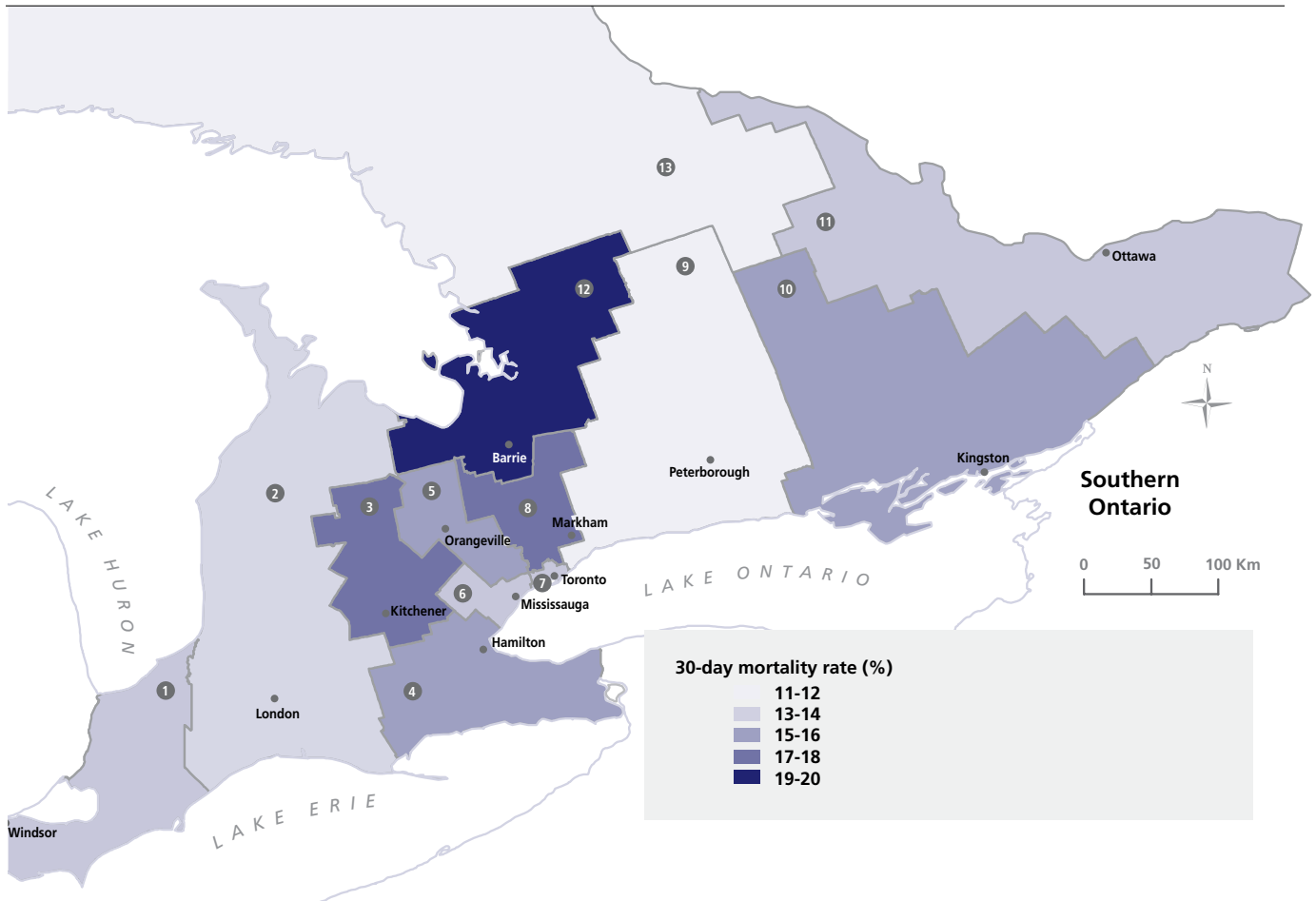


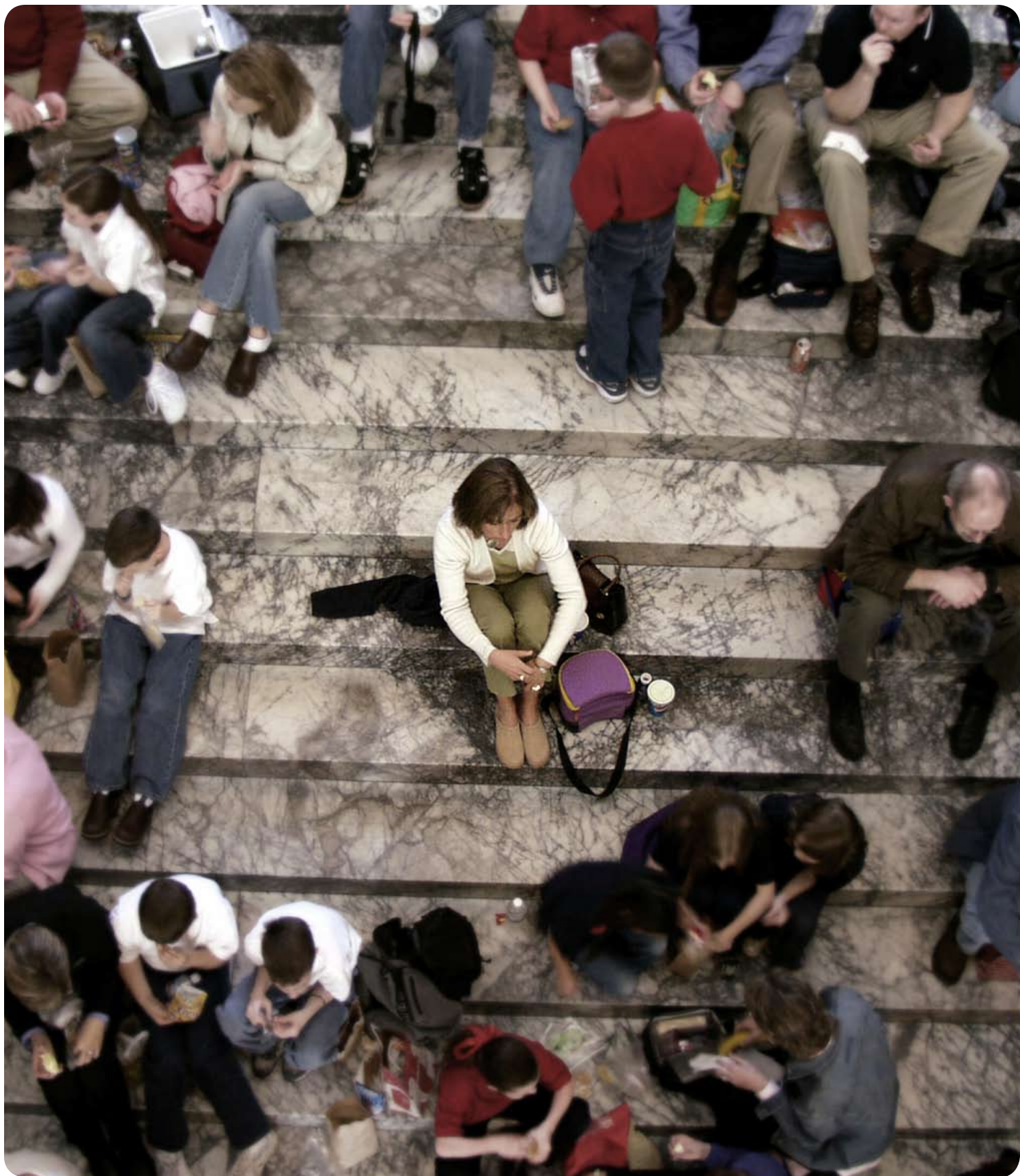
CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 4: Example of a Choropleth Map





Section 5A

Background Measures—the Need, Use and Supply of Health Care Services for Mental Health

INTRODUCTION

This section provides a snapshot of the need for and use of health care services for mental health in Ontario. In an equitable world with limitless resources, use of health services would match need regardless of factors such as sex, income and geography.

This section gives the broad context necessary to understand and interpret indicators of depression care described later in this chapter.

We looked at need (including the prevalence of depression and the health and functional status of people living with it), use of services (including physician visits, hospitalizations, treatments received and cost) and supply of medical services (including financial and human resources) for depression and mental health care. Some of these measures focus specifically on depression and depression care. Others, such as the supply and cost measures, relate to mental health in general and were based on definitions used in previous Ontario reports.⁵³⁻⁵⁵

The prevalence of depression varies by gender and socioeconomic status as do barriers to accessing services for depression care and patterns of use.^{11, 23, 28, 103} The supply of services such as the number of primary care physicians, psychiatrists and hospital beds per capita vary across communities.⁵³ These factors all contribute to the cost of depression care.

Although the data are from different sources and were gathered at different times for different purposes, they show remarkable consistency.^{26, 56, 57} We have divided them into four subsections:

Measures of Need: Prevalence, Health and Functional Status

- Prevalence of probable depression
- Among people with probable depression:
 - The percentage who rated their health as fair or poor
 - The percentage who reported no other comorbid chronic medical conditions
 - The average number of days in the past two weeks out of bed for all or most of the day
 - The average number of days in the past two weeks without cutting down on normal activities

Measures of Use: Treatment and Cost

- Number of individuals using OHIP core mental health services per 100,000 population
- OHIP core mental health services costs per capita
- Hospitalization rates for depression per 100,000 population

- Number of individuals who received electroconvulsive therapy (ECT) per 100,000 population

Measures of Supply: Financial and Human Resources

- Number of general practitioners (GPs) or family practice physicians (FPs) per 100,000 population

- Number of psychiatrists per 100,000 population
- Number of acute hospital psychiatric beds per 100,000 population

Patterns of Need, Use and Supply

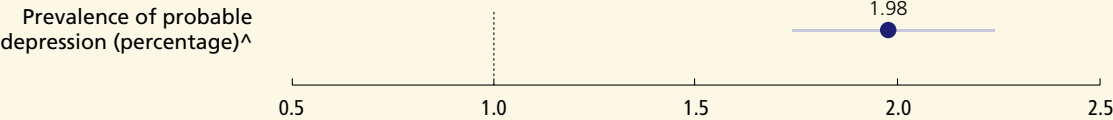
- Geographic patterns of use were examined with the goal of comparing them to the patterns of need and supply

INTERPRETING RISK RATIOS

In this section we present a number of risk ratio figures. Risk ratios estimate the likelihood that an event (e.g., having probable depression) occurring in one group is the same or different from the likelihood of the event occurring for another group. A ratio of 1.0 indicates that the likelihood for the two groups is equal (or very close to equal). A ratio that is less than 1.0 (e.g., 0.5) indicates that the likelihood is lower for the first group compared to the second, while a ratio greater than 1.0 indicates that it is higher. For each risk ratio, we also provide 95% confidence intervals to estimate the uncertainty associated with the ratio. If the value of 1.0 occurs within a confidence interval (e.g., a confidence

interval from 0.5 to 1.5 contains 1.0), this is interpreted as the two groups not being different in terms of their likelihood of having the event.

For example in [Exhibit 5A.8](#) the risk ratio for probable depression in women compared to men is 1.98. This means that women are 1.98 times (or twice) as likely to have probable depression as men. The 95% confidence interval is (1.74, 2.24). This means that taking into account variation due to sampling, we can have 95% certainty that the true value lies within this range. Because the lower value is greater than one, we can say that women have a higher prevalence of probable depression than men.



POWER Study

EXHIBITS AND FINDINGS

MEASURE OF NEED: PREVALENCE OF PROBABLE DEPRESSION

Measure: This measure assesses the percentage of Ontarians aged 15 and older with probable depression in 2000/01.

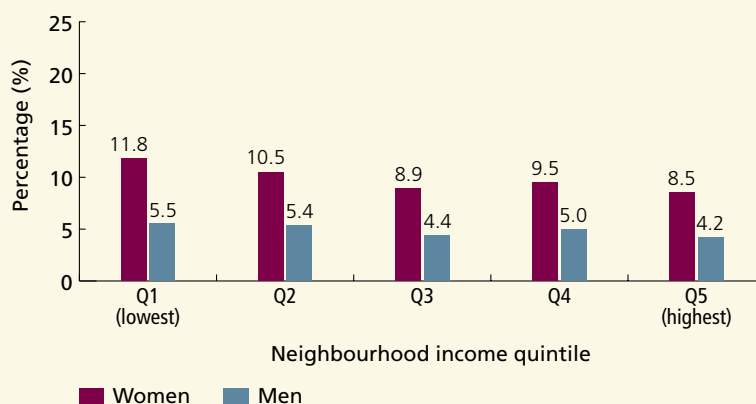
Background: Worldwide, major depression is a leading cause of disability and the third leading cause of burden of disease as measured in disability-adjusted life years (DALYS—the years of potential life lost because of early death, plus the years of productive life lost because of the disability).⁵⁸ Mood disorders (of which depression is the most common) have a major economic impact because of both health care costs and lost productivity. Because they are so common, cause suffering, pose a risk of suicide, reduce quality of life and have a large impact on the economy, mood disorders are a serious public health concern in Canada. This measure is based on data from the Canadian Community Health Survey (CCHS), Cycle 1.1 which measures depression using the Composite International Diagnostic Interview-Short Form (CIDI-SF) for Major Depression. This series of questions is used to calculate the predicted probability of major depressive episodes occurring within the year preceding the interview.⁵² Respondents whose predicted probability score was 0.9 or greater were considered to have probable depression. However, this scale was never fully validated, so rates reported here may differ from actual population prevalence.

Findings: In Ontario, in 2000/01, 7.4 percent of people aged 15 and older met the criteria for having probable depression. Women were more likely than men to have probable depression (9.8 percent versus 4.9 percent, respectively).

EXHIBIT 5A.1 | Age-standardized prevalence of probable depression in Ontarians aged 15 and older, by sex and neighbourhood income quintile, 2000/01

FINDINGS

- Women were twice as likely as men to have probable depression, regardless of neighbourhood income.
- The prevalence of depression varied by income for women and men. Rates were highest among those living in the lowest-income neighbourhoods (11.8 percent of women and 5.5 percent of men) compared to those living in the highest-income neighbourhoods (8.5 percent of women and 4.2 percent of men).
- The income difference in the prevalence of probable depression was significant for women but not for men.



DATA SOURCES: Canadian Community Health Survey (CCHS), Cycle 1.1; Statistics Canada 2001 Census

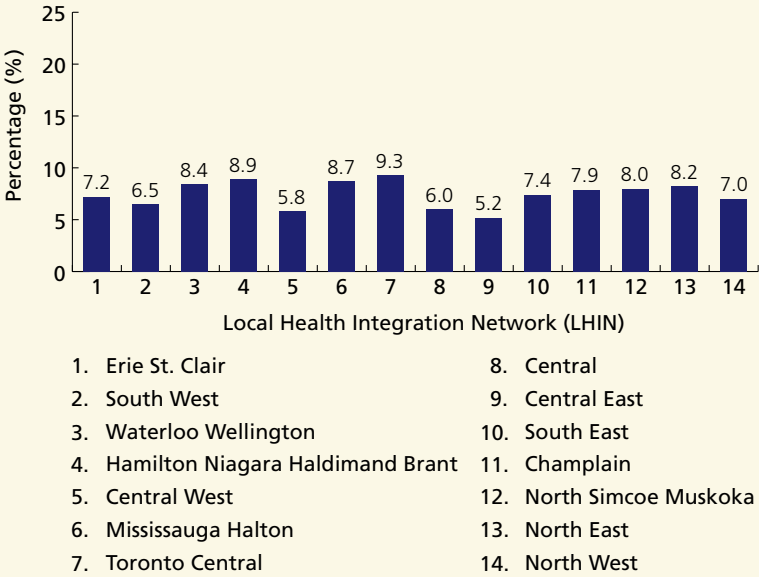
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5A.2 | Prevalence of probable depression in Ontarians^ aged 15 and older, by Local Health Integration Network (LHIN), 2000/01

FINDINGS

- There was significant regional variation in the prevalence of depression, from a low of 5.2 percent in the Central East LHIN to 9.3 percent in the Toronto Central LHIN.
- Sex differences in the prevalence of probable depression at the LHIN level were not reported because of small sample sizes in a number of LHINs. In those LHINs with adequate sample sizes, twice as many women as men had probable depression, consistent with the overall provincial pattern.
- After adjusting for age, prevalence of depression remained quite similar to the unadjusted rates, ranging from 5.1 percent in the Central East LHIN to 9.2 percent in the Toronto Central LHIN. The pattern across LHINs also did not change after adjusting for age (data not shown).



DATA SOURCES: Canadian Community Health Survey (CCHS), Cycle 1.1

^ Brant region did not participate in the depression module of CCHS, Cycle 1.1

POWER Study

MEASURES OF NEED: HEALTH AND FUNCTIONAL STATUS

Measures: The following measures assess the health and functional status of Ontarians aged 15 and older with probable depression:

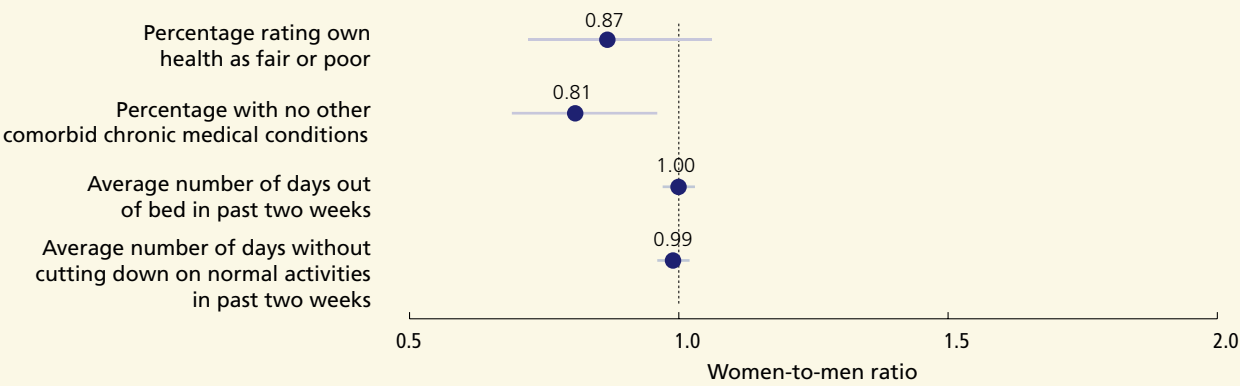
- The percentage who rated their health as fair or poor
- The percentage who reported no other comorbid chronic medical conditions
- The average number of days in the past two weeks out of bed for all or most of the day—that is not confined to bed due to illness, injury or hospitalization
- The average number of days in the past two weeks without cutting down on normal activities due to illness or injury.

Background: Prevalence rates provide information about only one dimension of need.⁵⁹ Need is also influenced by a person's general health, the severity of her/his functional impairment and any other health problems or comorbidities. Many people who have depression also have other comorbid chronic medical conditions. These coexisting illnesses or comorbidities may influence treatment choice and outcomes of depression care. Conversely, untreated depression can lead to worse outcomes for comorbid chronic medical conditions. The number of days a person with depression does not remain in bed or does not need to cut down on their normal activities is a measure of how well they are able to function.

Findings: Among individuals with probable depression in Ontario:

- 29 percent reported their health as fair or poor (27 percent of women and 32 percent of men), compared to 13 percent of women and men aged 25 and older in the general population (see [Burden of Illness, chapter 3](#)).
- 67 percent reported that they had at least one comorbid chronic medical condition in addition to depression (69 percent of women and 62 percent of men); in other words, only 33 percent reported having no comorbid chronic medical conditions.
- The average number of days in the previous two weeks when they were out of bed was 13 (13 days for both women and men).
- The average number of days in the previous two weeks when they did not have to cut down on normally activities was 12 (12 days in women and 13 days in men).

EXHIBIT 5A.3 | Sex differences (women-to-men ratios and 95% confidence intervals) in measures of self-reported health and functioning among individuals with probable depression, in Ontario, 2000/01



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 1.1

NOTE: See 'Interpreting Risk Ratios' box in the Introduction of [Section 5A](#)

FINDINGS

- Women with probable depression were significantly less likely than men to report having no other comorbid chronic medical conditions.
- There were no differences between women and men with probable depression in how they rated their own health or ability to function.
- Among people with probable depression, health and functional status did not vary by neighbourhood income or Local Health Integration Network (LHIN) (data not shown).

POWER Study

MEASURE OF USE: RATE OF HOSPITALIZATION FOR DEPRESSION

Measure: This descriptive measure reports the number of hospitalizations for depression per 100,000 population aged 15 and older.

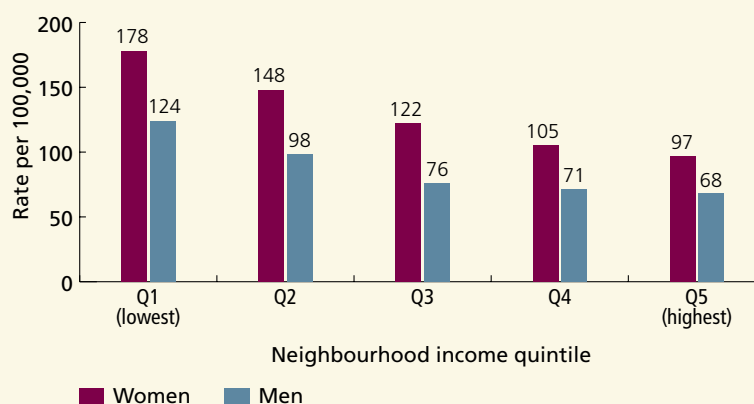
Background: Although most individuals with mood disorders (including depression) are treated in the community, hospitalization is sometimes necessary. Serious depressions may require hospitalization, with follow up medical attention or monitoring. High rates of hospitalization may signal a problem in how mental health services are delivered and integrated—good community care can prevent hospitalization. Ontario's policy for the past three decades has been to provide care in the least restrictive setting⁶⁰ with inpatient care being part of a network of physician, community and social support services that aim to keep patients in the community.

Findings: In Ontario, the rate of hospitalization for depression for the period from March 1, 2005 to February 28, 2006 was 108 per 100,000 population aged 15 and older: 127 per 100,000 women and 87 per 100,000 men.

EXHIBIT 5A.4 | Age-standardized rate (per 100,000 population) of hospitalizations for depression in Ontarians aged 15 and older, by sex and neighbourhood income quintile, 2005/06[^]

FINDINGS

- Women had higher rates of hospitalization than men, regardless of neighbourhood income.
- Lower-income women and men were more likely to be hospitalized for depression, with the rate in the lowest-income quintile nearly twice the rate for the highest-income quintile (178 versus 97 per 100,000 for women; 124 versus 68 per 100,000 for men).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census; Registered Persons Database (RPDB)

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

MEASURES OF USE: ONTARIO HEALTH INSURANCE PLAN (OHIP) CORE MENTAL HEALTH CARE USERS AND OHIP CORE MENTAL HEALTH CARE COSTS PER CAPITA

Measures: Two measures were used to assess the use of OHIP core mental health services:

- The proportion of Ontarians aged 15 and older who used OHIP physician services for mental health (assessment, diagnosis or treatment)
- The average cost (in 2005 Canadian dollar equivalents (CAD)) per capita paid for these core mental health services

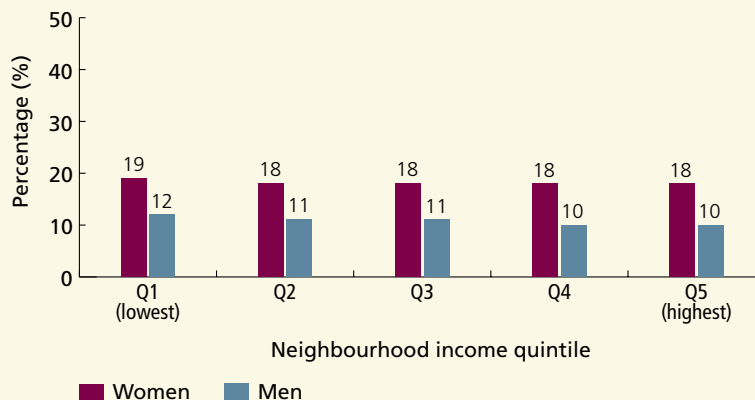
Background: Household surveys in Canada and Ontario consistently report that the majority of mental health care reported by survey respondents has been received from general practitioners and family physicians with the next largest source of care being psychiatrists (of people who use mental health services, approximately 60-75 percent receive care from general practitioners and approximately 25-40 percent receive care from psychiatrists).^{28, 61, 62} This fits with the view of the family doctor as the gatekeeper of the health care system where access to specialist care is by referral and all care is coordinated through a frontline provider. In Ontario, the most complete data source for both general and specialty physician care is the OHIP claims database.

Findings: In Ontario, 15 percent of the population aged 15 and older used OHIP core mental health services including psychiatric assessment, diagnosis or treatment in the course of one year (18 percent of women and 11 percent of men). The average cost paid for these services was \$33 (CAD) per capita (\$41 (CAD) for women and \$24 (CAD) for men).

EXHIBIT 5A.5 | Age-standardized percentage of Ontarians aged 15 and older who had an Ontario Health Insurance Plan (OHIP) core mental health visit,[^] by sex and neighbourhood income quintile, 2005/06[†]

FINDINGS

- Almost twice as many women as men used OHIP core mental health services, regardless of neighbourhood income.
- Low-income women and men were somewhat more likely to use core mental health services; however, these differences were very small.



DATA SOURCES: Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census; Registered Persons Database (RPDB)

[^] Based on fee-for-service OHIP billings for assessment, diagnosis or treatment

[†] People who accessed services from Mar 1, 2005 - Feb 28, 2006

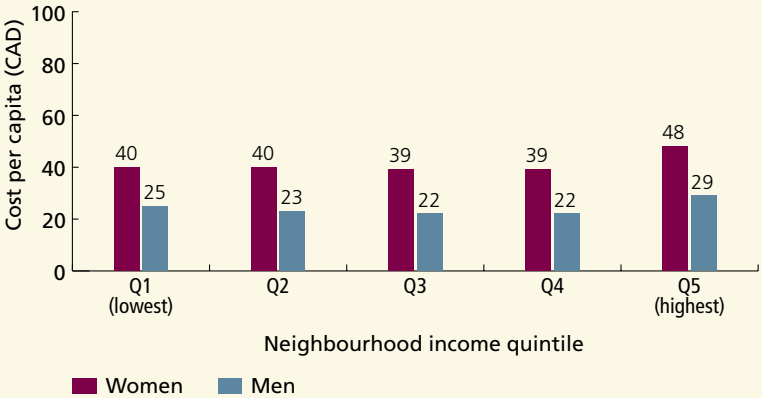
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5A.6 | Age-standardized Ontario Health Insurance Plan (OHIP) core mental health care costs[^] per capita, by sex and neighbourhood income quintile, in Ontario, 2005/06[†]

FINDINGS

- Consistent with their higher rates of physician visits for OHIP core mental health services, women also incurred higher OHIP core mental health care costs per capita than men, regardless of neighbourhood income.
- OHIP costs for core mental health services varied by neighbourhood income. Women and men living in the highest-income neighbourhoods had significantly higher OHIP costs than individuals living in lower-income neighbourhoods.



DATA SOURCES: Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census; Registered Persons Database (RPDB)

[^] Based on fee-for-service OHIP billings for assessment, diagnosis or treatment

[†] People who accessed services from Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

MEASURE OF USE: ELECTROCONVULSIVE THERAPY (ECT) USE

Measure: This measure reports the number of electroconvulsive therapy (ECT) users per 100,000 population aged 15 and older.

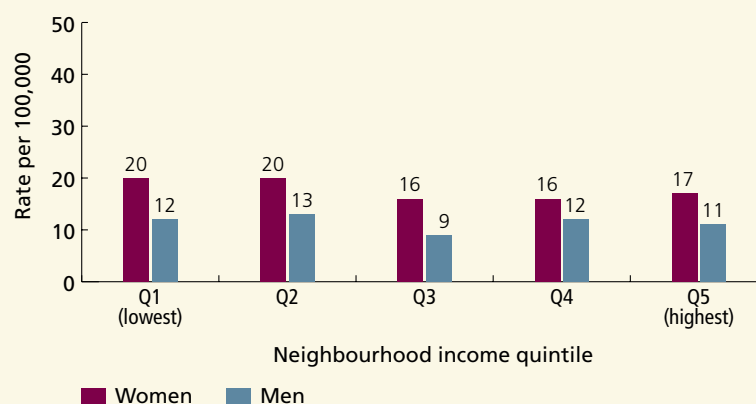
Background: Electroconvulsive therapy has been found to be effective for individuals with severe and treatment-resistant forms of depression.^{63, 64} It is also used to treat other severe mental illnesses such as bipolar disorder and schizophrenia, but more as an alternative to first-line treatment options.⁶⁴

Findings: In Ontario, the number of ECT users was 15 people per 100,000 population aged 15 and older. The rate was significantly higher in women than in men: 18 per 100,000 versus 11 per 100,000, respectively.

EXHIBIT 5A.7 | Age-standardized rate (per 100,000 population) of electroconvulsive therapy (ECT) users in Ontarians aged 15 and older, by sex and neighbourhood income quintile, 2005/06[^]

FINDINGS

- Women were more likely than men to receive ECT, regardless of neighbourhood income quintile.
- Women living in lower-income neighbourhoods were somewhat more likely to receive ECT than those living in higher-income neighbourhoods.



DATA SOURCES: Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census; Registered Persons Database (RPDB)

[^] People who accessed services from Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5A.8 | Summary of sex differences (women-to-men ratios and 95% confidence intervals) in background measures of need for and use of depression care, in Ontario



DATA SOURCES:

- [^] Canadian Community Health Survey (CCHS), Cycle 1.1, 2000/01
- [†] Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Mar 1, 2005 - Feb 28, 2006; Registered Persons Database (RPDB)
- [¥] Ontario Health Insurance Plan (OHIP), Mar 1, 2005 - Feb 28, 2006; RPDB
- [‡] Extremely narrow confidence intervals

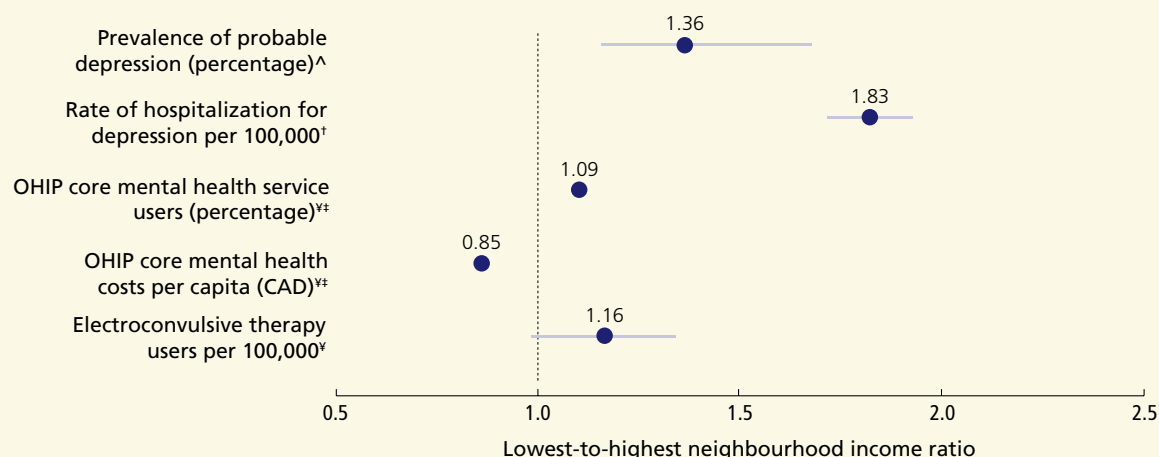
NOTE: See ‘[Interpreting Risk Ratios](#)’ box in the Introduction of [Section 5A](#)

FINDINGS

- Women were almost twice as likely as men (risk ratio - 1.98) to have probable depression.
- The pattern of service use was similar to the prevalence pattern. Women were consistently and significantly more likely than men to use both OHIP core mental health services and those more specific to the care of depression (hospitalization for depression and ECT use).

POWER Study

EXHIBIT 5A.9 | Summary of neighbourhood income differences (lowest-to-highest neighbourhood income quintile ratios and 95% confidence intervals) in background measures of need for and use of depression care, in Ontario



DATA SOURCES:

Statistics Canada 2001 Census

[^] Canadian Community Health Survey (CCHS), Cycle 1.1, 2000/01

[†] Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Mar 1, 2005 - Feb 28, 2006; Registered Persons Database (RPDB)

[¥] Ontario Health Insurance Plan (OHIP), Mar 1, 2005 - Feb 28, 2006; RPDB

[‡] Extremely narrow confidence intervals

NOTES: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

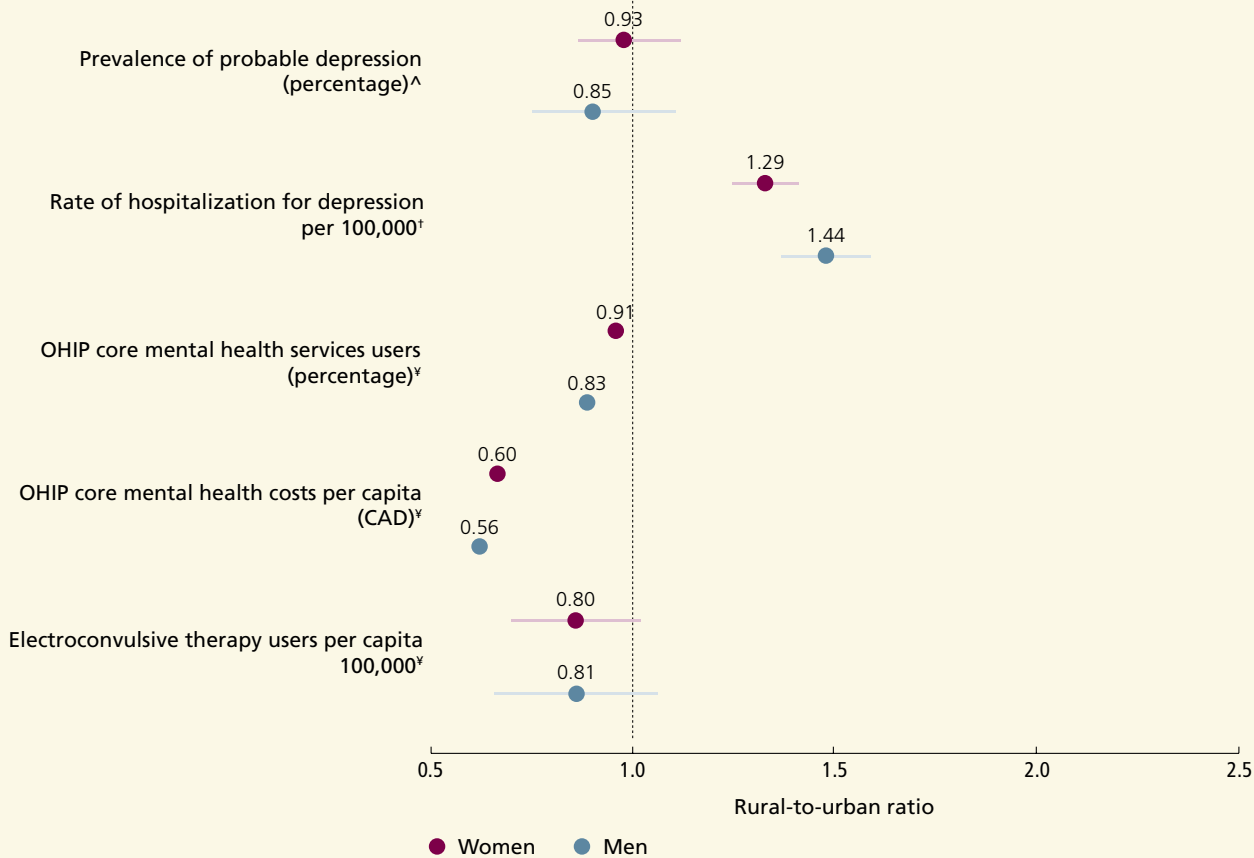
See 'Interpreting Risk Ratios' box in the Introduction of [Section 5A](#)

FINDINGS

- Lowest-income neighbourhoods had a significantly higher prevalence of probable depression than highest-income neighbourhoods (risk ratio - 1.36).
- Women and men living in the lowest-income neighbourhoods were also somewhat more likely to use OHIP core mental health services and to receive ECT and much more likely to be hospitalized for depression.
- However, individuals living in the lowest-income neighbourhoods accounted for lower OHIP core mental health care costs, which suggests they either made fewer visits or received less expensive services than those living in the highest-income neighbourhoods.
- The effect of neighbourhood income was similar for women and men for use and cost measures of depression care (data not shown).

POWER Study

EXHIBIT 5A.10 | Summary of rural/urban residency differences (rural-to-urban ratios and 95% confidence intervals) in background measures of need for and use of depression care, by sex, in Ontario



DATA SOURCES:

Statistics Canada 2001 Census

[^] Canadian Community Health Survey (CCHS), Cycle 1.1, 2000/01

[†] Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Mar 1, 2005 - Feb 28, 2006

[‡] Ontario Health Insurance Plan (OHIP), Mar 1, 2005 - Feb 28, 2006

[‡] Extremely narrow confidence intervals

NOTES: See [Appendix 5.3](#) for details about rural/urban residency calculation
See 'Interpreting Risk Ratios' box in the Introduction of [Section 5A](#)

FINDINGS

- The prevalence of probable depression was similar in rural and urban regions.
- Women and men from rural areas were less likely to have had OHIP core mental health visits but were more likely to have been hospitalized for depression than those living in urban areas.
- Women and men from rural areas also incurred lower OHIP core mental health costs per capita.

POWER Study

MEASURES OF SUPPLY: FINANCIAL AND HUMAN RESOURCES

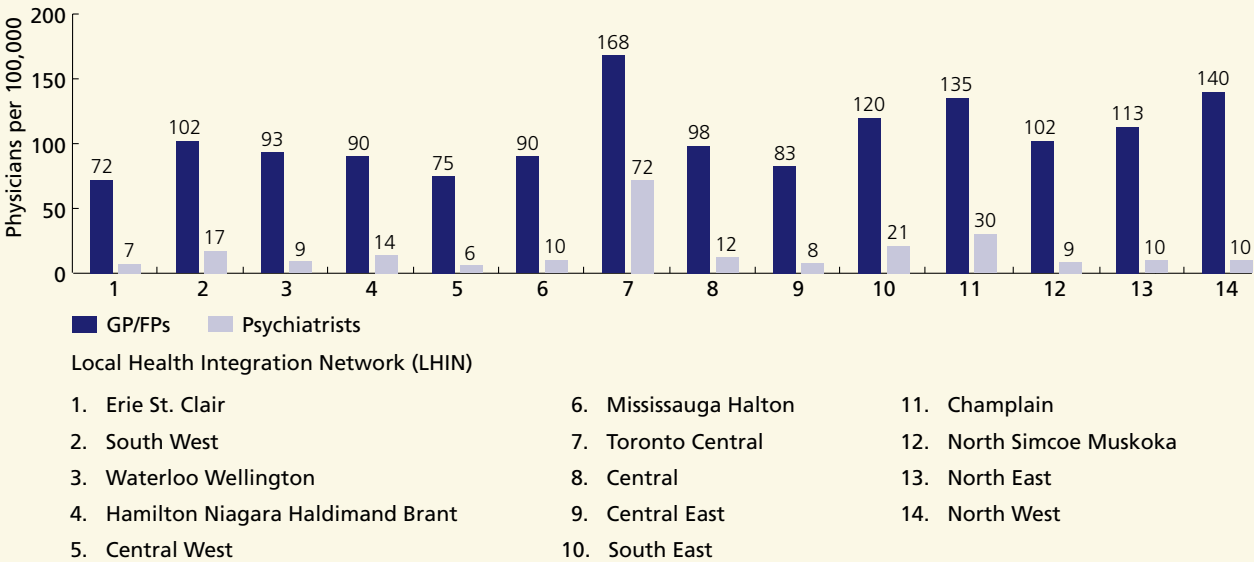
Measures: Three measures of supply of medical services for mental health care are explored:

- Number of general practitioners (GPs) or family practice physicians (FPs) per 100,000 population
- Number of psychiatrists per 100,000 population
- Number of acute hospital psychiatric beds per 100,000 population

Background: Most Canadians receive their medical mental health care through visits to family physicians and psychiatrists.^{28, 61, 62} A much smaller percentage receive care in walk-in clinics, community mental health agencies, case management and crisis teams, emergency departments and inpatient hospital beds.⁶⁵ The three supply measures reported here measure the most frequently visited medical providers of mental health care (family physicians and psychiatrists) and the most costly service (hospital beds).

Findings: In Ontario, there are 105 GP/FPs, 19 psychiatrists and 51 acute hospital psychiatric beds per 100,000 population.

EXHIBIT 5A.11 | Numbers of GP/FPs^ and psychiatrists per 100,000 population aged 15 and older, by physician type and Local Health Integration Network (LHIN), in Ontario, 2005/06



DATA SOURCES: ICES Physician Database (IPDB); Registered Persons Database (RPDB)

^ GP/FP=General Practitioner/Family Physician

FINDINGS

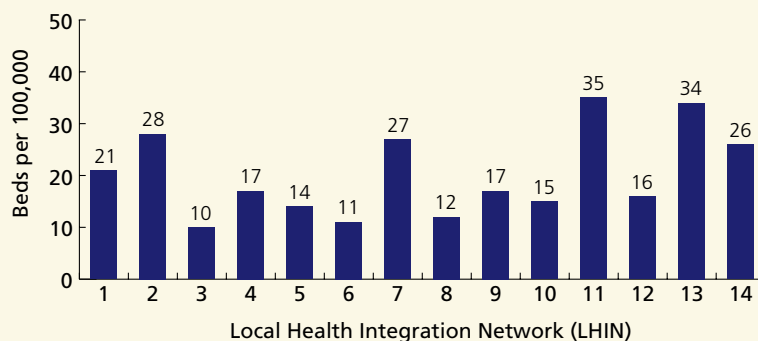
- There was considerable regional variation in physician supply across Ontario.
- The Toronto Central LHIN had more than twice as many GP/FPs as the Erie St. Clair LHIN (168 per 100,000 versus 72 per 100,000).
- The Toronto Central LHIN had more than twelve times as many psychiatrists available as the Central West LHIN (72 per 100,000 versus 6 per 100,000).

POWER Study

EXHIBIT 5A.12 | Number of psychiatric beds per 100,000 population aged 15 and older, by Local Health Integration Network (LHIN), in Ontario, 2005/06

FINDINGS

- There was nearly a three-fold difference in the number of psychiatric beds available across the LHINs. The Champlain LHIN had 35 beds per 100,000 population compared to 10 beds per 100,000 in the Waterloo Wellington LHIN.



- | | |
|-------------------------------------|--------------------------|
| 1. Erie St. Clair | 8. Central |
| 2. South West | 9. Central East |
| 3. Waterloo Wellington | 10. South East |
| 4. Hamilton Niagara Haldimand Brant | 11. Champlain |
| 5. Central West | 12. North Simcoe Muskoka |
| 6. Mississauga Halton | 13. North East |
| 7. Toronto Central | 14. North West |

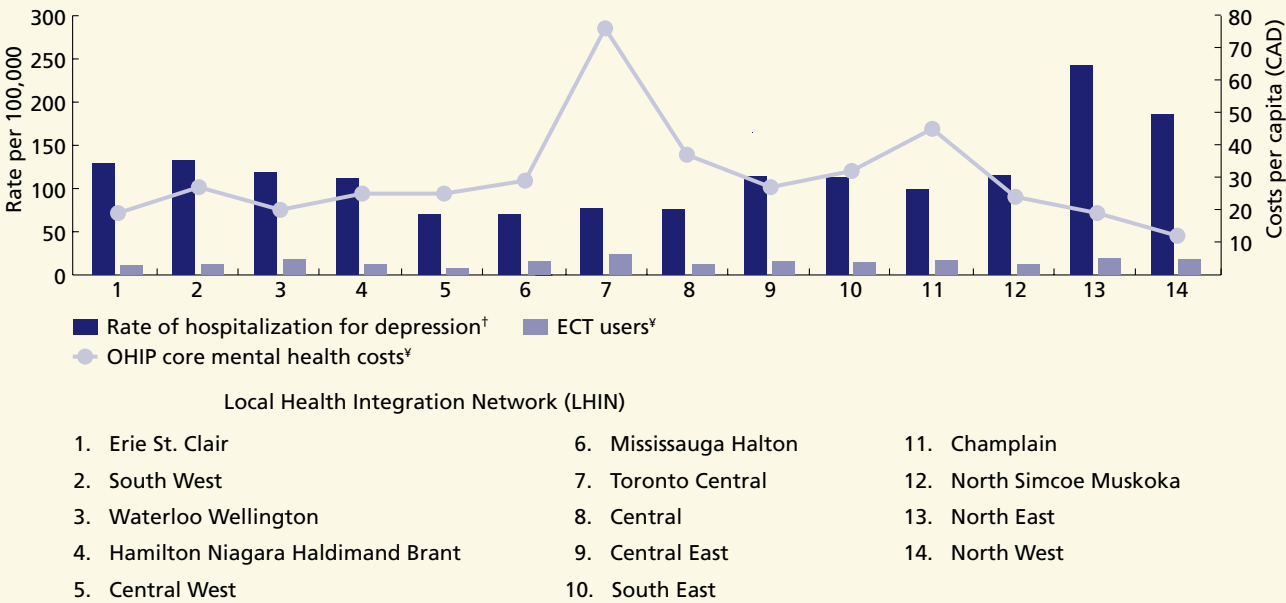
DATA SOURCES: Daily Census Summary Report Mental Health Beds online, MOHLTC Health Data Branch (http://www.mohltcfim.com/cms/client_webmaster/index.jsp, accessed February 6, 2008); Registered Persons Database (RPDB)

POWER Study

PATTERNS OF NEED, USE AND SUPPLY

The geographic variations in three of the descriptive measures of use are presented together with the objective of comparing them to the geographic patterns of need and supply presented earlier in this section.

EXHIBIT 5A.13 | Treatment rates and costs associated with depression and core mental health care use in Ontarians aged 15 and older, by measure and Local Health Integration Network (LHIN), 2005/06^



DATA SOURCES:

Registered Persons Database (RPDB)

† Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

‡ Ontario Health Insurance Plan (OHIP)

^ People who were discharged from hospital or accessed services from Mar 1, 2005 - Feb 28, 2006

FINDINGS

- The geographic patterns of hospitalizations for depression, electroconvulsive therapy use and cost per capita for Ontario Health Insurance Plan (OHIP) core mental health services varied considerably and there was no consistent relationship among these patterns. Some areas with low rates of hospitalization had high per capita expenditures for core mental health care, others did not.
- The OHIP core mental health care costs per capita align with the supply of physicians shown in an earlier exhibit (Exhibit 5A.11) while hospitalization rates align with the supply of hospital beds (Exhibit 5A.12).
- However, there was no consistent relationship across the LHINs between OHIP core mental health care costs or hospitalization rates and the prevalence of probable depression (Exhibit 5A.2).

POWER Study

Section 5A

SUMMARY OF FINDINGS

These measures provide a complex backdrop for studying gender and sociodemographic inequities in need and access to mental health care. We found, consistent with the literature, that prevalence of probable depression varied among population subgroups. Women had a higher prevalence of depression than men and women living in the lowest-income neighbourhoods had a higher prevalence than women living in the highest-income neighbourhoods. Women with probable depression were more likely to report comorbid chronic medical conditions than men. The data on use of Ontario Health Insurance Plan (OHIP) core mental health services clearly show differences in access by sex, neighbourhood income and rural/urban residency. There was sizable regional variation in supply and use of mental health services.

More information on the match between individual need for depression care and OHIP visits for depression follows in Sections 5B and 5C of this chapter.

Need

- Women were twice as likely to have probable depression as men in Ontario.
- There were regional and income differences in the prevalence of probable depression. Individuals living in the lowest-income neighbourhoods were more likely to have probable depression than those living in the highest-income neighbourhoods.
- There were no differences in the prevalence of probable depression between people who were living in rural and urban areas.
- Women with probable depression were somewhat more likely to report comorbid chronic medical conditions than men. However, there were few differences by sex in self-rated health or self-reported functioning among those with probable depression.

Use

- There were distinct sex differences in use of services for depression. Women were between one and a half to two times more likely than men to use OHIP core mental health services—a pattern consistent with their higher rates of depression.
- Although women from lower-income neighbourhoods were more likely to have probable depression than those from higher-income neighbourhoods, they had the same rate of use of OHIP core mental health services. However, women from higher-income neighbourhoods incurred greater OHIP core mental health costs than women from lower-income neighbourhoods.
- Women and men from lower-income neighbourhoods were almost twice as likely to be hospitalized for depression but incurred slightly lower average costs for OHIP mental health services than those from higher-income neighbourhoods.
- Rural and urban residents used services differently. Rural residents were more likely to be hospitalized for depression, while urban dwellers had higher per capita OHIP costs for mental health care.

Supply

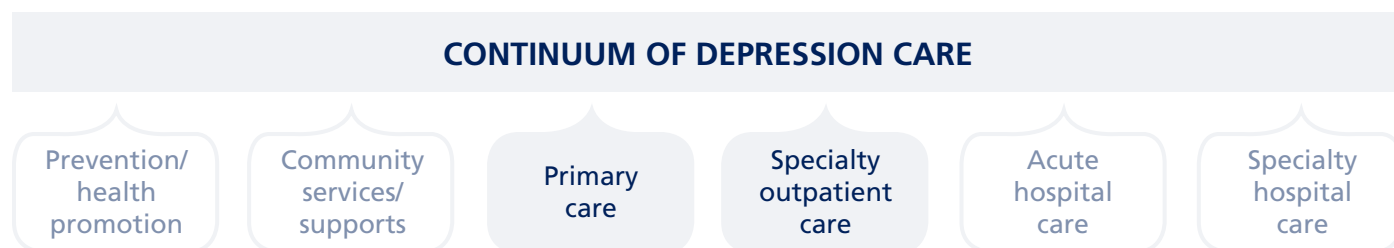
- Resources such as physician supply and psychiatric hospital beds varied markedly across Local Health Integration Networks (LHINs). The differences between the highest and lowest rates per 100,000 population among LHINs ranged from twice as many GPs to three times as many hospital beds and 12 times as many psychiatrists.

Patterns of Need, Use and Supply

- Patterns of service use reflected supply more than need.

Section 5B

Primary and Specialty Outpatient Care



INTRODUCTION

Along the continuum of depression care, primary care and specialty outpatient care play a critical role. Primary and specialty outpatient care providers identify and diagnose depression and provide treatment that improves mental health and prevents recurrence of the condition.

Early, equitable assessment and treatment are important because the costs of depression are high. Untreated depression results in poor functional status and disability among women and men with the disease. It can also lead to high costs to the health system and society because suboptimal diagnosis and treatment lead to costly and potentially preventable expenses including avoidable hospitalizations and lost productivity. In the previous section we showed that women were more likely to be depressed and also more likely to seek medical care for mental health problems. Although the medical literature shows gender differences in how women and men seek help and their reported barriers to care, those issues are beyond the scope of this chapter.⁶⁶ In this section, we look more specifically at the quality of care for depression in outpatient settings and try to determine whether there are sex differences in the delivery of that care.

People with depression often go untreated²⁻⁴ and other studies suggest that some receive suboptimal care.^{6, 7} However, there is growing evidence that a number of interventions do improve the quality and outcomes of depression care.^{8-10, 67} Furthermore, there are well-validated indicators that measure the quality of depression care which are in use internationally.⁶⁸

In this section we focus on depression care provided in primary and specialty outpatient settings, which are the most frequent source of overall mental health care reported in North American household surveys,⁶⁹⁻⁷¹ including Ontario surveys.⁷²

We examined three indicators specific to outpatient treatment for depression to assess whether there were gender disparities in depression care; and whether there were disparities among women and men associated

with income and age in access to or quality of care in the province. They are:

- Percentage of people with probable depression who had a physician visit for depression
- Percentage of patients, aged 66 and older, who filled and continued a new prescription for antidepressant medication and who had at least three physician visits for depression in the 12 weeks after starting antidepressants
- Percentage of women who had given birth who had a physician visit for depression within one year following delivery.

The definition of a physician visit for depression in this chapter is imprecise and may either under- or over-estimate the number of physician visits for depression

care because of some limitations with Ontario Health Insurance Plan (OHIP) data. Only one diagnostic code can be recorded in the OHIP database per patient visit, therefore, a person with depression plus another condition may have her/his visit coded as the other condition instead of depression, leading to under-counting. Also, one of the two codes related to depression (OHIP diagnostic code, 300) combines it with other mental health conditions such as anxiety. Since this is also the code most frequently used by family doctors, this leads to over-counting of physician visits for depression (see Appendix 5.3 for more detail).⁷³ However, when the definition is tied to a person with probable depression or a prescription for an antidepressant, it may more closely indicate a visit where depression was addressed.



EXHIBITS AND FINDINGS

PERCENTAGE OF INDIVIDUALS WITH PROBABLE DEPRESSION WHO HAD A PHYSICIAN VISIT FOR DEPRESSION

Indicator: This indicator measures the percentage of individuals, aged 15 and older, with probable depression who had a physician visit for depression in the year after being interviewed for a health survey (Canadian Community Health Survey (CCHS), Cycle 1.1).

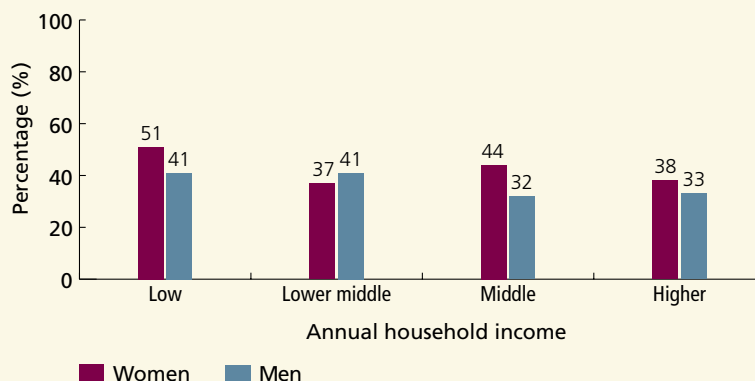
Background: Depression is a treatable condition and high quality care for depression leads to improved patient outcomes. Having a physician visit for depression is often the first step towards receiving this care. The best measures of population need for depression care come from household surveys such as the CCHS, Cycle 1.2 or the World Mental Health 2000 surveys developed by the World Health Organization.^{74, 75} Studies using these measures find that approximately 50 percent of those who met the survey criteria for major depression in the past year reported no contact with medical mental health services during that time.^{76, 77} While it is not clear that everyone who meets these kinds of survey criteria requires medically provided depression care, it is still certain that there are many who do not get the treatment they need.^{72, 78-80}

Findings: In Ontario, only 40 percent of people with probable depression (41 percent of women and 37 percent of men) had at least one physician visit for depression within the year following the CCHS interview.

EXHIBIT 5B.1 | Age-standardized percentage of Ontarians aged 15 and older with probable depression who had a physician visit for depression, by sex and annual household income, 2000/01

FINDINGS

- Low-income women with probable depression were significantly more likely than higher-income women to have had a physician visit for depression. The income variation was not significant in men.



DATA SOURCES: Canadian Community Health Survey (CCHS), Cycle 1.1; Ontario Health Insurance Plan (OHIP)

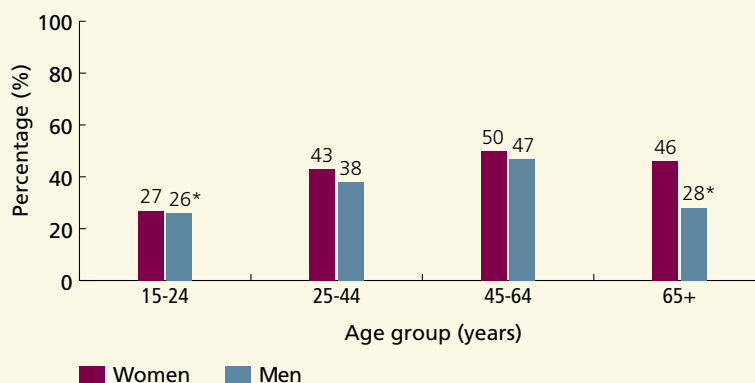
NOTE: See [Appendix 5.3](#) for definitions of annual household income categories

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EXHIBIT 5B.2 | Percentage of Ontarians aged 15 and older with probable depression who had a physician visit for depression, by sex and age group, 2000/01

FINDINGS

- There was no difference in the percentage of women and men who had a physician visit for depression, irrespective of age.
- The rate of physician visits for depression was highest among those aged 45-64 and lowest among those aged 15-24.



DATA SOURCES: Canadian Community Health Survey (CCHS), Cycle 1.1; Ontario Health Insurance Plan (OHIP)

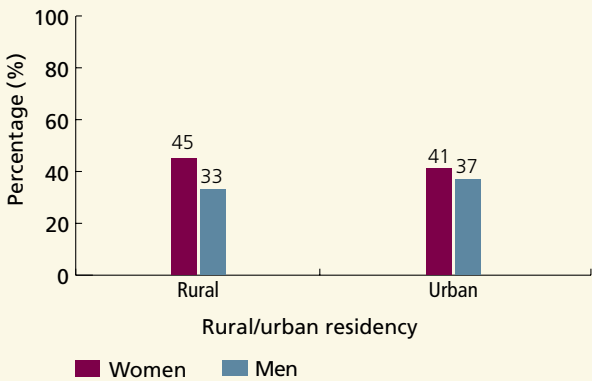
* Interpret with caution due to high sampling variability

POWER Study

EXHIBIT 5B.3 | Age-standardized percentage of Ontarians aged 15 and older with probable depression who had a physician visit for depression, by sex and rural/urban residency, 2000/01

FINDINGS

- The percentage of individuals with probable depression who had a physician visit for depression did not vary by rural/urban residency (data not shown).
- Among rural residents, women with probable depression were significantly more likely to have a physician visit for depression than men (45 percent versus 33 percent, respectively). There were no sex differences among urban residents.
- Across all LHINs, less than 50 percent of those with probable depression had a physician visit for depression within one year. The rates ranged from 31 percent in the North East LHIN to 45 percent in the Central West and Toronto Central LHINs; however this variation was not significant, possibly due to small sample sizes at the LHIN level (data not shown).



DATA SOURCES: Canadian Community Health Survey (CCHS), Cycle 1.1; Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 5.3](#) for definitions of rural/urban residency

POWER Study

PERCENTAGE OF OLDER ADULTS STARTING A NEW COURSE OF ANTIDEPRESSANT MEDICATION WHO RECEIVED ADEQUATE PHYSICIAN FOLLOW UP

Indicator: This indicator measures the percentage of patients aged 66 and older, who filled and continued a new prescription for antidepressant medication (i.e., refilled within 100 days) and who had the recommended minimum of at least three physician visits for depression in the 12 weeks after starting antidepressants.

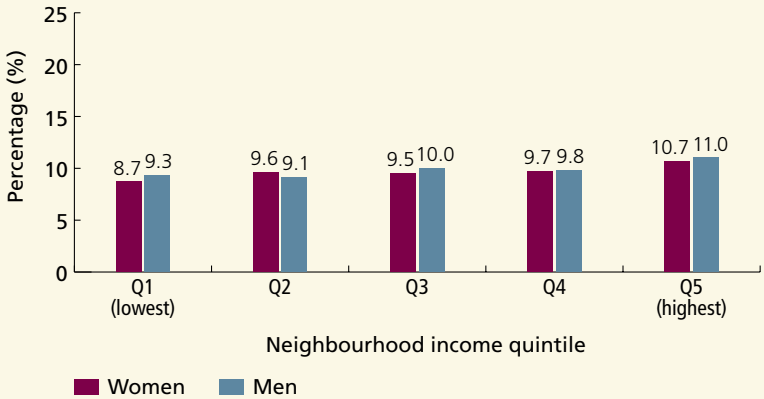
Background: This indicator assesses the quality of depression care for people on medication. Antidepressants effectively treat depression in about two-thirds of moderate to severe cases. People vary in their response to both the kind of antidepressant and the dosage because of factors such as genetic makeup, body mass index, racial or ethnic background and physical health. Therefore, frequent evaluation by a physician is important during the first 12 weeks of treatment (the acute phase) to monitor patients' responses, reduction of symptoms and adverse reactions to the drug.⁸¹ It was not possible to look at all adults who started antidepressant medication, because prescription data were only available for those aged 65 and older. Because we restricted our sample to people who had not filled a prescription for antidepressants in the previous year, the sample was limited to people aged 66 and older to be able to confirm this.

Findings: In Ontario, 9.6 percent of patients aged 66 and older (9.5 percent of women and 9.9 percent of men) who filled and continued a new prescription for antidepressants had at least three physician visits for depression in the 12 weeks after starting medication.

EXHIBIT 5B.4 | Age-standardized percentage of adults aged 66 and older, starting a new course of antidepressants[^] who had three or more physician visits for depression within 12 weeks of starting medication, by sex and neighbourhood income quintile, in Ontario, 2005/06[†]

FINDINGS

- There was no difference in the percentage of women and men aged 66 and older who had at least three physician visits for depression after starting on antidepressants, irrespective of neighbourhood income.
- Women and men living in lower-income neighbourhoods were somewhat less likely to have had at least three physician visits for depression after starting on antidepressants than those living in higher-income neighbourhoods. This difference was not significant among men, possibly due to small sample size.



DATA SOURCES: Ontario Drug Benefits (ODB) database; Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

[^] People with no history of antidepressant use in the past year, who then filled two or more antidepressant prescriptions with a 100-day period

[†] People whose first prescriptions were filled from Mar 1, 2005 - Feb 28, 2006

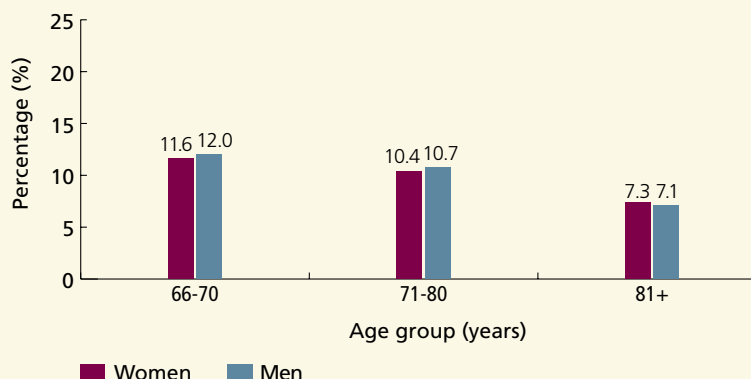
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 5B.5 | Percentage of adults aged 66 and older, starting a new course of antidepressants[^] who had three or more physician visits for depression within 12 weeks of starting medication, by sex and age group, in Ontario, 2005/06[†]

FINDINGS

- The percentage of patients who had the recommended number of physician visits to monitor antidepressant use declined significantly with age for women and men.
- Women and men were equally disadvantaged, irrespective of age, income or LHIN (income and LHIN data are not shown).
- This age variation was consistent across most Local Health Integration Networks (LHINs).
- Older patients often see their physicians for a complex variety of health problems, so we broadened this indicator to include physician visits for any reason, even though the data did not allow us to assess whether care for depression was actually provided. The more broadly defined version of this indicator showed substantially higher rates for both sexes, ranging between 80 and 90 percent. There were no sex differences for this version of the indicator across age, neighbourhood income, or LHIN (data not shown).
- The age variation seen in the broader definition of follow up was the opposite of that found for the narrower definition. The percentage of people who saw their doctors three times in the 12 weeks after they started a new course of antidepressants increased significantly with age, from 80 percent (aged 66-70) to 84 percent (aged 71-80) to 87 percent (aged 81 and older).
- As was the case for the narrower definition, the age variation was consistent and significant across most LHINs.



DATA SOURCES: Ontario Drug Benefits (ODB) database; Ontario Health Insurance Plan (OHIP)

[^] People with no history of antidepressant use in the past year, who then filled two or more antidepressant prescriptions within a 100-day period

[†] People whose first prescriptions were filled from Mar 1, 2005 - Feb 28, 2006

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EXHIBIT 5B.6 | Percentage of adults aged 66 and older, starting a new course of antidepressants[^] who had three or more physician visits for depression within 12 weeks of starting medication, by Local Health Integration Network (LHIN), in Ontario, 2005/06[†]

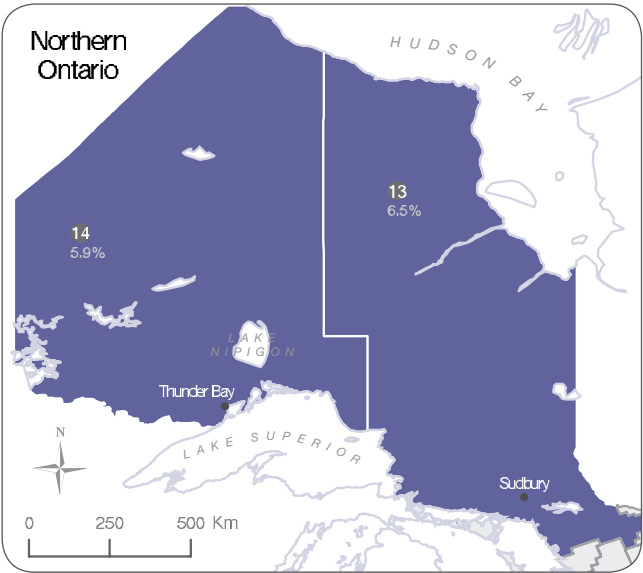
FINDINGS

- Unadjusted rates of having had three or more physician visits for depression after starting and continuing on antidepressant medication ranged from 5.9 percent in the North West LHIN to 13.6 percent in the Toronto Central LHIN.
- After adjusting for age, these rates remained similar to the unadjusted rates, ranging from 5.9 percent in the North West LHIN to 13.5 percent in the Toronto Central LHIN. Furthermore, the pattern across LHINs did not change (data not shown).
- For the broader definition of physician follow up, unadjusted rates ranged from 76 percent in the North West LHIN to 88 percent in the Central LHIN (data not shown).

POWER Study

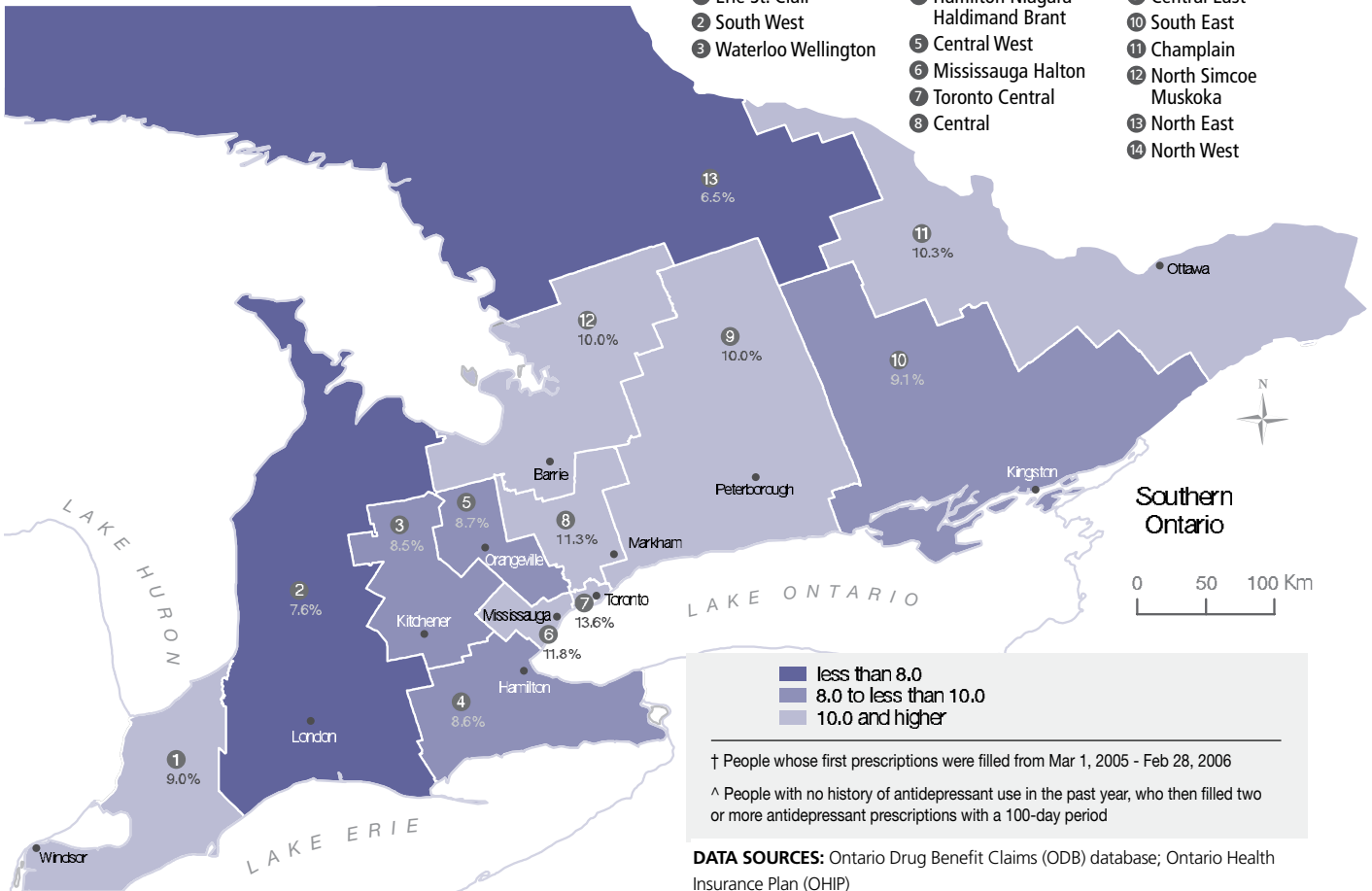
Overall Ontario

In Ontario, 9.6% of individuals, aged 66 and older who started and continued on an antidepressant had at least three physician visits for depression in the 12 weeks after starting medication.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



■ less than 8.0
■ 8.0 to less than 10.0
■ 10.0 and higher

[†] People whose first prescriptions were filled from Mar 1, 2005 - Feb 28, 2006

[^] People with no history of antidepressant use in the past year, who then filled two or more antidepressant prescriptions with a 100-day period

DATA SOURCES: Ontario Drug Benefit Claims (ODB) database; Ontario Health Insurance Plan (OHIP)

PERCENTAGE OF WOMEN WHO HAD A PHYSICIAN VISIT FOR DEPRESSION WITHIN ONE YEAR OF GIVING BIRTH

Indicator: This indicator measures the percentage of Ontario women who had a physician visit for depression within one year of giving birth in a hospital (excluding still births).

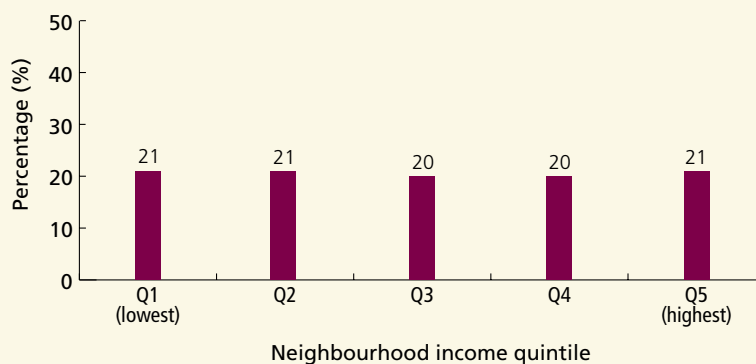
Background: Postpartum depression is estimated to occur after 13 percent of births⁸² although the rate varies across countries and ethnic groups.^{83, 84} Its impact on the mother, child and family can be substantial, both in the short- and long-term. This indicator provides baseline descriptive information on the proportion of Ontario women who had a physician visit for depression within one year of giving birth.

Findings: In Ontario, 20 percent of women who had given birth saw a physician for depression within one year of delivery.

EXHIBIT 5B.7 | Age-standardized percentage of women who had a physician visit for depression within one year of giving birth, by neighbourhood income quintile, in Ontario, 2005/06[^]

FINDINGS

- The percentage of women who gave birth and then had a physician visit for depression within one year did not vary by neighbourhood income.
- This indicator varied significantly by age; 20 percent of women aged 25-44 had a physician visit for depression within a year of giving birth compared to 24 percent of women aged 15-24. The rate in the oldest age group (aged 45-64) was less reliable because of small numbers (data not shown).
- There was significant regional variation in the percentage of women who gave birth and had a subsequent physician visit for depression within a year, ranging from 15 percent in the North West LHIN to 26 percent in the North Simcoe Muskoka LHIN (data not shown).



DATA SOURCES: ICES Mother-Baby (MOMBABY) Linked Database; Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

[^] Women with in-hospital live births (stillbirths were excluded) who were discharged between Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

Section 5B

SUMMARY OF FINDINGS

The indicators in this section include three measures of depression care provided in primary or specialty outpatient settings:

- Care for Ontarians with probable depression;
- Care for older Ontarians starting a new course of antidepressant medication and
- Care for postpartum women.

The first two indicators shared several patterns. We found women and men faced no significant differences in their access to care. Forty-one percent of women and 37 percent of men with probable depression had at least one physician visit for depression within a year of their survey interview. Older Ontarians who started antidepressant medications had the lowest follow up rates for depression (i.e., at least three physician visits for depression within 12 weeks of starting medication); 9.5 percent of women and 9.9 percent of men, although roughly 85 percent had at least three physician visits for any reason in the important first 12 weeks after starting antidepressants. Better data are needed to more accurately assess depression care in outpatient settings.

We showed potential under-treatment for depression—60 percent of Ontarians with probable depression did not have a physician visit for depression care. Because there is a high potential for impairment of functioning associated with depression, but a good record of effectiveness for both drug and non-drug therapies, many of those who do not get care may be suffering needlessly. Further, monitoring patients' responses to drugs and their side effects is a critical component of high-quality care in general, especially for fragile populations such as older adults.

All the indicators showed disparities associated with age although the patterns differed. Ontarians aged 45-64

with probable depression were the most likely to visit a physician for depression, although they were not the age group with the highest prevalence. Among older Ontarians starting antidepressants, age was associated with a decreasing likelihood of physician visits for depression but an increasing likelihood of physician visits for any reason.

Finally, there were differences by income. Women with probable depression who had lower annual household incomes were more likely have a physician visit for depression than those with higher annual household incomes. However, older women from lower-income neighbourhoods who started antidepressants were less likely to have had the recommended number of follow up physician visits than women from higher-income neighbourhoods.

The third indicator measured depression care for postpartum women. The finding that 20 percent of Ontario women who gave birth had a physician visit for depression in the year after delivery was considerably higher than the rate of postpartum depression reported in the literature (13 percent).⁸² One possible explanation is the large number of immigrants in Ontario. Stewart and colleagues²² found that 35 percent of women in Ontario and Quebec who had immigrated to Canada less than five years ago scored 10 or higher on the Edinburgh Postnatal Depression Scale, which is the usual cut off score for probable depression in community samples.⁸³ It is also possible that physicians and some groups of new mothers are more aware of the possibility of postpartum depression, or that the numbers differed because of the way physicians use OHIP codes to bill for counselling non-depressed women in some Local Health Integration Networks (LHINs).



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The limitations in our data mean we cannot be certain why our findings of the rates of physician visits for depression during the postpartum period were different from other studies. However, because there were no significant differences by neighbourhood income, and younger women were more likely than those aged 25-44 to have physician visits for postpartum depression, it suggests need, as measured by prevalence, is not fully reflected in physician visits for

depression. The significant differences in postpartum physician visits for depression across the LHINs (ranging from 15 to 26 percent) suggest local practice patterns or the way services are organized regionally may influence rates of physician visits for depression. Other factors that predict postpartum depression, such as social support or poor marital relationships, may also play a role⁸² and could be explored if data on those issues become available in Ontario.

Section 5C

Acute and Specialty Inpatient Care



INTRODUCTION

Acute and specialty hospital care are also vital components of the continuum of depression care. Important services for those with severe depression are provided by emergency departments, inpatient units of acute care hospitals or psychiatric hospitals.

The aim of these services is to ameliorate severe depression symptoms, prevent mortality due to depression and stabilize the individual so that she or he can benefit from outpatient and other community-based care.

The percentage of people who visit emergency departments or are hospitalized for depression is quite small: only about 1.5 percent of Ontario's adult population had emergency department visits for mental health reasons.⁸⁵ Hospitalization rates specifically for depression are also low, at only 80-150 per 100,000 for women and 60-100 per 100,000 for men.⁸⁶ Nevertheless, it is important for us to look closely at acute and specialty hospital care because these services are quite resource intensive. Although Ontario has focused on reducing the rate of hospitalization for major depression,^{60, 87, 88} it still accounted for 18 percent (\$80 million) of the province's total direct health care costs for major depression in 2000.⁸⁹

It is also important to look at indicators of inpatient care because they serve people with the most complex and serious forms of depression. These acutely ill patients may be very fragile and at risk of imminent harm to themselves (either due to suicidal intentions or because they are unable to look after their own basic needs) or to others. Depression of this severity is associated with the highest individual, family and societal burden.⁹⁰

The Canadian clinical treatment guidelines for depressive disorders recommend that discharge from hospital services include a discharge plan that refers the patient to relevant mental health services and monitoring since the period after discharge is high-risk for suicidal behaviour.⁹¹

Research has found gender differences in hospital care for other health conditions, including heart attacks.⁹² We know women have a higher rate of hospitalization for depression.⁹³ However, sex differences in the management and outcomes of acute and specialty

inpatient care for depression have not been previously reported for Ontario. This information is important for assessing whether there are gender inequities in the depression care delivered here.

In this section we assess sex differences in patterns of acute and specialty inpatient care for depression. The evidence-based indicators for measuring process and outcomes in acute and speciality inpatient services were measured in patients admitted to hospital for depression and include:

- Physician visits for depression within 30 days of discharge;
- Average number of days post-discharge to first physician visit for depression;
- Emergency department visits (with no subsequent hospital admission) within 30 days of discharge;
- 30-day readmission rate for depression.

These indicators are based on data from all Ontario hospitals submitting discharge records to the Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD) which, at the time of writing, did not include four psychiatric or former psychiatric hospitals. However, because the vast majority of hospitalizations for depression are in general hospitals (all covered in the CIHI-DAD) and people admitted to the four speciality hospitals tend to stay longer and are less likely to be discharged within a year, the proportion of discharges for depression that could be missed should be quite small. The accuracy of the CIHI-DAD information on hospital stays for depression is considered quite high because of the precise diagnostic codes used.

The first two indicators in this section measure physician visits for depression following hospitalization for depression. As noted in [Section 5B](#), the definition of a physician visit for depression in this chapter is imprecise and may either under- or over-estimate the number of physician visits for depression care due to limitations of Ontario Health Insurance Plan (OHIP) codes for these visits (see [Appendix 5.3](#) for more detail).



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EXHIBITS AND FINDINGS

PHYSICIAN VISITS FOR DEPRESSION WITHIN 30 DAYS OF HOSPITAL DISCHARGE

Indicator: This indicator measures the percentage of patients aged 15 and older hospitalized for depression who had a physician visit for depression within 30 days of discharge.

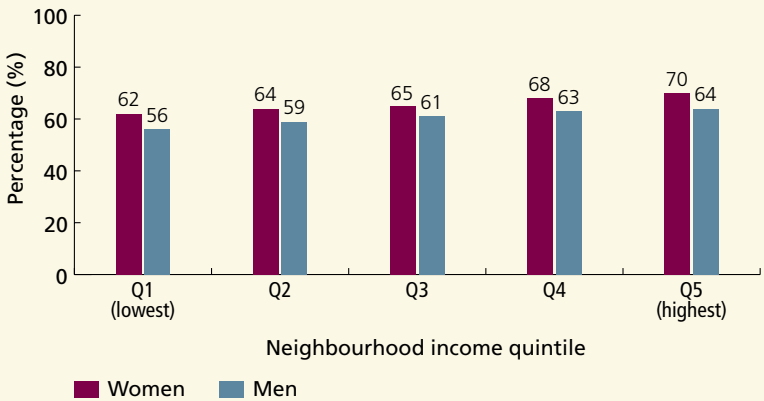
Background: Post-discharge follow up care, including ongoing medical attention, is critical for people experiencing severe depression. Recent work in Ontario found that 80 to 90 percent of clients in community mental health programs or provincial hospitals are on psychotropic medication and that compliance and symptom and medication management are important concerns for these individuals.⁹⁴

Findings: In Ontario, 63 percent of patients (65 percent of women and 60 percent of men) who were hospitalized for depression had a follow up physician visit for depression within 30 days of discharge.

EXHIBIT 5C.1 | Age-standardized percentage of patients aged 15 and older admitted to hospital for depression who had a physician visit for depression within 30 days of discharge, by sex and neighbourhood income quintile, in Ontario, 2005/06[^]

FINDINGS

- One in three Ontario women and men did not have a physician visit within 30 days of being discharged after a hospital stay for depression.
- Regardless of income, men were less likely than women to receive physician follow up after a hospital stay for depression.
- Income was a significant factor in who received physician care following hospitalization for depression. Women and men living in lower-income neighbourhoods had lower rates of physician follow up than those from higher-income neighbourhoods.
- Sex differences in physician follow up care persisted across age groups (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

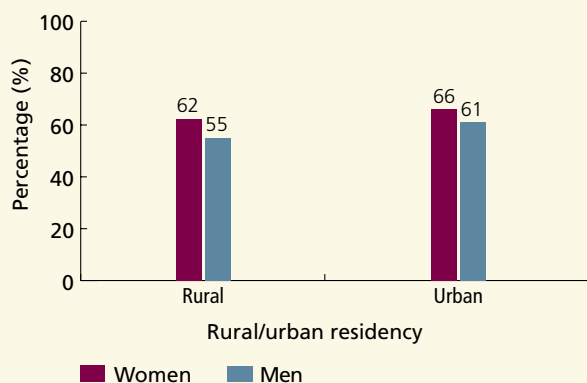
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5C.2 | Age-standardized percentage of patients aged 15 and older admitted to hospital for depression who had a physician visit for depression within 30 days of discharge, by sex and rural/urban residency, in Ontario, 2005/06[^]

FINDINGS

- A larger percentage of women than men had a physician visit for depression within 30 days of discharge, irrespective of rural/urban residency.
- Urban residents who were hospitalized for depression were significantly more likely than rural residents to have a physician visit for depression within 30 days of hospital discharge (64 percent versus 59 percent) (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for definitions of rural/urban residency

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EXHIBIT 5C.3 | Percentage of patients aged 15 and older admitted to hospital for depression who had a physician visit for depression within 30 days of discharge, by Local Health Integration Network (LHIN), in Ontario, 2005/06[^]

FINDINGS

- The unadjusted rates of physician visits for depression within 30 days of discharge varied significantly by LHIN. The rates were lowest in the South East LHIN (50 percent) and highest in the Central LHIN (72 percent).

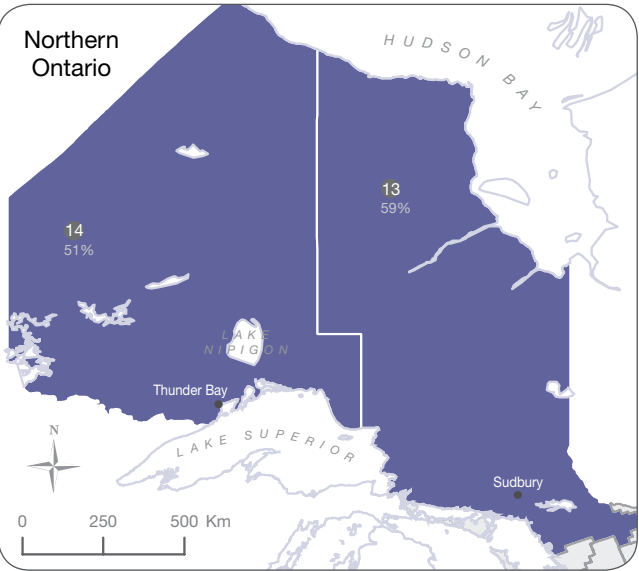
POWER Study

Overall Ontario

In Ontario, 63% of all inpatient stays for depression were followed by one or more physician visits for depression within 30 days after discharge.

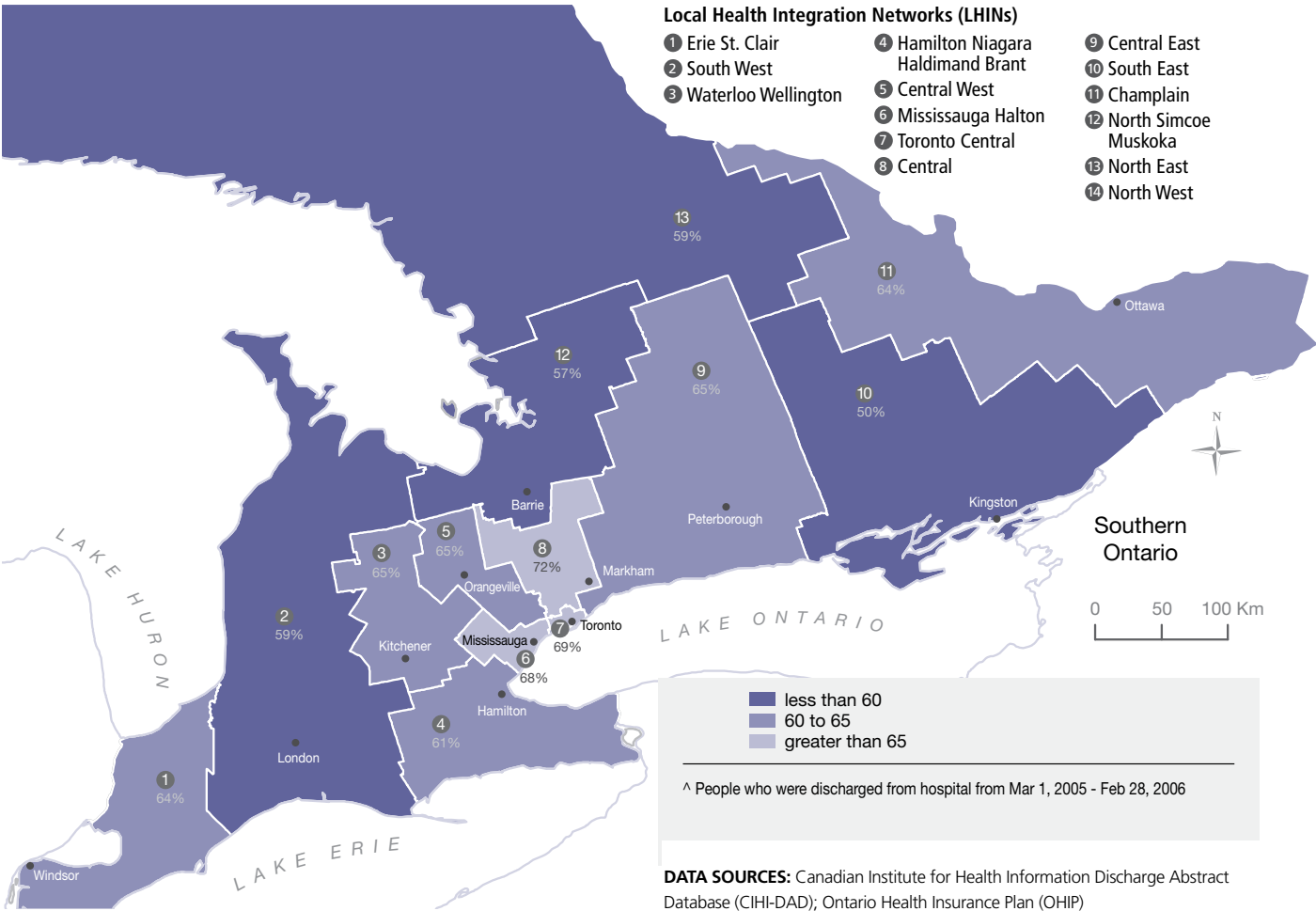


Northern Ontario



Local Health Integration Networks (LHINs)

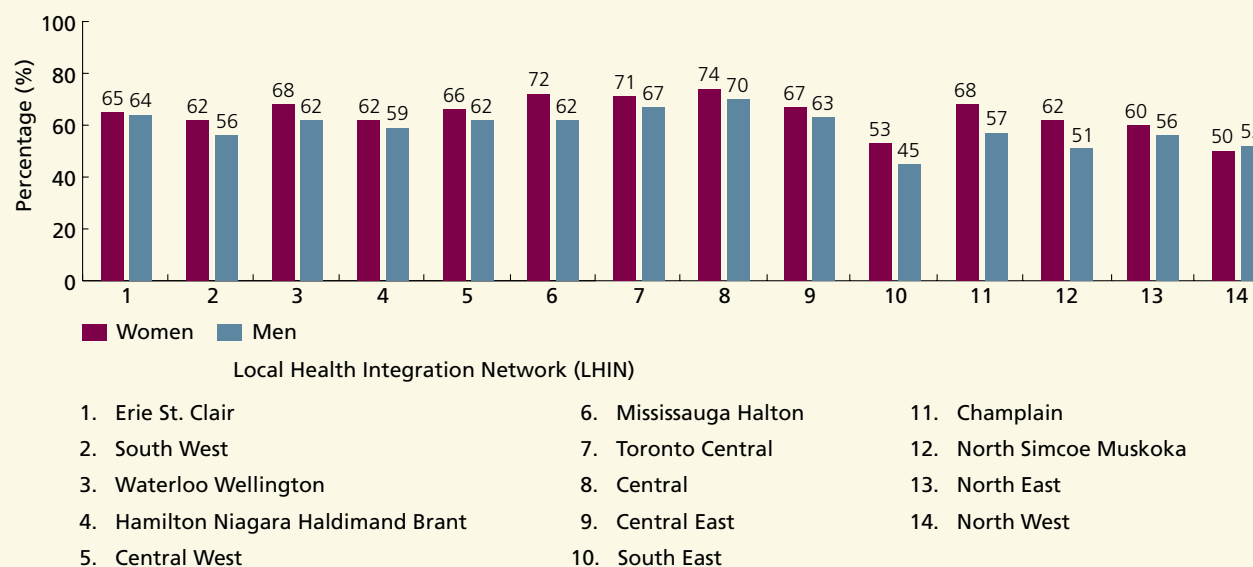
- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

EXHIBIT 5C.4 | Age-standardized percentage of patients aged 15 and older admitted to hospital for depression who had a physician visit for depression within 30 days of discharge, by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

FINDINGS

- The age-standardized rates of physician visits for depression within 30 days of discharge from hospital were higher among women than men in most LHINs.
- The age-standardized rates of physician visits within 30 days showed significant regional variation for both sexes. Among women, rates ranged from 50 percent in the North West LHIN to 74 percent in the Central LHIN; among men, rates ranged from 45 percent in the South East LHIN to 70 percent in the Central LHIN.

POWER Study

TIME FROM HOSPITAL DISCHARGE TO FIRST PHYSICIAN VISIT FOR DEPRESSION

Indicators: Two indicators measure the time from discharge to the first physician visit for depression among patients hospitalized for depression. The first is the percentage of discharged patients aged 15 and older who had a physician visit for depression within 30 days (see also the [previous indicator](#)), 30 days to 12 weeks, 12 weeks to six months and six to 12 months, as well as those who did not see a physician for depression in the year after discharge. The second is the mean number of days to the first physician visit for those who were seen by a physician within one year of discharge from hospital.

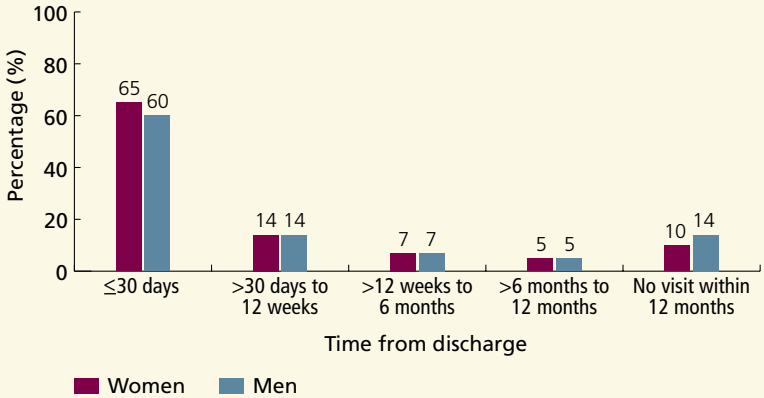
Background: The first visit is used as a proxy for the promptness of adequate follow up. Prompt follow up after discharge may help prevent unnecessary readmission to hospital.

Findings: In Ontario, 10 percent of women and 14 percent of men aged 15 and older were not seen by a physician within one year of hospital discharge. People who had been hospitalized for depression and who were seen within 30 days of discharge, had an average of 9.6 days for women and 9.7 days for men to their first physician visit for depression. Over the course of one year, the average time to a physician visit was 37 days for women and 41 days for men.

EXHIBIT 5C.5 | Percentage of patients aged 15 and older admitted to hospital for depression who had a post-discharge physician visit for depression, by sex and time from discharge, 2005/06[^]

FINDINGS

- Less than two-thirds of women (65 percent) and men (60 percent) had a physician visit for depression within 30 days of hospital discharge. Women were somewhat more likely than men to have had a visit within this period.
- The gender gap did not narrow over time: 10 percent of women and 14 percent of men had no physician visit for depression in the 12 months after they were discharged from hospital.
- The time between discharge and a first physician visit for depression, among people seen within the first 30 days, did not differ by sex (9.6 days for women and 9.7 days for men), but it did differ for people who were seen over the course of a year (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

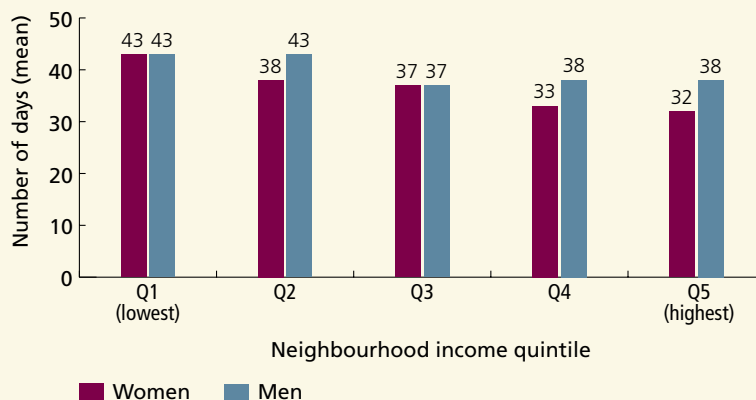
[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

POWER Study

EXHIBIT 5C.6 | Mean number of days to a first physician visit[¥] for depression in patients aged 15 and older admitted to hospital for depression, by sex and neighbourhood income quintile, in Ontario, 2005/06[^]

FINDINGS

- Following a hospitalization for depression, people living in lower-income neighbourhoods had a longer time to a physician visit for depression than those from higher-income neighbourhoods (43 days versus 34 days, respectively) (data not shown).
- The mean number of days to the first physician visit for depression varied significantly by income for women and men.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

[¥] For patients who were seen by a physician within 12 months of discharge

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

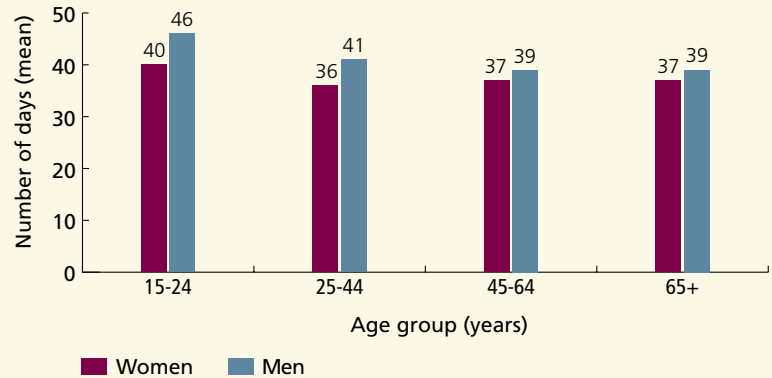
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5C.7 | Mean number of days to a first physician visit[¥] for depression in patients aged 15 and older admitted to hospital for depression, by sex and age group, in Ontario, 2005/06[^]

FINDINGS

- Across all age groups, the mean number of days between discharge to the first physician visit for depression was longer for men than women.
- On average, those aged 15-24 had a significantly longer time to a physician visit for depression than other age groups. The mean number of days to the first visit were similar in the other age groups.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

¥ For patients who were seen by a physician within 12 months of discharge

^ People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

POWER Study

30-DAY POST-DISCHARGE RATE OF EMERGENCY DEPARTMENT (ED) VISITS (WITH NO SUBSEQUENT HOSPITAL ADMISSION)

Indicator: This indicator measures the percentage of Ontarians aged 15 and older who were hospitalized for depression who had an emergency department (ED) visit (but were not readmitted) within 30 days of being discharged.

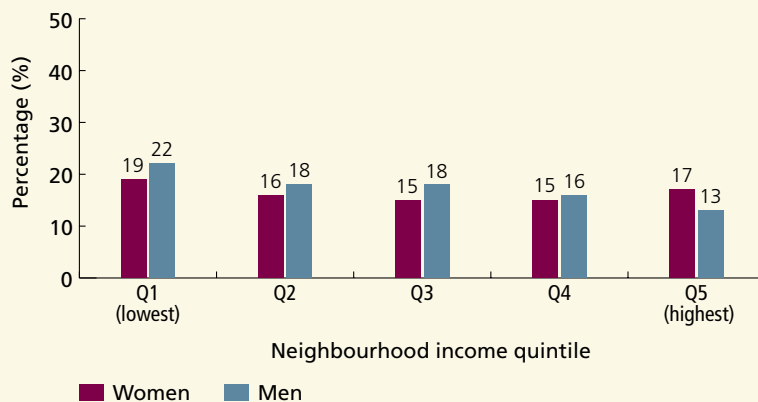
Background: A high percentage of patients visiting an ED shortly after their discharge from an inpatient stay for depression may signal less-than-optimal continuity of care.⁵³ A high rate may reflect poor discharge planning, a lack of appropriate community supports or poor integration with community services.

Findings: In Ontario, 17 percent of patients aged 15 and older (17 percent of women and 18 percent of men) who had been in hospital for depression were seen in an ED within 30 days of discharge, but were not readmitted at that time.

EXHIBIT 5C.8 | Age-standardized percentage of patients aged 15 and older hospitalized for depression who were seen in an emergency department (ED) within 30 days of discharge without a subsequent hospitalization, by sex and neighbourhood income quintile, in Ontario, 2005/06[^]

FINDINGS

- There was significant income variation in the percentage of men who had an ED visit within 30 days of discharge from hospital; 22 percent of men from lower-income neighbourhoods were seen in an ED compared to 13 percent of men from higher-income neighbourhoods. The income difference among women was smaller.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Statistics Canada 2001 Census

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

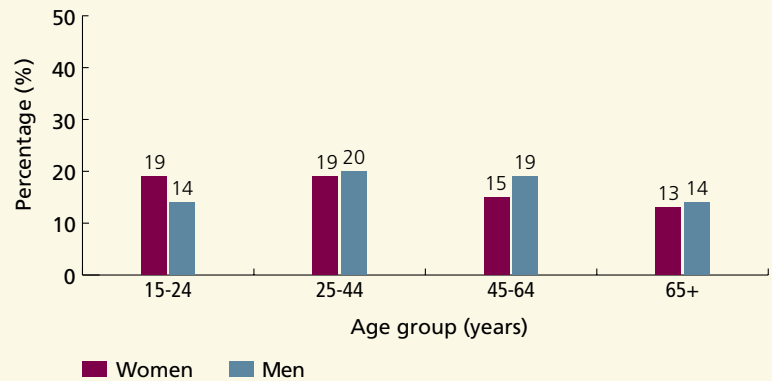
NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 5C.9 | Percentage of patients aged 15 and older hospitalized for depression who were seen in an emergency department (ED) within 30 days of discharge without a subsequent hospitalization, by sex and age group, in Ontario, 2005/06[^]

FINDINGS

- Ontarians aged 65 and older were less likely to be seen in an ED in the 30 days following a hospital stay for depression. The rate in this age group was 13 percent, compared to a combined rate of 18 percent for those under age 65 (data not shown).
- In the youngest age group, 19 percent of women versus 14 percent of men were seen in an ED in the 30 days following a hospital stay for depression. This pattern was reversed among those aged 45-64, with 15 percent of women and 19 percent of men being seen in an ED within 30 days.
- ED visits within 30 days of hospital discharge were more common among rural residents than urban residents (21 percent versus 16 percent, respectively) (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

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EXHIBIT 5C.10 | Percentage of patients aged 15 and older hospitalized for depression who were seen in an emergency department (ED) within 30 days of discharge without a subsequent hospitalization, by Local Health Integration Network (LHIN), in Ontario, 2005/06[^]

FINDINGS

- There was significant regional variation in the percentage of people who visited an ED within 30 days of discharge after a hospital stay for depression. The unadjusted rates ranged from 11 percent in the Central West LHIN to 21 percent in the South West, South East and North East LHINs.

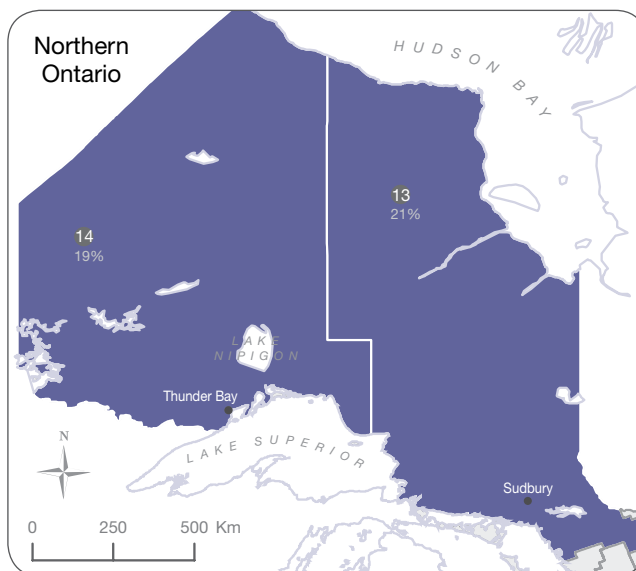
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Overall Ontario

In Ontario, 17% of patients with depression had ED visits without a resulting hospitalization within 30 days of discharge from hospital.

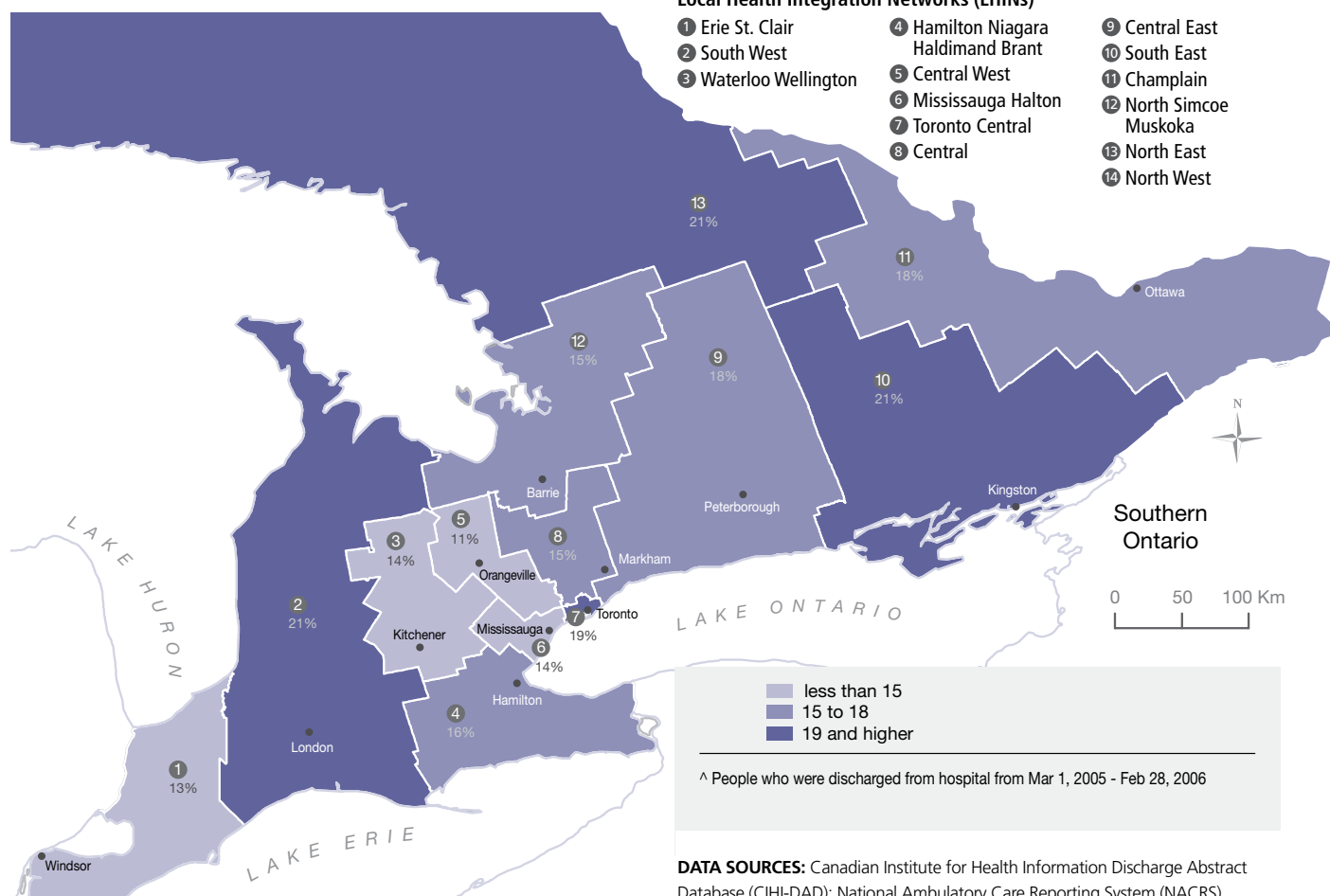


Northern Ontario



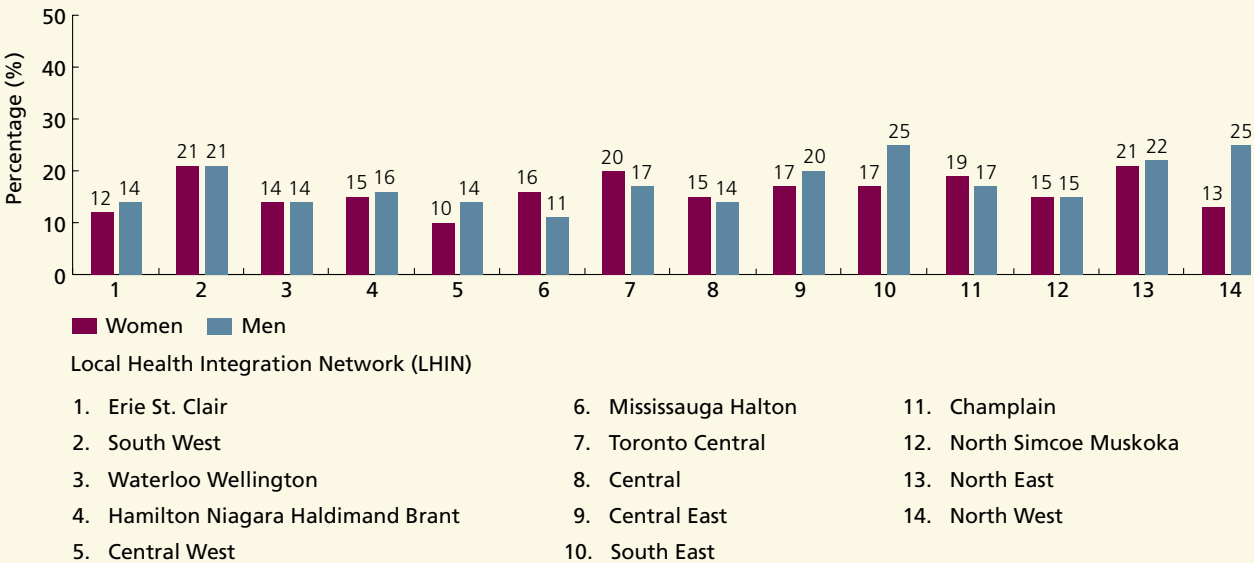
Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

EXHIBIT 5C.11 | Age-standardized percentage of patients aged 15 and older hospitalized for depression who were seen in an emergency department (ED) within 30 days of discharge without a subsequent hospitalization, by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

FINDINGS

- There was significant regional variation in the age-standardized rates of ED visits within 30 days of discharge after a hospital stay for depression. Among women, the rates ranged from 10 percent in the Central West LHIN to 21 percent in the South West and North East LHINs. Among men, the rates ranged from 11 percent in the Mississauga Halton LHIN to 25 percent in the South East and North West LHINs.

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30-DAY READMISSION RATE FOR DEPRESSION

Indicator: This indicator measures the percentage of patients aged 15 and older who were readmitted to hospital for depression in the 30 days post-discharge after a hospital stay for depression.

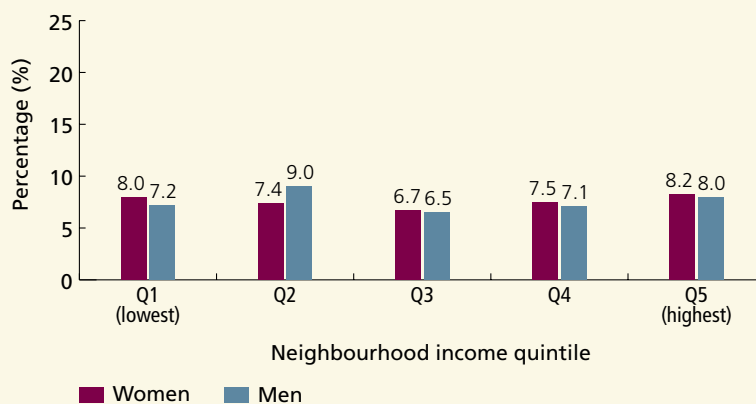
Background: The role of inpatient care in mental health is to stabilize individuals experiencing acute episodes of illness so they can be discharged to community-based services and supports. Readmission to hospital shortly after a previous inpatient stay suggests problems in the continuity of care. It may indicate inadequate preparation for discharge, poor community-based follow up or a lack of adequate community services. For this indicator, readmissions can be to the same or a different hospital, but transfers between hospitals are not considered readmissions. Since this may be an access issue, rates may vary by geographic location, sex, or other population subgroups.

Finding: In Ontario, 7.6 percent of both women and men aged 15 and older who had been hospitalized for depression were readmitted to hospital for depression within 30 days of discharge.

EXHIBIT 5C.12 | Age-standardized 30-day readmission rate (percentage) for depression among patients aged 15 and older admitted to hospital for depression, by sex and neighbourhood income quintile, in Ontario, 2005/06[^]

FINDINGS

- Readmission rates did not vary by income for women or men.
- Readmission rates for depression did not vary by age group or rural/urban residency (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

NOTE: See [Appendix 5.3](#) for details about neighbourhood income quintile calculation

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EXHIBIT 5C.13 | 30-day readmission rate (percentage) for depression among patients aged 15 and older admitted to hospital for depression, by Local Health Integration Network (LHIN), in Ontario, 2005/06[^]

FINDINGS

- Unadjusted readmission rates for depression showed significant regional variation.
- Readmission rates ranged from 2.9 percent in the Erie St. Clair LHIN to 11.9 percent in the North East LHIN.

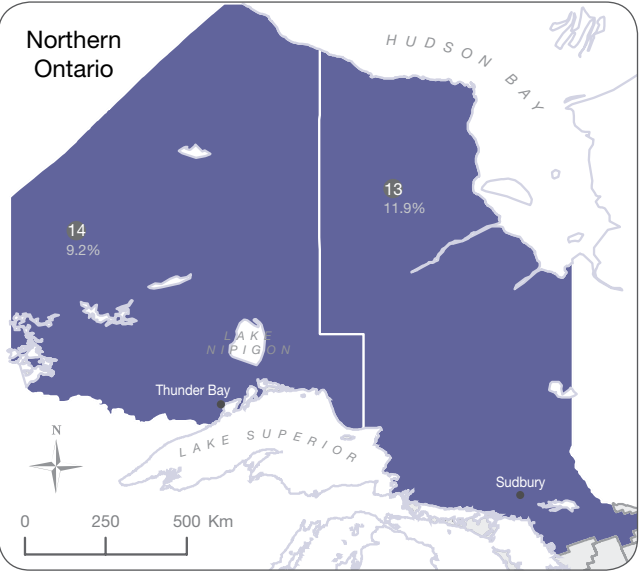
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Overall Ontario

In Ontario, 7.6% of all inpatient stays for depression were followed by readmission within 30 days after discharge.

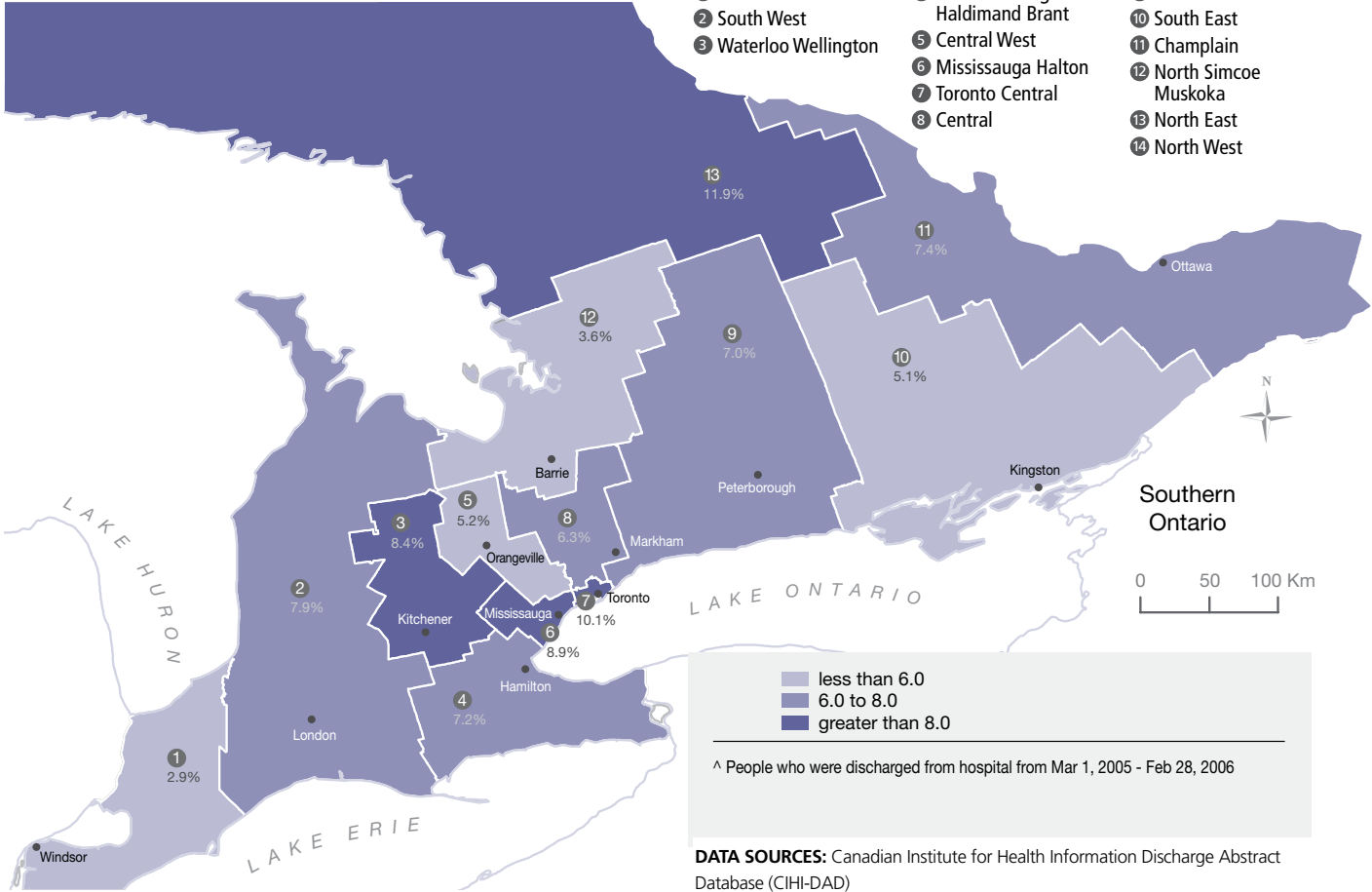


Northern Ontario



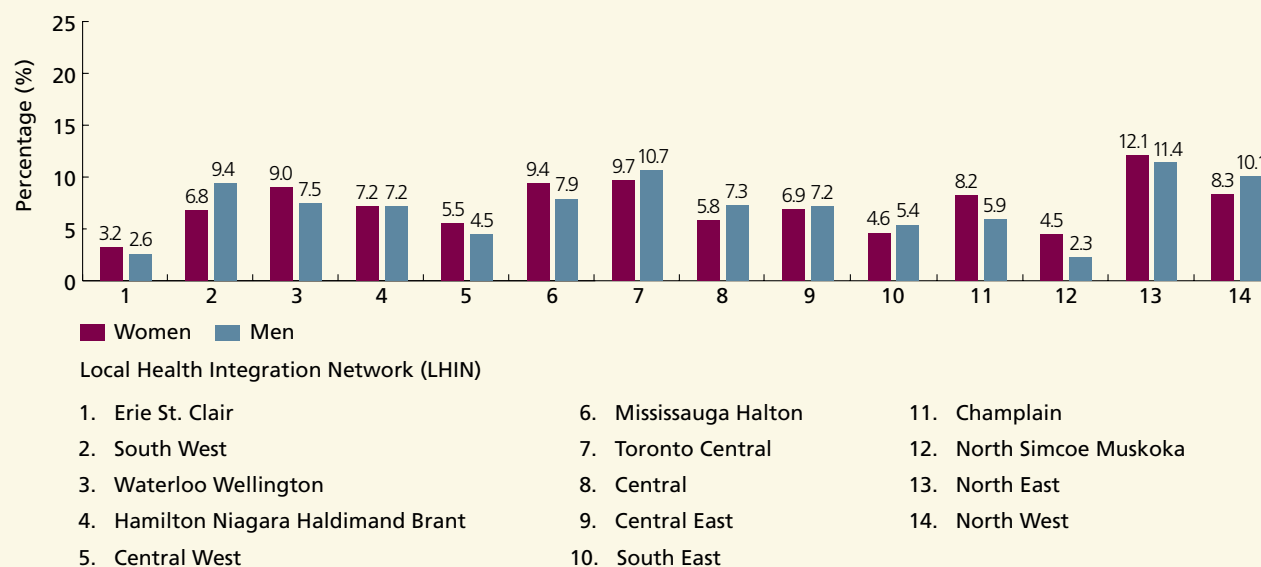
Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

EXHIBIT 5C.14 | Age-standardized 30-day readmission rate (percentage) for depression among patients aged 15 and older admitted to hospital for depression, by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

[^] People who were discharged from hospital from Mar 1, 2005 - Feb 28, 2006

FINDINGS

- Age-standardized readmission rates for depression varied significantly across LHINs for both sexes. The rates for women ranged from 3.2 percent (Erie St. Clair LHIN) to 12.1 percent (North East LHIN). For men, the rates ranged from 2.3 percent (North Simcoe Muskoka LHIN) to 11.4 percent (North East LHIN).

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Section 5C

SUMMARY OF FINDINGS

The indicators of acute and specialty inpatient services all focus on the care a person who has been hospitalized for depression receives post-discharge. While the quality and outcomes of the care delivered in hospital are important, the primary purpose is to stabilize depressed patients to the point that they can benefit from less structured and less intensive community or outpatient services. The assumption is that a poor transition from hospital to community care will undo the gains the individual made in hospital and also will undermine the value of keeping people in the community and providing the least restrictive care possible.⁶⁰ Higher rates of physician visits for depression after a hospital stay and lower rates of emergency department visits or hospital readmissions are therefore desirable.

Overall, one in three Ontarians did not see a physician for depression after a hospital stay for depression, indicating suboptimal care coordination in transition from the hospital to the community. Women were consistently more likely than men to have seen a physician for depression after discharge from hospital. This pattern held true across neighbourhood income levels, rural/urban residency and almost all LHINs. The difference was apparent in the first 30 days after hospitalization (65 percent of women versus 60 percent of men) and had not gone away even after a year post-discharge, by which time 90 percent of women had seen a physician for depression versus 86 percent of men. There was no difference by sex in how long women and men took to get a follow up visit within the first 30 days of discharge. Beyond 30 days, men had somewhat longer times to a physician visit.

People living in higher-income neighbourhoods and those living in urban areas were more likely to have a

post-discharge physician visit for depression within 30 days than those living in lower-income neighbourhoods or rural areas. The largest differences, however, were across LHINs, where the rates ranged from 50 percent to 72 percent.

Women and men were equally likely to receive care in an emergency department after being discharged (17 percent and 18 percent, respectively). Men living in the lowest-income neighbourhoods were more likely to visit an emergency department than men from the highest-income neighbourhoods and men from rural areas were more likely to return to an emergency department than those from urban areas. Sex disparities occurred within age groups; women aged 15-24 had a higher rate of emergency department visits than men that age, but men aged 45-64 had higher rates of use than women.

As was the case for physician care for depression, the largest differences were across LHINs. The highest rate (21 percent) was almost double the lowest rate (11 percent).

Men and women were equally likely to be readmitted to hospital for depression within 30 days post-discharge (7.6 percent for each). There were few differences in readmission rates across age groups, neighbourhood income levels and rural/urban residency. There were differences across LHINs, however, where rates ranged from 2.9 percent to 11.9 percent. It is often argued that high readmission rates may result from hospital stays that are too short but the literature shows the relationship is not that straightforward and high readmission rates occur in situations with both shorter and longer lengths of stay.⁹⁵



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Chapter Summary of Findings

In this chapter, we presented background information on the need, use and supply of depression care in Ontario, as well as indicators of inpatient and outpatient depression care. [Figure 5](#) provides a summary of where sex, income, age and regional differences were found.

Overall, we found many instances where depression care was suboptimal for everyone. Less than half of women and men with probable depression (as reported in a national survey) had a physician visit for this condition within one year. Many older adults who started on antidepressant therapy did not receive the recommended number of follow up visits for medication management. One in three women and men hospitalized for depression did not have a follow up physician visit for depression within 30 days of hospital discharge and nearly one in five patients had an emergency department visit in this time frame, indicating suboptimal care coordination during care transitions.

We found differences in the prevalence of depression—one of the important markers of need for depression care—across sex, age, income and geography. We also found differences in the use of services for both depression and mental health in general. In some cases, the prevalence patterns were similar to the service use patterns. For example, women had higher rates of both depression and use of Ontario Health Insurance Plan (OHIP) core mental health services. In other cases, however, the patterns differed. For example, lower-income women were more likely to report probable depression but had the same rate of use of OHIP core mental health services as higher-income women.

There were also gender and sociodemographic differences in which service sectors were used. Women and men living in lower-income neighbourhoods were almost twice as likely to be hospitalized for depression but incurred slightly lower average costs for OHIP core mental health services compared to Ontarians living in the highest-income neighbourhoods. Rural residents were more likely to be hospitalized for depression while urban dwellers accounted for proportionately greater OHIP costs for mental health care.

A comparison of need, use and supply across Local Health Integration Networks (LHINs) suggested that the geographic patterns of use reflected the geographic distribution of supply more than need.

We reported results for several indicators of depression care. For some indicators, we found no significant sex differences. Women and men with probable depression had similar rates of having a physician visit for depression within a one-year period. Men and women aged 66 and older who started on a new course of antidepressants were equally likely to have had the recommended number of physician follow up visits. And women and men who were hospitalized for depression were equally likely to be readmitted or to have visited an emergency department in the month after they were discharged.

There were some gender differences. Among people who were hospitalized for depression, women were more likely than men to have had a physician visit for depression within 30 days of discharge. For those who were seen by a physician within 30 days of discharge, there was no difference in the mean time women and

men took to have their first physician follow up visit. Beyond 30 days, men took somewhat longer to see a physician.

A few indicators of depression care were associated with age. Ontarians with probable depression aged 45-64 were the most likely to have had a physician visit for depression, although they were not the group with the highest prevalence. Among older Ontarians starting antidepressants, age was associated with a decreasing likelihood of adequate follow up (i.e., three or more within the 12 weeks after starting medication) for depression but an increasing likelihood of having had three or more physician visits for any reason.

Disparities by income were found in several indicators. Among women with probable depression, those who had lower household incomes were more likely to see a physician for depression than those with higher household incomes. However, among women aged 66 and older who had started antidepressants, those from lower-income neighbourhoods were less likely to have had the recommended number of follow up physician visits for depression than women from higher-income neighbourhoods. Among Ontarians who had been hospitalized for depression, people who lived in higher-income neighbourhoods were more likely to have a post-discharge physician visit for depression (and to do so more quickly) than those from lower-income neighbourhoods. And, men living in the lowest-income

neighbourhoods were more likely than men from the highest-income neighbourhoods to visit the emergency department in the one month period post-discharge after a hospital stay for depression.

Some rural/urban differences were seen. People living in urban areas were more likely to have a post-discharge physician visit for depression than people living in rural areas. Also, men from rural areas were more likely to visit an emergency department after discharge than those from urban areas.

Variations across Local Health Integration Networks (LHINs) were seen for a number of indicators, and these represented the largest disparities reported in this chapter. Differences between the highest and lowest LHINs ranged from roughly one and a half times as large (physician visits for depression within 30 days of hospital discharge) to twice as large (percentage of adults aged 66 and older, starting a new course of antidepressants who had three or more physician visits for depression within 12 weeks of starting medication; 30-day post-discharge rate of emergency department visits) to as much as four times as large (30-day readmission rate for depression).

Figure 5 | Summary of differences by sex, age, income and LHIN for background measures and indicators of depression care

Indicator	Overall Result	Stratification Factor			
		Sex	Age	Income	LHIN
Background Information: Need, Use and Supply of Medical Services (8 measures)					
Prevalence of probable depression	7.4%	Y	Y	Y	Y
Health and functional status					
Fair or poor self-rated health	29%	N	Y*	N*	N*
No other comorbid chronic medical conditions	33%	Y	Y*	N	N*
Number of days 'out of bed'	13 days	N	Y	N	N
Number of days without cutting down activities	12 days	N	N	N	N
Rate of hospitalization for depression	108 per 100,000	Y	Y	Y	Y
OHIP core mental health care users^	15%	Y	Y	N	Y
OHIP core mental health services costs per capita^	\$33 per capita	Y	Y	Y	Y
Electroconvulsive therapy (ECT) use	15 per 100,000	Y	Y	N	Y
Number of general practitioners / family physicians and psychiatrists	19-105 per 100,000	•	•	•	Y
Number of acute hospital psychiatric beds	51 per 100,000	•	•	•	Y
Primary and Specialty Outpatient Care (3 indicators)					
Physician visit for depression	40%	N	Y	N*	N*
Three physician visits within 12 weeks of starting medication	9.6%	N	Y	Y	Y
Physician visit for depression within one year after giving birth	20%	•	Y	N	Y
Acute and Specialty Inpatient Care (4 indicators)					
Physician visit within 30 days of hospital discharge	63%	Y	N	Y	Y
Time from hospital discharge to first physician visit for patients seen within 30 days of discharge	9.6 days	N	N	Y	Y
30-day post-discharge rate of emergency department visits	17%	N	Y	Y	Y
30-day readmission rate for depression	7.6%	N	N	N	Y

• Not applicable

* Based on some values that should be interpreted with caution

[^] Confidence intervals for values are extremely small

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Discussion

Depression, the leading cause of disease-related disability among women, puts a tremendous burden on the people suffering from it, their families and society as whole.

Almost five percent of Ontario's population experiences an episode of depression in any 12-month period. Women are twice as likely as men to experience depression.²³

Previous research has shown that women's experiences with depression are different from men's. They tend to be younger when they have their first episode of depression, have poorer social adjustment and lower quality of life¹⁶ and report more severe episodes and more chronic depression than men. Men are more likely to develop alcohol and substance abuse problems¹⁹ and have higher suicide rates.²⁰ Clearly, depression causes great suffering for both sexes and our goal, as we developed indicators for this chapter, was to help ensure high quality mental health care for all Ontarians with depression.

We found disparities in depression care in Ontario related to sex, income, age and geography. The findings suggest a need for improvement in several areas, including access to and the distribution and organization of mental health care. In particular, our research suggests there may be breakdowns in care continuity and a need for more collaborative approaches to managing depression—an area where Local Health Integration Networks (LHINs) have an important role to play.

Gender makes a difference.

Because women have a higher prevalence of depression than men, you would expect that they use depression care in greater numbers. For some kinds of care, this was indeed the case: Ontario women were more likely to visit a physician for depression and were roughly one

and a half times more likely than Ontario men to receive electroconvulsive therapy (ECT) or be hospitalized for depression.

Among those Ontarians with probable depression in the community, we found no important differences between women and men in their overall access to physician care for depression. Interestingly, the self-perceived health and self-reported disability of women and men with probable depression in Ontario were similar. However, among individuals who were hospitalized, women were more likely than men to see their physician after they had been discharged.

Age also makes a difference.

Ontarians aged 15-24—the age group with the highest rate of depression—were least likely to see a doctor for the problem. Younger Ontario women were also more likely than older women to visit an emergency department within 30 days of discharge after a hospital stay for depression.

Among Ontario seniors who had started a new prescription for antidepressants, the oldest women and men—those aged 81 and older—were the least likely to have had the recommended number of physician follow up visits (i.e., three visits for depression within the first 12 weeks) for monitoring their medication use.

Socioeconomic status makes an even bigger difference.

Socioeconomic status was associated with access to care for depression. Ontarians living in the highest-income neighbourhoods were more likely to see a

physician after a hospital stay for depression, and to do so more quickly, than those living in lower-income neighbourhoods. People living in the lowest-income neighbourhoods were the most likely to visit an emergency department after a hospital stay, an indicator of suboptimal care coordination during transition from hospital to home. Women with probable depression who were living in the lowest-income neighbourhoods were more likely than men and higher-income women to have a physician visit for depression. This could be consistent with a study that found fewer socioeconomic differences in use of depression care services in Ontario compared to several other jurisdictions. However, more work needs to be done to determine whether this reflects actual use patterns, differences in coding or differential use of mental health services not covered by OHIP.

For older Ontarians (aged 66 and older) starting a new course of antidepressant medication, those from the highest-income areas were more likely than lower-income seniors to receive the recommended number of follow up visits.

Geography also makes a big difference.

Rural Ontarians were less likely than urban residents to have a physician visit for depression after being hospitalized and they had a longer time between hospital discharge and their first visit. They were also more likely than urban residents to visit an emergency department in the month following their hospital stay.

The largest and most consistent differences seen were across LHINs, where there were significant differences in almost every indicator. One exception was 'percent of individuals with probable depression who had a physician visit for depression' where the numbers were too small to allow reporting. Some of these differences may reflect rural/urban differences (e.g., LHINs with the

largest urban concentrations tend to have better rates of physician follow up or visits for monitoring older patients who were starting antidepressant medication). Some of the variation reflects known regional differences—for example, care in northern Ontario relies more on inpatient services⁵³ than in other parts of the province.

These differences in use do not reflect differences in need.

Patterns of use of depression services often did not reflect differences in assessed need. We found patterns of depression care across neighbourhood income, rural/urban residency and LHINs that did not reflect the prevalence of probable depression ([Section 5A](#)). In the case of neighbourhood income, prevalence and supply of care were opposite; depression rates were highest among women and men living in the lowest-income neighbourhoods, but OHIP spending on care was highest for those residing in the highest-income neighbourhoods. In comparing rural and urban locations, we found significant differences in care for depression, although there were no significant differences in prevalence. Across LHINs, the magnitude and patterns of differences in care were larger than differences in prevalence. Because there are no consistently accepted benchmarks, the implications of the mismatch between indicators of depression care and measures of prevalence cannot be fully assessed. However, as noted in [Section 5A](#), it is important to consider why the availability of services seems to have more influence on the care people receive than level of need. More work is needed to better understand the reasons for these differences and barriers to care encountered by specific population subgroups.

There are important gaps in depression care in Ontario for everyone regardless of sex, income, age or where one lives.

There were gaps everywhere in Ontario, for all population groups, between the desired or recommended depression care and the care that was delivered. Less than 50 percent of people who reported probable depression saw a doctor for depression in the year following their interview. This indicator does not include visits to non-medical mental health professionals, but physicians are the most common provider of depression care.^{7, 62, 96, 97} Because depression is a recurrent disease and often is associated with a 'silent' or partly visible disability,⁹⁸ this finding suggests there are missed opportunities to intervene early in what becomes a chronic illness for many Ontarians.

Less than ten percent of people aged 66 and older who started a new course of antidepressant medication received the recommended number of physician follow up visits for depression. It is possible this number underestimates the actual number of people who are adequately monitored, because the monitoring may happen during physician visits for other conditions. If we assume that is what is happening, then the rate of adequate follow up increases to a more reassuring range of 80 to 90 percent. However, since there is no definitive way of determining whether antidepressants are being monitored in more broadly defined physician visits and we know from the literature that depression is frequently under-recognized and under-treated in primary care settings and among individuals with comorbid chronic medical conditions, this is still an area for concern. This indicator is used internationally to assess the quality of depression care and we need to improve the capacity to better assess this dimension of depression care through improvements in data comprehensiveness. Individuals with depression are a potentially fragile population^{99, 100} and some antidepressants have severe side effects,¹⁰¹ so monitoring

according to guidelines is clinically important. It is also important to assess the management of antidepressant therapy in those under age 65. However, this is not possible using data currently available in the province. Finally, we know the most effective treatment for depression often combines medication and psychotherapy.¹⁰² While it is possible that psychotherapy is taking place in more broadly defined follow up visits, it seems unlikely given that effective treatment requires a lengthier visit and there is a financial incentive to code these visits using a small set of specified codes. All these findings raise questions about the quality of care being delivered to older Ontarians who take antidepressants.

People who have been hospitalized for depression often have severe and quite debilitating forms of the illness, but only 63 percent of them had a physician visit for depression in the 30 days after they were discharged. While depression can be stabilized by inpatient care, continued follow up in the community, including monitoring and treatment by a physician is necessary to ensure gains made in hospital are not lost and, for those taking medication, that problems with side effects or dosages are addressed.

Up to one-quarter of all hospital stays for depression were followed by a readmission or a visit to the emergency department within 30 days of discharge. Turning to these resource-intensive services within a fairly short time is a less desirable outcome for patients than being maintained with outpatient care and community support.⁶⁰

Depression as a chronic illness: the need for collaborative care.

Findings of suboptimal access, quality and outcomes of depression care are not new. Reports over two decades and from around the world^{71, 74, 103-105} have consistently documented large gaps where individuals with depression do not seek care or are not recognized as needing care. Because there is solid evidence that

effective treatments for depression are available, these gaps have led to campaigns to raise public and individual awareness of depression and to educate physicians, families and employers about its nature and severity. But the impact of these campaigns has been limited.¹⁰⁶⁻¹¹⁰

The current understanding of depression is that it is a chronic disease,¹¹¹ like diabetes or coronary heart disease, and it may be that past approaches to managing it failed because they tried single solutions to a complex problem. Examples from other jurisdictions show that collaborative care is an effective approach to the diagnosis and management of depression.^{9, 10, 105, 112} Collaborative care is multifaceted, involving the client, providers and the broader mental health system all at once. Typically:

- Clients are involved in developing their treatment plan (including setting goals for self-management) and then are provided with sustained follow up;
- Clients' progress is systematically evaluated and those evaluations are used to modify the treatment plan;
- Primary care providers work with a multidisciplinary team including mental health professionals to make and implement decisions about the client's care and
- Communication among the care team is systematically evaluated to identify breakdowns in information flow or interruptions in care.^{113, 114}

Clients cared for in a collaborative model are more likely to receive evidence-based care, to follow their care plan and to report greater satisfaction with their care. Their symptoms and functioning improve more rapidly, the benefits last longer and there are greater cost benefits compared to other forms of depression care.^{9, 114, 115}

Other approaches such as stepped care models, patient self-management support and e-health interventions through use of the internet also hold promise. In stepped care models, primary care physicians diagnose

and treat mild to moderate depression and have ready access to psychiatric professionals for advice, consultation and referral.¹¹⁶ Patients who do not respond to initial therapy may have their treatment modified by the primary care physician in consultation with a psychiatrist, be referred for management by a psychiatrist or other mental health professionals or referred for additional mental health services depending upon response to therapy or severity of illness.¹¹⁶ Stepped care is typically a component of collaborative care models, but may be implemented separately. Additionally, mechanisms for providing self-management support to patients either through written materials¹¹⁷ or via the internet¹¹⁸ have been developed and have shown some benefit.

The internet also holds promise as a tool for prevention, diagnosis and management of depression. A web-based, screening instrument for the diagnosis of depression in primary care shows promise.¹¹⁹ Both patient information on depression and online cognitive behavioural therapy have been shown to improve depression outcomes.^{118, 120}

The need for policy and programs to address the social determinants of inequitable care.

The observed disparities in depression care across sex, age and geography suggest a need for province- and LHIN-wide interventions for improvement (see [Improving Depression Care: Different Approaches](#)). They also highlight the need to address social determinants to reduce the risk of developing depression. There are perennial requests for increased resources to deliver more services, which would be consistent with some of the background findings we reported in [Section 5A](#). However, those findings also suggest that a simple increase in the amount of care available is not enough. The large variations found by neighbourhood income, rural/urban residency and across LHINs suggest how resources are distributed and organized are also important factors in access to care. Importantly,

mechanisms need to be put in place to better measure access, quality and outcomes of depression care.

Collaborative care models can address both suboptimal quality and disparities in depression care in primary care—the main source of formal medical depression care for most Ontarians. Improved coordination across primary care, community agencies and inpatient care is particularly important to ensure that people with more severe and debilitating forms of depression get high quality care. Additional measures used in the Hospital Report 2007⁵³ or under development, such as the number of days psychiatric patients spend in hospital after they have been judged ready to be discharged⁵³ and how long people wait in emergency to see a psychiatrist¹²¹ also suggest a need for more, and more effective, coordination of mental health care. Ontario has made some significant investments in community mental health agencies and programs such as assertive community treatment and intensive case management.⁸⁵ Other initiatives include the development of coordinated access programs and care-planning tables in LHINs and hospitals across the province^{122, 123} as well as models for improving post-discharge transitions¹²⁴ and mental health care in the emergency room.¹²⁵ Most of these programs however, are limited in scope, organized within community-based services or linking community and hospital-based care.

Research on models of coordinated care shows promising results for several groups—men, younger people, older adults and those with low-incomes—all groups we found had less access to care.^{34, 115, 126} While specific outcomes may differ (e.g., some groups take longer to show improvement than others), the positive results appear to be consistent even when models are adapted to allow for the needs of the particular populations and providers involved.¹¹³

An important question for Ontario may be how to adapt collaborative care for rural areas, since most of the research has been conducted in large organizations.

There is some promise that managing depression by telephone can improve outcomes.^{127, 128} In addition, telemedicine has been used in rural settings with some success to improve access to mental health professionals and to adapt the collaborative care model to rural primary care practices.¹²⁹

How to reach patients who need care but have not sought it is another issue, since many of the studies we looked at were done in clinics regularly delivering care to members of underserved groups. There is some evidence that outreach may be effective,¹³⁰ but it needs to be tailored and can be time consuming to establish.¹³¹

Finally, policy and outreach efforts in mental health care must be coordinated with larger initiatives. In particular, policies to address the underlying issues of poverty and delivering care in diverse geographic location and policies and programs to better integrate depression care with other types of health care services, particularly chronic disease management, can have a tremendous impact on care for depression.

The need for improved measurement tools.

With the data we have, we can only do a piecemeal evaluation of coordinated care (see ‘What we can’t measure’ below). Information on individual sectors of care—such as we present in this chapter—is valuable, but an integrated system of mental health care (the goal of several Ontario governments over the years)^{60, 87, 88} requires data on transitions between services and their cumulative contribution to outcomes for depression. We have captured some of those transitions in our data, particularly how people contact health services after discharge from a hospital stay for depression. But without integrated data on all sectors of care, we have only a limited sense of how many people fall through the cracks, or of who they are.

Indicators used in other jurisdictions to assess depression care, but not feasible with Ontario data, tell

us where efforts to gather better data on coordinated care could begin. In addition, other jurisdictions have used client satisfaction, cost-effectiveness, timely communication among care providers and outcomes (such as symptom or functioning levels) to evaluate the success of coordinated care, which Ontario could also consider.

LIMITATIONS

As noted throughout this chapter, these indicators have a number of limitations that need to be considered in their interpretation. The indicators **indicate** where disparities are likely and it is possible to track them across time to assess progress. They do not include enough detail to explain **why** disparities occur, so they cannot dictate solutions.

Secondly, there are limitations inherent in the data. Administrative data in a universal health system have the advantage of capturing the breadth of the population but provide little clinical or risk factor information. They can show access to broadly defined categories of care, but cannot illustrate the quality or adequacy of care received. Administrative data also are uneven in the accuracy of what they record. For example, in the OHIP data, diagnostic information is not audited and is limited to one field. Individuals with both depression and another illness may have their physician visit attributed to that other illness, leading to under-counting of depression care. On the other hand, they may be over-counted—one of the codes used to identify depression in this chapter (OHIP diagnostic code 300) is non-specific and also the single most frequently used code by primary care physicians.⁷³

Survey data, while they usually contain a wealth of information on individuals, may be influenced by reporting biases, recall biases and subjective interpretation of the participants. Census data, which

were used in this chapter to define neighbourhood income, can accurately capture an area's overall characteristics, but they may not reflect the factors that influence people individually.

Thirdly, the data in this chapter are not current—they date from 2001 and 2005/06. However, they provide a baseline for comparison as newer information becomes available.

WHAT WE CAN'T MEASURE

As we developed the indicators for this chapter, we found several aspects of depression care we could not measure, because of three main barriers. For some potential indicators, there were no Ontario-wide data. For example, none of the measures relating to care in community mental health settings could be calculated at the time of writing. In addition, no data on ethnic or minority status were available. More comprehensive data are needed to assess quality and outcomes of depression care in primary care, speciality care and hospital settings.

Some domains lacked adequately researched indicators. For example, there is a lack of measurable indicators for depression care outside of the formal medical setting—specifically, for prevention and promotion activities. We were unable to address that gap, largely because we do not know what types of prevention and promotion activities are most effective for depression.¹³² The thinking is that targeted initiatives aimed at groups at greater risk for developing depression are effective,¹¹¹ but there is limited evidence on which methods work for which groups.

Some indicators could only be measured for a subset of the population. For example, we could not assess monitoring of antidepressant therapy for those under age 65. The need to closely monitor antidepressant therapy is important for all age groups.

Finally, there were evidence-based indicators for which Ontario data were available but could still not be reported. Despite relatively large sample sizes (the smallest being 39,000 Ontarians in the CCHS 1.1 survey) these indicators measured events that were very rare. Small sample sizes prevented us from reporting the percentage of ‘depressed’ individuals who were either taking medication or had a physician visit for depression, who had a serious outcome (such as a suicide attempt, an emergency room visit for depression

or electroconvulsive therapy). Such small numbers are a problem both statistically (because they cannot be reported with any confidence) and ethically (because reporting them might violate privacy and confidentiality guidelines). We suspect similar limitations will apply to many clinically important measures, particularly those on interventions or outcomes specific to subgroups of people suffering from depression.

KEY MESSAGES

Our findings support the need to re-evaluate care for depression in Ontario along several fronts and at several levels. The indicators chosen for this chapter arise from evidence-based recommendations or guidelines for appropriate depression care and suggest specific and immediate aspects of clinical practice that need further examination and improvement. The distribution and organization of existing resources—an important element in supporting the continuity of care envisioned across the decades of Mental Health Reform in Ontario and an obvious focus for the newly organized LHINs—will also play important roles in both improving access and delivering more appropriate and effective courses of care in the immediate and medium term. In particular, a wider adoption of collaborative care models for depression deserves serious consideration.

The following actions could help to improve access to, and the quality of, depression care in Ontario:

- Develop and support collaborative care models in primary care and across depression care sectors;

- Explore developing care models for specific underserved groups (including men, younger people, the elderly, people with low incomes and people who live in rural areas) and evaluate their impact, especially when combined with targeted outreach;
- Implement models to better coordinate care through transition periods between sectors, particularly from hospital to home;
- Coordinate depression care with other types of health care, particularly chronic disease management, so that patients with more than one health problem do not receive fragmented care;
- Evaluate the effectiveness of care through routine gender and equity analyses of indicators of depression care and its outcomes;
- Improve data capacity to better measure access, quality and outcomes of depression care across the care continuum.

Improving Depression Care: Different Approaches

In this chapter we present results pertaining to patterns of depression care in Ontario with a focus on gender and equity issues. We identified many opportunities for improvement.

Measurement is only the first step towards improving care. Once gaps in care are found, identification and implementation of interventions to improve care are essential next steps. Quality improvement interventions can take many forms, but are usually targeted at the policy, practice, provider or patient levels or a combination of these. Because women have different patterns of depression and different experiences with care, the provision of depression care should be sensitive to these differences. There are a number of evidence-based interventions available to improve depression care. In addition, much work in Ontario and internationally is aimed at developing new approaches to improving access, quality and outcomes of care among individuals with depression. Below we provide selected examples of both well studied, evidence-based interventions to improve depression care as well as emerging models where there is some evidence that they can lead to improvements in care, but the evidence is limited.

Collaborative care

A body of evidence from randomized controlled trials and supported by systematic reviews has found collaborative care models to be an effective approach for improving quality and outcomes of depression care in primary care settings.^{67, 133-135} This approach uses a team of health professionals (including primary care physicians, allied health professionals and psychiatrists) to ensure proactive treatment and follow up care of depressed patients (see [the Discussion](#)).^{134, 136} Primary

care physicians are provided the support they need to effectively manage depression and ready access to mental health professionals for both shared care and referral for more complex cases. Patients are commonly provided with self-management support. An adaptation of the collaborative care model for people on short-term disability leave for psychiatric disorders in Ontario was found to be effective in a recent trial.¹³⁷

Collaborative care has proven effective at improving both short- and long-term depression outcomes as well as reducing gender, socioeconomic and racial disparities in care.^{47, 67, 115} In addition, the model is effective across age groups including older adults¹³⁸ and adolescents.¹²⁶

Multiple large scale randomized controlled trials have found collaborative care for depression to be effective. However, knowledge that a model works does not necessarily ensure that the model will be widely implemented. Much work has been done to implement these models into real-world primary care practice and there is growing evidence on how to do this effectively. Large scale projects that have made headway in developing quality improvement strategies to implement collaborative care models into real-world primary care practices include Improving Mood-Promoting Access to Collaborative Treatment (IMPACT), Re-Engineering Systems for Primary Care Treatment of Depression (RESPECT-Depression) project¹³⁹⁻¹⁴¹ Partners in Care^{142, 143} and Translating Initiatives for Depression into Effective Solutions (TIDES) project.¹⁴⁴⁻¹⁴⁶ For example, IMPACT is an effective collaborative care model for older adults

that incorporates a depression care manager, routine outcomes assessments, psychiatric consultation when needed and a stepped care approach.^{138, 147, 148} IMPACT has been implemented into many settings.^{126, 149-151} Many of these programs have also made materials and resources available online to assist clinicians and organizations interested in adapting and implementing the IMPACT model in their unique care settings.¹⁵² Examples of successful implementation of this model are also available on the IMPACT website.

These projects have shown quality improvement efforts in primary care settings can improve depression care and outcomes of depressed patients.⁸⁻¹⁰

Assertive community treatment

Assertive community treatment (ACT) is a community-based model for delivering treatment and support to people with severe and persistent mental illness, including severe depression. Rather than a case-management system which provides referrals to outside services, ACT services are delivered directly by a multi-disciplinary team of service providers who have expertise in areas of psychiatry, social work, nursing, substance abuse treatment and vocational training. These services are delivered in home or community settings and are available 24 hours a day, 7 days a week.¹⁵³

Multiple studies from the US have shown ACT programs can reduce hospital days, while improving quality of life and functioning.¹⁵⁴⁻¹⁵⁸ ACT has also been shown to improve additional outcomes such as increased housing stability and reduction in jail days. ACT programs have been shown to be cost-effective when the model is faithfully implemented and high risk patients are targeted.¹⁵⁹ Studies from the UK and Europe have had more modest results when comparing ACT to community mental health care teams, which may in part reflect the effectiveness of usual mental health care in those settings.^{160, 161} These trials found improved patient engagement, satisfaction and reduction in loss of contact with the mental health system.^{160, 161}

The National Alliance on Mental Illness (NAMI) undertook the goal of promoting the ACT model in order to improve access to this evidence-based service-delivery model.¹⁶² Through strong advocacy, education and dissemination of implementation resources, NAMI has created a grassroots demand for ACT programs and has worked with providers to establish ACT programs.¹⁶³

The Implementing Evidence-Based Practices for Severe Mental Illness project,^{163, 164} an initiative to improve access to empirically supported practices for people with severe mental illness, has developed and made available an Assertive Community Treatment Evidence-Based Practice KIT to aid service providers in implementing ACT services.¹⁶⁵

It is often challenging to adapt a model implemented in a rigorously designed trial into routine practice. ACT models have been implemented in Ontario. However, a recent study identified challenges to full implementation of the model.¹⁶⁶ These findings have led to changes to the implementation strategy, illustrating the importance of formally evaluating practice innovations and improvement initiatives.

Performance measurement and reporting

Performance measurement and reporting is one strategy for improving health care quality. Important progress has been made in the development and testing of quality indicators for depression care in both ambulatory care and hospital settings, though indicator development in this area lags behind other sectors.^{81, 167-169} In the US, the National Committee on Quality Assurance's (NCQA) Health Plan Employer Data and Information Set (HEDIS), a tool used by more than 90 percent of American health plans to measure performance on important dimensions of care, contains five measures relating to mental health (three assessing the management of antidepressant therapy in ambulatory care settings and two assessing follow up care after hospitalization for mental illness).

Recently an expert consensus process was used to identify a set of fifteen quality indicators to assess hospital care for mental illness, including measures for care coordination in the transitions from home to hospital and back to the community.¹⁶⁹

The impact of measurement and reporting of HEDIS depression measures has been assessed. Only modest improvements have been made on these performance measures over time and rates of improvement have been much smaller than for other chronic conditions.^{68, 81, 167, 168} This finding underscores the unique challenges to improving mental health care and the need for health system redesign to achieve improvements in depression care. Furthermore, there is need for development of more comprehensive and sensitive indicators in depression care.

Integration and coordination of mental health services

The need to integrate and coordinate mental health services across the continuum of care (see [Figure 1](#)) is well recognized and local systems are working to implement innovative approaches to this problem. However, there is limited evidence as to how do this most effectively and efficiently. Nevertheless, a number of approaches show promise, albeit evaluated in single systems of care with limited data on patient outcomes.

Care coordinators have been shown to improve outpatient follow up both at 7 days and 30 days after a psychiatric hospitalization.¹⁷⁰ Nurse-led mental health liaison services have been implemented in Australia and the United Kingdom.¹⁷¹ The mental health liaison nurse serves as a care coordinator, provides support to patients, education and support to providers, and may function as a member of a multidisciplinary team providing care.¹⁷¹

In Canada, one Alberta Health Region has implemented a mental health liaison role in a rural community. The role was filled by a mental health nurse who provided

advocacy, education, indirect and direct client intervention and follow up. It was developed to eliminate gaps in mental health care and build collaborative cultures between the local hospital, physicians' offices, mental health clinics, and community agencies. The goal was to address unmet need for mental health services in this rural community.¹⁷² In Winnipeg, psychiatric emergency nurses based in emergency departments have been used to support the care of patients presenting to the emergency department for mental health problems.¹⁷³ One challenge in implementing the mental health liaison role has been clear definition of the roles and responsibilities of the mental health liaison. More information is needed on the impact of this role in different care settings on patient outcomes as well as on the cost effectiveness of different models of this function.

E-Health and web-based interventions

E-health and web-based interventions are increasingly being used to improve access to depression care and provide self-management support and depression education to patients, support primary care physicians, integrate and coordinate depression care and provide early intervention and prevention.¹¹⁸⁻¹²⁰ Telemedicine can be used increase access to mental health professionals. One randomized control trial found telemedicine effective in adapting the collaborative care model of depression care to rural communities. The Ontario Telemedicine Network is using telemedicine to deliver psychiatric care to those who otherwise would have difficulty accessing these services (see [the Discussion](#)).

There are a growing number of web-based interventions for depression directed both at patients and providers. The internet also holds promise as a tool for prevention, diagnosis and management of depression. Delivery of both patient information on depression and online cognitive behavioural therapy has been shown to improve depression outcomes in a randomized control trial in Australia.^{118, 120} The investigators hypothesized

that providing depression education and training in cognitive behavioural therapy to adolescents and young adults can foster resilience and behaviours to help prevent depression. This web-based program also provides self-management support to patients receiving depression care.¹¹⁸ A web-based screening instrument for the diagnosis of depression in primary care has also been tested.¹¹⁹ It is likely that there will be growing availability of a range of e-health interventions and web-based interventions for depression. More evidence will be needed about their effectiveness for specific purposes in different settings as well as effectiveness in different population subgroups.

Improving accessibility, acceptability and outcomes of depression care among racial and ethnic minorities

Depression care needs to be accessible and acceptable and delivered in a culturally sensitive manner to immigrants and ethnic minorities who may have different cultural beliefs about depression and different preferences for care.^{174, 175} Different population subgroups may also encounter different barriers to care and have different experiences within the health care system.¹⁷⁶ Furthermore, there is evidence that patient-physician communication may differ across diverse population sub-groups.¹⁷⁷ Language may also provide a barrier to depression treatment.

Racial disparities in depression care in primary care have been observed but not in all studies, suggesting that the presence of disparities varies across practice settings and that it is possible to close care gaps associated with race and ethnicity.^{178, 179} A quality improvement intervention using the collaborative care model in primary care has

been shown to reduce racial disparities in depression care.^{47, 180} One study found that racial differences in receipt of counselling was explained by education, employment status and insurance status.¹⁷⁸ Thus, care needs to be provided in the context of intersecting factors of gender, ethnicity and socioeconomic position. It is recommended that clinicians consider patients' cultural and social context when negotiating treatment decisions for depression.¹⁷⁴

In addition to collaborative care a number of different approaches are being studied to improve the cultural acceptability and sensitivity of depression care and to improve the effectiveness of depression care to diverse populations. For example, low-income women may benefit from case management to address other social issues. The literature suggests models that allow patients to select the treatment of their choice (medication or psychotherapy or a combination) while providing outreach and other supportive services (case management, childcare and transportation) appear to result in optimal clinical benefits for disadvantaged women suffering from depression.¹⁸¹ A culturally tailored videotape about depression was found to be acceptable for most African Americans with depression participating in focus groups and improved knowledge and several attitudes about depression.¹⁸² While more evidence is needed on how to best tailor depression care to diverse communities and what strategies best optimize outcomes the evidence supports the idea that high quality, culturally acceptable depression care coupled with supports that address social context can lead to improved outcomes for all patients with depression.

Appendix 5.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

APPENDIX 5.1 | Depression indicators: links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 5A – Background Measures		
Prevalence of probable depression	<ul style="list-style-type: none"> • Accessible • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Influence broader determinants of health • Improve health status of Ontarians
Health and functional status of people with probable depression	<ul style="list-style-type: none"> • Effective • Focused on population health 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Influence broader determinants of health • Improve health status of Ontarians
Rate of hospitalization for depression	<ul style="list-style-type: none"> • Accessible • Effective 	<ul style="list-style-type: none"> • Improve clinical and population health outcomes • Influence broader determinants of health • Improve health status of Ontarians
OHIP core mental health care users and OHIP core mental health care costs	<ul style="list-style-type: none"> • Accessible • Focused on population health 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services
Electroconvulsive therapy (ECT) use	<ul style="list-style-type: none"> • Accessible • Effective 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system

APPENDIX 5.1 | Depression indicators: links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 5A – Background Measures		
Number of general practitioners (GPs)/ family practice (FP) physicians and psychiatrists	<ul style="list-style-type: none"> • Accessible 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services
Number of acute hospital psychiatric beds	<ul style="list-style-type: none"> • Accessible 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services
Section 5B – Primary and Specialty Outpatient Care		
Percentage of individuals with probable depression who had a physician visit for depression	<ul style="list-style-type: none"> • Accessible • Patient-centered 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centeredness
Percentage of older adults starting a new course of antidepressant medication who received adequate physician follow up	<ul style="list-style-type: none"> • Effective • Patient-centered 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management
Percentage of women who had a physician visit for depression within one year of giving birth	<ul style="list-style-type: none"> • Accessible • Patient-centered 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centeredness

APPENDIX 5.1 | Depression indicators: links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 5C – Acute and Specialty Inpatient Care		
30-day post-discharge rate of physician visits for depression	<ul style="list-style-type: none"> • Effective • Patient-centered • Integrated 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes and systems • Improve safety and effectiveness of health services • Improve chronic disease management
Average number of days post-discharge to first physician visit for depression	<ul style="list-style-type: none"> • Accessible • Integrated 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes and systems • Improve access to appropriate health services • Improve chronic disease management
30-day post-discharge rate of emergency department visits (with no subsequent hospital admission)	<ul style="list-style-type: none"> • Accessible • Effective • Integrated 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes and systems • Improve safety and effectiveness of health services • Improve chronic disease management
30-day readmission rate for depression	<ul style="list-style-type: none"> • Accessible • Effective 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes and systems • Improve safety and effectiveness of health services • Improve chronic disease management

Appendix 5.2

INDICATORS AND THEIR SOURCES

APPENDIX 5.2 | Depression indicators: indicator sources and data sources

Measures and Indicators	Indicator Source	Data Source
Section 5A – Background Measures		
Prevalence of probable depression	<ul style="list-style-type: none"> A Profile of Women's Health Indicators in Canada¹⁸³ Association of Public Health Epidemiologist in Ontario (APHEO) 	Canadian Community Health Survey (CCHS), Cycle 1.1
Health and functional status of people with probable depression	<ul style="list-style-type: none"> A Profile of Women's Health Indicators in Canada¹⁸³ ^ Statistics Canada. Health Indictors 2008^ Association of Public Health Epidemiologist in Ontario (APHEO)^ Report of the Consultative Meeting to Finalize a Gender-sensitive Core Set of Leading Health Indicators¹⁸⁴^ 	CCHS, Cycle 1.1
Rate of hospitalization for depression	<ul style="list-style-type: none"> Hospital Report 2004: Mental Health¹⁸⁵ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
OHIP core mental health care users and OHIP core mental health care costs per capita	<ul style="list-style-type: none"> ICES Atlas: Fee-for-Service Core Mental Health Services: Changes in Provider Source and Visit Frequency⁵⁵ Accountability and Performance Indicators for Mental Health Services and Supports: A Resource Kit¹⁸⁶ 	Ontario Health Insurance Plan (OHIP); RPDB
Electroconvulsive therapy (ECT) use	<ul style="list-style-type: none"> Electroconvulsive Therapy in Older Adults: 13-year Trends¹⁸⁷ Epidemiological Analysis of Electroconvulsive Therapy in Victoria Australia¹⁸⁸ 	OHIP; RPDB

APPENDIX 5.2 | Depression indicators: indicator sources and data sources

Measures and Indicators	Indicator Source	Data Source
Section 5A – Background Measures		
Number of general practitioners (GPs)/ family practice (FP) physicians and psychiatrists	<ul style="list-style-type: none"> Accountability and Performance Indicators for Mental Health Services and Supports: A Resource Kit¹⁸⁶ Psychosocial Wellbeing and Psychiatric Care in the European Communities: Analysis of Macro Indicators¹⁸⁹ Hospital Report 2004: Mental Health¹⁸⁵ 	ICES Physician Database (IPDB); RPDB
Number of acute hospital psychiatric beds	<ul style="list-style-type: none"> Accountability and Performance Indicators for Mental Health Services and Supports: A Resource Kit¹⁸⁶ Psychosocial Wellbeing and Psychiatric Care in the European Communities: Analysis of Macro Indicators¹⁸⁹ 	Daily Census Summary Report Mental Health Beds online, Ministry of Health and Long-term Care (MOHLTC) Health Data Branch; RPDB
Section 5B – Primary and Specialty Outpatient Care		
Percentage of individuals with probable depression who had a physician visit for depression	<ul style="list-style-type: none"> Continuous Enhancement of Quality Measurement in Primary Health Care (CEQM), BC Women's Health Surveillance Report: A Multi-Dimensional Look at the Health of Canadian Women¹⁹⁰ 	CCHS, Cycle 1.1; OHIP
Percentage of older adults starting a new course of antidepressant medication who received adequate physician follow up	<ul style="list-style-type: none"> The National Committee for Quality Assurance (NCQA). Healthcare Effectiveness Data and Information Set (HEDIS) 	Ontario Drug Benefit (ODB) database; OHIP
Percentage of women who had a physician visit for depression within one year of giving birth	<ul style="list-style-type: none"> National Health Priority Areas Report: Mental Health 1998, Australia¹⁹¹ 	CIHI-DAD; OHIP; ICES Mother-Baby (MOMBABY) Linked database

APPENDIX 5.2 | Depression indicators: indicator sources and data sources

Measures and Indicators	Indicator Source	Data Source
Section 5C – Acute and Specialty Inpatient Care		
30-day post-discharge rate of physician visits for depression	<ul style="list-style-type: none"> Hospital Report 2004: Mental Health¹⁸⁵ The National Committee for Quality Assurance (NCQA), Healthcare Effectiveness Data and Information Set (HEDIS) 	CIHI-DAD; OHIP
Average number of days post-discharge to first physician visit for depression	<ul style="list-style-type: none"> Continuous Enhancement of Quality Measurement in Primary Health Care (CEQM), BC A Mental Health Program Report Card: A Multidimensional Approach Monitoring in Public Sector Programs¹⁹² 	CIHI-DAD; OHIP
30-day post-discharge rate of emergency department visits (with no subsequent hospital admission)	<ul style="list-style-type: none"> Hospital Report 2004: Mental Health¹⁸⁵ 	CIHI-DAD; National Ambulatory Care Reporting System (NACRS)
30-day readmission rate for depression	<ul style="list-style-type: none"> Hospital Report 2004: Mental Health¹⁸⁵ Accountability and Performance Indicators for Mental Health Services and Supports: A Resource Kit¹⁸⁶ 	CIHI-DAD

^ These references examine self-rated health and self-reported functional status in the general population.

Appendix 5.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators reported in this chapter were selected using a modified Delphi process combined with a structured literature review. The process began with a review of a continuum of care framework that spanned seven types of services ranging from prevention through palliative care services. The project team decided to exclude palliative care from consideration as issues related to depression care in this setting are complex and could not be readily assessed.

The remaining six service types ([Figure 1](#)) were the basis for a survey to be completed by an expert panel. In this survey, panel members were asked to identify the two most critical issues for each service continuum point that represented 1) a gap between women and men in the treatment for depression or in the exposure to negative or positive factors associated with depression incidence, course of the illness, access or use of services, and/or outcomes and/or 2) a substantial issue in the care of depression. 'Substantial' was defined in terms of the size of the affected population or the severity of the associated outcome. Participants were also to provide a rationale for each issue so that these could be incorporated into the subsequent Delphi process.

Twenty-six issues were identified by the panel ([Table 5.1](#)), which then served as the basis for a structured review of both published and grey literature. One hundred and twenty measures were identified through this search with primary care measures accounting for the vast majority (76) followed by acute/specialty inpatient care (23). Because no indicators were found for 'chronic and rehabilitation care', this continuum point was dropped from consideration.

The Working Group then reviewed these potential indicators using three filters. First, items that were descriptive measures (e.g., prevalence of depression) were set aside from those that were more direct indicators of depression care (e.g., percentage of population receiving preventive screening). The substantial number of items identified as 'descriptive' in this process led the team to add [Section 5A](#) of this chapter as these measures provide important contextual information about disease burden in the population, need for services and patterns of care.

Second, the Working Group evaluated the remaining items in terms of their importance and relevance to the chapter's purpose. Examples of items judged less relevant include measures of specific rather than broader types of intervention (e.g., lithium therapy) or of outcomes more relevant to specific program types (e.g., percent of clients employed within six months post diagnosis).

Third, because the goal of the POWER Study was to report actual numbers, candidate indicators were reviewed in terms of whether or not they could be measured using available Ontario-wide data. This feasibility filter was applied somewhat liberally with the intent of maximizing the number of measurable candidate indicators. In some cases, similar indicators were merged into a single, more easily measured, item. In other cases, proxy or interim measures were used as 'placeholders' for indicators that could not be measured in their original form. The application of these three filters reduced the number of candidate indicators to thirteen.

The final set of indicators was selected through a modified Delphi process by a Technical Expert Panel using a two-step method—first through an online questionnaire using explicit indicator selection criteria and then at a face-to-face meeting on April 4, 2007 (see [Introduction to the POWER Study, chapter 1](#) for a more detailed description of the Delphi process. See [Appendix 5.1](#) or [5.2](#) for a complete list of reported indicators).

Indicators and background measures were calculated at the provincial and Local Health Integration Network (LHIN) levels. They were first stratified by sex and then by age, income (either neighbourhood income quintile or annual household income), and rural/urban residency, when sample size allowed. Age-adjustment was done using indirect standardization.

2. Data Sources and Measures

The data presented in this chapter came from several sources, including survey and administrative data. In most cases, administrative data from fiscal year 2005/06 were used, however for those indicators based on linked administrative and CCHS, Cycle 1.1 data, fiscal years 2000/01 and 2001/02 were used to maintain a consistent time frame. The administrative data sources that were used in producing this chapter are described below.

The indicators included measure the percentage of individuals aged 15 and older with probable depression (based on survey data) and those who received care for depression (based on routinely collected administrative data or linked survey and administrative data). Depression-related service contacts were defined using the diagnostic information available in each database or, in the case of the Ontario Drug Benefits (ODB) database, the drug information numbers (DIN) associated with antidepressant medication. For the Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD) an encounter was defined as depression-related if the

most responsible diagnosis included an ICD-10 code for major depression (ICD 10 codes F32, F33, F412 or F480). For the Ontario Health Insurance Plan (OHIP) physician claims' data, the diagnostic codes were those that included depression (311) or reactive depression (300) in their descriptions.

The definition of a physician visit for depression used in this chapter is imprecise because it can both under- and over-report whether depression, versus other conditions, was addressed during the visit. The OHIP database only allows one diagnosis per visit, irrespective of the number of conditions that are addressed during the visit, thus contributing to under-reporting of depression. However, one of the diagnostic codes (300: Anxiety neurosis, hysteria, neurasthenia, obsessive compulsive neurosis, reactive depression) used to define a physician visit for depression in this chapter is overwhelmingly the one most frequently used in family physician practice, suggesting an overuse of this code. This code is not specific to depression, therefore, including it in the definition may over-report visits for depression, to some extent, and may counterbalance under-reporting of depression due to the one available diagnostic field.⁷³ When this definition is tied to a person having depression (see 'Measuring Depression' box in the Introduction of this chapter) or a prescription for an antidepressant, it may even more closely indicate a visit in which depression is addressed.

The denominators for indicators based upon 2005/06 administrative data were derived from 2005 estimates obtained from the Registered Persons Database (RPDB). The RPDB overestimates the number of people living in Ontario. This overestimate was corrected by using a methodology that adjusts the RPDB so that population counts by age and sex match estimates from Statistics Canada.

Canadian Community Health Survey (CCHS)

The CCHS is a nationally representative cross-sectional survey of the Canadian community-dwelling population conducted every two years by Statistics Canada. It is conducted via face-to-face interviews and covers material that alternates between a general overview of the health of Canadians (the x.1 cycle surveys) and more in-depth issues (the x.2 cycle surveys). Residents living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded.

The two surveys considered for use for this chapter on depression were Cycles 1.1 (2000/01) and 1.2 (2002). Cycle 1.2 includes a more comprehensive assessment of depression than Cycle 1.1. However, because the linkable version of Cycle 1.2 was not available at the time of this reporting, only data from Cycle 1.1 were used.

Background measures and indicators using the CCHS data were restricted to Ontario respondents aged 15 and older since depression is an illness that appears in the late teens as well as in later years. Past-year depression was measured in Cycle 1.1 using a cut-off score of 0.9 on the Composite International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD). The CIDI-SFMD probability score of >0.9 was considered to predict probable depression. Since the CIDI-SFMD was designed to predict the probability that a person would be considered depressed using the full set of CIDI depression questions (as was done in Cycle 1.2), it may somewhat overestimate prevalence. The prevalence of depression based on Cycle 1.2 was 4.8% (6.1% of women, 3.5% of men) compared to the rate of 7.4 (9.8% of women, 4.9% of men) from Cycle 1.1 which is reported in this chapter. It should be noted that the CIDI-SFMD has not yet been fully validated.¹⁹³ Thus the prevalence reported here is not precise and very likely somewhat overestimates the actual population prevalence. However, it is still useful in providing a

comparative picture of differences in depression care across sociodemographic and geographic groups.

Two other limitations of the CCHS, Cycle 1.1 data should be noted. First, the depression questions were optional and one Ontario public health unit/region (Brant) opted not to include these questions for their region. The impact is that the prevalence of probable depression may be under- or over-reported for the Hamilton Niagara Haldimand Brant LHIN. This may impact the overall finding that there was geographic variability in the prevalence of probable depression and that the patterns of use and supply did not match the patterns of need. Second, the CCHS, Cycle 1.1 sampling method was designed around health regions since the LHINs did not exist at the time of the survey. This may introduce some error into the estimates reported for the LHINs.

The studentized range test was used to assess the significance of differences among the rates. For the indicators based on the CCHS, Cycle 1.1 data, the standard errors of the rates and 95 percent confidence intervals were calculated using 500 bootstrap weights provided by Statistics Canada. In addition, relative rates were calculated for women-to-men, lowest-to-highest neighbourhood income quintile and rural-to-urban residence.

Statistics Canada rules were followed in the reporting of estimates using the Ontario share file as follows:

- Estimates should not be reported if the unweighted sample is less than 10
- Estimates are adequate and can be reported if the coefficient of variation is 16.5 or less
- Estimates should be reported with caution if the coefficient of variation is between 16.6 and 33.3
- Estimates should be suppressed if the coefficient of variation is greater than 33.3

Ontario Health Insurance Plan (OHIP)

The OHIP claims database covers all reimbursement claims to the Ontario Ministry of Health and Long-Term Care, made by fee-for-service physicians, community-based laboratories and radiology facilities. The OHIP database at ICES contains encrypted patient and physician identifiers, code for service provided, date of service and the associated diagnosis and fee paid. Services which are missing from the OHIP claims data include: some lab services, services received in provincial psychiatric hospitals, services provided by health service organizations and other alternate funding plans, diagnostic procedures performed on an inpatient basis and lab services performed at hospitals (both inpatient and same day). Also excluded is remuneration to physicians through Alternate Fee Plans (AFPs). Their concentration in certain specialties or geographic areas could distort the analysis.

Canadian Institute of Health Information Discharge Abstracts Database (CIHI-DAD)

The CIHI-DAD is a database of information abstracted from hospital records. It includes patient-level data for acute and chronic care hospitals, rehabilitation hospitals and day surgery clinics in Ontario. The main data elements of the CIHI-DAD database are encrypted patient identifier, patient demographics (age, sex, geographic location), diagnoses, procedures and administrative information (institution number, admission category, length of stay).

National Ambulatory Care Reporting System (NACRS)

NACRS is a data collection tool used to capture patient and clinical information on patient visits to hospital and community-based ambulatory care: day surgery, outpatient clinics and emergency departments. It is currently mandated in Ontario for emergency department, day surgery, dialysis, cardiac catheterization and oncology facilities.

The Ontario Drug Benefit Program (ODB)

The ODB database contains information about the use of medications, including antidepressants, in Ontarians aged 65 and older as well as individuals on welfare assistance who are covered by the ODB. The ODB tracks all filled prescriptions for medications listed in its Formulary.

ICES Physician Database (IPDB)

The IPDB contains information on physician demographics and specialty training. The IPDB incorporates information from the Corporate Provider Database (CPDB), the Ontario Physician Human Resource Data Centre (OPHRDC) database and the OHIP database of physician billings. The CPDB contains information about physician demographics, specialty training and certification and practice location. This information is validated against the OPHRDC database, which verifies this information through periodic telephone interviews with all physicians practicing in Ontario. The number of physicians per 100,000 population was derived from the IPDB and census population estimates for 2005.

ICES Mother-Baby (MOMBABY) Linked Database

The MOMBABY dataset is a cumulative database created by linking the CIHI-DAD inpatient admission records of delivering mothers to those of their newborns. The linking algorithm makes use of maternal and newborn chart numbers, institutions, postal codes, admission/discharge dates and procedure codes. The database includes information on maternal gestational age at admission and at delivery, newborn gestational weeks at delivery and flags that identify multiple births and still births.

Linked Data Measures (Administrative and/or Survey Data)

The linked indicator for individuals with probable depression was defined using the CCHS, Cycle 1.1. CCHS data were linked to the administrative data using the scrambled unique identifier available across all the databases used in this chapter. The time period for the administrative data included was based on the CCHS interview date and the indicator. The linkage was with administrative records within one year after the CCHS interview.

Indicators for depression (e.g., physician visits for depression) were defined using the diagnostic information in the various administrative data as described earlier. The date of the referent event (e.g., hospital discharge) was used to determine the time period of the other administrative data to be linked (e.g., emergency department (ED) visit within 30-days post-discharge).

3. Regional and Socioeconomic Variables

Patients Residence

For all analyses presented in the report, the definition of 'Local Health Integration Network (LHIN) of patient residence' is based on the postal code of the individual at the time of completing the survey for CCHS data, the postal code at the time of discharge for CIHI-DAD data or the postal code of the individual as of July 1, 2005 for data from OHIP or the ODB.

Income Quintile

Average neighbourhood income is calculated by Statistics Canada and is updated every five years when new Census data become available. Income was calculated using the neighbourhood income per person-equivalent (IPPE), which is a household-size adjusted measure of household income based on 2001 census summary data at the dissemination area (DA) and using person-equivalents implied by the 2006 low income cut-offs (LICOs). In 2001, average income

estimates were calculated by DA. Ontario neighbourhoods are classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are used as proxy for overall SES, which has been shown to be related to population health status and levels of health care utilizations. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to Enumerations Areas (EAs) or Dissemination Areas (DAs) (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. EAs and DAs are small adjacent geographic areas, designated for collection of census data. DAs replaced EAs in 2001 and have a population of 400–700 persons.

Annual Household Income

Annual household income was collected in the CCHS, Cycle 1.1. Taking the number of household members into consideration, annual household income was classified into four categories: low income, lower middle, middle or higher income. Low income was defined as <\$15,000 for 1 or 2 household members, <\$20,000 for 3 or 4 household members or <\$30,000 for 5 or more household members. Lower middle income was defined as \$15,000 to \$29,999 for 1 or 2 household members, \$20,000 to \$39,999 for 3 or 4 household members or \$30,000 to \$59,999 for 5 or more household members. Upper middle income was defined as \$30,000 to \$59,999 for 1 or 2 household members, \$40,000 to \$79,999 for 3 or 4 household members or \$60,000 to \$79,999 for 5 or more household members. Higher income was defined as ≥\$60,000 for 1 or 2 household members or ≥\$80,000 for 3 or more household members.

Location of Residence (Rural Versus Urban)

Rural/urban residency was assigned based on postal code and using the Statistics Canada PCCF+ macro to assign locations. Community size was derived from the Statistics Canada 2001 Census data. Communities of 10,000 or fewer residents were defined as rural. All other communities were classified as urban.

Standardization

All indicators were age-adjusted to the study cohort using indirect standardization.

4. BACKGROUND MEASURES AND INDICATORS

Prevalence of Depression

The prevalence of depression was measured using the CCHS, Cycle 1.1. Respondents who scored 0.9 or higher on the Composite International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD) were classified as having probable depression.

Health and Functional Status

Self-rated health, comorbidity and functioning were assessed using four measures from CCHS, Cycle 1.1—the percentage of Ontarians with probable depression who rated their health as fair or poor, those who indicated they had no other chronic medical conditions, the average number of days in the previous two weeks spent out of bed for all or most of the day and the average number of days in the previous two weeks when the person did not have to cut down on normal activities. The last two measures of functional status were derived from the following CCHS questions:

- During the past 14 days, did you stay in bed at all because of illness or injury, including nights spent as a patient in a hospital?
- Not including bed days, during those 14 days, were there any days that you cut down on things you normally do because of illness or injury?

Because of issues of sample size and high sampling variability of the responses to these questions, we report the indicators as described above.

Measures of Health Service Use

Administrative data were used to measure health service use. While the original intent was to include the 12-months of data within a single fiscal year (i.e., from April 1 to March 31), this had to be modified. CIHI-DAD and NACRS data are released for analyses in 12-month blocks corresponding to a fiscal year. However, two indicators (30-day readmission rate and 30-day post-discharge rate of ED visits) required the capability of following up one month after the fiscal year ended. The solution was to shift the 12 months back by one month—that is from March 1 to February 28.

CIHI-DAD was used to measure the number of hospital admissions from March 1, 2005 – February 28, 2006 per 100,000 population aged 15 and older with a most responsible diagnosis of depression (ICD 10 codes F32, F33, F412 or F480).

OHIP data were used to measure the proportion of Ontarians aged 15 and older who saw a physician for assessment, diagnosis or treatment of a mental health condition (OHIP diagnosis codes 300 or 311) during the period March 1, 2005 – February 28, 2006. The fees associated with these visits, based on OHIP fee codes, were used to calculate the average cost per capita paid for these core mental health services.

OHIP data were also used to measure the number of electroconvulsive therapy (ECT) users from March 1, 2005 – February 28, 2006 per 100,000 population aged 15 and older defined as any individual for whom a code of G478 or G479 (electroconvulsive therapy cerebral) was billed.

Measures of Supply

Administrative data were used to measure supply of medical services. The IPDB was used to identify the number of general practitioners/family physicians and the number of psychiatrists available in Ontario per 100,000 population aged 15 and older. The number of acute care psychiatric beds available in Ontario was based on estimates available from the Ministry of Health and Long-Term Care's (MOHLTC) Health Data Branch. The report was accessed on February 6, 2008 at http://www.mohltcfim.com/cms/client_webmaster/index.jsp

Physician Visits for Depression

Ontarians with probable depression, based on CCHS, Cycle 1.1 were linked (using encrypted health card numbers) to OHIP data (from the 2000/01 and 2001/02 fiscal years) to identify the number of people with probable depression who were seen by a physician for a depression-related visit during the year after the survey date. OHIP diagnostic codes 300 or 311 were used to identify 'depression-related' visits.

Physician Follow Up for Patients On a New Course of Antidepressants

The ODB was used to identify patients who started on a new course of antidepressants and who filled two or more prescriptions within 100 days (first prescriptions filled during the period March 1, 2005 - February 28, 2006). The sample was restricted to adults aged 66 and older to allow review of data from one year prior to confirm that the medication use represented a new prescription. This cohort was linked, using encrypted health card numbers, to the OHIP database to identify physician visits for depression (OHIP diagnosis codes 300 or 311) within 12 weeks of starting medication. Three or more visits during the acute period of treatment are recommended.⁸¹

Women Who Had a Physician Visit for Depression After Giving Birth

CIHI-DAD was used to identify women who were discharged from hospital (from March 1, 2005 - February 28, 2006) after having given birth. Still births were excluded. This cohort was linked, using encrypted health card numbers, to the OHIP database to identify physician visits for depression (OHIP diagnosis codes 300 or 311) within one year of hospital discharge.

Physician Visits, Emergency Department Visits and Readmissions Following Discharge from a Hospital Stay for Depression

These indicators included all discharges from acute care hospitals and those psychiatric hospitals included in the CIHI-DAD from March 1, 2005 - February 28, 2006 after an admission for depression (ICD10 codes F32, F33, F412 or F480).

- Discharge records for patients admitted to hospital for depression were linked to the OHIP database, using encrypted health card numbers, to determine the percentage that were seen by a physician for depression (OHIP diagnostic codes 300 or 311) within 30 days, 12 weeks, six months and one year of discharge. The mean number of days to the first visit was also calculated.
- Discharge records for patients admitted to hospital for depression were also linked to the NACRS database, using encrypted health card numbers, to identify the percentage of patients that were seen in an emergency department for any reason within 30 days of discharge without a resulting hospital admission.
- Patients who were discharged from hospital after an admission for depression were followed for 30 days from the date of discharge to identify patients who were readmitted to hospital for depression within 30 days of discharge.

5. ANALYSIS

Bivariate analyses were used to estimate differences by sex. Differences were also estimated by age, neighbourhood income quintile, rural/urban residency, and LHIN and, where the numbers permitted, by sex within these variables. Indicators based on CCHS data were weighted to represent the demographic makeup of the Ontario population during the survey year. For indicators based on administrative data, indirect age-standardization, using the 2005 Registered Persons Database (adjusted for the Statistics Canada Census) was applied. Where numbers were too small, results were either not reported or were aggregated.

Limitations

The results based on CCHS data should be interpreted with caution for the following reasons:

- The survey relies on self-reports and voluntary participation of randomly selected participants, and thus the data reflect individuals' interpretation of questions and how they perceive their own health. Hence, results may be an under- or over-estimation of the prevalence of some conditions.
- The CCHS does not survey Aboriginal people living on reserves, institutionalized individuals, individuals unable to be surveyed in English or French, or persons in the armed forces. While the findings pertain to a large proportion of Ontarians (those living in households), they may be biased if the group not surveyed have significantly different need or utilization rates.
- The CCHS survey was conducted before LHINs were created and there was inadequate sample size for some measures for some LHINs. This prevented comparative analysis of some indicators.

Administrative data have the following limitations that should be considered when interpreting findings from these data:

- Although coders undergo extensive training and rechecking procedures, variations in interpreting coding and reporting guidelines and in hospital practices may create biases in hospital administrative data.
- Physician claims data have one field for diagnostic information. Anecdotal information suggests variation in coding across medical specialties and when patients present multiple conditions during a single visit. While cross-province comparisons provide some evidence for the reliability of physician coding at a gross level,⁵⁶ there are likely biases and omissions when using these data to identify visits for depression.

The following cautions should be kept in mind when data for the ecological variables (SES, rural/urban) are interpreted:

- Accuracy of the information depends on the accuracy of the data provided to the census or the Ministry of Health and Long-Term Care (RPDB).
- Data definitions may differ (e.g., urban vs. rural) for various reasons such as changes in population concentration or composition or use of different analytic thresholds (e.g., using quartiles vs. quintiles).

TABLE 5.1 | Summary of critical issues vis-à-vis care for depression from expert panel survey

Care for depression continuum point	Issue
Prevention	<ol style="list-style-type: none"> 1. Few gender-specific prevention/public education programs 2. Need programs designed to prevent exposure to likely risk factors and/or support to at-risk subgroups <ul style="list-style-type: none"> • Programs should be based on evidence • Populations/factors to be targeted: <ul style="list-style-type: none"> Poverty/low income and depression for women Parental history of mental illness Childhood maltreatment Low SES women with children Men – recognition and treatment of depression Workplace stress Postpartum period for women
Community Services/Supports	<ol style="list-style-type: none"> 3. Few gender specific community services/supports programs 4. Accessibility of such programs (e.g., child care options, non-business hours) 5. [gender-specific] Acceptability of such programs 6. Clinics need to follow current guidelines regarding identifying and either referral or treatment for depression 7. Vocational support programs need gender-sensitive case finding and intervention programs 8. Men less likely to access these services. Mental health stigma is higher for men and male adolescents who have a higher dropout rate in treatment programs
Primary Care	<ol style="list-style-type: none"> 9. Women should be screened for depression (especially postpartum and pre-menopausal) 10. Need better access (for all) to primary care and especially family physicians 11. Training and capability of primary care providers to recognize and treat mild to moderate depression 12. Need for primary care to follow guidelines for assessment and treatment of depression 13. Need for [equitable] interconnection between primary and other types of care, e.g., <ul style="list-style-type: none"> • Availability of specialty services that primary care can refer to • Encouragement of shared care arrangements • Access to services outside the ones funded by province (e.g., psychologists) • Need to evaluate if referrals are gender-specific • Need to evaluate whether current fee-for-service payments result in perverse incentives

TABLE 5.1 | Summary of critical issues vis-à-vis care for depression from expert panel survey

Care for depression continuum point	Issue
Primary Care	<p>14. More consistent offering and greater availability of evidence-based psychotherapy as supplement/-alternative to anti-depressants (to counteract potential overuse of biologicals in affected population which are mostly women)</p> <p>15. Need to address stigma—e.g., women viewed as weak and not trying hard enough to cope with depression. This negatively impacts help-seeking behaviour and impedes recovery</p>
Acute Hospital Care	<p>16. Bed accessibility</p> <p>17. Impact of gender on the decision to admit to hospital</p> <p>18. Need to incorporate the demands of women's roles as mothers and wives into the care process.</p> <ul style="list-style-type: none"> • Assessment and care need to explicitly consider the depressed woman's role as mother and wife • Inclusion in discharge planning for possible need to assistance in caring for home/family • Marital relationships are predictor of recovery and/or relapse. Marital therapy/counselling is often not offered at discharge
Specialty Hospital Care	<p>Same as #16 - #18</p> <p>19. Availability of gender-segregated units/wards</p> <p>20. Relationship of length of stay for mental health [depression] reasons to gender</p> <p>21. Need to link to community and primary care services so that inpatient stay is a short episode in a continuum of care</p> <p>22. Need for improved community nursing teams to act as case managers and care coordinators for individual with severe mental illness</p>
Chronic & Rehabilitation Care	<p>Same as #18</p> <p>23. Cost of non-insured services and medications</p> <p>24. More attention to work environment regarding readiness to return to work. Management training and occupational health policies should be targeted.</p> <p>25. Sheltered accommodation</p> <p>26. Meaningful employment opportunities</p>

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ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Cardiovascular Disease

Chapter 6

AUTHORS

Arlene S. Bierman, MD, MS, FRCPC

R. Liisa Jaakkimainen, MD, MSc, CCFP

Heart Failure Lead

Beth L. Abramson, MD, MSc, FRCPC, FACC

Ischemic Heart Disease Lead

Moira K. Kapral, MD, MSc, FRCPC

Stroke Lead

Nahid Azad, MD, FRCPC

Ruth Hall, PhD

Patrice Lindsay, RN, PhD

Gladys Honein, BScN, MPH

Naushaba Degani, PhD

INSIDE

- Health and Functional Status
- Heart Failure
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- Stroke

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Project for an Ontario Women's Health Evidence-Based Report

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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.toronto.on.ca

www.powerstudy.ca

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Executive Summary

ISSUE

Prevention and treatment of cardiovascular disease (CVD) is an important women's health issue.

CVD is the leading cause of death and disability among Canadian women and men accounting for 37 percent of all deaths in 1999¹ and 32 percent of deaths in 2004.²

Among individuals with CVD, there are gender differences in epidemiology, prevalence of risk factors, clinical presentation and quality and outcomes of care.³ Mortality from CVD in Canada has declined steadily since the 1950s.⁴ Between 1994 and 2004, mortality from CVD in Canada declined by 30 percent from 360.6 deaths/100,000 in 1994 to 252.5 deaths/100,000 in 2004.⁵ At the same time the ratio of deaths due to CVD in men compared to women declined sharply.⁶ In 1973, there were 23 percent fewer CVD deaths among women than men. By 2003, the number of CVD-related deaths among men had decreased while the number in women had increased such that the number of CVD-related deaths among women equaled those among men.^{2, 6} By 2004, just over half of all CVD-related deaths (50.5 percent) occurred in women.⁵

Despite noted declines in CVD-related mortality, the number of people living with CVD is expected to rise over the next 25 years due to an aging population, changes in health behaviours, improved diagnostic testing and treatment options that extend the lives of people with CVD. Rising rates of obesity and diabetes are likely to result in increasing CVD incidence and prevalence and threaten to reverse declining mortality rates.^{7,8}

ABOUT THIS CHAPTER

The chapter has four sections:

- A. Health and Functional Status
- B. Heart Failure
- C. Ischemic Heart Disease
- D. Stroke

In the first section of this chapter we report on the health and functional status of Ontario women and men with CVD including self-rated health, health transition, activity limitations and disability, health behaviours and CVD risk factors. In the subsequent three sections, we examine the leading causes of CVD-related morbidity and mortality—heart failure (HF), ischemic heart disease (IHD) and cerebrovascular disease (including stroke and transient ischemic attack). We report on indicators that assess the types of physicians providing care, medication management in the acute setting and for secondary prevention, diagnostic testing and clinical interventions. In addition, we report on patient outcomes including health service use (emergency department visits and hospital readmissions) and mortality.

There is a substantial body of evidence on the effects of primary and secondary prevention at the patient and population levels, health system redesign aimed at chronic disease prevention and management, and patient self-management interventions on CVD-related morbidity and mortality. Adherence to clinical practice guidelines for the diagnosis and management of CVD can improve outcomes of care for women and men and narrow gender disparities in care. Gender-specific guidelines have been developed to help reduce gender gaps in CVD prevention and management.^{9, 10} Social policy aimed at addressing the social determinants of health combined with community engagement can contribute to reducing the burden of illness in the population due to CVD.

STUDY

The indicators we report are the result of a systematic review of the literature and rigorous selection process (see [Introduction to the POWER Study, chapter 1](#)). The indicators that have been included have been identified through many sources including the Canadian Cardiovascular Society (CCS)/the Canadian Cardiovascular Outcomes Research Team (CCORT),³⁸⁻⁴⁰ the Canadian Stroke Quality of Care Study,⁴¹ the Canadian CABG Quality Indicators group,⁴² the US Agency for Health Care Research and Quality (AHRQ) and the Danish National Indicators Project on Stroke.⁴³ Many of these indicators are widely used to measure quality of care. We build on these reports by incorporating a gender and equity analysis (see [The POWER Study Framework, chapter 2](#)). This is important because women and men have different patterns of disease, disability and mortality. Women and men also have different social contexts and different experiences with health care which, together with differences in biology, contribute to observed gender differences in health. Furthermore, well documented health inequities among women and

men associated with sociodemographic factors are such that differences in illness burden between subgroups of women may be larger than overall differences between women and men.

Data from several sources were used to produce this section. These include: Statistics Canada 2001 Census; the Canadian Community Health Survey (CCHS) Cycles 1.1 and 3.1; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); CIHI National Rehabilitation Reporting System (CIHI-NRS); Ontario Drug Benefit (ODB) database; Ontario Health Insurance Plan (OHIP) physician claims data; the National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB); Cardiac Care Network (CCN) data including wait times data and data on angiography; Registry of the Canadian Stroke Network (RCSN) Ontario Stroke Audit (OSA) data; the Ontario Congestive Heart Failure Database (OCHFDB); the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB); the CABG dataset at ICES and data from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study.⁴⁰ Data on functional and health status were first stratified by sex and then further stratified by socioeconomic variables including annual household income, educational attainment, age, years since immigration and Local Health Integration Network (LHIN) and analysed as allowed by sample size. Data on clinical care and outcomes were first stratified by sex and then further stratified by neighbourhood income, age and LHIN and analysed as allowed by sample size. Age-adjustment, where appropriate, was done using indirect standardization. Risk-adjustment, based on previously used adjustment models, was used to assess readmissions and mortality. [Appendix 6.3](#) provides a brief description of research methods. A complete list of the indicators in this chapter and their data sources can be found in [Appendix 6.2](#).

KEY FINDINGS

We found gender differences in the health and functional status of adults who indicated they had heart disease or a stroke. Women consistently reported worse functional status and higher rates of disability than men. Women were more likely to report activity limitations ([Exhibit 6A.4](#)), limitations in Instrumental Activities of Daily Living (IADLs) and/or limitations in Activities of Daily Living (ADLs) ([Exhibit 6A.5](#)), mobility problems and activities prevented by pain ([Exhibit 6A.7](#)). Women were also more likely than men to report disability days in the previous two weeks ([Exhibit 6A.6](#)).

The prevalence of CVD risk factors was high among both women and men and across income categories ([Exhibit 6A.11](#)), underscoring the need for secondary prevention. Women were more likely to be physically inactive, but less likely than men to report being overweight or obese or to report inadequate fruit and vegetable intake. Smoking rates were similar among women and men ([Exhibit 6A.10](#)). A larger percentage of women than men reported low socioeconomic status as measured by less education and lower annual household income ([Exhibit 6A.8](#)), which is associated with higher risk for CVD and for risk factors for CVD.

Income was associated with almost all quality of life indicators. Low-income and less educated adults were more likely to report fair or poor health ([Exhibit 6A.1](#), [6A.2](#)), declining health status ([Exhibit 6A.3](#)), activity limitations ([Exhibit 6A.4](#)), IADL and/or ADL limitations ([Exhibit 6A.5](#)), disability days ([Exhibit 6A.6](#)), mobility limitations, limitations in their activities due to pain ([Exhibit 6A.7](#)) and risk factors than those with higher income or more education. Conversely, they were less likely to report having made changes to improve their health ([Exhibit 6A.12](#)).

Women with HF were less likely than men to have a cardiologist as their most responsible physician while in hospital and more likely to be under the sole care of a general practitioner/family physician (GP/FP) ([Exhibit 6B.1](#)). This pattern was also seen for outpatient care in newly diagnosed HF patients ([Exhibit 6B.26](#)). Women were less likely than men to undergo evaluation and cardiac testing for HF, including left ventricular function evaluation, cardiac stress testing, echocardiography and angiography. These differences were reduced, but not eliminated, with age-adjustment.

Lower-income women and men with HF were less likely to have a cardiologist as their most responsible physician, and more likely to be under the sole care of a GP/FP while in hospital ([Exhibit 6B.2](#)) or while being cared for in the community for newly diagnosed HF ([Exhibit 6B.27](#)). Low income was also associated with lower rates of angiography ([Exhibit 6B.13](#)) and echocardiography ([Exhibit 6B.11](#)) among men but not among women.

Among individuals aged 65 and older, who were discharged after an episode of HF, medication management for HF did not differ by sex and income. However, there were regional variations in medication use ([Exhibit 6B.7](#)).

Emergency department visits ([Exhibit 6B.15](#)) and readmissions ([Exhibit 6B.17](#)) among HF patients were high. Within 30 days of discharge, 30 percent of patients hospitalized for HF visited an emergency department and 20 percent were readmitted to hospital. Within one year, 75 percent had visited an emergency department and 59 percent had been readmitted. About one-third of hospital readmissions (within 30

days and within one year) among women and men were for non-CVD related causes.

Women who had an acute myocardial infarction (AMI) were less likely than men to have a cardiologist as their most responsible physician while in hospital ([Exhibit 6C.1](#)), undergo or be referred for angiography within the recommended period (during admission or within three months of discharge), or to fill a prescription for a statin within the first 90 days post-discharge or at one year post-discharge. Women also had higher risk-adjusted 30-day and one-year non-elective readmission rates than men ([Exhibit 6C.14](#)) and higher crude but not risk-adjusted mortality during the same follow up intervals.

Women and men experienced similar rates of physician follow up within 30 days; beta-blocker, angiotensin-converting enzyme (ACE) inhibitor and/or angiotensin II receptor blocker (ARB) and aspirin use post-AMI and wait times for coronary procedures.

Low-income women and men who had an AMI were less likely to have a cardiologist as their most responsible physician, more likely to be under the sole care of a GP/FP ([Exhibit 6C.2](#)) while in hospital and had lower rates of coronary angiography ([Exhibit 6C.11](#)) than higher-income adults.

Eight percent of AMI patients were under the sole care of a GP/FP when hospitalized. Women, older patients and those from lower-income neighbourhoods were more likely to be under the sole care of a GP/FP. This also varied significantly by region, from less than one percent

of patients in the Toronto Central LHIN to 36 percent of patients in the North West LHIN ([Exhibit 6C.4](#)).

We found no significant sex differences in the delivery of the majority of acute stroke care quality indicators.

Women were less likely to be prescribed statins for hyperlipidemia at the time of discharge from hospital, at 90 days, and at one year than men.

Women were less likely than men to undergo carotid imaging, and this appeared to be primarily driven by lower rates of imaging in patients aged 80 and older ([Exhibit 6D.14](#)). Women were also half as likely as men to undergo carotid endarterectomy within six months of the index stroke admission ([Exhibit 6D.16](#)).

There were no significant sex differences in risk-adjusted seven-day, thirty-day or one-year readmission ([Exhibit 6D.30](#)) or mortality rates ([Exhibit 6D.33](#)) after stroke.

There was significant regional variation in stroke care including access to stroke units ([Exhibit 6D.18](#)), medication management, neurologist or neurosurgery consultation ([Exhibit 6D.22](#)), dysphagia screening ([Exhibit 6D.20](#)), access to rehabilitation and nutritional assessment ([Exhibit 6D.25](#)) and referral to stroke prevention clinics for patients discharged directly from an emergency department ([Exhibit 6D.26](#)). While development and implementation of the Ontario Stroke System has improved stroke care in the province, regional variations persist.

KEY MESSAGES

We took a broad look at the burden of cardiovascular disease (CVD) and quality and outcomes of care for heart disease and stroke in the province, focusing on gender, socioeconomic and regional variations. While much progress has been made in improving quality and outcomes of care for CVD as well as narrowing gender gaps in care, much work remains to be done. Inequities in health and functional status associated with gender and socioeconomic status were much greater than inequities in the provision of acute care services, underscoring the need to address the social determinants of health to reduce the burden of CVD. Our findings point to a number of key areas for intervention and improvement. For many indicators, there was sizable variation across the Local Health Integration Networks (LHINs). The Cardiac Care Network and the Ontario Stroke System among others are working to reduce regional variations in CVD care. The results of our analyses are available for the LHINs to use in their priority setting, planning and quality improvement activities. By implementing interventions at the policy, population health and practice levels and coordinating these interventions for maximum impact, it will be possible to hasten progress.

The following six actions can help accelerate progress in reducing the burden of CVD, improving health outcomes among women and men with CVD and reducing health inequities related to CVD. For these actions to be truly successful, gender and socioeconomic differences in the prevalence of CVD and experiences with care will need to be addressed.

Reduce health inequities associated with CVD by focusing upstream.

- Upstream causes of disease such as poverty, low levels of educational attainment, access to healthy foods and neighbourhood and workplace characteristics contribute to increasing the population burden of CVD and CVD-related health inequities. Focusing

efforts upstream, through cross-sectoral collaboration, can serve to address the root causes of these health inequities while reducing the burden of CVD in the population.

- Women are more likely to live in low-income households than men, thus contributing to their risk of developing CVD. To be most effective, upstream approaches will need to address the factors that lead to increased rates of poverty among women.

Prevention (primary and secondary) is key to reducing the burden of illness due to CVD.

- The prevalence of behavioural risk factors for CVD remains high in Ontario—smoking, physical inactivity, obesity, and poor diets (see [Burden of Illness, chapter 3](#)). Thus, reducing risk among those who do not yet have CVD (primary prevention) is key to reducing illness burden. Prevention interventions need to address the social determinants of health, be gender sensitive and target those who are socioeconomically disadvantaged and therefore at greatest risk. Increased emphasis on prevention and integrated approaches at the population, community and clinical levels are essential to reduce the burden of illness due to CVD in Ontario.
- The same risk factors—smoking, physical inactivity, obesity and poor diets—lead to worse health outcomes among women and men once they have developed CVD. Interventions to modify these risk factors among those with the disease (secondary prevention) reduce CVD-related morbidity and mortality. The high prevalence of these risk factors among women and men with CVD underscores the need for increased emphasis on secondary prevention to improve CVD outcomes.

Close the gender gap in care for CVD.

- Gender gaps in care for CVD have narrowed for several reasons, including an increased awareness of the importance of CVD to women's health and recognition

of gender disparities in care, combined with activities to close these gaps including gender-specific guidelines. We found no gender differences in medication management with the exception of statin use. We found few gender differences in stroke care. Gender differences on other quality indicators were modest. Nevertheless, women were still less likely to receive care from a cardiologist, to undergo or be referred for angiography after an acute myocardial infarction (AMI), undergo diagnostic testing for ischemic heart disease (IHD) and heart failure (HF), and more likely to be readmitted to the hospital after an admission for an AMI. There is a need to develop and implement targeted interventions to eliminate gender gaps in care.

- Women with CVD consistently reported worse functional status and higher rates of disability than men. Women were more likely to report activity limitations, limitations in Instrumental Activities of Daily Living (IADLs) and/or limitations in Activities of Daily Living (ADLs), mobility problems, activities prevented by pain and more disability days. Gender sensitive models of care that focus on disability prevention and improving functional status are needed to improve the quality of life of women with CVD.

Comprehensive patient-centred chronic disease management can improve quality and outcomes of care for CVD.

- CVD is a chronic disease requiring coordination of primary and specialty care across different settings. Individuals with CVD often have multiple chronic conditions because the risk factors for CVD are also risk factors for other chronic conditions such as diabetes and because CVD is more prevalent with increasing age. Therefore, implementation of a comprehensive and coordinated patient-centred chronic disease prevention and management strategy—one that addresses the needs of at-risk populations—is the key to improving quality and outcomes of care for CVD.

- Rates of emergency department use and hospital readmission were very high after an admission for HF for women and men. Additionally, women were more likely than men to be readmitted to the hospital after an AMI. An effective chronic disease management strategy could help prevent both emergency department use and hospital readmissions, thus reducing the burden on the hospital sector and freeing needed resources.

Province-wide, integrated, organized models of care delivery can improve health outcomes and reduce inequities in care.

- The Ontario Stroke System—which targets activities across the continuum of stroke care from prevention, pre-hospital care, acute care and rehabilitation and community reintegration—is an example of a model that could be applied to other types of CVD such as HF and IHD.
- We found sizable regional variations in care likely due to differences in human resources and regional capacity, as well as regional difference in practice patterns. Interventions used by the Ontario Stroke System such as regionalization of care, use of telemedicine, performance measurement and improvement and training local practitioners are all approaches that can reduce regional variations in care.

Improve quality, availability and timeliness of data to assess CVD and CVD care in the province.

- While data quality and availability to assess CVD care in the province has improved, there is still much to be done to improve the quality, availability and timeliness of data. Specifically, medication data on those under age 65, data on management of CVD in ambulatory care settings, and datasets that capture clinical factors are needed.
- Data on ethnicity would allow us to assess disease burden, access to care, quality and outcomes of care in Ontario's diverse communities.

KEY FINDINGS BY SECTION

SECTION A | Health and Functional Status

- Almost half (45 percent) of adults who have heart disease or who have had a stroke reported that their health status was fair or poor, compared to 13 percent in the general population in Ontario (see [Burden of Illness, chapter 3](#)).
- Adults with heart disease or who have had a stroke who were from lower-income households ([Exhibit 6A.1](#)) or who had less than a secondary education ([Exhibit 6A.2](#)) were between one and a half to twice as likely to report fair or poor health as compared to those from higher-income neighbourhoods or with a Bachelor's degree or higher, respectively.
- Among adults with heart disease or who have had a stroke, 58 percent reported having activity limitations due to their health problem, 49 percent reported having limitations in their IADLs and/or ADLs and one-quarter had taken at least one disability day in the two weeks prior to being surveyed.
- Women were more likely to report activity limitations than men; 63 percent of women versus 55 percent of men reported activity limitations due to a chronic health problem ([Exhibit 6A.4](#)); 59 percent of women versus 40 percent of men reported IADL and/or ADL limitations ([Exhibit 6A.5](#)) and 28 percent of women versus 21 percent of men reported disability days ([Exhibit 6A.6](#)).
- Women with CVD were more likely than men to report living with pain (38 percent versus 29 percent, respectively) or problems with mobility (26 percent versus 19 percent, respectively). Both of these indicators also varied by household income and educational attainment, with lower socioeconomic status adults being more likely to report living with pain and mobility limitations than those with higher socioeconomic status ([Exhibit 6A.7](#)).
- Forty-eight percent of individuals living with heart disease or the effects of a stroke had less than secondary

education and 37 percent were from lower-income households. Women were more likely than men to live in a lower-income household (46 percent versus 31 percent, respectively) or to have lower educational attainment (55 percent versus 43 percent, respectively) ([Exhibit 6A.8](#)).

- Slightly less than one-quarter of adults with heart disease or who have had a stroke also reported having physician diagnosed diabetes and 59 percent reported having hypertension. Women with CVD were less likely to report diabetes than men, but both women and men reported similar rates of physician diagnosed hypertension ([Exhibit 6A.9](#)).
- More than half of adults with heart disease or who have had a stroke reported being overweight or obese (61 percent), physically inactive (59 percent) or inadequate fruit and vegetable intake (54 percent). Women reported higher rates of physical inactivity while men reported higher rates of the other two risk factors. Fifteen percent of adults with heart disease or who have had a stroke reported being current smokers (daily or occasional). This did not vary by sex ([Exhibit 6A.10](#)).
- Lower-income women were more likely than higher-income women to report physical inactivity (72 percent versus 60 percent, respectively) or being a current smoker (18 percent versus 10 percent, respectively) ([Exhibit 6A.11](#)).
- Just over half of adults (55 percent) with heart disease or who have had a stroke reported making at least one behavioural change over the previous year to improve their health. This did not vary by sex, but did vary by income ([Exhibit 6A.12](#)) and age ([Exhibit 6A.13](#)).

SECTION B | Heart Failure (HF)

- Among adults with HF, the type of physician providing care in hospital (most responsible physician for patients admitted to hospital with HF) or in the community

(among newly diagnosed HF patients) varied by sex. Sixteen percent of women versus 22 percent of men were under the care of a cardiologist while in hospital ([Exhibit 6B.1](#)) and 41 percent of women versus 54 percent of men saw a cardiologist in the community within one year of diagnosis ([Exhibit 6B.26](#)).

- Receipt of cardiology specialty care, both in hospital and in the community varied by age, region and by income. For both women and men with HF, those from the highest-income neighbourhoods were more likely to be under the care of a cardiologist than those from the lowest-income neighbourhoods ([Exhibits 6B.2, 6B.27](#)).
- Almost all HF patients (98 percent) saw a physician within four weeks of hospital discharge ([Exhibit 6B.4](#)), regardless of sex, neighbourhood income, age or region.
- Medication management for HF patients aged 65 and older, was similar for women and men and across income for use of ACE inhibitors and/or ARBs, beta-blockers and warfarin in patients with atrial fibrillation. Older adults, aged 80 and older were less likely than those aged 65-79 to have filled prescriptions for any of the medications ([Exhibits 6B.6, 6B.8, 6B.9](#)). This may be due to more contraindications to therapy in older HF patients as well as potential under use.
- Among patients admitted to hospital with HF, 76 percent had their left ventricular (LV) function evaluated, 33 percent underwent echocardiography, 68 percent underwent cardiac stress testing and 14 percent underwent angiography during the prescribed period (between six months prior to admission to one month post-discharge).
- Women were less likely than men to receive any of these diagnostic tests: 73 percent versus 79 percent (LV function assessment) ([Exhibit 6B.10](#)), 30 percent versus 35 percent (echocardiography) ([Exhibit 6B.11](#)); 65 percent versus 72 percent (stress tests, exercise tests and perfusion imaging) ([Exhibit 6B.12](#)); and 12 percent versus 17 percent (angiography) ([Exhibit 6B.13](#)). These differences remained significant after adjusting for age.
- Emergency department use ([Exhibit 6B.15](#)) and readmissions ([Exhibit 6B.17](#)) among HF patients were high. Within 30 days of discharge, 30 percent of patients hospitalized for HF visited an emergency department and 20 percent were readmitted to hospital. Within one year, 75 percent had visited an emergency department and 59 percent had been readmitted. About one-third of hospital readmissions (within 30 days and within one year) among women and men were for non-CVD related causes.
- For patient admitted to hospital for HF, 35 percent died within one year of their admission. After risk-adjustment for age and comorbidities, women (34 percent) had a lower mortality rate than men (37 percent) ([Exhibit 6B.20](#)).

SECTION C | Ischemic Heart Disease (IHD)

- Among adults who had been admitted to hospital with an AMI, 36 percent had a cardiologist as their most responsible physician, however, eight percent were under the sole care of a GP/FP ([Exhibit 6C.1](#)). The type of physician providing care in hospital varied by sex, income ([Exhibit 6C.2](#)) or age ([Exhibit 6C.3](#)). Twenty-nine percent of women from the lowest-income neighbourhoods were under the care of a cardiologist compared to 37 percent of women from the highest-income neighbourhoods, 36 percent of men from the lowest-income neighbourhoods and 42 percent of men from the highest-income neighbourhoods ([Exhibit 6C.2](#)).
- There was substantial regional variation in in-hospital physician care. The proportion of AMI patients under the sole care of a GP/FP ranged from less than one percent of patients from the Toronto Central LHIN to more than one-third of patients from the North West LHIN ([Exhibit 6C.4](#)).
- Initial follow up care for AMI patients is routinely provided in Ontario; 99 percent of women and men discharged from hospital following an AMI had a

follow up physician visit within four weeks of discharge ([Exhibit 6C.5](#)).

- Medication management for AMI patients aged 65 and older, was similar for women and men and across income for ACE inhibitors and/or ARBs, and beta-blockers. However, women were less likely than men to be using statins within 90 days of discharge and at one year post-discharge ([Exhibit 6C.6](#)). Medication use post-AMI did not vary by income, but did vary by LHIN and age. AMI patients aged 80 and older had lower rates of medication use than those aged 65-79 at both follow up periods.
- Overall, 54 percent of AMI patients received or were referred for coronary angiography within three months of discharge. Women were less likely than men to undergo angiography (44 percent versus 61 percent, respectively) and AMI patients from the lowest-income neighbourhoods had lower rates than those from the highest-income neighbourhoods. Age-adjustment reduced but did not eliminate these differences ([Exhibit 6C.11](#)).
- Age-adjusted angiography rates varied regionally from 40 percent in the North West LHIN to 69 percent in the South East LHIN ([Exhibit 6C.13](#)).
- Overall, 15 percent of AMI patients were readmitted to hospital within 30 days and 39 percent were readmitted to hospital within one year for any reason ([Exhibit 6C.14](#)). After risk-adjustment for age and comorbidities, women were more likely than men to be readmitted to hospital.
- Nine percent of AMI patients had died within 30 days and 20 percent had died within one year of hospitalization ([Exhibit 6C.15](#)). Crude mortality rates were higher in women than in men at both follow up periods, but these differences were eliminated after risk-adjustment for age and comorbidities.
- Median wait times for cardiac procedures were three days for angiography, two days for angioplasty and seven days for CABG surgery. Wait times did not vary by sex or neighbourhood income, but did vary somewhat by age and region. Wait times data are based on patients who are referred for procedures, and as such, are not able to capture referral biases or delays in referrals.
- Median door-to-needle time for patients with ST segment elevation myocardial infarction who received thrombolysis within four hours of arrival to hospital was 38 minutes. Women had significantly longer median door-to-needle times than men; 45 minutes versus 35 minutes, respectively ([Exhibit 6C.23](#)).
- Overall, 87 percent of patients had their internal mammary artery used to bypass their left anterior descending artery and this did not vary by sex or income. There was substantial regional variation in the use of the internal mammary artery to bypass the left anterior descending artery in CABG surgeries. Rates ranged from 77 percent in the North East LHIN to 95 percent in the Erie St. Clair LHIN (excluding the South East LHIN, due to incomplete reporting) ([Exhibit 6C.25](#)).
- The mean post-operative length of stay for CABG surgery patients was seven days. Lengths of stay varied significantly by sex (7.9 days for women and 6.8 days for men).
- Women were more likely to undergo revascularization within one year than men (2.5 percent versus 1.3 percent, respectively) and this difference persisted after adjusting for age.

SECTION D | Stroke

- For stroke or transient ischemic attack (TIA), administration of acute therapy did not differ by sex, income, age or region. Thrombolysis was administered to 14 percent of stroke patients presenting to hospital within 2.5 hours of stroke onset ([Exhibit 6D.1](#)), and 68 percent of patients with ischemic stroke or TIA were treated with antiplatelet therapy within 48 hours of presentation ([Exhibit 6D.2](#)).
- With respect to secondary prevention for stroke,

93 percent of ischemic stroke or TIA patients were prescribed antithrombotic therapy (aspirin, clopidogrel, combination aspirin and dipyridamole or warfarin) at the time of discharge ([Exhibit 6D.3](#)) and 79 percent were prescribed antihypertensive therapy ([Exhibit 6D.11](#)). Of those with atrial fibrillation and ischemic stroke or TIA, 74 percent were prescribed warfarin at discharge ([Exhibit 6D.4](#)).

- Fifty-four percent of patients with ischemic stroke or TIA were prescribed lipid-lowering therapy at discharge, with lower rates of prescribing in women compared to men and in older (aged 80 and older) compared to younger patients ([Exhibit 6D.8](#)). There was also significant regional variation in prescribing rates ([Exhibit 6D.9](#)). The measurement of lipid levels also varied significantly by age, with lower assessment rates in older patients ([Exhibit 6D.6](#)). This may partially explain variations in prescription rates by sex.
- Fifty-three percent of patients had carotid imaging either performed during their hospital stay or scheduled to be done as an outpatient post-discharge. Women were less likely to undergo carotid imaging than men and rates were lower in older adults (aged 80 and older) compared to younger patients ([Exhibit 6D.14](#)). There was also regional variation in carotid imaging rates ([Exhibit 6D.15](#)).
- Fewer than one in five stroke or TIA patients were cared for in a dedicated stroke unit, 47 percent were screened for dysphagia and 46 percent received a consultation from a neurologist or neurosurgeon while in hospital. All these indicators varied significantly by region ([Exhibits 6D.18, 6D.20, 6D.22](#)), but did not vary by sex or income. Dysphagia screening rates increased with increasing age ([Exhibit 6D.19](#)), but no age-related differences were

observed in the other indicators.

- Seventy percent of patients with stroke were assessed by a physiotherapist, 61 percent by an occupational therapist, 47 percent by a speech language pathologist and 34 percent by a nutritionist ([Exhibit 6D.23](#)). There were variations in assessment rates by region ([Exhibit 6D.25](#)) and age ([Exhibit 6D.24](#)) (with lower assessment rates in younger compared to older patients), but there were no differences by sex or income. Higher assessment rates in older individuals may be appropriate based on comorbid illness and functional status both before and after stroke.
- Among patients with stroke or TIA who were discharged directly from the emergency department, 30 percent were referred to a stroke prevention clinic, with significant regional variation ([Exhibit 6D.26](#)) but no differences in referral rates by sex, income or age.
- Non-elective readmission rates after an admission for ischemic stroke or TIA were 3.2 percent (seven days), 8.4 percent (30 days) and 15.7 percent (one year) ([Exhibit 6D.30](#)), with no significant variation by sex, neighbourhood income ([Exhibit 6D.31](#)) or age ([Exhibit 6D.32](#)), but some regional variation in readmission rates at one year.
- All-cause mortality rates were 9 percent, 17 percent and 28 percent within seven, 30 and 365 days of admission for stroke or TIA, respectively ([Exhibit 6D.33](#)). Mortality was significantly higher for patients suffering a hemorrhagic compared to ischemic stroke ([Exhibit 6D.34](#)). There were regional variations in stroke mortality ([Exhibit 6D.36](#)) but no significant variation by sex, neighbourhood income or age ([Exhibit 6D.35](#)).

Introduction

Prevention and treatment of cardiovascular disease (CVD) is an important women's health issue. CVD is the leading cause of death and disability among Canadian women and men accounting for 37 percent of all deaths in 1999¹ and 32 percent of deaths in 2004.²

Among individuals with CVD, there are gender differences in epidemiology, prevalence of risk factors, clinical presentation and quality and outcomes of care.³ Mortality from CVD in Canada has declined steadily since the 1950s.⁴ Between 1994 and 2004, mortality from CVD in Canada declined 30 percent from 360.6 deaths/100,000 in 1994 to 252.5 deaths/100,000 in 2004.⁵ At the same time the ratio of deaths due to CVD in men compared to women declined sharply.⁶ In 1973, there were 23 percent fewer CVD deaths among women than men. By 2003, the number of CVD-related deaths among men had decreased while the number in women had increased such that the number of CVD-related deaths among women equaled those among men.^{2, 6} By 2004, just over half of all CVD-related deaths (50.5 percent) occurred in women.⁵

Despite noted declines in CVD-related mortality, the number of people living with CVD is expected to rise over the next 25 years due to an aging population, changes in health behaviours, improved diagnostic testing and treatment options that extend the lives of people with CVD. A worrisome autopsy study found that recent declines in CVD prevalence have reached a plateau.⁷ Rising rates of obesity and diabetes are likely to result in increasing CVD prevalence and threaten to reverse declining mortality rates.⁸

This chapter has four sections:

- Health and Functional Status
- Heart Failure
- Ischemic Heart Disease
- Stroke

In the first section of this chapter we report on the health and functional status of Ontario women and men with CVD including self-rated health, health transitions, activity limitations and disability, health behaviours and CVD risk factors. In the subsequent three sections, we examine the leading causes of CVD-related morbidity and mortality—heart failure (HF), ischemic heart disease (IHD) and cerebrovascular disease (including stroke and transient ischemic attack). We report on indicators that assess the types of physicians providing care, medication management in the acute setting and for secondary prevention, diagnostic testing and clinical interventions. In addition, we report on patient outcomes including health service use (emergency department visits and hospital readmissions) and mortality.

There is a substantial body of evidence that shows that primary and secondary prevention both at the patient and population levels, health system redesign aimed at chronic disease prevention and management and

patient self-management interventions can reduce CVD associated morbidity and mortality. Adherence to clinical practice guidelines for diagnosis and management of CVD can improve outcomes of care for women and men and narrow gender disparities in clinical outcomes. Gender-specific guidelines have been developed to help reduce gender gaps in CVD prevention and management.^{9, 10} Furthermore, social policy aimed at addressing the social determinants of health combined with community engagement and empowerment can contribute to reducing the burden of illness in the population due to CVD.

Risk Factors for Cardiovascular Disease

Most CVD is preventable and can be attributed to well known modifiable risk factors which are the same for men and women.^{11, 12} However, there are gender differences in the prevalence and relative contribution of these risk factors to the development of CVD.¹³ The INTERHEART Study, a case-control study of individuals from 52 countries, found that nine cardiovascular risk factors: lipid abnormalities, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, physical inactivity, low fruit and vegetable intake and alcohol use (moderate alcohol use was protective) account for 90 percent of the attributable risk for acute myocardial infarction (AMI) in men and 94 percent in women. The population attributable risk (PAR) or the relative contribution of these risk factors for AMI varied by gender for some risk factors but not for others. For example, abnormal lipids contributed equally to CVD in both men (49.5 percent) and women (47.1 percent), as did abdominal obesity (19.7 percent versus 18.7 percent, respectively). However the PAR for smoking was greater in men (42.7 percent versus 14.8 percent of women), while the PARs for psychosocial risk factors (28.8 percent of men versus 45.2 percent of women), and hypertension (14.9 percent of men versus 29.0 percent of women) were greater in women.¹² Women were also more likely to have multiple CVD risk factors.¹¹

Women and Cardiovascular Disease

Women develop IHD approximately seven to ten years later than men. Although the prevalence of IHD among women before menopause is lower than the rate in similarly aged men, this difference narrows by the seventh decade of life, and by age 80, the prevalence of IHD is nearly equal for women and men.^{13, 14} Younger women benefit from the protective effect of estrogen prior to menopause, but the presence of chronic diseases such as diabetes eliminates the advantage that is afforded women because of the favourable hormone profile. In fact, the presence of chronic conditions such as diabetes appears to have a significantly greater impact on CVD in women than in men.

Gender differences in outcomes for heart disease can be explained in part by the fact that women tend to be older, have more comorbidities, and worse risk profiles than men with IHD. In addition, physical disability is an independent predictor of IHD mortality and women are more likely to report physical disabilities.^{1, 15} Finally, psychosocial factors affect health outcomes and older women are more likely to be poor, live alone and lack social support, all of which increase their risk for suboptimal outcomes and impede health care access.¹⁴

Historically, women with CVD have been treated differently than men in terms of access, diagnosis and treatment.¹⁶ These differences have narrowed over time. Over a decade ago, Naylor and colleagues showed that women in Ontario were less likely to receive procedures such as angioplasty or bypass surgery than men.¹⁷ Many subsequent studies have found sex differences in the diagnosis and management of heart disease. Anand and colleagues found that high-risk women with acute coronary syndromes were less likely than men to undergo coronary angiography, angioplasty and coronary artery bypass graft surgery (CABG), and while they did not have a higher incidence of cardiovascular death, recurrent MI or stroke, women did have increased rates of refractory ischemia and rehospitalization post-intervention.¹⁸ Kaul and colleagues found that

women presenting to emergency departments with acute coronary problems were less likely than men to be admitted to an acute care facility and were less likely to receive cardiac revascularization procedures.¹⁹ In other Canadian research, women presenting to hospital with an AMI were less likely than men to receive interventions that can improve outcomes including reperfusion therapies (e.g. thrombolytic therapy) and percutaneous coronary interventions (PCI).²⁰ Women were also less likely than men to undergo CABG²¹ or to receive implantable cardiac defibrillators for AMI or HF.²² This may reflect appropriate referral and care and/or differences in patient preferences for care, but it may also reflect gender bias on the part of providers.

Patient-level factors may also contribute to gender differences in diagnosis. Women may be less aware of their risk for CVD. Compared to men, women have been reported to be less likely to attribute their symptoms to cardiac-related causes or to seek timely medical attention for these symptoms. The Heart and Stroke Foundation National Omnibus Survey in 2003 found that 60 percent of Canadian women felt breast cancer was the leading cause of death; only 17 percent correctly identified heart disease as the major cause of mortality among women.²³

Cardiovascular Disease, Ethnicity and Socioeconomic Status

Lower socioeconomic status has been widely associated with an increase risk of CVD.¹⁸ CVD prevalence also differs by race and ethnicity. At the same time, individuals with lower socioeconomic position or from racial and ethnic minority communities may experience barriers to accessing care and are at risk of receiving suboptimal care. Interactions have been observed between gender, ethnicity and socioeconomic status such that low-income and minority women may be particularly at risk for not receiving recommended care.²⁴⁻²⁷ An American study by Vacarino and colleagues²⁸ found that, after risk-adjustment, racial and sex differences persisted in rates of reperfusion therapy and coronary

angiography, but not for medication use such as aspirin and beta-blockers. White women and Black men had similar relative risks as compared to White men, but Black women were doubly disadvantaged because of their race and their sex. This translated into a higher risk-adjusted mortality rate for Black women as compared to White men. Alter and colleagues²⁹ reported on variations in cardiac procedure rates by socioeconomic status. Using hierarchical models to control for service availability, the authors were able to show that as neighborhood income of the patient increased, rates of angiography increased. After controlling for availability of cardiac catheterization, access to tertiary care and hospital teaching status, the socioeconomic gradient persisted. A further study by the same authors found through patient follow up, that more affluent patients had higher rates of cardiac rehabilitation and cardiologist follow up as well as angiography as compared to those with lower annual household income or lower educational attainment and the differences persisted after adjustment for confounding.³⁰ These differences did not translate into socioeconomic differences in one-year mortality rates in this population, however another Canadian study set in Alberta found socioeconomic-related variation in one-year mortality, especially among patients who had not been revascularized after an AMI.³¹

While there is variation in care and outcomes by sex, socioeconomic status and ethnicity or race, there are a number of interventions that have been shown to reduce disparities and to improve care. These range from application of practice guidelines to improve care,^{32, 33} targeted interventions to improve aspects of care,³⁴ educational interventions to improve the overall care provided by general practitioners/family physicians (GP/FP) and specialists³⁵ and community-based interventions to increase the level of knowledge of patients.^{36, 37} These types of studies suggest that existing disparities can be mitigated but that tailored interventions may be necessary to achieve this objective.

STUDY

The indicators we report are the result of a systematic review of the literature and rigorous selection process (see [Introduction to the POWER Study, chapter 1](#)). The indicators that have been included have been identified through many sources including the Canadian Cardiovascular Society (CCS)/the Canadian Cardiovascular Outcomes Research Team (CCORT),³⁸⁻⁴⁰ the Canadian Stroke Quality of Care Study,⁴¹ the Canadian CABG Quality Indicators group,⁴² the Agency for Health Care Research and Quality (AHRQ) in the US and the Danish National Indicators Project on Stroke.⁴³ Many of these indicators are widely used to measure quality of care. We build on these reports by incorporating a gender and equity analysis (see [The POWER Study Framework, chapter 2](#)). This is important because women and men have different patterns of disease, disability and mortality. Women and men also have different social contexts and different experiences with health care which, together with differences in biology, contribute to observed gender differences in health. Furthermore, well documented health inequities among women and men associated with sociodemographic factors are such that differences in illness burden between subgroups of women may be larger than overall differences between women and men.

Data from several sources were used to produce this section. These include: Statistics Canada 2001 Census; the Canadian Community Health Survey (CCHS), Cycles 1.1 and 3.1; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); CIHI National Rehabilitation Reporting System (CIHI-NRS); Ontario Drug Benefit (ODB) database; Ontario Health Insurance

Plan (OHIP) physician claims data; the National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB); Cardiac Care Network (CCN) data including wait times data and data on angiography; Registry of the Canadian Stroke Network (RCSN) Ontario Stroke Audit (OSA) data; the Ontario Congestive Heart Failure Database (OCHFDB); the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB); the CABG dataset at ICES and data from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study.⁴⁰ Data on functional and health status were first stratified by sex and then further stratified by annual household income, educational attainment, age, ethnicity, years since immigration and Local Health Integration Network (LHIN) and analysed as sample size permitted. Data on clinical care and outcomes were also first stratified by sex and then further stratified by neighbourhood income, age and LHIN and analysed as allowed by sample size. Age-adjustment, where appropriate, was done using indirect standardization. Risk-adjustment, based on previously used adjustment models, was used to assess readmissions and mortality. [Appendix 6.3](#) provides a brief description of research methods.

A complete list of the indicators in this chapter and their data sources can be found in [Appendix 6.2](#). [Appendix 6.1](#) indicates which attribute of the Ontario Health Quality Council's nine attributes of a high performing health system the indicator assesses. It also indicates which of the strategic objectives included in the Ontario Ministry of Health and Long-Term Care strategy map would be met through improvement on this indicator.

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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 2, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 3, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

Figure 2: Example of a Two Bar Map

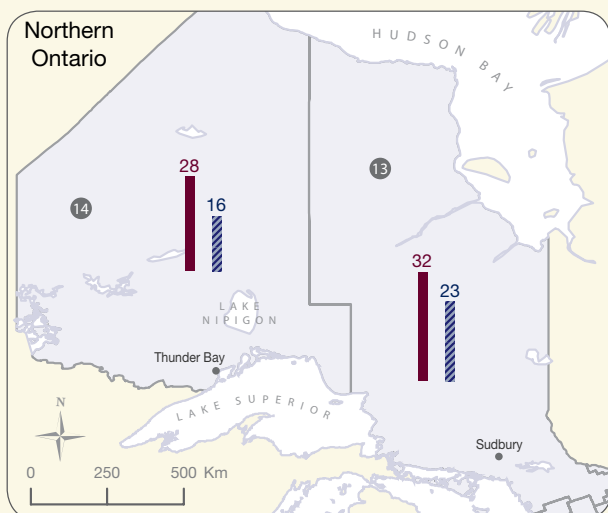
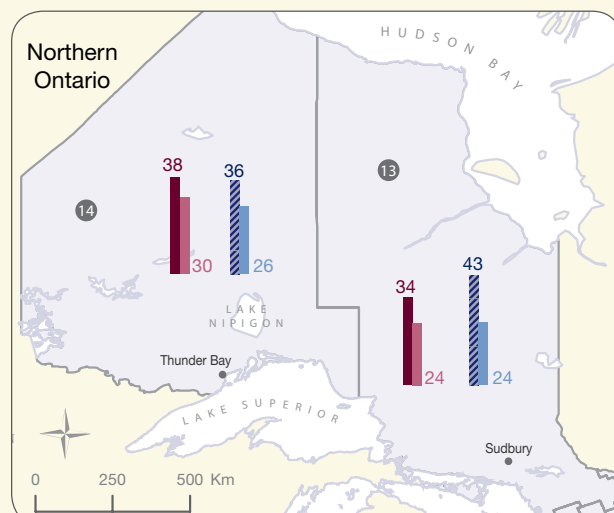


Figure 3: Example of a Four Bar Map

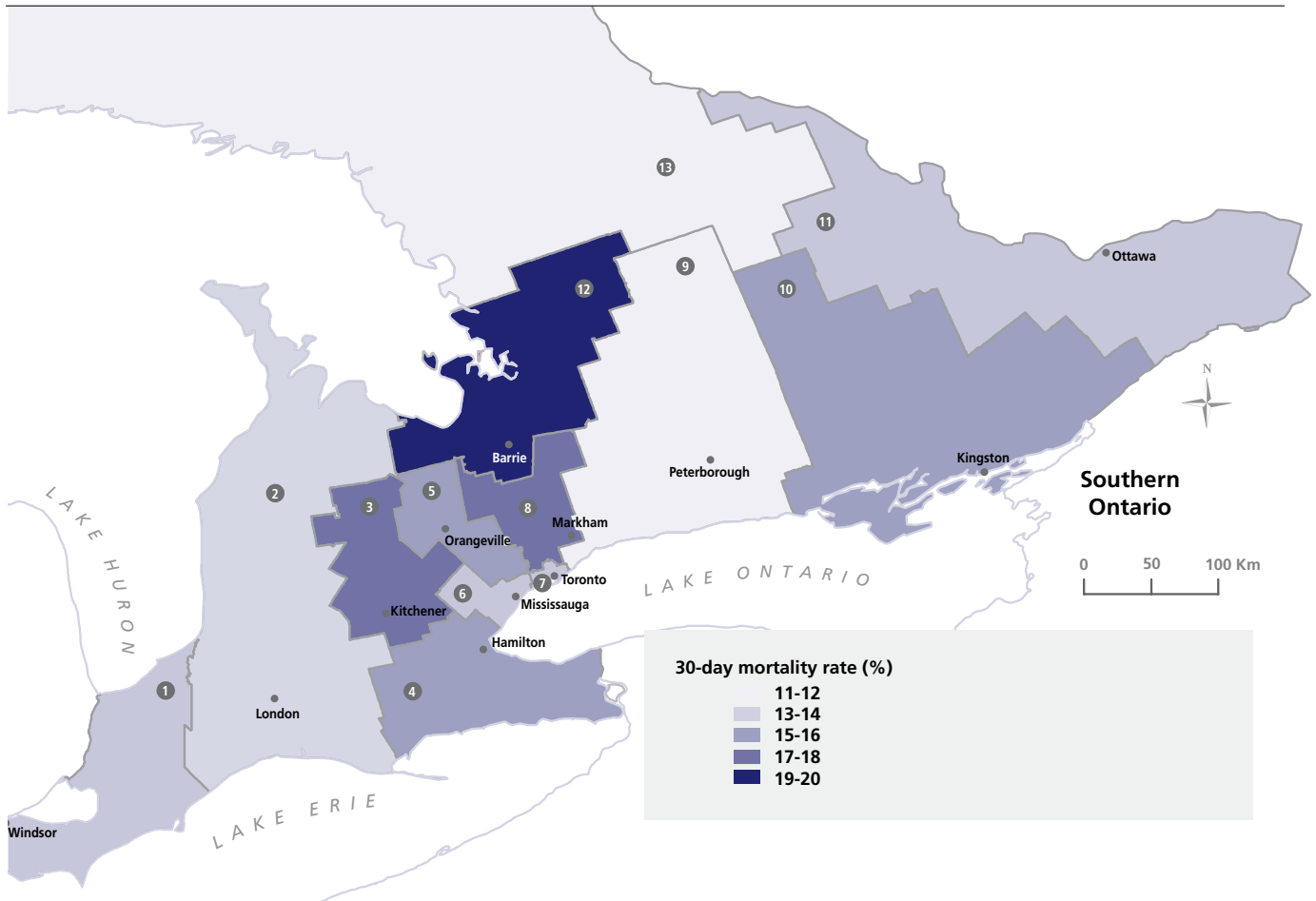


CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 4: Example of a Choropleth Map



Section 6A

Health and Functional Status

INTRODUCTION

This section provides an assessment of the overall health and functional status of Ontarians who reported having heart disease and/or who have had a stroke, as well as the prevalence of cardiovascular disease (CVD) risk factors in this population (see [Burden of Illness, chapter 3](#) for the prevalence of these risk factors in the overall population).

Most CVD is preventable through risk factor modification. Among individuals with CVD, risk factor modification and chronic disease management can improve their health and functional status, thereby improving their quality of life. By addressing socioeconomic factors, barriers to health care and disparities in the quality of health care, it is possible to improve the quality of life of disadvantaged women and men with CVD and thus reduce health inequities.

Self-rated health and functional status predict health services use and mortality.⁴⁴ Functional status is affected by both physical health and mental health. Individuals living with CVD or with the effects of a stroke experience symptoms which may limit their activities and ultimately result in disability. For example, patients living with heart failure (HF) commonly experience shortness of breath, limiting their physical ability to perform daily tasks.⁴⁵ Optimizing medical management can reduce symptoms and improve functioning. Survivors of stroke, depending on the extent and location of the ischemic lesion may experience difficulty walking, bathing or with meal preparation.⁴⁶ Effective stroke management in the

acute setting together with effective rehabilitation can reduce the prevalence and severity of disability in this population. Social activities of individuals living with CVD or the effects of a stroke may also be limited due to their physical symptoms. They can experience short- and long-term disability days (i.e., days in bed or cut down on activities because of the disease) resulting in difficulty maintaining employment or social isolation.⁴⁵ Women with CVD often report worse functional status than men.^{47, 48}

In this section we report on common behavioural risk factors for CVD including physical inactivity, inadequate fruit and vegetable intake, being overweight or obese⁴⁹ and smoking⁵⁰ among individuals who reported having heart disease and/or who have had a stroke. These risk factors both increase the risk of developing CVD and result in worse outcomes among individuals. Secondary prevention through risk factor modification among individuals with CVD reduces morbidity and mortality.^{12, 51, 52} However, these risk factors remain common among those with the disease. For example, Ma and colleagues reported that only a small minority of coronary heart diseases survivors had adequate fruit and

vegetable intake. Smokers, adults who were obese and those with lower educational attainment were more likely to have poor dietary habits.⁵³ Regular physical activity can greatly reduce the risk of a recurrent event or disease progression. In order to reduce the risks associated with physical inactivity, organized exercise programs can increase activity levels and substantially improve the quality of life and outcomes of survivors of CVD⁵⁴ and stroke.⁴⁶ Evidence-based guidelines that incorporate behavioural risk reduction strategies are available for the prevention of heart disease in women.⁵⁵

Behavioural risk factors increase the risk of hypertension and diabetes which in turn are major risk factors for CVD. Rates of hypertension and diabetes in Canada increased substantially over the last decade, more so among low-income individuals than among those with higher incomes.⁸ Among persons with CVD, hypertension and diabetes are important comorbid conditions that have implications for disease management and influence health outcomes. In one study of stroke survivors, 20 percent had diabetes and 58 percent had hypertension.⁴⁶ Most patients with CVD have multiple risk factors and benefit from comprehensive risk factor intervention to address these multiple risks.

Socioeconomic position is an independent risk factor for CVD.⁵⁶ Lower socioeconomic position is associated with increase prevalence of CVD risk factors, psychosocial and work-related factors that increase CVD risk, more barriers to accessing care, lower quality of care received and worse health outcomes.⁵⁷⁻⁵⁹ Income and education are commonly used measures of socioeconomic position.^{60, 61} In a study of 10 Western European nations, low socioeconomic status was independently associated with a 55 percent increase in ischemic heart

disease (IHD) mortality risk in men and a two-fold risk increase in women.⁶² Low income and lower levels of educational attainment are associated with higher rates of low health literacy which can make it challenging to navigate a complex health care system or to adhere to complex medication regimens.⁶³ Women are more likely than men to have low incomes (see [Burden of Illness, chapter 3](#)).

In this section we measure select indicators using data from the Canadian Community Health Survey (CCHS) to assess a number of health domains among adults who have heart disease or who have had a stroke and who are living with these diseases in the community:

- Overall self-rated health, health transition and behavioural changes to improve health;
- Functional status including prevalence of activity limitations, limitations in Instrumental Activities of Daily Living (IADLs) (meal preparation, shopping for groceries, light or heavy housework), limitations in Activities of Daily Living (ADLs) (washing, dressing, eating, moving about inside the house), the number of disability days in the past two weeks and living with pain and problems with mobility;
- Socioeconomic status, specifically low education and low income;
- Comorbid conditions, specifically diabetes and hypertension;
- Risk factors, specifically smoking, physical inactivity, being overweight or obese and inadequate fruit and vegetable intake;

The indicators reported in this section may respond to interventions at policy, health system, provider and community levels.

EXHIBITS AND FINDINGS

HEALTH AND FUNCTIONAL STATUS: SELF-RATED HEALTH

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who rated their health to be fair or poor.

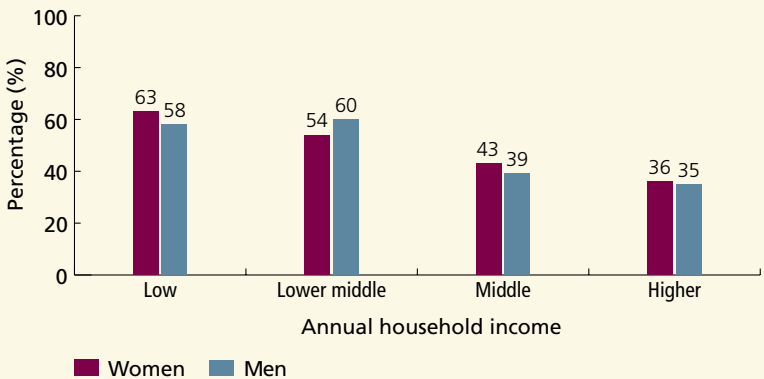
Background: Self-rated health—also known as global, self-reported or self-perceived health—is an indicator of how people rate their overall health status. Self-rated health is a well validated measure of health status that has been shown to have strong predictive relationships with numerous health outcomes including health care utilization, health care costs and mortality in diverse populations.⁶⁴⁻⁶⁶ Cardiovascular disease (CVD) has a large impact on a person's health. In one study, patients with CVD reported high rates of poor or extremely poor self-rated health (58 percent) while only a small percentage (10 percent) felt that their health was good or better.⁶⁷ In a more recent study, patients with CVD were fifteen times more likely to report poor self-rated health than those without CVD in a population-based, multivariable analysis controlling for sociodemographic factors and comorbidity.⁶⁸

Findings: Overall, 45 percent of Ontario adults aged 25 and older who had heart disease or who have had a stroke rated their health status as fair or poor. This did not vary by sex, 47 percent of women versus 43 percent of men.

EXHIBIT 6A.1 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who rated their health as fair or poor, by sex and annual household income, in Ontario, 2005

FINDINGS

- The percentage of adults with heart disease or who have had a stroke who rated their health as fair or poor did not vary by sex.
- The percentage of women and men who rated their health as fair or poor increased as income level decreased.
- Six out of ten adults in the lowest-income group reported their health to be fair or poor as compared to slightly more than one-third of adults in the highest-income group.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

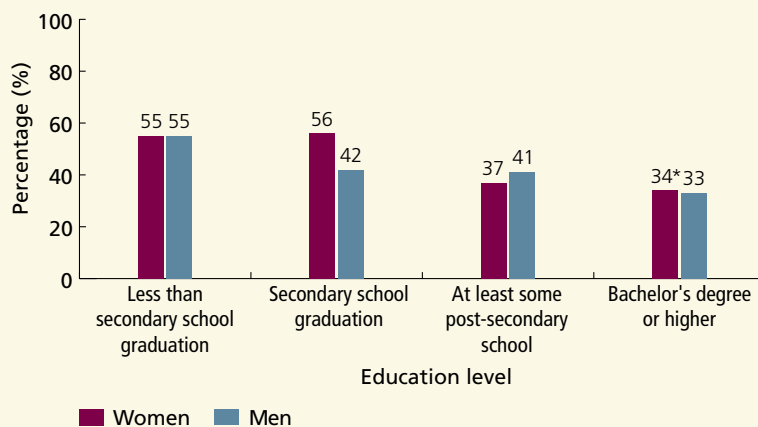
NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 6A.2 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who rated their health as fair or poor, by sex and education level, in Ontario, 2005

FINDINGS

- Among adults with heart disease or who have had a stroke, lower educational attainment was associated with higher rates of reporting fair or poor health.
- More than half of women and men who had less than a secondary school education reported their health as fair or poor as compared to one-third of those with a Bachelor's degree or higher.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability (coefficient of variation 16.6-33.3)

POWER Study

SELF-RATED HEALTH AS COMPARED TO A YEAR AGO

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported their health status was somewhat or much worse than their health one year prior.

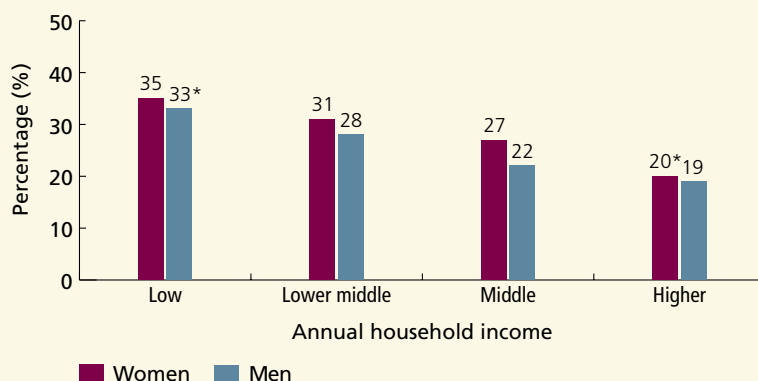
Background: Self-rated health is an indicator of well-being and quality of life. A decrease in self-rated health over time in older adults is associated with an increase in the number of acute illnesses, decrease in functional status and increase in disabilities.^{69, 70} Conversely, an improvement in self-rated health is associated with an increase in life expectancy and decrease in health services demands.⁷¹ Individuals with cardiovascular disease (CVD) are particularly at risk for declines in their self-rated health.⁷² Secondary prevention and chronic disease management improve health outcomes in individuals with CVD. In the Canadian Community Health Survey, Cycle 3.1, adults with heart disease or who have had a stroke were asked “Compared to one year ago, how would you say your health is now?” We report the proportion that rated their current health as ‘somewhat worse’ or ‘much worse’ than one year ago.

Findings: Overall, 25 percent of Ontario adults aged 25 and older with heart disease or who have had a stroke felt that their health status was worse than the year before. This did not vary by sex; 28 percent of women and 24 percent of men felt their health status had declined over the previous year.

EXHIBIT 6A.3 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported that their current health was somewhat or much worse than their health one year prior, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was an income gradient in the percentage of women and men who had heart disease or who have had a stroke who rated their health as somewhat or much worse than the year prior. As household income decreased, the percentage of adults who felt their health had worsened increased.
- One-third of low-income women and men reported worsening health from the previous year as compared to one-fifth of higher-income adults.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

* Interpret with caution due to high sampling variability (coefficient of variation 16.6–33.3)

POWER Study

ACTIVITY LIMITATIONS

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported that their activities at home, school or work were limited due to a long-term physical or mental condition or health problem. A long-term condition is one that is expected to last or has already lasted six months or more.

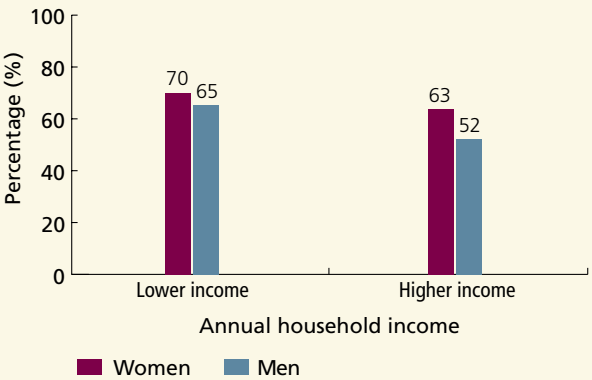
Background: Among individuals living with cardiovascular disease (CVD) or the effects of a stroke, activity limitation is a useful measure of the impact of the disease on one's quality of life.⁷³ Women and men who have had a myocardial infarction or stroke patients are at increased risk of reporting activity limitations.^{46, 73} Prevention, chronic disease management and cardiac rehabilitation can all improve functional health outcomes in this population and reduce the prevalence and severity of activity restrictions.

Findings: Overall, 58 percent of Ontario adults aged 25 and older who have heart disease or who have had a stroke reported having activity limitations. Women were more likely than men to report activity limitations, 63 percent versus 55 percent, respectively.

EXHIBIT 6A.4 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported having activity limitations[¥], by sex and annual household income, in Ontario, 2005

FINDINGS

- Women were more likely than men to report activity limitations, irrespective of household income.
- Lower-income men were more likely to report activity limitations than higher-income men, 65 percent versus 52 percent, respectively. The income difference was not significant in women.
- As age increased, the proportion of women and men reporting activity limitations increased (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

[¥] Activities at home, school or work have been limited due to a long-term physical condition, mental condition, or health problem

POWER Study

PREVALENCE OF LIMITATIONS IN IADLS (INSTRUMENTAL ACTIVITIES OF DAILY LIVING) OR ADLS (ACTIVITIES OF DAILY LIVING)

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported having limitations in their Instrumental Activities of Daily Living (IADLs) or their Activities of Daily Living (ADLs).

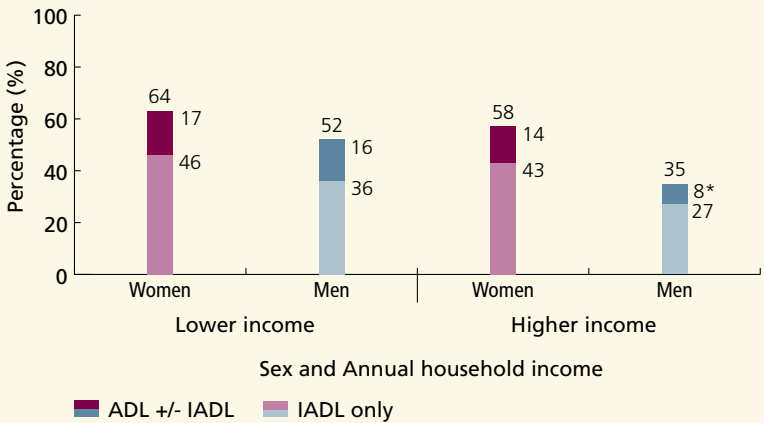
Background: ADLs include washing, dressing, eating and moving about inside the house. IADLs include housework, laundry, meal preparation, transportation, grocery shopping, using the telephone and money management. IADL limitations represent difficulties in carrying out routine life activities and are generally interpreted as an indicator of mild to moderate disability. Limitations in ADLs reflect difficulty in carrying out self-care activities, and therefore represent a more severe disability. IADL and ADL limitations may result from either physical or mental impairments. Most people who report ADL limitation will also have IADL limitations. Community-dwelling stroke survivors are more than twice as likely to experience difficulty with bathing and three times as likely to require assistance with getting around the house as individuals who have not had a stroke.⁴⁶ Similarly, 64 percent of women and 55 percent of men living with heart disease needed help with IADLs as compared to 23 percent of women and 19 percent of men with no history of heart disease.¹ Because limitation in IADLs is a predictor of mortality⁷⁴ and both ADL and IADL limitations are prevalent in the community and have been linked to reduced quality of life, this indicator is an important measure of the impact of disease on quality of life.

Findings: Overall, 49 percent of Ontario adults aged 25 and older with heart disease or who have had a stroke reported having any IADL and/or ADL limitations, 36 percent reported IADL limitations only and 13 percent reported ADL limitations with or without IADL limitations. A significantly larger percentage of women than men reported limitations in all categories: 59 percent of women versus 40 percent of men reported IADL and/or ADL limitations; 44 percent of women versus 30 percent of men reported IADL limitations only and 15 percent of women versus 10 percent of men reported ADL limitations with or without IADL limitations.

EXHIBIT 6A.5 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported having limitations in Instrumental Activities of Daily Living (IADL) and/or Activities of Daily Living (ADL), by sex and annual household income, in Ontario, 2005

FINDINGS

- Regardless of income, among individuals with heart disease or who have had a stroke women were more likely than men to report any limitations in IADLs and/or ADLs. Sixty-four percent of lower-income women 58 percent of higher-income women compared to 52 percent of lower-income men and 35 percent of higher-income men reported any limitations in IADLs and/or ADLs.
- Lower-income men were more likely than higher-income men to report IADL limitation (36 percent versus 27 percent, respectively) or ADL limitations with or without IADL limitations (16 percent versus eight percent, respectively).
- Among women, income was not associated with limitations in IADLs or ADLs with or without IADLs.
- Similar patterns were seen for the association between educational attainment and any limitations in IADLs and/or ADLs and ADLs with or without IADLs (data not shown).
- ADL limitations increased with age for women and men (data not shown).
- IADL limitations increased with age, but this difference was significant among men only (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

NOTE: Bars may not add to overall numbers because of rounding

* Interpret with caution due to high sampling variability (coefficient of variation 16.6–33.3)

POWER Study

DISABILITY DAYS IN THE PREVIOUS TWO WEEKS

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported disability days in the previous two weeks.

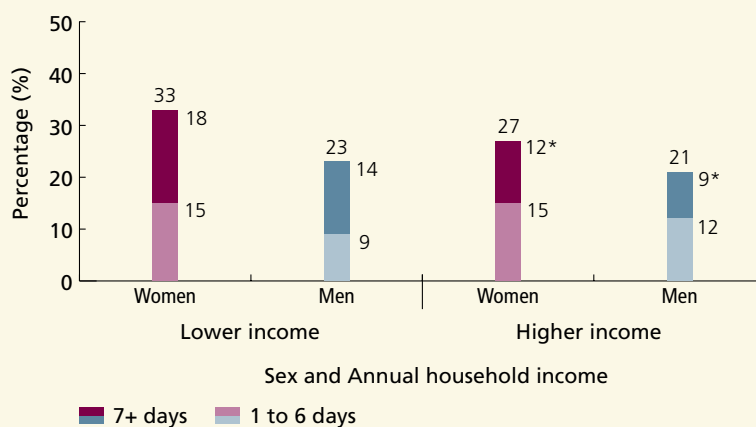
Background: Heart disease and stroke affect the quality of life of individuals by impairing their physical, mental and social functioning.⁴⁵ Short- and long-term disability days are important predictors of unemployment and quality of life. As such, the economic burden of the diseases has a direct cost on the health care system and an indirect cost on individuals.¹ This indicator measures the number of days in the past two weeks when the respondent stayed in bed or cut down on activities because of illness or injury.

Findings: Overall, 25 percent of Ontario adults aged 25 and older with heart disease or who have had a stroke reported any disability days in the previous two weeks. Thirteen percent of those sampled reported between one and six disability days and 12 percent reported seven or more disability days. A significantly higher percentage of women than men reported having at least one disability day in the previous two weeks; 28 percent versus 21 percent, respectively.

EXHIBIT 6A.6 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported disability days in the previous two weeks, by sex and annual household income, in Ontario, 2005

FINDINGS

- Among adults with heart disease or who have had a stroke, women were more likely than men to report disability days, irrespective of household income. Thirty-three percent of lower-income women and 27 percent of higher-income women compared to 23 percent of lower-income men and 21 percent of higher-income men reported any disability days in the previous two weeks.
- The percentage of adults with heart disease or who have had a stroke who reported any disability days in the previous two weeks did not vary by annual household income for women or men.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

* Interpret with caution due to high sampling variability (coefficient of variation 16.6–33.3)

POWER Study

PAIN AND MOBILITY

Indicator: This indicator measures the proportion of adults aged 25 and older who reported having heart disease or who have had a stroke who reported:

- At least some of their activities were prevented due to pain or discomfort;
- Problems with mobility including inability to walk around the neighborhood or an ability to walk with difficulty, requiring help of others or mechanical supports such as braces, a cane, crutches or a wheelchair.

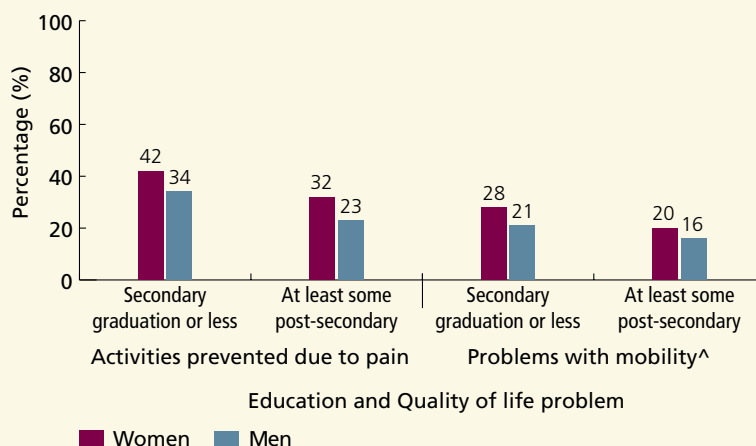
Background: A study by Unsar and colleagues⁷⁵ found that adults with heart disease or stroke scored lower on a number of quality of life dimensions including mobility, discomfort, symptoms and overall quality of life. Among patients with coronary artery disease, older adults and women had worse overall quality of life scores than their counterparts.⁷⁵ Results from the 2000/01 Canadian Community Health Survey showed that among people with heart disease, 21 percent of women and 14 percent of men reported mobility limitations. This proportion was approximately six times greater than that seen among people without heart disease.¹ There are effective strategies focused on the population with heart disease that can reduce the frequency and severity of chronic pain, improve functioning and reduce mobility limitations.⁷⁶⁻⁷⁸ Improvements on these indicators would represent improvements in functional status and overall quality of life.⁷⁹

Findings: Overall, 33 percent of Ontario adults aged 25 and older with heart disease or who have had a stroke reported living with pain and 22 percent reported problems with mobility. A significantly greater percentage of women than men reported mobility problems (26 percent versus 19 percent, respectively) and living with pain (38 percent versus 29 percent, respectively).

EXHIBIT 6A.7 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported that their activities were prevented due to pain or discomfort or problems with mobility[^], by sex and education level, in Ontario, 2000/01

FINDINGS

- Women with secondary school graduation or less were more likely to report that their activities were limited by pain and that they had mobility problems than men with a similar level of educational attainment.
- Women with secondary school or less were more likely to report that their activities were limited due to pain (42 percent versus 32 percent, respectively) and that they had problems with mobility (28 percent versus 20 percent, respectively) than women with higher levels of educational attainment.
- Among men, lower educational attainment was also associated with activity limitations due to pain (34 percent versus 23 percent, respectively) and mobility problems (21 percent versus 16 percent, respectively).
- Adults with lower annual household income were more likely than higher-income individuals to report problems with mobility (27 percent versus 17 percent, respectively) and activity limitation due to pain (42 percent versus 26 percent, respectively) (data not shown).
- Adults aged 65 and older were three times more likely than younger people to report problems with mobility; 30 percent versus 10 percent, respectively. Age was not associated with reporting activity limitations due to pain (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 1.1

[^] Including an inability to walk around the neighbourhood or an ability to walk with difficulty, requiring help of other or mechanical supports such as braces, a cane, crutches or a wheelchair

POWER Study

RISK FACTORS FOR HEART DISEASE AND/OR STROKE

INCOME AND EDUCATION

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported living in lower-income households (the two lowest levels of annual household income) or having lower educational attainment (secondary school graduation or less).

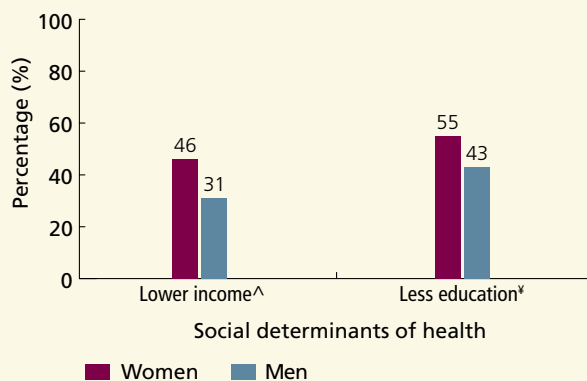
Background: Socioeconomic gradients in cardiovascular disease (CVD) risk have been well-documented in the literature.⁵⁶ Education and income, commonly used measures of socioeconomic status, are important social determinants of health. They are both strongly associated with an increased risk of developing CVD.^{8, 56, 80} These indicators measure the percentage of the population who reported living in lower-income households or having lower levels of education, defined here as secondary school graduation or less. There is a dose-response association between income and education and the development of CVD. There is also a clustering of other risk factors including smoking, obesity and access to health services among lower-income and less educated individuals.^{8, 80} In addition, the socioenvironmental effect of living circumstances associated with being of lower socioeconomic position include stress, depression and isolation which may increase the risk of CVD as well as overall mortality rates.⁵⁶

Findings: Among adults aged 25 and older who had heart disease or who have had a stroke, 48 percent had secondary graduation or less (less education) and for 37 percent their income fell within the two lowest levels of annual household income (lower income).

EXHIBIT 6A.8 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported lower income[^] or less education[¥], by sex, in Ontario, 2005

FINDINGS

- Among persons with heart disease or who have had a stroke, women were significantly more likely than men to live in a lower-income household (46 percent versus 31 percent, respectively) or to have lower educational attainment (55 percent versus 43 percent, respectively).
- There was a strong correlation between reporting lower income and less education among women and men. Adults with less education were more likely than those with higher educational attainment to live in a lower-income household; 59 percent versus 41 percent, respectively (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

[^] Lower income includes the two lowest annual household income categories

[¥] Less education includes secondary school education or less

POWER Study

CHRONIC CONDITIONS

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who also reported having physician diagnosed diabetes and/or hypertension.

Background: Both hypertension and diabetes are important risk factors for the development of cardiovascular disease (CVD) including coronary artery disease, heart failure and stroke. Persons with diabetes are at a significantly higher risk of developing CVD than persons without diabetes.⁸¹ Women with diabetes develop ischemic heart disease at a younger age than women who do not have diabetes.⁸² Hypertension and diabetes are more prevalent among individuals of lower socioeconomic position.⁸³ Both hypertension and diabetes are preventable through risk factor modification. In addition hypertension and diabetes are important comorbidities among women and men who have heart disease or who have had a stroke and can result in adverse events and worse health outcomes if not effectively controlled.

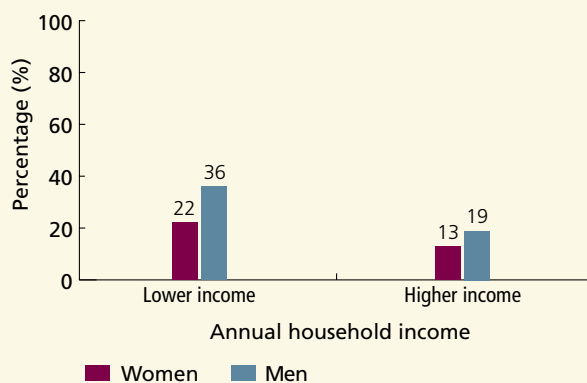
Findings: Among adults aged 25 and older who had heart disease or who have had a stroke, 22 percent reported having diabetes and 59 percent reported having hypertension. Women were less likely to report having diabetes than men; 18 percent versus 25 percent, respectively. Women and men reported similar rates of hypertension; 61 percent and 58 percent, respectively.

EXHIBIT 6A.9 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported having diabetes and/or hypertension, by sex and annual household income, in Ontario 2005

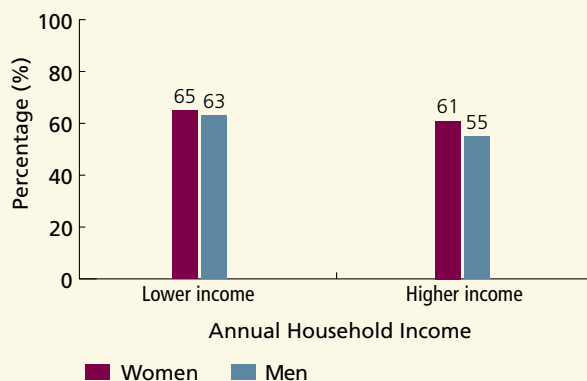
FINDINGS

- Income was associated with self-reported diabetes prevalence among individuals with heart disease or who have had a stroke. Lower-income women had higher rates of diabetes than those with higher incomes (22 percent versus 13 percent, respectively) and the same was true for lower-income men (36 percent versus 19 percent, respectively).
- Regardless of income, more than half of women and men with heart disease or who have had a stroke reported having hypertension. Rates of hypertension did not vary by income for women or for men.
- The percentage of women and men who had diabetes and/or hypertension increased with age (data not shown).

Diabetes



Hypertension



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

POWER Study

HEALTH BEHAVIOURS

Indicator: This group of indicators measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported one or more risk factors for cardiovascular disease (CVD) (physical inactivity, inadequate fruit and vegetable intake, being overweight or obese or smoking).

Background: Physical inactivity, inadequate fruit and vegetable intake, being overweight or obese or smoking increase the risk of CVD; lifestyle modification and risk factor reduction are important interventions to reduce the risk of adverse outcomes among those with the disease. As such secondary prevention is critical in this population.

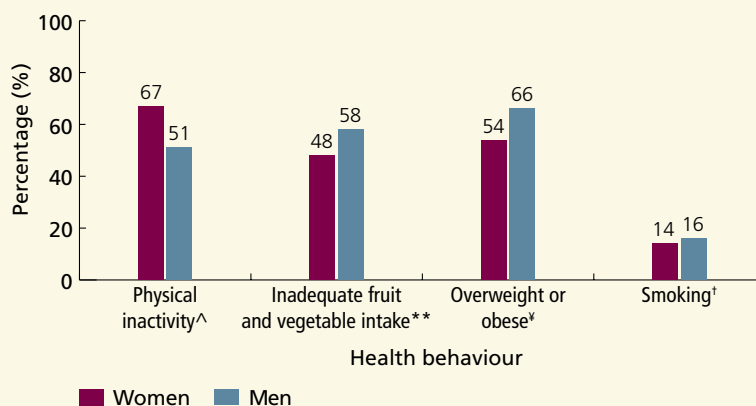
Physical inactivity is an important risk factor for CVD. In addition, a sedentary lifestyle is associated with being overweight or obese which results in an increased risk for diabetes and hypertension. Physical activity can improve outcomes and reducing morbidity and mortality among individuals with CVD. Physical activity is associated with positive mental health and is a strong predictor of well-being.⁵⁴ **Inadequate fruit and vegetable consumption** is associated with many negative health consequences including increased risk of complications from CVD.⁵³ In one study of risk behaviours in CVD patients, the percentage reporting adequate fruit and vegetable intake was extremely low (7.8 percent for fruits and 12.4 percent for vegetables).⁵³ **Being overweight or obese** is associated with having or developing dyslipidemia, diabetes or hypertension, which are risk factors for CVD. The prevalence of being overweight or obese was reported to be 69 percent among individuals with CVD in the year following diagnosis.⁵³ **Smoking** is an important risk factor for CVD and for stroke and smoking cessation is an important behavioural modification associated with a reduction in recurrence and complications from CVD and stroke. It is estimated that only 32 percent of CVD patients will quit smoking following their first heart attack.⁸⁴

Findings: Overall, among adults aged 25 and older who had heart disease or who have had a stroke 59 percent were physically inactive, 54 percent reported inadequate fruit and vegetable intake, 61 percent were overweight or obese and 15 percent were current smokers. Women were more likely than men to be physically inactive but they were less likely than men to be overweight or obese or to report inadequate fruit and vegetable intake. Women and men reported similar smoking rates ([Exhibit 6A.10](#)).

EXHIBIT 6A.10 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who reported health behaviours that increase risk for chronic diseases, by sex and health behaviour, in Ontario, 2005

FINDINGS

- Among those with heart disease or who have had a stroke, women were more likely than men to report physical inactivity; 67 percent versus 51 percent, respectively.
- Men were more likely than women to be overweight or obese; 66 percent versus 54 percent, respectively.
- Men were more likely than women to report inadequate fruit and vegetable intake; 58 percent versus 48 percent, respectively.
- Among those with heart disease or who have had a stroke, 14 percent of women and 16 percent of men reported being daily or occasional smokers.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

[^] Physical Activity Index of < 1.5 kcal/kg/day

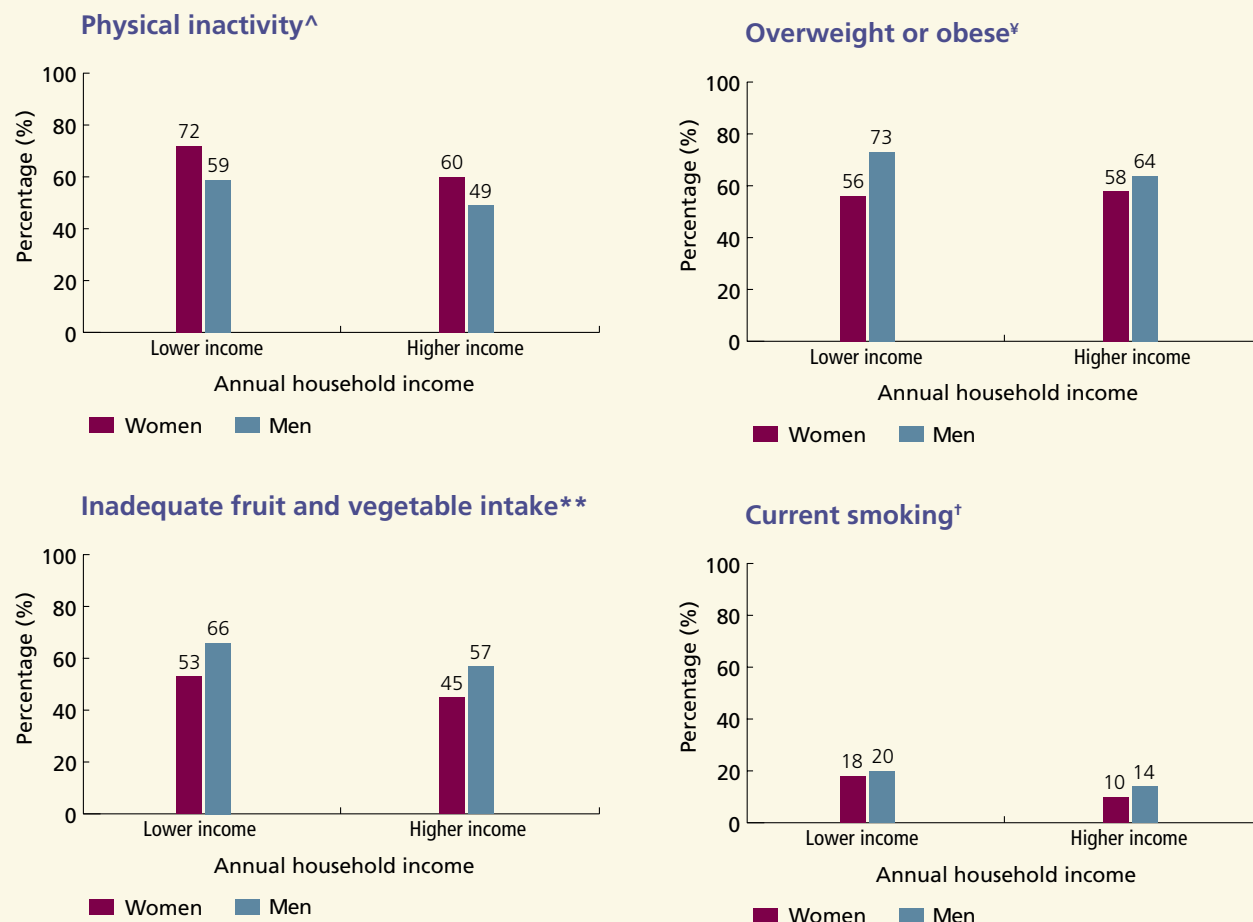
^{**} Daily consumption of less than five servings of fruits and vegetables

[¥] Body Mass Index (BMI) ≥ 25 , calculated from self-reported height and weight

[†] Current smokers (daily or occasional)

POWER Study

EXHIBIT 6A.11 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who report health behaviours that increase risk for chronic diseases, by sex and annual household income, in Ontario, 2005



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

[^] Physical Activity Index of < 1.5 kcal/kg/day

^{**} Daily consumption of less than five servings of fruits and vegetables

[¥] Body Mass Index (BMI) ≥25, calculated from self-reported height and weight

[†] Current smokers (daily or occasional)

FINDINGS

- Regardless of income, prevalence of these risk factors was high among individuals with CVD.
- Among those with heart disease or who have had a stroke, lower-income women were more likely to report physical inactivity than higher-income women; 72 percent versus 60 percent, respectively.
- Lower-income women were more likely to report daily or occasional smoking than higher-income women; 18 percent versus 10 percent, respectively.
- Older adults (aged 65 and older) reported lower rates of being overweight or obese, inadequate fruit and vegetable intake or smoking but higher rates of physical inactivity than younger people (data not shown).

POWER Study

CHANGES TO IMPROVE HEALTH

Indicator: This indicator measures the percentage of adults aged 25 and older who reported having heart disease or who have had a stroke who reported making positive lifestyle changes (for example, increased physical activity, weight loss, dietary changes, smoking cessation, reduced alcohol consumption, reduced stress or increased medical care) in the previous year to improve their health.

Background: Positive lifestyle changes can reduce the risk of acute events or worsening disease and extend overall survival in those with heart disease or who have had a stroke (secondary prevention).⁸⁴ For example, smoking cessation is an effective lifestyle modification intervention. In a randomized trial of an intensive smoking cessation intervention among smokers with acute CVD, those patients that were assigned to the intervention had a four-fold decrease in all-cause mortality and a 44 percent reduction in all-cause readmissions at 24 months post-discharge.⁸⁵ Dietary modification, such as changing to a low lipid diet, has been shown to decrease mortality among myocardial infarction patients by one-third during the three-year period following diagnosis.⁸⁶ Increased physical activity is another important change. In one study, 53 percent of patients with congestive heart failure who participated in exercise training had significant and noticeable clinical improvement compared to 33 percent of those who did not receive any exercise training.⁵⁴

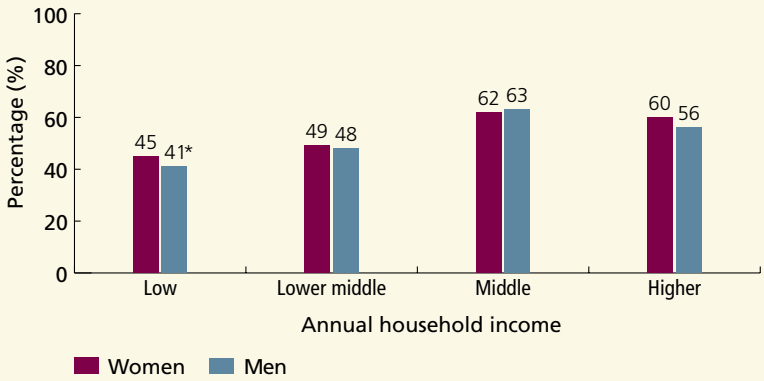
In the 2005 Canadian Community Health Survey, adults with heart disease or who have had a stroke were asked “In the past 12 months, did you do anything to improve your health?” Women and men were also asked to identify what they believed to have been the most important change they had made.

Findings: Overall, 55 percent of Ontario adults aged 25 and older with heart disease or who have had a stroke reported making at least one change in the previous year intended to improve their health. This did not vary by sex; 54 percent of women versus 55 percent of men. In their own opinions, the most important changes that they had made included increased physical activity (42 percent); weight loss (15 percent); positive dietary changes (14 percent); seeking medical treatment for their disease (13 percent) and smoking cessation (five percent of the total CVD population). Similar rates were seen for both women and men.

EXHIBIT 6A.12 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who did something to improve their health in the previous year, by sex and annual household income, in Ontario, 2005

FINDINGS

- Among adults with heart disease or who have had a stroke, women and men from the middle- and higher-income groups were significantly more likely to have made changes to improve their health in the previous year than those from the lower middle- and low-income groups.
- A similar pattern was seen for education level among women, but not among men (data not shown).
- The percentage of adults with heart disease or who have had a stroke who had done something in the previous year to improve their health varied across the Local Health Integration Networks (LHINs) from 43 percent in the Toronto Central LHIN to 62 percent in the Waterloo Wellington LHIN (data not shown). The regional variation was not significant, possibly due to small sample sizes in some LHINs and thus limited power to detect differences.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See [Appendix 6.3](#) for definitions of annual household income categories

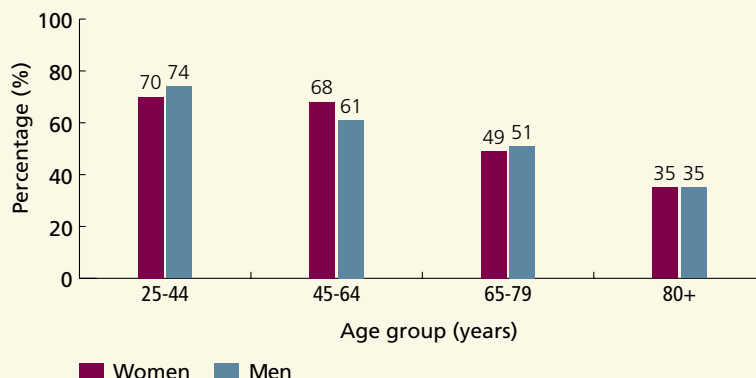
* Interpret with caution due to high sampling variability (coefficient of variation 16.6–33.3)

POWER Study

EXHIBIT 6A.13 | Percentage of adults aged 25 and older with heart disease or who have had a stroke who did something to improve their health in the previous year, by sex and age group, in Ontario, 2005

FINDINGS

- As age increased, the percentage of women and men who reported doing something to improve their health in the previous year decreased. Women and men aged 80 and older were half as likely as adults aged 25-44 to have made changes to improve their health.



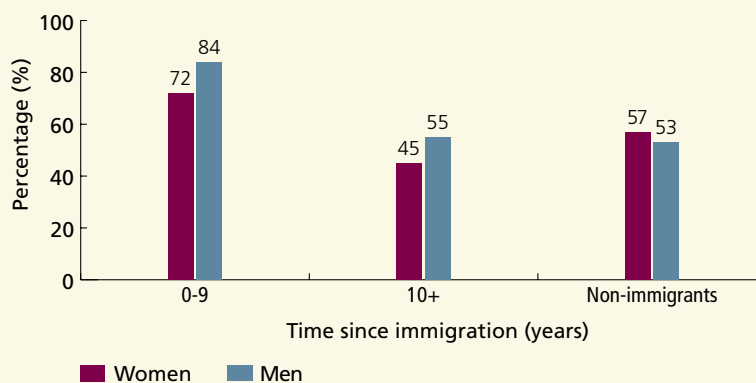
DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

POWER Study

EXHIBIT 6A.14 | Age-standardized percentage of adults aged 25 and older with heart disease or who have had a stroke who did something to improve their health in the previous year, by sex and length of time since immigration, in Ontario, 2005

FINDINGS

- Adults with heart disease or who have had a stroke who had been in Canada for less than ten years were more likely to report making changes to improve their health (78 percent) than non-immigrants (55 percent) and immigrants who had been in the country for 10 or more years (51 percent). This difference was significant among men but not among women.



DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

POWER Study

Section 6A

SUMMARY OF FINDINGS

We found sex differences in the health and functional status of adults who indicated they had heart disease or that they have had a stroke. Women consistently reported worse functional status and higher rates of disability than men. Women were more likely to report activity limitations, limitations in Instrumental Activities of Daily Living (IADLs) and/or limitations in Activities of Daily Living (ADLs), mobility problems and activities prevented by pain. Women were also more likely than men to report disability days in the previous two weeks. Though women seemed to experience more limitations in their day to day lives than men, they reported similar rates of fair or poor self-rated health or worsening health over the past year.

The prevalence of cardiovascular disease (CVD) risk factors was high among both women and men and across income categories, underscoring the need for secondary prevention. With respect to risk factors for CVD, women were more likely to be physically inactive, but less likely than men to report being overweight or obese or to report inadequate fruit and vegetable intake. Smoking rates were similar among women and men. A larger percentage of women than men reported low socioeconomic status as measured by less education and lower annual household income, which is associated with higher risk for CVD and with risk factors for CVD.⁸ Women also reported lower rates of comorbid diabetes than men, but similar rates of hypertension.

Income was associated with almost all indicators. Low-income and less educated adults were more likely to report fair or poor health, declining health status, activity limitations, IADL and/or ADL limitations, disability days, mobility limitations, limitations in their activities due to pain and risk factors than those with higher income or more education. Conversely, they

were less likely to report lifestyle changes to improve survival and quality of life. As expected, we found that older age was associated with higher rates of activity limitations, reduced mobility due to pain and increased comorbidities. We also found disparities associated with immigration status and where one lives.

Findings for the indicators reported in this section are summarized below.

Self-Rated Health and Health Transition

- Overall, 45 percent of adults who had heart disease or a stroke rated their health status as fair or poor. There was no sex difference in self-rated health, but there was a social gradient.
- Low-income adults were almost twice as likely to report fair or poor health as compared to higher income adults (60 percent versus 35 percent, respectively).
- More than half of those with less than a secondary education reported their health as fair or poor as compared to one-third of those with a Bachelor's degree or higher (55 percent versus 33 percent, respectively).
- One-quarter of adults with heart disease or who have had a stroke reported a decline in their health status over the previous year. This decline varied by income but not by education or sex.
- One-third of low-income individuals reported a decline in their health status as compared to one-fifth in the higher-income group.

Activity Limitations

- More than half (58 percent) of individuals with heart disease or who have had a stroke reported having activity limitations due to a chronic health problem. This varied by sex, income, education and age.

- Women were more likely to report activity limitations than men, 63 percent versus 55 percent, respectively.
- Lower-income adults and those with lower educational attainment were more likely to report activity limitations than their counterparts. The income difference was significant in men but not in women.
- Older age was also associated with a higher likelihood of reporting activity limitations.

Limitations in Instrumental Activities of Daily Living (IADLs) and or Activities for Daily Living (ADLs)

- About half of Ontarians (49 percent) living with heart disease or stroke reported having any IADL and/or ADL limitations, more than a third (36 percent) reported IADL limitations and 13 percent reported ADL with or without IADL limitations.
- A larger percentage of women than men reported limitations in all categories: 59 percent of women versus 40 percent of men reported any IADL and/or ADL limitations; 44 percent of women versus 30 percent of men reported IADL limitations only and 15 percent of women versus 10 percent of men reported ADL limitations with or without IADL limitations.
- Among men, lower annual household income was associated with a higher likelihood of reporting any limitations in IADLs and/or ADLs. Among women, income was not associated with either type of limitation.

Disability Days

- One-quarter of adults with heart disease or who have had a stroke reported at least one disability day in the two weeks prior to the survey. Women were more likely to report disability days than men; 28 percent versus 21 percent, respectively.
- The proportion of women and men reporting disability days did not vary by income, educational attainment or age.

Activities Prevented by Pain and Problems with Mobility

- Among adults with heart disease or who have had a stroke, women were more likely than men to report problems with mobility (26 percent versus 19 percent, respectively) and living with pain (38 percent versus 29 percent, respectively).
- Both measures varied by income and educational attainment. People with lower annual household income and/or less educational attainment were more likely to report that they had problems with mobility or that at least some of their activities were prevented due to pain or discomfort.
- Adults aged 65 and older were more than three times more likely to report problems with mobility than younger people. There was no age variation in the proportions reporting that their activities were prevented by pain.

Socioeconomic Risk Factors

- We found that 48 percent of individuals living with heart disease or the effects of a stroke had less than secondary education and 37 percent were from lower-income households.
- Women were significantly more likely than men to live in a lower-income household (46 percent versus 31 percent, respectively) or to have lower educational attainment (55 percent versus 43 percent, respectively).

Diabetes and Hypertension

- With respect to comorbid conditions, 22 percent of adults with heart disease or who have had a stroke reported having diabetes and 59 percent reported having hypertension. Women were less likely than men to have diabetes, but reported similar proportions of hypertension.
- Lower-income women had higher rates of diabetes than higher-income women (22 percent versus 13 percent, respectively) and the same was true for lower-income men versus higher-income men (36 percent versus 19 percent, respectively). Rates of hypertension did not vary by household income.

- The percentage of adults who reported having comorbid diabetes or hypertension increased with age.

Behavioural Risk Factors

- More than half of adults with heart disease or who have had a stroke reported being overweight or obese (61 percent), physical inactivity (59 percent) or having inadequate fruit and vegetable intake (54 percent). Women reported higher rates of physical inactivity while men reported higher rates of the other two risk factors.
- Fifteen percent of adults with heart disease or who have had a stroke reported being daily or occasional smokers. This did not vary by sex.
- Lower-income women or women with less than secondary education were more likely to report physical inactivity than their female counterparts. Physical inactivity rates did not vary by income or education among men.
- Older adults, aged 65 and older, were more likely to be physically inactive than those aged 25-64, but reported lower rates of all other behavioural risk factors.

Changes to Improve Health

- More than half of adults with heart disease or who had suffered from a stroke made at least one behavioural change during the previous year to improve their health. The most important changes made included increasing physical activity, losing weight, dietary changes, seeking medical treatment and smoking cessation. Similar patterns were seen for women and for men.
- Higher-income adults were more likely to have made a change than those from lower-income groups and a similar pattern was seen for educational attainment, but only among women.
- Adults aged 80 and older were half as likely as those aged 25-44 to have made changes to improve their health.
- Women and men who had been in Canada for less than ten years were more likely to report making changes to improve their health (78 percent) than non-immigrants (55 percent) and immigrants who had been in the country for 10 or more years (51 percent). This difference was significant among men but not among women.

Section 6B

Heart Failure

INTRODUCTION

It is estimated that over 400,000 Canadians are living with heart failure (HF).⁸⁷ HF is one of the leading causes of preventable hospital admissions in older women and men and additionally has a significant impact on patients' activities of daily living and quality of life.

In Canada, there were 53,706 hospital admissions for HF in 2004, with an age- sex-standardized hospitalization rate of 189 per 100,000 Canadian population and an age- sex-standardized mortality of 15 per 100,000 Canadian population.⁵ While rates of both hospital admissions and mortality have declined over the last decade,⁵ there is much opportunity for further improvement. There are evidence-based guidelines to improve care of patients with HF and a number of effective strategies have been recommended aimed at further reducing HF-related morbidity and mortality, both among people living with HF and those who are at high risk for developing it.^{88, 89}

HF occurs after the heart muscle has been damaged or weakened by a primary cause, such as high blood pressure, coronary artery disease, or certain types of infections and is a condition in which the heart cannot pump enough blood to meet the needs of the body. HF results from cardiac dysfunction which is either systolic or diastolic. Systolic dysfunction occurs when the left ventricle is damaged and fails to pump sufficiently to force blood through the body, resulting in reduced ejection fraction and ventricular dilation. Diastolic dysfunction refers to damage that causes the left ventricle to become stiff and unable to accept all

the blood (or venous return), and therefore unable to function effectively.

Treatment of Heart Failure

Lifestyle modification and medication management are key to the treatment of HF. Lifestyle modifications such as salt restriction, weight loss and exercise improve health outcomes among patients with HF. Patients need to take an active role in their management by monitoring their weight and symptoms and adhering to prescribed medication regimens. The goal of pharmacologic therapy in HF is to improve symptoms, slow or reverse deterioration in myocardial function and reduce mortality. Evidence-based medication therapy improves outcomes (morbidity and mortality) among HF patients.

Clinical guidelines for the treatment of HF have been developed and validated from national and international sources such as Canadian Cardiovascular Society (CCS), the European Society of Cardiology and the American College of Cardiology/American Heart Association. The Canadian Cardiovascular Outcomes Research Team (CCORT) has developed quality indicators for HF care for use in Canada. Current Canadian guidelines recommend the use of angiotensin-converting enzyme (ACE) inhibitors and beta-blockers in the management

of HF patients.⁸⁹ ACE inhibitor therapy is recommended for asymptomatic and symptomatic patients with HF due to systolic dysfunction. ACE inhibitors improve long-term survival, reduce the incidence of symptomatic HF and lower the rate of associated hospitalizations. Recent clinical trials have also established angiotensin II receptor blocker (ARB) therapy as an acceptable alternative treatment option for patients who cannot tolerate ACE inhibitors.⁹⁰ Beta-blockers are believed to slow the progression of HF, alleviate symptoms and increase survival. Use of beta-blockers in HF increased from 15 percent in 1997/98 to 32 percent in 2001/2002 in Canadian provinces, however rates varied regionally.⁹⁰

Sex and Gender Differences in Heart Failure

The pathophysiology of HF differs between women and men. Coronary artery disease is the most common cause of HF in men. Women tend to have more hypertension, diabetes and diastolic dysfunction.⁹¹ Research suggests that women have better left ventricular ejection fraction but worse New York Heart Association functional class than men.^{91, 92} Forty to 44 percent of HF cases are caused by diastolic HF,^{93, 94} mostly among women with late onset of the disease.⁹⁴ HF care will vary depending on the underlying cause, and as such, it is critical to assess left ventricular function to manage HF patients. A study by Rathore and colleagues⁹⁵ found that women with HF were less likely to undergo assessment of left ventricular function than men.

Outside of the differences in the pathophysiology of HF, there appear to be differences in how women and men receive medical care for HF and the response to HF therapy also varies by sex. In Europe and the United States, research has documented that women are less likely than men to receive care which follows HF guidelines.⁹⁶⁻⁹⁸ For example, women were less likely than men to receive ACE inhibitor medications.⁹⁹ In addition, Canadian guidelines also recommend that

an echocardiogram be performed on all patients suspected of having HF. In Canadian studies, women were less likely than men to receive an evaluation of left ventricular function.^{100, 101}

The influence of gender on HF outcomes such as hospitalization and mortality is less clear. Some research has demonstrated no gender differences for HF readmission.^{101, 102} However, women hospitalized for HF have been shown to have lower one-year mortality rates than men.^{28, 95, 103} It is difficult to disentangle the relative contributions of sex, gender, clinical factors or sociodemographic factors on observed differences in care and outcomes in HF patients.

Socioeconomic Differences in Heart Failure

Disparities associated with socioeconomic status among HF patients and HF risk factors have been well documented. Low socioeconomic status was found to be an independent risk factor for HF, especially among men,^{104, 105} while poor self-management of the disease was an important predictor of adverse outcomes for both women and men. Effective management of HF requires lifestyle changes, dietary restrictions, and often complex medication regimens that can be difficult for patients to follow, especially those with low levels of health literacy. Low health literacy is more common among individuals of low socioeconomic position. A disease management intervention targeting low literacy HF patients, showed an improvement in self-care behaviour and an associated reduction in HF-related symptoms,³⁶ indicating that differences in outcomes associated with socioeconomic position may be modifiable. One-year mortality rates are higher among HF patients with lower socioeconomic status,^{106, 107} which may be due to a combination of patient factors, low quality of care and socioeconomic circumstances.

There are conflicting reports linking quality of care to socioeconomic status. Rathore and colleagues¹⁰⁸ found that although patients with lower socioeconomic status

were modestly less likely to have had a left ventricular systolic function assessment, their overall quality of care did not differ by socioeconomic status level and neither did their 30-day mortality rate. The study did find that at one year, mortality and readmission rates were higher among patients from lower socioeconomic strata suggesting that socioeconomic status, rather than health care system factors influenced outcomes after hospitalization. Implantable cardioverter-defibrillators are indicated for some patients with HF at risk for life threatening cardiac arrhythmias. Hernandez and colleagues²² found that less than 40 percent of eligible patients received implantable cardioverter-defibrillator therapy and that these rates were even lower among women and Black patients than among White men. Similar findings were reported in Ontario by Udell and colleagues;¹⁰⁹ they found that the application of this technology was characterized by inequities associated with sex, age and socioeconomic status. Their findings revealed that the odds of receiving this treatment were 30 percent higher among those who lived in higher-income neighbourhoods.

Several process and outcome indicators of HF care will be examined in this chapter. The study cohort consisted of all patients in Ontario admitted to hospital in the 2005/06 fiscal year for HF (ICD10 diagnostic code I50). The type of physician (cardiologist, internist, general practitioner/family physician) providing care for HF patients while in hospital and the proportion of HF patients who saw a physician within four weeks of discharge were assessed. The proportions of patients admitted for HF who underwent evaluation of left ventricular function and cardiac testing (defined as stress testing, angiography and echocardiography) within the period of six months prior to admission to one month post-discharge were reported. When feasible, Enhanced Feedback for Effective Cardiac

Treatment (EFFECT) study clinical data were used to measure clinical care indicators including the use of discharge instructions and the regular measurement of body weight while in hospital.

The use of ACE inhibitors (and/or ARBs) and beta-blockers for hospitalized HF patients aged 65 and older was measured within 90 days of discharge and at one year post-discharge for surviving patients. For HF patients with atrial fibrillation the proportions who filled a prescription for warfarin within the same time frames (90 days and one year) were also determined. Data from the Ontario Drug Benefits database were used to evaluate medication use in HF patients aged 65 and older. The sample was restricted to this age group because of access to provincially funded drug benefits in this population. The data do not include sufficient clinical information to exclude those with contraindications to medication use. Thus, all patients in the cohort are included in these analyses and there may be appropriate reasons for not receiving these medications in some cases. As such, we would not expect 100 percent drug use in this cohort. In Ontario, there were 11,789 patients aged 65 and older who had been admitted to hospital (and discharged alive) in the 2005 fiscal year with a primary diagnosis of HF and 2,955 of these patients had concomitant atrial fibrillation. The sample used to measure continuation of medication use (at one year) was limited to people who were alive one year post-discharge (n=8,041 for ACE inhibitors and beta-blockers; n=2,090 for warfarin therapy).

HF outcome indicators were also examined, including emergency department visits, readmission to hospital and mortality rates. Finally the type of physician providing care for patients in a newly diagnosed HF cohort that included patients both admitted to hospital and cared for in the community was assessed.

EXHIBITS AND FINDINGS

IN-HOSPITAL PHYSICIAN CARE FOR HEART FAILURE (HF)

This indicator identifies the type of physician (cardiologist, internist or general practitioner/family physician (GP/FP)) designated as the most responsible physician for adults aged 45 and older who were hospitalized for heart failure (HF).

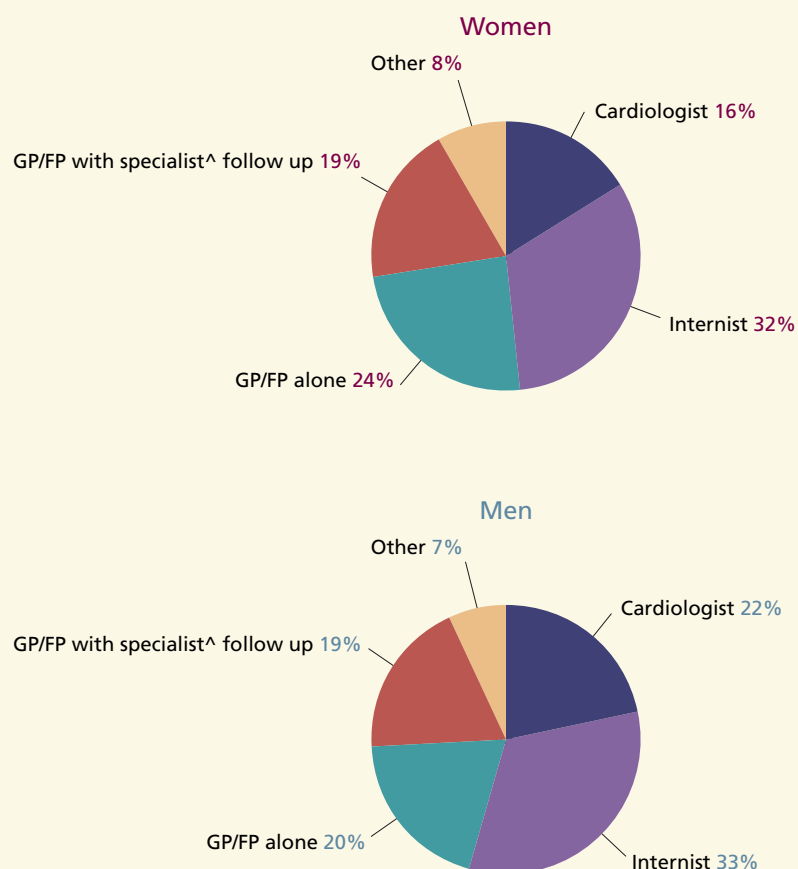
Background: Between 1997 and 2000, elderly patients, women and people living in rural areas were less likely to be cared for by specialists in Canada.^{110, 111} Studies have shown that a patient's quality of care and outcomes vary by the type of physician caring for them. Care by a general cardiologist or HF specialist while in hospital for HF has been associated with improved quality of care and outcomes¹¹¹ and is a structural indicator of HF care.³⁷ Involvement of cardiologists (or specialists) in the care of hospitalized HF patients is associated with increased diagnostic testing and lower six-month readmission rates. Between 1997 and 2000, approximately half of Canadian patients who were hospitalized with HF had a GP/FP as their most responsible physician.¹¹¹

Findings: In the Ontario population of patients aged 45 and older admitted to hospital in 2005/06 with a primary diagnosis of HF (n=15,257), 19 percent had a cardiologist, 33 percent had an internist and 40 percent had a GP/FP as their most responsible physician (including those who saw a GP/FP with specialist follow up). The remaining eight percent were seen by another type of physician while in hospital. Of those who had a GP/FP as their most responsible physician, slightly more than half saw a GP/FP only (22 percent of the total population), while the rest received specialist consultation while in hospital (16 percent by an internist and three percent by a cardiologist). The type of physician providing care in hospital varied by sex ([Exhibit 6B.1](#)).

EXHIBIT 6B.1 | Type of physician providing in-hospital care to adults aged 45 and older hospitalized for heart failure (HF), by sex, in Ontario, 2005/06

FINDINGS

- Women were significantly more likely than men to have had a GP/FP as their most responsible physician while in hospital; 43 percent versus 39 percent, respectively.
- Fewer women than men had a cardiologist as their most responsible physician while in hospital; 16 percent versus 22 percent, respectively. Women and men had similar rates of specialist consultation (cardiologist or internist/geriatrician) while in hospital (19 percent for both).
- More women than men were under the sole care of a GP/FP (without specialist consult) while in hospital; 24 percent versus 20 percent, respectively.



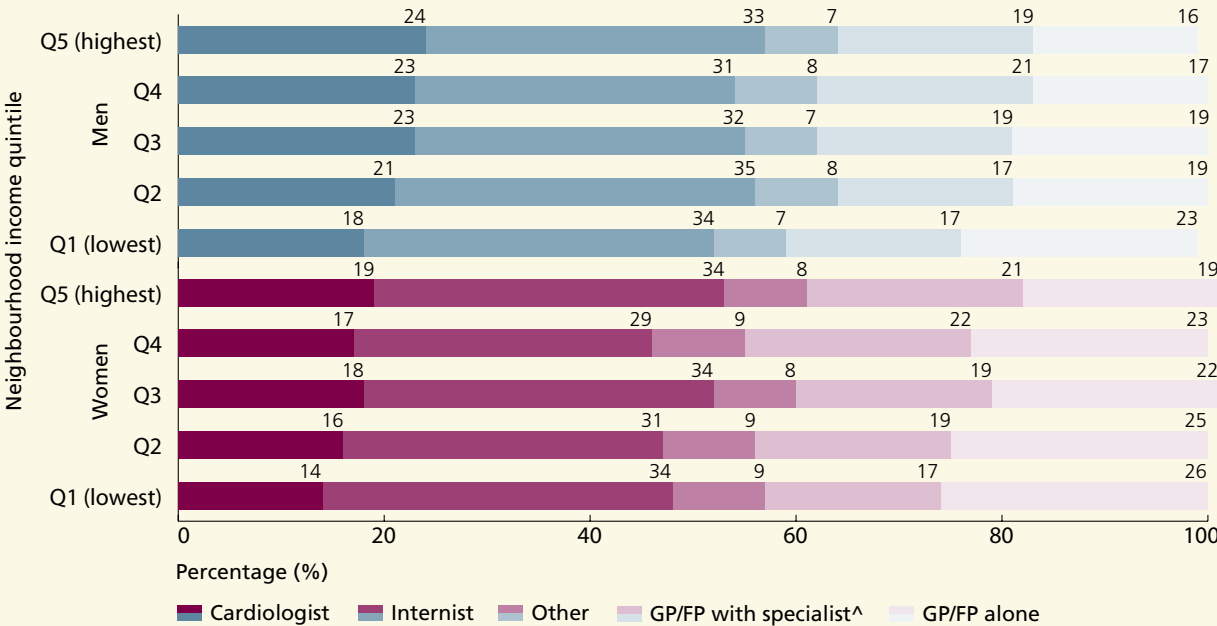
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

GP/FP = General practitioner/family physician

[^] Specialist includes cardiologists and internists

POWER Study

EXHIBIT 6B.2 | Type of physician providing in-hospital care to adults aged 45 and older hospitalized for heart failure (HF), by sex and neighbourhood income quintile, in Ontario, 2005/06



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

NOTE: Bars may not add to 100 percent due to rounding

GP/FP = General practitioner/family physician

[^] Specialist includes cardiologists and internists

FINDINGS

- There was an income gradient in the type of physician providing care to HF patients while in hospital. The percentage of patients who were under the most responsible care of a cardiologist increased as neighbourhood income increased. Conversely, HF patients from lower-income neighbourhoods were more likely to be under the sole care of a GP/FP while in hospital than patients from higher-income neighbourhoods.
- Women from the highest-income neighbourhoods were equally likely to have a cardiologist as their most responsible physician while in hospital as men from the lowest-income neighbourhoods.
- The likelihood of having a cardiologist as the most responsible physician while in hospital varied by patient age. Twenty-seven percent of patients aged 45-64, 21 percent of patients aged 65-79 and 15 percent of patients aged 80 and older were under the most responsible care of a cardiologist while in hospital for HF (data not shown).

POWER Study

EXHIBIT 6B.3 | Percentage of adults aged 45 and older who were under the sole care of a general practitioner/family physician (GP/FP) while hospitalized for heart failure (HF), by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

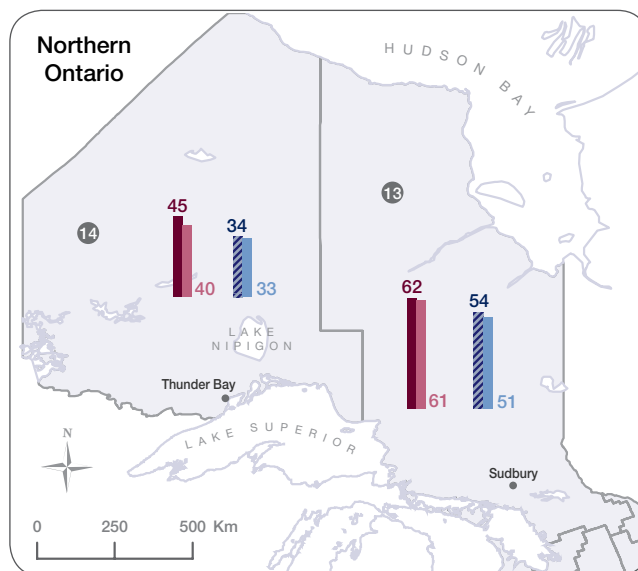
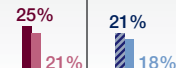
FINDINGS

- The percentage of patients admitted to hospital for HF who were under the sole care of a GP/FP varied significantly across Local Health Integration Networks (LHINs).
- The rates ranged from two percent (Toronto Central LHIN) to 62 percent (North East LHIN) among lower-income women and from five percent (Central LHIN) to 61 percent (North East LHIN) among higher-income women.
- The rates in men ranged from four percent (Central LHIN) to 54 percent (North East LHIN) among lower-income men and from five percent (Central West, Central and Mississauga Halton LHINs) to 51 percent (North East LHIN) among higher-income men.
- Rates were suppressed in some LHINs due to small numbers.

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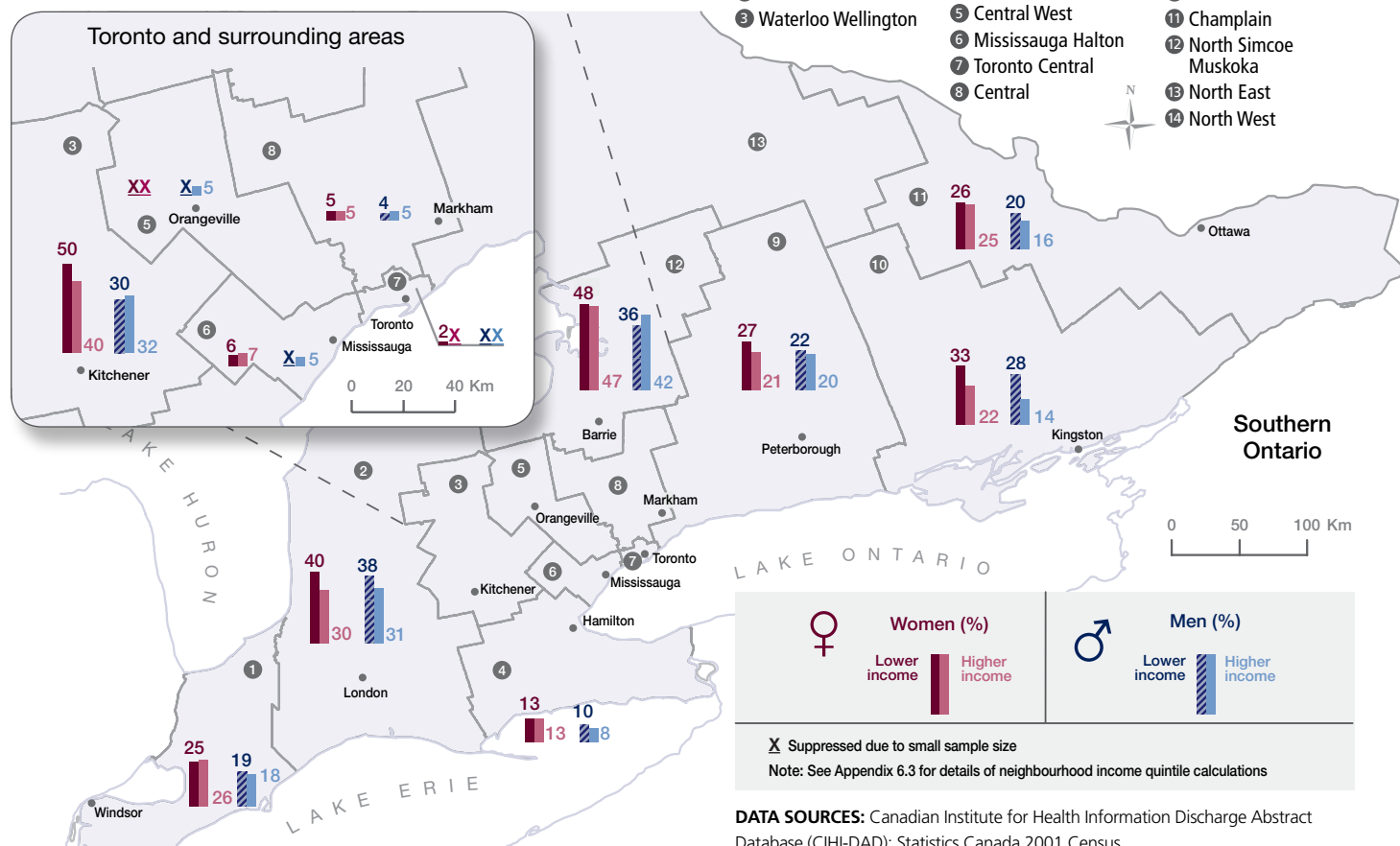
Overall Ontario

In Ontario, 25% of lower-income women, 21% of higher-income women and 18% of higher-income men were under the sole care of a GP/FP while hospitalized for HF.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

PHYSICIAN CARE WITHIN FOUR WEEKS OF HOSPITAL DISCHARGE FOR HEART FAILURE (HF)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with heart failure (HF) who were seen by a physician within four weeks following discharge from hospital.

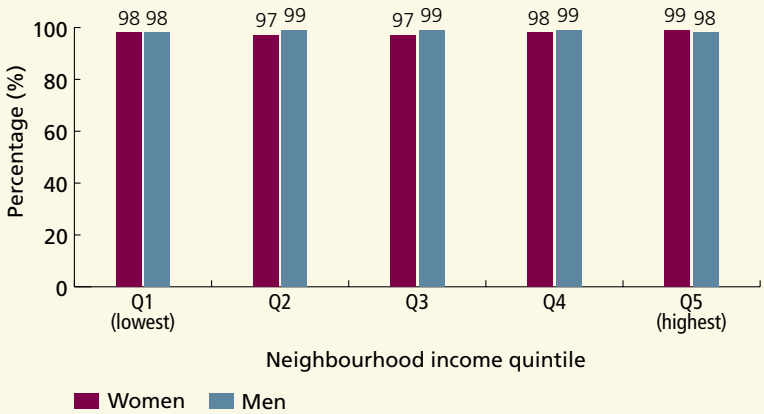
Background: Patients who have been hospitalized for HF should be seen within one month of discharge³⁸ to make sure that they are stable in the outpatient setting and to check their understanding of their treatment and their compliance with treatment.

Findings: In the Ontario population of patients aged 45 and older admitted to hospital in 2005/06 for HF who were discharged home and who were alive one month later (n=9078), 98 percent had seen a physician within four weeks of hospital discharge. This did not vary by sex, 98 percent of women and 98 percent of men received physician follow up within four weeks of discharge. The majority of patients (87 percent) had seen a general practitioner or family physician (GP/FP), while 32 percent had seen a cardiologist. While women were not less likely to see a physician within the follow up period, they were less likely than men to have seen a cardiologist (data not shown).

EXHIBIT 6B.4 | Percentage of adults aged 45 and older who were seen by a physician within four weeks of discharge from hospital for heart failure (HF), by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Nearly all HF patients (98 percent) had seen a physician within four weeks of discharge from hospital. This did not vary by sex, neighbourhood income, age group or Local Health Integration Network (income data are shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

POWER Study

MEDICATION MANAGEMENT

ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITOR THERAPY FOR HEART FAILURE (HF) PATIENTS POST-DISCHARGE

Indicator: This indicator measures the percentage of patients aged 65 and older admitted to hospital with heart failure (HF) who filled a prescription for an angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB). Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

Background: ACE inhibitor therapy can slow the progression of HF; delay the onset of symptoms and decrease morbidity and mortality.^{89, 113} ACE inhibitor therapy is recommended for all HF patients with systolic dysfunction.⁸⁹ Treatment with ACE inhibitors results in about a 20 percent decline in mortality and a 30-40 percent decline in hospitalization rates for HF. Recent clinical trials have also established ARB therapy as an acceptable alternative to ACE inhibitors in patients who are ACE inhibitor intolerant.⁹⁰ A large recent trial (CHARM-preserved) suggested ARBs may reduce hospitalization rates in patients with diastolic dysfunction.¹¹³ Despite the existence of evidence-based guidelines, research shows continued under use of ACE inhibitors. Between 1997 and 2000, approximately 55 percent of HF patients in Canada received ACE inhibitors and rates varied by provinces.¹¹⁴ The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for ACE inhibitor use in “ideal” HF patients is 90 percent.¹¹⁵ We would expect lower rates of use in our sample as, without sufficient clinical data, patients with contraindications could not be excluded.

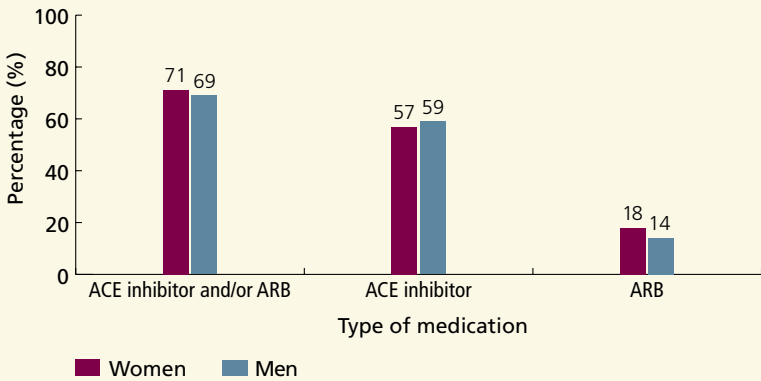
Findings: In the Ontario population of patients aged 65 and older, admitted to hospital in 2005/06 with a primary diagnosis of HF and discharged alive (n=11,789), 70 percent had filled a prescription for an ACE inhibitor and/or an ARB within 90 days of discharge. Of those who were alive one year post-discharge (n=8,041), 69 percent had filled a prescription for one or both of these classes of drugs one year post-discharge. The use of ACE inhibitors and/or ARBs did not vary significantly by sex at either time period.

EXHIBIT 6B.5 | Percentage of heart failure (HF) patients aged 65 and older who filled a prescription for an ACE inhibitor and/or an ARB post-discharge from hospital, by sex and type of medication, in Ontario, 2005/06

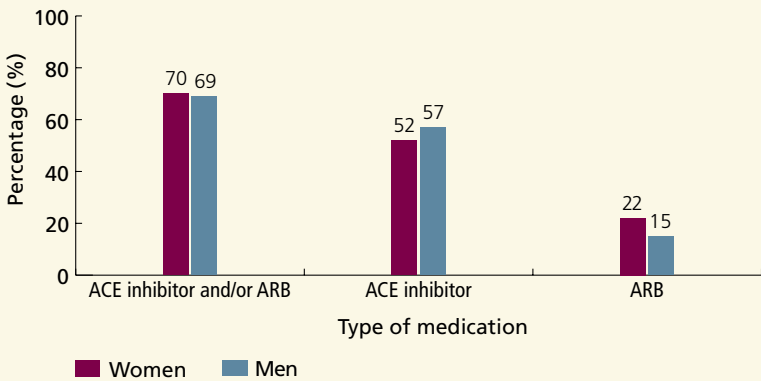
FINDINGS

- A similar percentage of women and men had filled a prescription for an ACE inhibitor and/or an ARB within 90 days and at one year post-discharge for HF.
- Of those who had filled a prescription for one or both of these drugs within 90 days, greater than 80 percent had filled a prescription for an ACE inhibitor. While the majority continued to use ACE inhibitors at one year (70 percent), the proportion of HF patients on ACE inhibitors had declined with a concomitant increase in ARB use.
- ACE inhibitors and/or ARB use did not vary by neighbourhood income for women or men at either time period (data not shown).

Within 90 days of discharge



One year post-discharge[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

ACE inhibitor = Angiotensin-converting enzyme inhibitor;

ARB = Angiotensin II receptor blocker

NOTE: The use of ACE inhibitors and ARBs are not mutually exclusive and the overlap in use may reflect change in treatment from an ACE inhibitor to an ARB or combined therapy with both drugs.

[^] Sample is restricted to patients who were alive one year post-discharge

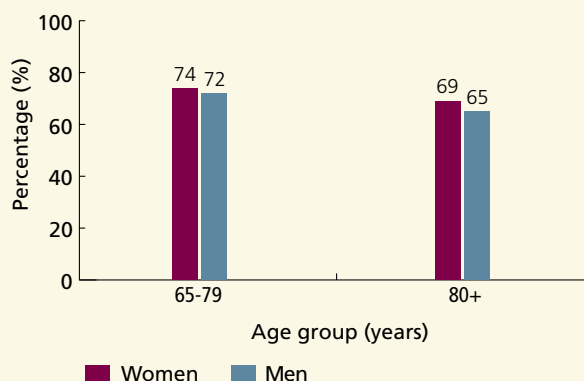
POWER Study

EXHIBIT 6B.6 | Percentage of heart failure (HF) patients aged 65 and older who filled a prescription for an ACE inhibitor and/or an ARB post-discharge from hospital, by sex and age group, in Ontario, 2005/06

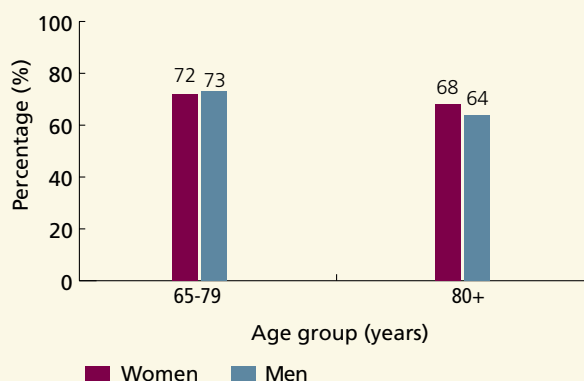
FINDINGS

- At 90 days and one year post-discharge, HF patients aged 80 and older were less likely to be on ACE inhibitors and/or ARBs than women and men aged 65-79.
- At one year post-discharge, 68 percent of women and 64 percent of men aged 80 and older, had filled prescriptions for ACE inhibitors and/or ARBs compared to 72 percent of women and 64 percent of men aged 65-79. This may be due to more contraindications to therapy in older HF patients well as potential under use.
- Use of ACE inhibitors and/or ARBs did not decline at one year.

Within 90 days of discharge



One year post-discharge[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

ACE inhibitor = Angiotensin-converting enzyme inhibitor;

ARB = Angiotensin II receptor blocker

[^] Sample is restricted to patients who were alive one year post-discharge

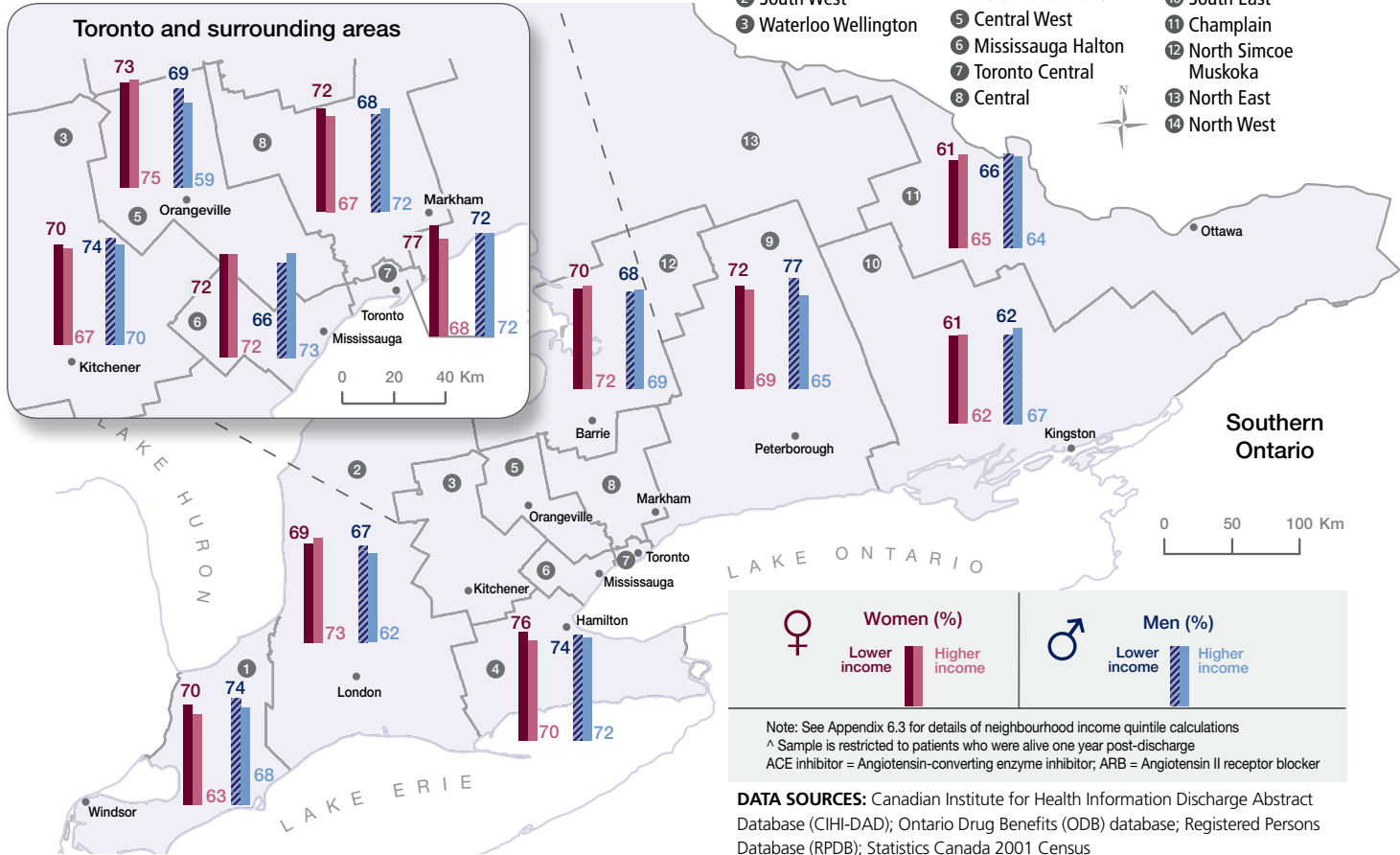
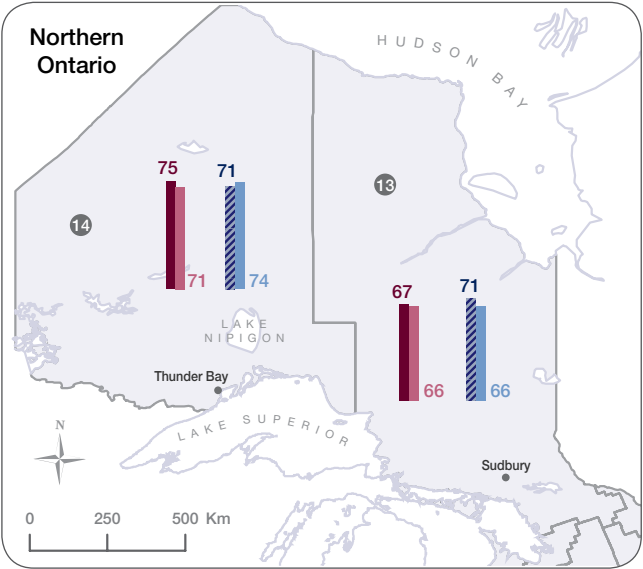
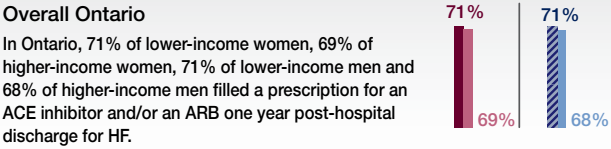
POWER Study

EXHIBIT 6B.7 | Percentage of heart failure (HF) patients aged 65 and older[^] who filled a prescription for an ACE inhibitor and/or an ARB one year post-discharge from hospital, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

FINDINGS

- There was significant variation in the use of ACE inhibitors and/or ARBs across LHINs.
- The rates in women ranged from 61 percent (South East and Champlain LHINs) to 77 percent (Toronto Central LHIN) among lower-income women and from 62 percent (South East LHIN) to 75 percent (Central West LHIN) among higher-income women.
- The rates in men ranged from 62 percent (South East LHIN) to 77 percent (Central East LHIN) among lower-income men and from 62 percent (South West LHIN) to 74 percent (North West LHIN) among higher-income men.

POWER Study



BETA-BLOCKER THERAPY FOR HEART FAILURE (HF) PATIENTS POST-DISCHARGE

Indicator: This indicator measures the percentage of patients aged 65 and older admitted to hospital with heart failure (HF) who filled a prescription for a beta-blocker. Medication use was measured based on filled prescriptions at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

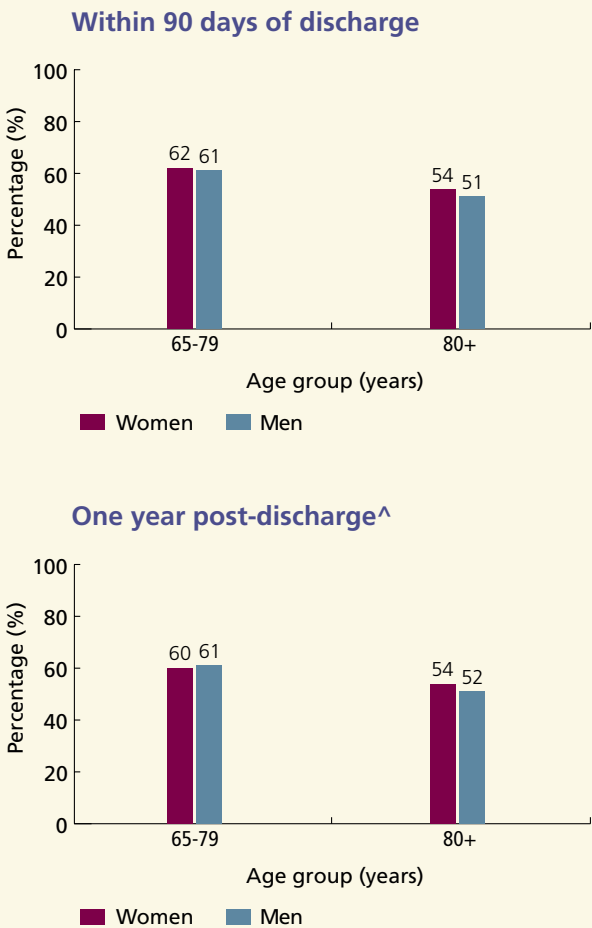
Background: Beta-blockers slow progression of heart disease, alleviate symptoms, and increase survival of HF patients. They decrease mortality in patients and their benefits are additive when combined with ACE inhibitors.^{116, 117} Beta-blocker use in HF patients has become a standard of care for HF patients with systolic dysfunction. Treatment with a beta-blocker results in a 30 percent reduction in total mortality.^{118, 119} The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for beta-blocker use in “ideal” HF patients is 90 percent.¹¹⁵ We would expect lower rates of use in our sample as, without sufficient clinical data, we could not distinguish between systolic and diastolic dysfunction and patients with contraindications could not be excluded.

Findings: In the Ontario population of patients aged 65 and older, admitted to hospital in 2005/06 with a primary diagnosis of HF and discharged alive (n=11,789), 57 percent of patients had filled a prescription for a beta-blocker within 90 days of discharge. This did not vary by sex; 57 percent of women and 56 percent of men. Of those who were alive one year post-discharge (n=8,041), 57 percent of women and 57 percent of men had filled a prescription for a beta-blocker between nine months and one year post-discharge.

EXHIBIT 6B.8 | Percentage of heart failure (HF) patients aged 65 and older who filled a prescription for a beta-blocker post-discharge from hospital, by sex and age group, in Ontario, 2005/06

FINDINGS

- Within 90 days of discharge from hospital, a smaller percentage of HF patients aged 80 and older were using beta-blockers compared to patients aged 65-79; 53 percent versus 62 percent, respectively.
- At one year post-discharge, a smaller percentage of HF patients aged 80 and older were using beta-blockers compared to patients aged 65-79; 53 percent versus 60 percent, respectively.
- The age variation may be due to more contraindications to therapy in the older age group as well as potential under use.
- Use of beta-blockers did not vary by neighbourhood income for women or for men, irrespective of follow up interval (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

[^] Sample is restricted to patients who were alive one year post-discharge

POWER Study

WARFARIN THERAPY IN HEART FAILURE (HF) PATIENTS WITH ATRIAL FIBRILLATION POST-DISCHARGE

Indicator: This indicator measures the percentage of patients aged 65 and older admitted to hospital for heart failure (HF) who had atrial fibrillation and who filled a prescription for warfarin. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

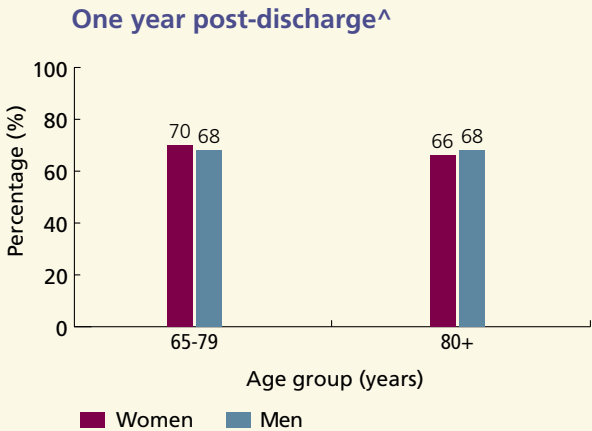
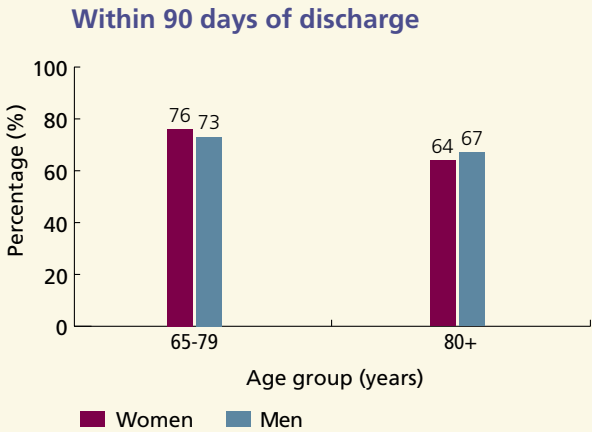
Background: Warfarin therapy in HF patients with atrial fibrillation is recommended for the prevention of thrombosis and stroke. Research suggests that patients with atrial fibrillation who are taking warfarin have fewer hospital readmissions when compared to aspirin therapy.¹²⁰ Warfarin therapy is also associated with a 26 percent reduction in all-cause mortality and an 18 percent reduction in HF-related death or hospital admission.¹²⁰ The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for warfarin use in “ideal” HF patients with atrial fibrillation is 90 percent.¹¹⁵ We would expect lower rates of use in our sample as, without sufficient clinical data, patients with contraindications could not be excluded.

Findings: In the Ontario population of patients aged 65 and older, admitted to hospital in 2005/06 with a primary diagnosis of HF and concomitant atrial fibrillation and discharged alive (n=2,955), 68 percent of women and 70 percent of men had filled a prescription for warfarin within 90 days of discharge. In the population that was alive one year post-discharge (n=2,090), 67 percent of women and 68 percent of men had filled a prescription for warfarin between nine months and one year post-discharge. Warfarin use did not vary by sex at either follow up interval.

EXHIBIT 6B.9 | Percentage of heart failure (HF) patients with atrial fibrillation, aged 65 and older who filled a prescription for warfarin post-discharge from hospital, by sex and age group, in Ontario, 2005/06

FINDINGS

- Within 90 days of hospital discharge, patients aged 80 and older were less likely to use warfarin for atrial fibrillation compared to younger patients, 65 percent versus 74 percent, respectively. This may be due to more contraindications to therapy in the older age group as well as potential under use.
- There was no age-related variation in warfarin use at one year post-discharge for women or for men.
- Warfarin use did not vary by neighbourhood income at either time period (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

[^] Sample is restricted to HF patients with concomitant atrial fibrillation who were alive one year post-discharge

POWER Study

EVALUATION OF HEART FAILURE

LEFT VENTRICULAR (LV) FUNCTION EVALUATION IN HEART FAILURE (HF)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital for heart failure (HF) who underwent left ventricular (LV) function evaluation during the period six months before hospital admission, during admission and up to one month post-discharge.

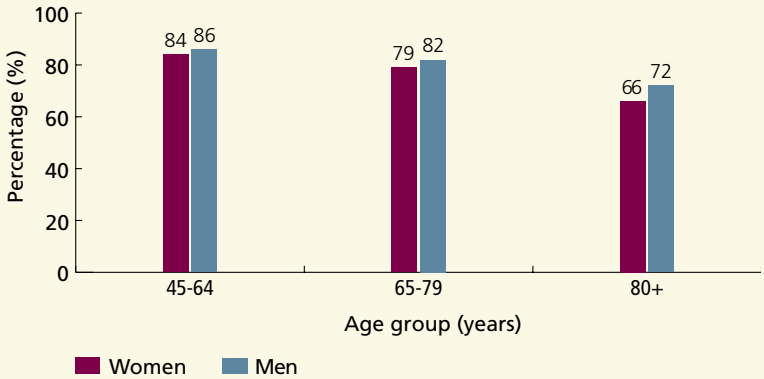
Background: LV function tests provide important information on ventricular size and function and are necessary to confirm the diagnosis and to identify modifiable factors that affect the development and progression of heart failure. These factors differ between women and men. A number of different diagnostic tests can assess LV function including echocardiography, nuclear studies, and angiography. The Enhanced Feedback for Effective Treatment (EFFECT) study benchmark for LV function evaluation in HF patients is 90 percent.¹¹⁵

Findings: In the Ontario population of patients aged 45 and older who had been hospitalized for HF in 2005/06 and discharged alive (n=13,888), 76 percent had an LV function evaluation during the period from six months prior to their admission to one month of post-discharge. Women were significantly less likely than men to receive LV function assessment within the prescribed period; 73 percent versus 79 percent, respectively. After adjusting for age, the difference between women and men was reduced, but remained significant; 74 percent versus 78 percent, respectively.

EXHIBIT 6B.10 | Percentage of hospitalized heart failure (HF) patients aged 45 and older who underwent left ventricular (LV) function evaluation[^], by sex and age group, in Ontario, 2005/06

FINDINGS

- Women were significantly less likely than men to receive LV function assessment within the prescribed period. After age-adjustment, this difference was reduced but not eliminated.
- As age increased, the likelihood of undergoing LV function assessment declined significantly. While 85 percent of HF patients (84 percent of women and 86 percent of men) aged 45-64 underwent LV function assessment within the prescribed period, this rate declined to 69 percent (66 percent of women and 72 percent of men) among patients aged 80 and older.
- Rates of LV function assessment did not vary by neighbourhood income for women or for men (data not shown).
- The percentage of patients who underwent LV function assessment varied significantly by Local Health Integration Network (LHIN) and ranged from 66 percent in the Erie St Clair LHIN to 81 percent in the Central LHIN (data not shown).



DATA SOURCE: Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

NOTE: LV function evaluation includes echocardiography, angiography, and nuclear imaging

[^] Measured during the period six months before hospital admission for heart failure (HF) to one month post-discharge

POWER Study

CARDIAC TESTING IN HEART FAILURE (HF)

Indicator: These indicators measure the percentage of patients aged 45 and older admitted to hospital for heart failure (HF) who underwent cardiac testing, including echocardiography, cardiac stress testing and angiography during the period six months before hospital admission to one month post-discharge.

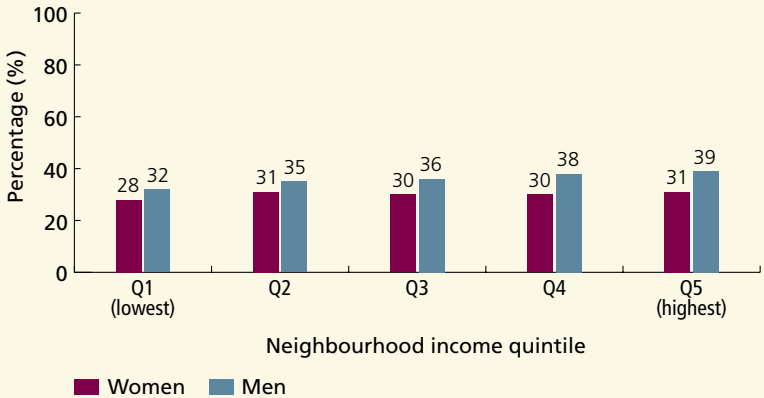
Background: Diagnostic testing can be used to identify the treatable causes of HF which influences clinical management. Echocardiography distinguishes between systolic and diastolic dysfunction and identifies valvular disease and other structural causes for HF. Cardiac stress testing allows the diagnosis of ischemic heart disease as a cause of HF. When indicated, angiography is used to evaluate structural causes of HF as well as to assess the extent of coronary artery disease. While these are not strictly quality indicators, the Technical Expert Panel recommended including these measures as it is important to look for treatable and reversible causes of HF. We examined use of these tests around the time of hospital admission for HF. It is possible that individuals may have undergone these tests outside of the timeframe, which may still be appropriate. Studies have shown differences in cardiac diagnostic testing by age and sex in Ontario. In Canadian and international studies, men had higher rates of stress testing and echocardiography than women.^{96, 100}

Findings: In the Ontario population of patients aged 45 and older who had been admitted to hospital in 2005/06 with a primary diagnosis of HF (n=13,888), 33 percent underwent echocardiography, 68 percent underwent cardiac stress testing and 14 percent underwent angiography during the prescribed period. Women had significantly lower testing rates than men for all types of cardiac testing; 30 percent versus 35 percent (echocardiography); 65 percent versus 72 percent (stress tests, exercise tests and perfusion imaging); and 12 percent versus 17 percent (angiography). After adjusting for age, the sex differences in all types of cardiac testing remained significant.

EXHIBIT 6B.11 | Percentage of hospitalized heart failure (HF) patients aged 45 and older who underwent echocardiography^ by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Among patients admitted to hospital for HF, women had lower rates of echocardiography than men across all neighbourhood income quintiles.
- Echocardiography rates did not vary by neighbourhood income in women.
- Men from the lowest-income neighbourhoods had significantly lower rates of echocardiography than men from the highest-income neighbourhoods, 32 percent versus 39 percent, respectively. This difference remained significant after adjusting for age (data not shown).
- As age increased, rates of echocardiography declined significantly in women and men from 42 percent in patients aged 45-64 to 25 percent in patients aged 80 and older (data not shown).
- Echocardiography rates varied significantly across Local Health Integration Networks (LHINs) from 24 percent in the North West LHIN to 37 percent in the Hamilton Niagara Haldimand Brant and Waterloo Wellington LHINs (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

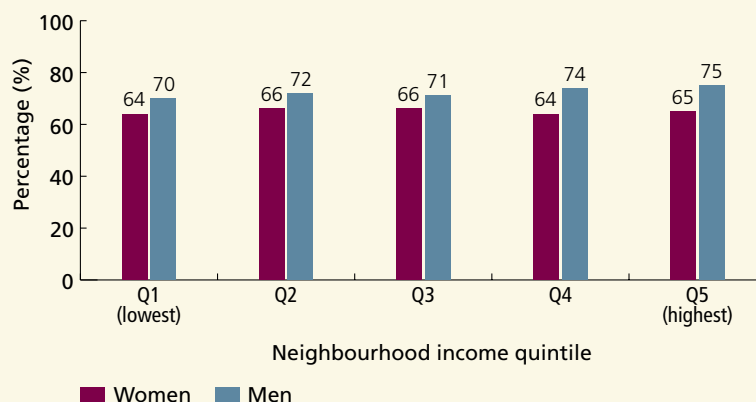
^ Measured during the period six months before hospital admission for heart failure (HF) to one month post-discharge

POWER Study

EXHIBIT 6B.12 | Percentage of hospitalized heart failure (HF) patients aged 45 and older who underwent cardiac stress testing (stress tests, exercise tests, perfusion imaging)[^], by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Among patients admitted to hospital for HF, women had lower rates of cardiac testing than men across all neighbourhood income quintiles.
- Cardiac stress testing rates in women and men did not vary by neighbourhood income.
- Among women and men, as age increased, the likelihood of undergoing cardiac stress testing decreased significantly from a high of 75 percent among patients aged 45-64 to 62 percent among patients aged 80 and older (data not shown).
- Cardiac stress testing rates varied significantly across Local Health Integration Networks (LHINs) from 59 percent in the North Simcoe Muskoka LHIN to 75 percent in the Toronto Central LHIN (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

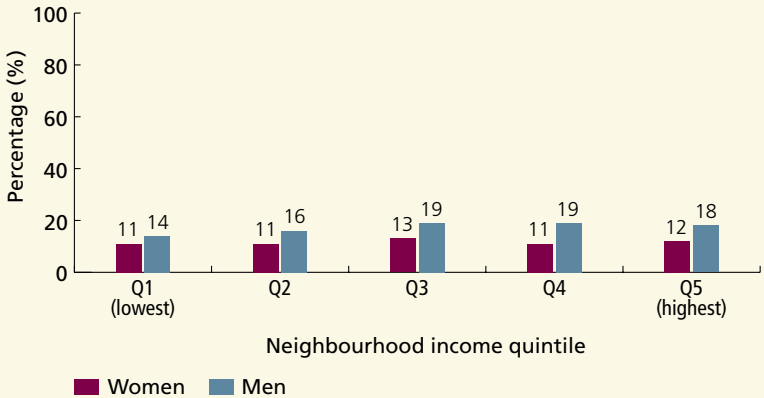
[^] Measured during the period six months before hospital admission for heart failure (HF) to one month post-discharge

POWER Study

EXHIBIT 6B.13 | Percentage of hospitalized heart failure (HF) patients aged 45 and older who underwent angiography[^], by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Among patients admitted to hospital for HF, women had lower rates of angiography than men across all neighbourhood income quintiles.
- Angiography rates in women did not vary by neighbourhood income (crude or age-adjusted) (crude data are shown).
- Among men with HF, angiography rates varied by income; 14 percent of men from the lowest income neighbourhoods underwent angiography during the prescribed period compared to 18 percent of men from the highest income neighbourhoods. This difference remained significant after adjusting for age (data not shown).
- As age increased, angiography rates declined significantly in women and men, from 27 percent in patients aged 45-64 to 20 percent in patients aged 65-79 and to seven percent in patients aged 80 and older (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

[^] Measured during the period six months before hospital admission for heart failure (HF) to one month post-discharge

POWER Study

EXHIBIT 6B.14 | Percentage of hospitalized heart failure (HF) patients aged 45 and older who underwent angiography[^], by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

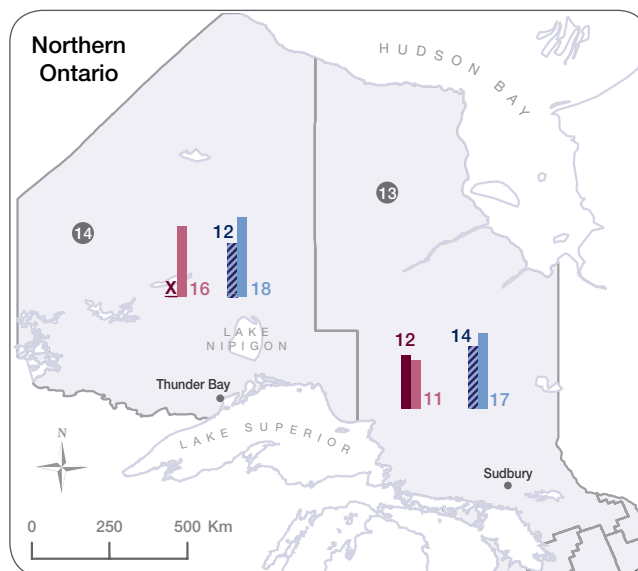
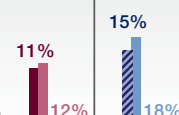
FINDINGS

- Among patients admitted to hospital for HF, there was significant variation in angiography rates across Local Health Integration Networks (LHINs).
- The rates ranged from five percent (South West LHIN) to 21 percent (Central West LHIN) among lower-income women and from eight percent (Champlain LHIN) to 18 percent (Central West and South East LHINs) among higher-income women.
- Among men, the rates ranged from 10 percent (South West LHIN) to 22 percent (South East LHIN) among lower-income men and from 12 percent (South West LHIN) to 25 percent (South East LHIN) among higher-income men.

POWER Study

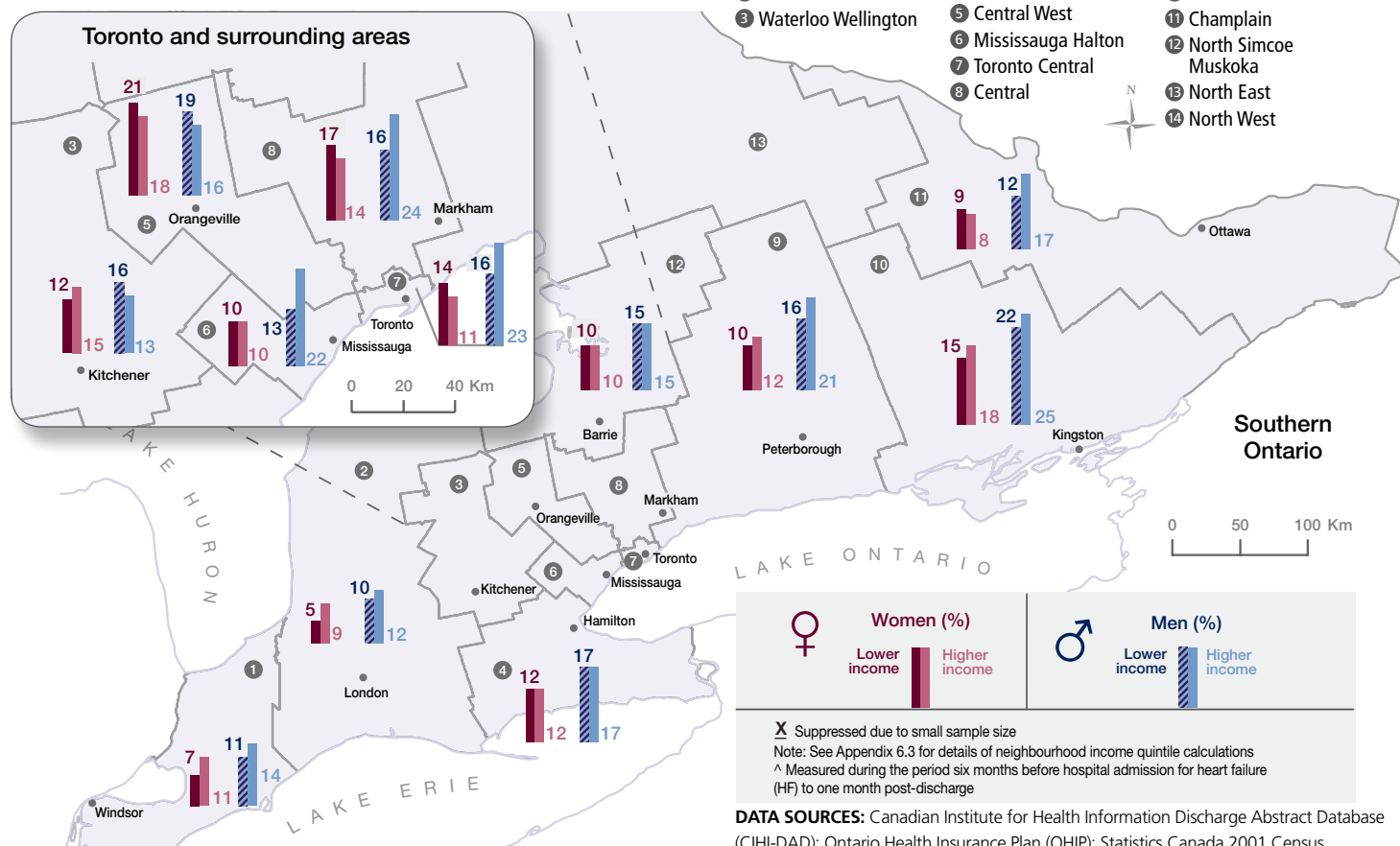
Overall Ontario

In Ontario, 11% of lower-income women, 12% of higher-income women, 15% of lower-income men and 18% of higher-income men underwent angiography during the period from six months before hospital admission to one month post-hospital discharge for HF.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|----------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe |
| | ⑧ Central | ⑬ Muskoka |
| | | ⑭ North East |
| | | ⑮ North West |



OUTCOMES IN HEART FAILURE

AGE-STANDARDIZED EMERGENCY DEPARTMENT VISITS AMONG HF PATIENTS

Indicator: This outcome indicator measures the percentage of patients aged 45 and older admitted to hospital for heart failure (HF) who visited an emergency department (ED) within 30 days and within one year following hospital discharge.

Background: ED visits after a hospital discharge may be a marker of suboptimal outpatient management in HF and may be preventable with access to effective primary care and ambulatory specialty care. Discharge planning and care coordination can reduce ED visit rates after hospital discharge.¹²¹ For this analysis, only the first ED visit per patient was counted in an effort to measure any ED utilization post-discharge. The range in the number of visits per patient within 30 days of discharge was zero to 22 visits. The range in the number of visits per patient within one year of discharge was one to 113 visits. The median number of visits did not vary by sex at either follow up period.

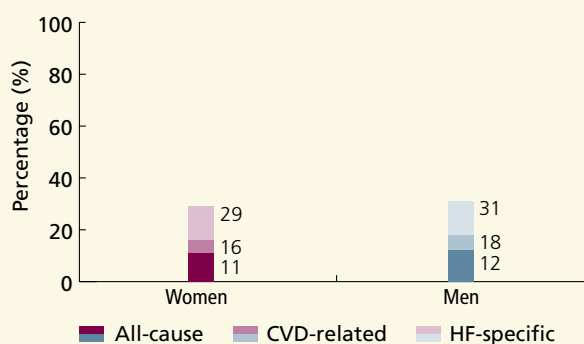
Findings: In the Ontario population of patients aged 45 and older who were discharged alive from hospital in 2005/06 with a primary diagnosis of HF (n=13,888), 30 percent had been seen in an ED at least once within 30 days of discharge and 75 percent had been to an ED at least once within one year of discharge. Approximately one-third of visits within 30 days and almost half of visits within one year were related to HF (based on the first ED visit by a patient).

EXHIBIT 6B.15 | Age-standardized percentage of heart failure (HF) patients aged 45 and older who were seen in an emergency department (ED), by sex and reason for visit, in Ontario, 2005/06

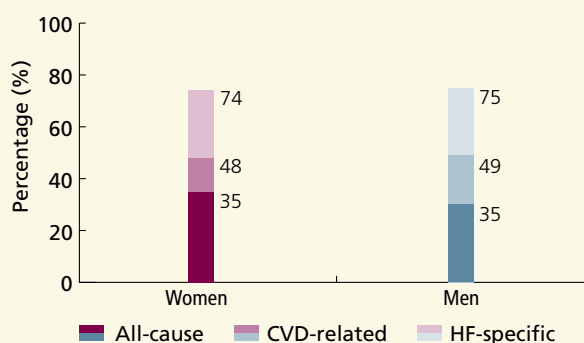
FINDINGS

- Among patients who were hospitalized for HF, 29 percent of women and 31 percent of men visited an ED at least once within 30 days of discharge and 74 percent of women and 75 percent of men visited an ED at least once within one year of discharge.
- Irrespective of follow up period, greater than half of all visits were CVD-related, and between one third and one half were specifically related to HF.
- Among both women and men, over 40 percent of ED visits within 30 days and a third of ED visits within one year were for non-CVD related causes.
- Within 30 days of discharge, fewer women than men had used an ED at least once for any reason (29 percent versus 31 percent) or for a CVD-related visit (16 percent versus 18 percent). However, these differences were small. Women and men were equally likely to go to an ED for a HF-specific visit within 30 days of discharge (11 percent of women and 12 percent of men).
- ED utilization within one year of discharge did not vary by sex.
- ED utilization within 30 days of discharge did not vary by neighbourhood income or age group.
- Among HF patients, ED utilization within 30 days of discharge varied by Local Health Integration Network (LHIN) and ranged from 23 percent in the Waterloo Wellington LHIN to 34 percent in the South East LHIN (data not shown).
- ED utilization within one year of discharge did not vary by LHIN (data not shown).

Within 30 days of discharge



Within one year of discharge



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

NOTE: HF specific visits are part of CVD-related visits. All-cause visits represent all ED visits including CVD-related visits

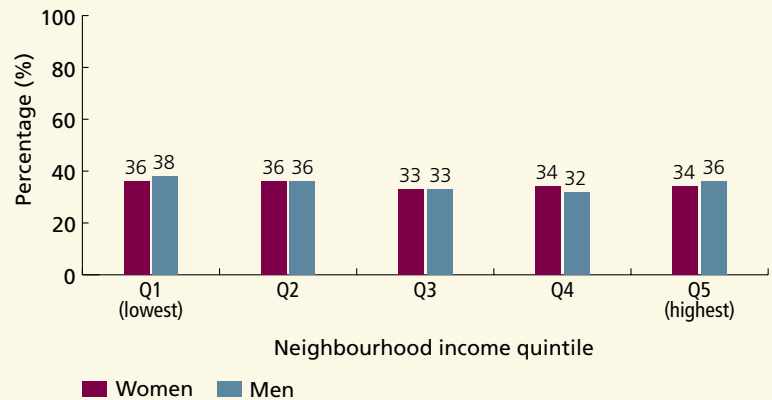
CVD = cardiovascular disease; HF = heart failure

POWER Study

EXHIBIT 6B.16 | Age-standardized percentage of heart failure (HF) patients aged 45 and older who were seen in an emergency department (ED) for an HF-specific visit within one year of hospital discharge, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- ED visits within one year of discharge did not vary by neighbourhood income for women or for men, regardless of cause (only HF-specific data are shown).
- Among women, ED visits within one year of discharge did not vary by age group; 72 percent of women aged 45-64 and 75 percent of women aged 65 and older (data not shown).
- Among men, HF patients aged 80 and older were more likely than those aged 45-64 to visit an ED for any reason; 78 percent versus 70 percent, respectively (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

POWER Study

RISK-ADJUSTED READMISSION RATES (PERCENTAGE) AMONG HEART FAILURE (HF) PATIENTS

Indicator: This outcome indicator measures the percentage of patients aged 45 and older admitted to hospital for heart failure (HF) who had a non-elective readmission within 30 days and within one year following hospital discharge. The results of this analysis are risk-adjusted based on the models developed by the Canadian Institute for Health Information (CIHI) and used in the 2006 Hospital Report Card.¹²² The model adjusts the readmission rates for patient age, sex and comorbidities (see [Appendix 6.3](#)).

Background: HF patients have high, non-elective (unplanned) readmission rates, with up to 50 percent of HF patients being readmitted to hospital for any cause within one year.¹²³ As an ambulatory care sensitive condition, many HF admissions can be prevented with coordinated care and guideline concordant disease management in primary and specialty care outside of hospital, and as such, readmissions may be an indication of suboptimal care in transition from hospital to home or in outpatient settings. Care management strategies that address comorbid conditions common in these patients can further reduce hospitalization rates.

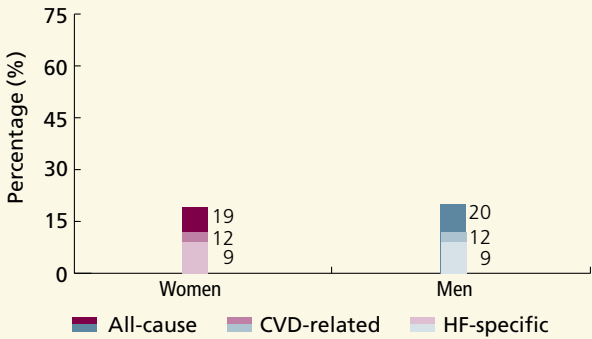
Findings: After risk-adjustment in the Ontario population of patients aged 45 and older who were admitted to hospital in 2005/06 for HF and discharged alive (n=13,888), 20 percent of patients had at least one non-elective readmission within 30 days of discharge. Nine percent had at least one HF-specific readmission and 12 percent had at least one cardiovascular disease (CVD)-related readmission (including HF-specific readmissions). The rates of readmission were substantially higher at one year; 59 percent of patients had at least one non-elective readmission within one year of discharge. Twenty-eight percent had at least one HF-specific readmission and 39 percent had at least one CVD-related readmission (including HF-specific readmissions). There were no differences in readmission rates between women and men at either time period, irrespective of reason for readmission.

EXHIBIT 6B.17 | Risk-adjusted percentage of heart failure (HF) patients aged 45 and older who were non-electively readmitted to hospital, by sex and reason for admission, in Ontario, 2005/06

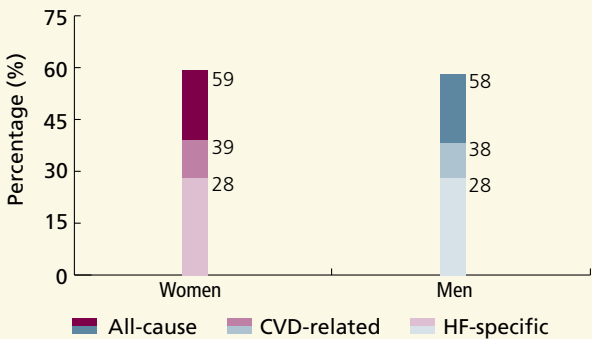
FINDINGS

- Risk-adjusted readmission rates did not vary by sex, irrespective of cause or period of follow up.
- Among patients who were hospitalized for HF, 19 percent of women and 20 percent of men were readmitted to hospital within 30 days of discharge and 59 percent of women and 58 percent of men had at least one non-elective readmission within one year of discharge.
- Irrespective of follow up period, greater than half of all readmissions were CVD-related, and between one-third and half of all readmissions were specifically related to HF.
- About a third of hospital readmissions within 30 days and within one year among both women and men were for non-CVD related causes.
- The crude rates of readmission within 30 days and within one year did not differ from the risk-adjusted rates (data not shown).

30-day readmissions



One-year readmissions



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

NOTE: HF specific readmissions are part of CVD-related readmissions. All-cause readmissions represent all readmissions including CVD-related visits

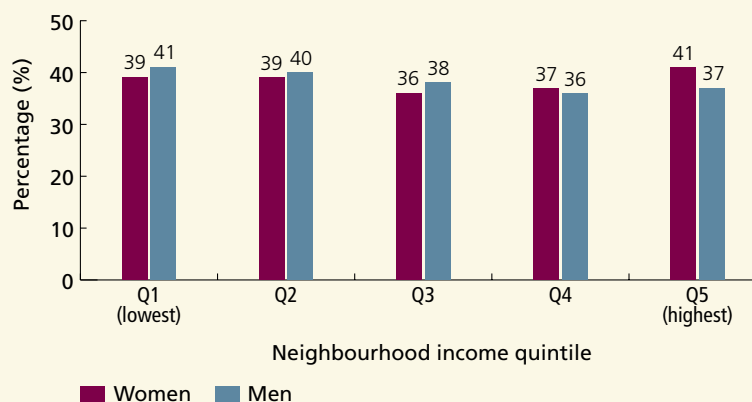
CVD = cardiovascular disease

POWER Study

EXHIBIT 6B.18 | Risk-adjusted percentage of heart failure (HF) patients aged 45 and older who were readmitted to hospital for a CVD-related reason within one year of discharge, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Among women, readmission rates, irrespective of cause or follow up period, did not vary by income.
- Among men, CVD-related one-year readmissions varied by neighbourhood income. Men from the lowest-income neighbourhoods had higher CVD-related readmissions than men from the highest-income neighbourhoods; 41 percent versus 37 percent, respectively. One-year, all-cause and HF-related readmissions did not vary by neighbourhood income among men.
- Thirty-day readmission rates did not vary by neighbourhood income among men, irrespective of cause.



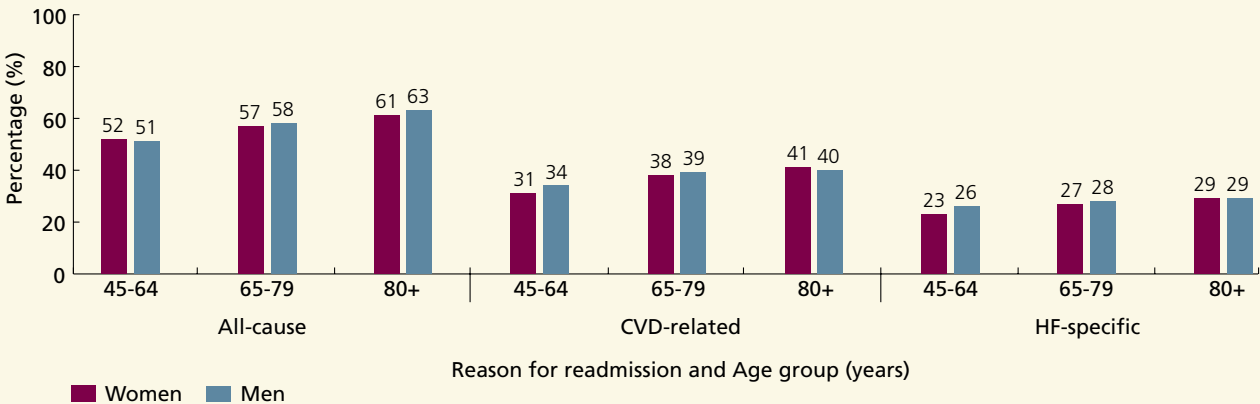
DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

CVD = cardiovascular disease

POWER Study

EXHIBIT 6B.19 | Risk-adjusted percentage of heart failure (HF) patients aged 45 and older who were readmitted to hospital within one year of discharge, by sex, age group and reason for admission, in Ontario, 2005/06



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

NOTE: HF specific readmissions are part of CVD-related readmissions. All-cause represent all readmissions including CVD-related readmissions.

CVD = cardiovascular disease

FINDINGS

- Women and men aged 80 and older had higher readmission rates, irrespective of cause and follow up period, than patients aged 45-64 (one year data are shown).
- Thirty-day readmission rates did not vary by Local Health Integration Network (LHIN) among women or men (data not shown).
- Risk-adjusted, one-year readmission rates varied significantly by LHIN; all-cause readmission rates ranged from 52 percent in the Waterloo Wellington LHIN to 66 percent in the North West LHIN; CVD-related readmission rates ranged from 33 percent in the Waterloo Wellington LHIN to 45 percent in the North West LHIN; HF-specific readmission rates ranged from 23 percent in the Waterloo Wellington LHIN to 34 percent in the North West LHIN (data not shown).

POWER Study

RISK-ADJUSTED ONE-YEAR MORTALITY AMONG HEART FAILURE (HF) PATIENTS

Indicator: This outcome indicator measures the percentage of patients aged 45 and older admitted to hospital for heart failure (HF) who died within one year of admission. The results are risk-adjusted based on the Ontario acute myocardial infarction (AMI) prediction model. The model adjusts for patient age, sex (in the overall sample only) and comorbidities (see [Appendix 6.3](#)).

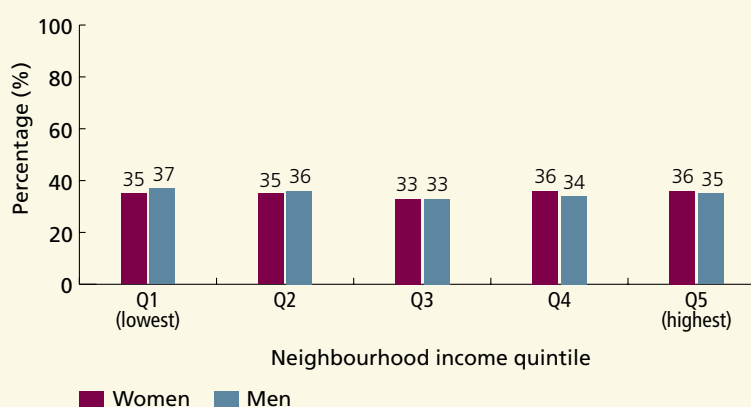
Background: HF is associated with significant mortality, with one Canadian study estimating one-year mortality rates to be approximately 30 percent.¹²⁴ Mortality varies by age, sex, in Canada and regionally within Canada.^{5, 102} Mortality for people with HF depends on acute treatment of disease and chronic disease management to prevent disease progression and complications. One-year mortality is an important indicator of the quality of HF care and is considered to be potentially modifiable by improvements in the structure and process of HF care.

Findings: In the Ontario population of patients aged 45 and older who had been admitted to hospital in 2005/06 with a primary diagnosis of HF (n=15,257), 35 percent had died within one year of admission. The crude mortality rate was 35 percent for women and 36 percent for men. After risk-adjustment, women had significantly lower one-year mortality than men; 34 percent versus 37 percent, respectively.

EXHIBIT 6B.20 | Risk-adjusted one-year mortality (percentage) among adults aged 45 and older admitted to hospital for heart failure (HF), by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Across all neighbourhood income quintiles, one in three women and men died within one year of a hospital admission for HF.
- One-year risk-adjusted mortality rates did not vary by neighbourhood income for women or men.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

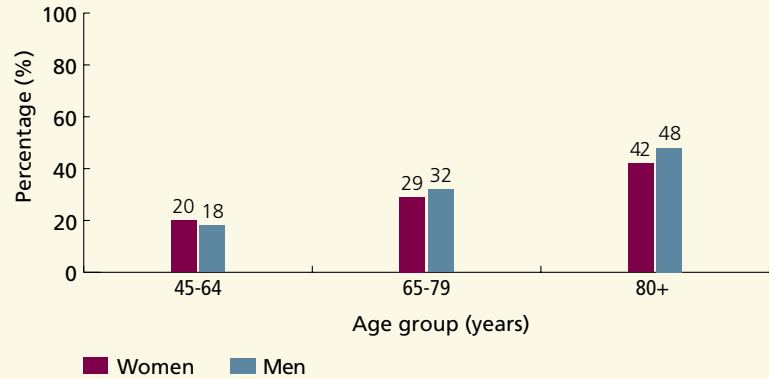
NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

POWER Study

EXHIBIT 6B.21 | Risk-adjusted^ one-year mortality (percentage) among adults aged 45 and older admitted to hospital for heart failure (HF), by sex and age group, in Ontario, 2005/06

FINDINGS

- Among HF patients aged 65 and older, women had significantly lower risk-adjusted mortality than men. There was no sex difference in mortality rates among patients aged 45-64.
- Mortality rates increased with age for women and men with HF.
- The risk-adjusted rates ranged from 19 percent in adults aged 45-64 to 30 percent in those aged 65-79 and 45 percent in HF patients aged 80 and older.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

^ Risk-adjusted mortality rates by age group are adjusted for comorbidities only

POWER Study

EXHIBIT 6B.22 | Risk-adjusted one-year mortality (percentage) among adults aged 45 and older who were admitted to hospital for heart failure (HF), by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

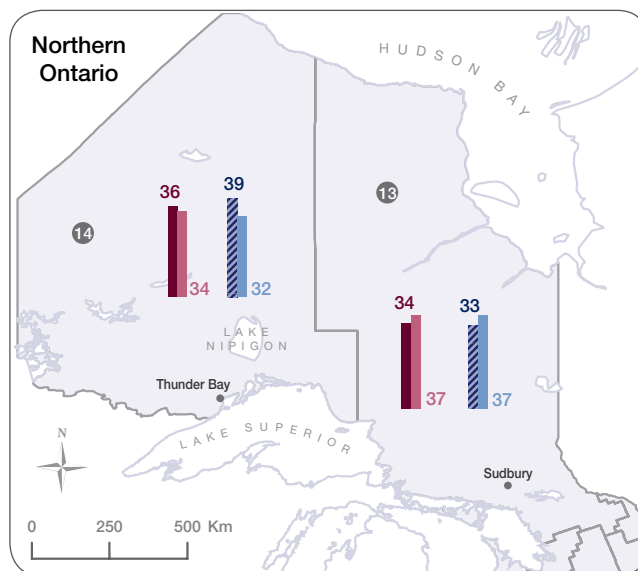
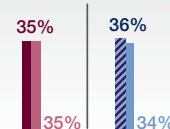
FINDINGS

- There was variation in risk-adjusted one-year mortality among HF patients across LHINs.
- Mortality rates in women ranged from 33 percent (Erie St. Clair LHIN) to 40 percent (Mississauga Halton LHIN) among lower-income women and from 32 percent (Mississauga Halton and Toronto Central LHINs) to 37 percent (Erie St. Clair and North East LHINs) among higher-income women.
- The rates in men ranged from 33 percent (North East LHIN) to 44 percent (Mississauga Halton LHIN) among lower-income men and from 30 percent (South East LHIN) to 37 percent (North East LHIN) among higher-income men.

POWER Study

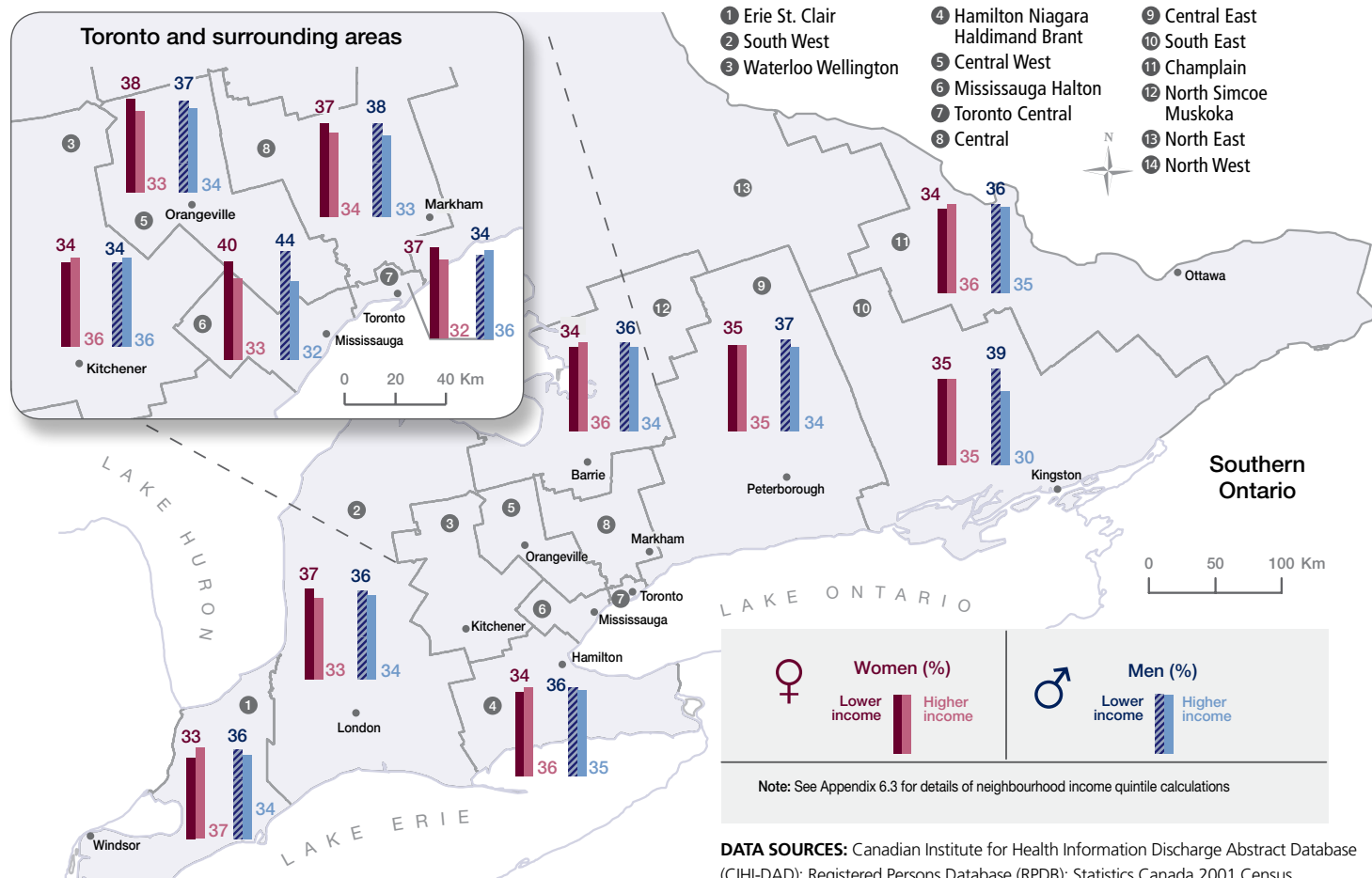
Overall Ontario

In Ontario, 35% of lower-income women, 35% of higher-income women, 36% of lower-income men and 34% of higher-income men died within one year of being admitted to hospital for HF.



Local Health Integration Networks (LHINs)

- 1 Erie St. Clair
- 2 South West
- 3 Waterloo Wellington
- 4 Hamilton Niagara Haldimand Brant
- 5 Central West
- 6 Mississauga Halton
- 7 Toronto Central
- 8 Central
- 9 Central East
- 10 South East
- 11 Champlain
- 12 North Simcoe Muskoka
- 13 North East
- 14 North West



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

INPATIENT CARE

WEIGHT MEASUREMENT WHILE IN HOSPITAL AMONG PATIENTS ADMITTED FOR HEART FAILURE (HF)

Indicator: This indicator measures the percentage of patients aged 45 and older who were admitted to hospital for heart failure (HF) during the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study timeframe who had their weight measured on at least 50 percent of days during their hospitalization.

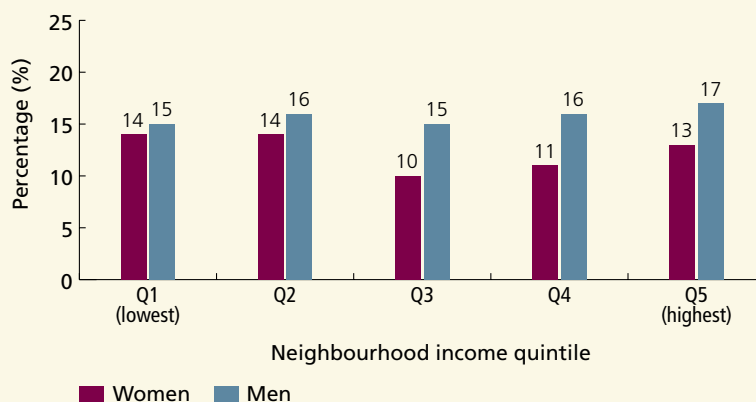
Background: One of the initial symptoms of HF is volume overload leading to increased weight and peripheral oedema. It is recommended that HF patients are weighed regularly (at least 50 percent of their days in hospital).³⁸ The data that were used for this indicator are from the EFFECT study, Phase I (see [Appendix 6.3](#)). The EFFECT study collected clinical data from a sample of hospital charts on patients that were admitted to acute care facilities in Ontario with a most responsible diagnosis of HF (study years 1999/00-2000/01). Data used are from fiscal years 1999/00-2000/01 and practice patterns may have changed over time. However, our primary purpose was to determine whether there were gender and socioeconomic differences in care on this measure.

Findings: In the EFFECT study population of patients aged 45 and older who had been admitted to hospital during the study timeframe with a most responsible diagnosis of HF (n=9,799), 14 percent had their weight measured on at least 50 percent of the days while in hospital. Women were less likely than men to have their weight measured regularly; 12 percent versus 16 percent, respectively.

EXHIBIT 6B.23 | Percentage of EFFECT study patients aged 45 and older admitted to hospital for heart failure (HF) who had their weight measured on at least 50 percent of hospital days, by sex and neighbourhood income quintile, in Ontario, 1999/00-2000/01

FINDINGS

- Among patients admitted to hospital with HF, women were less likely than men to have their weight measured on 50 percent of days while in hospital, regardless of neighbourhood income.
- The proportion of HF patients who had their weight measured on 50 percent of their days in hospital did not vary by neighbourhood income.
- The rates of in-hospital weight measurement were uniformly low.
- The proportion of HF patients who had their weight measured on 50 percent of their days in hospital varied by age. Patients aged 80 and older (11 percent) were less likely to have their weight measured at least 50 percent of the days while in hospital for HF than patients aged 45-64 (18 percent) and patients aged 65-79 (15 percent) (data not shown).



DATA SOURCE: Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I; Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

POWER Study

PROVISION OF DISCHARGE INSTRUCTIONS TO HEART FAILURE (HF) PATIENTS

Indicator: This indicator measures the percentage of patients aged 45 and older who were discharged from hospital after an admission for heart failure (HF) during the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study timeframe who received discharge instructions.

Background: It is recommended that all patients diagnosed with HF should be counselled regarding the nature of the disease, drug regimens, dietary restrictions, symptoms of worsening HF, what to do if these symptoms occur and prognosis among other things.³⁸ This helps them to understand their disease and be involved in developing the plan for their care. In addition, family members and other responsible caregivers should be included in counselling and decision making sessions. Regular education can help reduce non-compliance which is a major cause of morbidity and unnecessary hospital admissions among HF patients. The data that was used for this indicator are from the EFFECT study (see [Appendix 6.3](#)). The EFFECT study collected clinical data from a sample of hospital charts on patients that were admitted to acute care facilities in Ontario with a most responsible diagnosis of HF (study years 1999/00-2000/01).

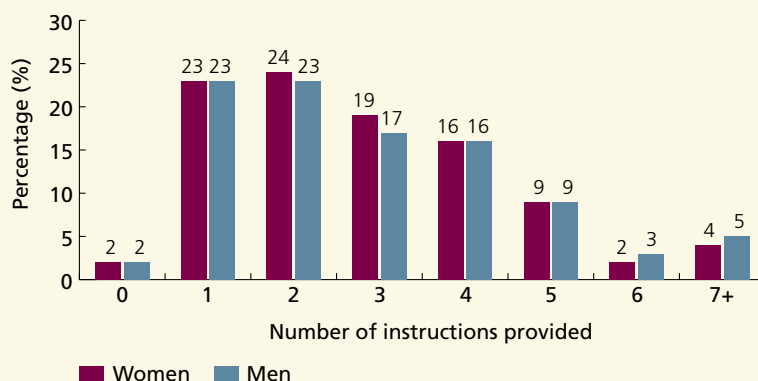
Information was available on follow up appointments, instructions provided on medications, salt and fluid restrictions, daily weight monitoring, symptoms of worsening disease, smoking cessation for smokers, diuretic titration counselling, other dietary instructions and activity instructions. Charts with missing information on specific discharge instructions, were coded as 'missing'. Adequacy of documentation of counselling will influence rates. However, documentation of these instructions is an important aspect of quality of care. Data used are from fiscal years 1999/00-2000/01 and practice patterns may have changed over time. However, our primary purpose was to determine whether there were gender and socioeconomic differences in care on this measure.

Findings: In the EFFECT study population of patients aged 45 and older who had been admitted to hospital during the study time frame with a primary diagnosis of HF and discharged home (n=7,335), 100 percent of patients were given a follow up appointment at discharge and 97 percent were provided with discharge instructions in at least one of the areas noted above. However, only slightly more than half all patients were provided with discharge instructions in more than two areas. The median number of instructions provided to women and men was three (interquartile range was one to four instructions). Neither the median number of instructions provided nor the distribution of the number of instructions provided varied by sex.

EXHIBIT 6B.24 | Percentage of EFFECT study patients aged 45 and older admitted to hospital for heart failure (HF) and discharged home who received discharge instructions, by sex, in Ontario, 1999/00-2000/01

FINDINGS

- The percentage of patients receiving multiple discharge instructions was low. While almost all patients received some instruction upon discharge from hospital (97 percent of women and men), a very small number received a comprehensive set of discharge instructions (4 percent of women and 5 percent of men received 7 or more instructions). The number of instructions received did not vary by sex.



DATA SOURCE: Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I

NOTE: A small percentage of patients were missing all information on discharge instructions; 0.4 percent of women and 0.6 percent of men. Because of this and due to rounding, numbers may not total to 100 percent.

POWER Study

EXHIBIT 6B.25 | Percentage of EFFECT study patients aged 45 and older admitted to hospital for heart failure (HF) and discharged home who were given different types of discharge instructions, by sex, in Ontario, 1999/00-2000/01

Type of Instruction	Women (%)	Men (%)
Instructions on medications	71	71
Other dietary instructions	55	56
Activity instructions	47	45
How to identify symptoms of worsening heart failure	19	22
Smoking cessation (for smokers only)	10	12
Instructions on salt and fluid restrictions	8	12
Daily weight monitoring	8	10
Diuretic titration counseling	4	5

DATA SOURCE: Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I

NOTE: Rates are calculated excluding missing data

FINDINGS

- A smaller percentage of women than men received instructions on salt and fluid restriction, daily weight monitoring and how to identify symptoms of worsening heart failure. However, overall rates of documented instructions were low for both women and men.
- Very few patients received counselling on how to manage their diuretic therapy.
- There were no sex differences in receipt of any of the other discharge instructions.

POWER Study

OUTPATIENT CARE FOR ADULTS AGED 45 AND OLDER NEWLY IDENTIFIED AS HAVING HEART FAILURE (HF)

Indicator: This indicator describes the type of physician providing care to newly diagnosed heart failure (HF) patients aged 45 and older within one year of diagnosis.

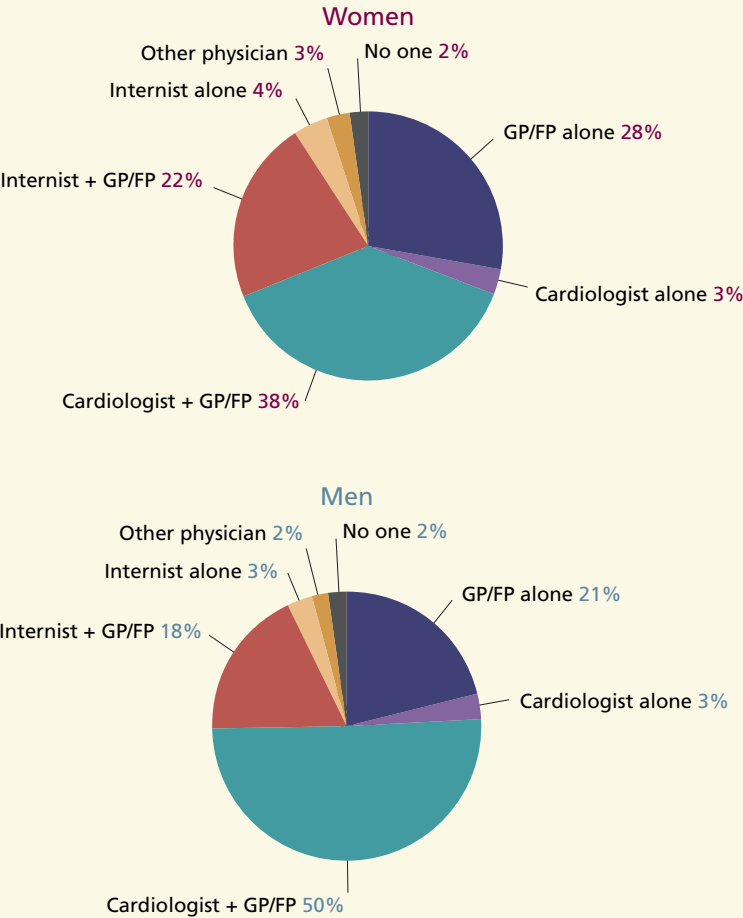
Background: The Ontario Congestive HF Database (OCHFDB) identifies patients with incident HF through an administrative data algorithm (see [Appendix 6.3](#)). These data include patients with a wider disease spectrum than those identified through hospital discharge data and include people with early and less severe disease. The incident cohort used for this analysis is derived from data for the 2005/06 fiscal year. Adults with HF were followed for one year to determine access to physician care. For the purpose of the income- and age-stratified analyses, specialist care was viewed hierarchically. All patients were first classified as receiving care from a cardiologist and then by an internist and/or geriatrician. Patients who had seen a cardiologist and an internist and/or geriatrician were classified as having seen a cardiologist, based on the hierarchy. For these analyses, patients who were classified as having seen a general practitioner/family physician (GP/FP) were seen only by a GP/FP during the year. Shared care between a GP/FP and a specialist (a cardiologist or an internist/geriatrician) was measured for women and men only.

Findings: In the Ontario population of patients aged 45 and older who had been identified by the administrative algorithm as having incident HF in the 2005/06 fiscal year (n=33,006), 47 percent had seen a cardiologist at least once within a year of being identified as having HF. An additional 24 percent had seen an internist or geriatrician during the course of the year and 25 percent were under the sole care of a GP/FP. Two percent of patients had seen another type of physician and the remaining two percent of patients had not seen a physician during the year following their diagnosis.

EXHIBIT 6B.26 | Percentage of adults aged 45 and older with newly diagnosed heart failure (HF) who received care from different types of physicians within one year of initial diagnosis, by sex, in Ontario, 2005/06

FINDINGS

- Women were less likely than men to have seen a cardiologist during the course of the year; 41 percent versus 53 percent, respectively.
- Conversely, women were more likely than men to have seen only a GP/FP during the course of the year; 28 percent versus 21 percent, respectively.



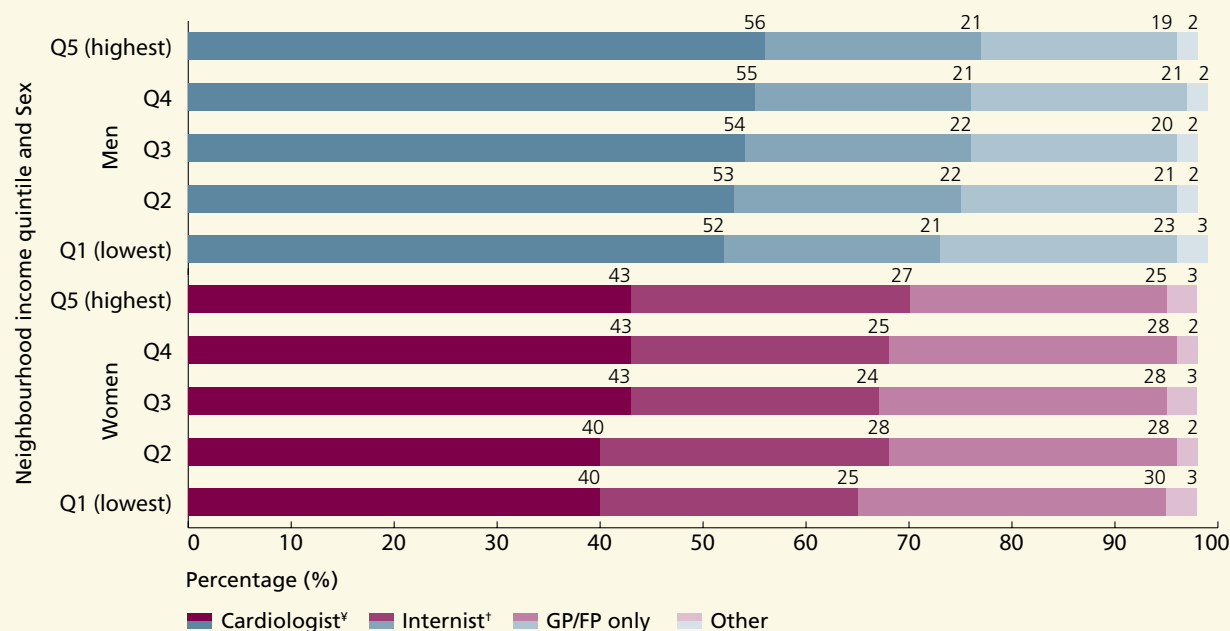
DATA SOURCES: Ontario Congestive Heart Failure Database (OCHFDB); ICES Physician Database (IPDB)

NOTE: Values may not add to 100 percent due to rounding

GP/FP = General practitioner/family physician

POWER Study

EXHIBIT 6B.27 | Percentage of adults aged 45 and older with newly diagnosed heart failure (HF) who received physician care within one year of initial diagnosis, by sex, neighbourhood income quintile and type of physician, in Ontario, 2005/06



DATA SOURCES: Ontario Congestive Heart Failure Database (OCHFDB); ICES Physician Database (IPDB)

NOTE: Bars may not add to 100 percent as some patients had not seen a physician in the year after diagnosis and because of rounding

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculations

GP/FP = General practitioner/family physician

* Cardiologist includes care by cardiologists with or without other physicians

† Internist includes care by an internist/geriatrician with or without other physicians with the exception of cardiologists

FINDINGS

- Irrespective of neighbourhood income, women were less likely than men to have seen a cardiologist in the year following their HF diagnosis.
- The percentage of patients who had seen a cardiologist varied significantly by neighbourhood income; 45 percent of patients from the lowest-income neighbourhoods had seen a cardiologist during the course of one year compared to 50 percent of patients from the highest-income neighbourhoods.
- Conversely, the percentage of patients who had only seen a GP/FP during the year increased as income decreased; 26 percent of patients from the lowest-income neighbourhoods had seen only a GP/FP during the year following their diagnosis compared to 22 percent of patients who lived in the highest-income neighbourhoods.
- The percentage of patients who were under the sole care of GP/FP within one year of diagnosis varied significantly by age from 16 percent of patients aged 45-64 to 21 percent of patients aged 65-79 and 32 percent of patients aged 80 and older (data not shown).

POWER Study

EXHIBIT 6B.28 | Percentage of newly diagnosed heart failure (HF) patients aged 45 and older who were seen by a cardiologist and/or internist/geriatrician within one year of initial diagnosis, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

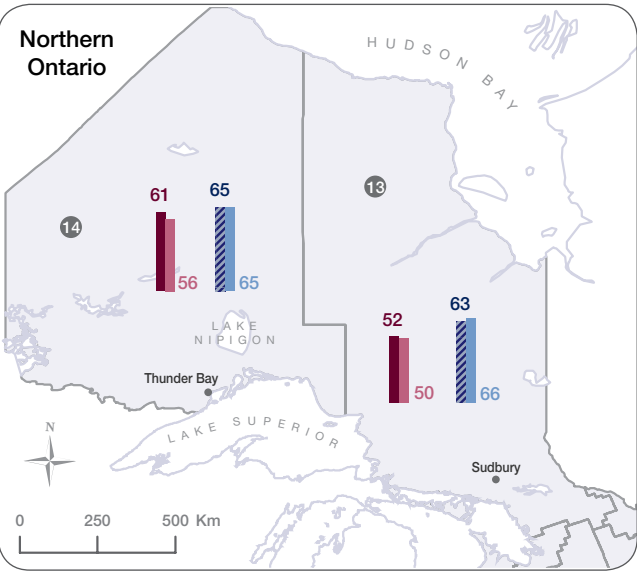
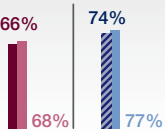
FINDINGS

- The proportion of HF patients who had been seen by a specialist (cardiologist or internist/geriatrician) in the year after their diagnosis varied significantly by LHIN.
- A smaller percentage of women than men had seen a specialist for their HF care in the year after their diagnosis; the trend was consistent across all LHINs.
- The rates in women ranged from 51 percent (South West LHIN) to 83 percent (Central West LHIN) among lower-income women and from 50 percent (North East LHIN) to 82 percent (Central LHIN) among higher-income women.
- The rates in men ranged from 61 percent (South West LHIN) to 86 percent (Central West LHIN) among lower-income men and from 64 percent (South West LHIN) to 86 percent (Central LHIN) among higher-income men.

POWER Study

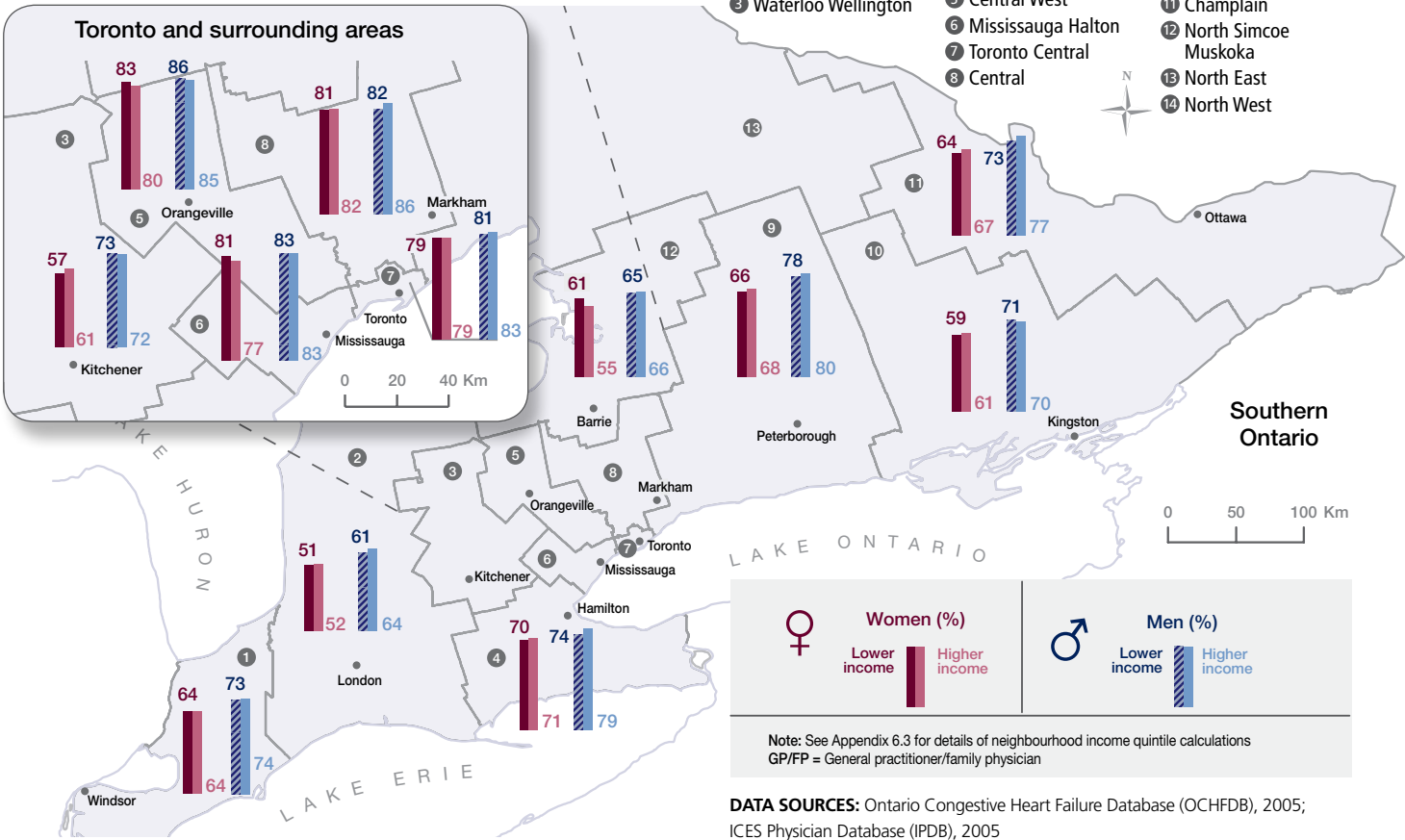
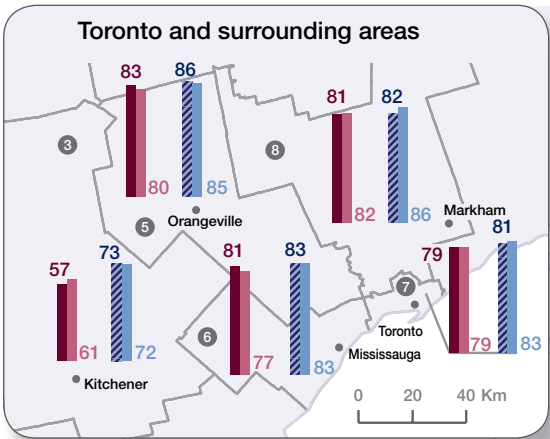
Overall Ontario

In Ontario, 66% of lower-income women, 68% of higher-income women, 74% of lower-income men and 77% of higher-income men who were newly diagnosed with HF were seen by a cardiologist or internist/geriatrician during one year follow up care.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



Women (%)

Lower income
Higher income



Men (%)

Lower income
Higher income

Note: See Appendix 6.3 for details of neighbourhood income quintile calculations
GP/FP = General practitioner/family physician

DATA SOURCES: Ontario Congestive Heart Failure Database (OCHFDB), 2005;
ICES Physician Database (IPDB), 2005

Section 6B

SUMMARY OF FINDINGS

We found some differences in the management of patients admitted to hospital for heart failure (HF), by sex, income, age and where one lives. Women were less likely than men to have a cardiologist as their most responsible physician while in hospital and more likely to be under the sole care of a general practitioner/family physician (GP/FP). This pattern was also seen for outpatient care in newly diagnosed HF patients. Women were less likely than men to undergo evaluation and cardiac testing for HF, including left ventricular function evaluation, cardiac stress testing, echocardiography and angiography. These differences were reduced, but not eliminated, with age-adjustment. Regular weight measurement while in hospital is used to assess patients for volume overload. Women were less likely than men to have their weight measured regularly while in hospital. With respect to outcome indicators, women and men had similar rates of non-elective readmissions (within 30 days and within one year of discharge) but had lower rates of emergency department use than men. Crude mortality rates for women and men were similar, but after risk-adjustment for age and comorbidities, women were less likely than men to die within one year.

Lower-income women and men with HF were less likely to have a cardiologist as their most responsible physician, and more likely to be under the sole care of a GP/FP while in hospital or while being cared for in the community for newly diagnosed HF. Lower income was also associated with lower rates of angiography and echocardiography among men but not among women. Outcome measures (emergency department visits, readmissions and mortality) also showed little variation by income; however men from lower-income

neighbourhoods were slightly more likely to be readmitted to hospital within one year for a cardiovascular disease-related reason. Performance on other quality indicators examined did not differ by neighbourhood income. However, due to data limitations we could not assess differences in medication use among those under age 65, and it is possible that medication use may differ in this age group due to differential access to prescription drug coverage.

For many measures, rates of performance were lower for older patients. This is likely to be due to higher rates of clinical contraindications for treatments as well as under use of effective interventions in this age group. More detailed clinical information is needed to determine the relative contribution of these factors to performance. Findings for the indicators reported in this section are summarized below.

Physician Care

- Whether cared for in hospital or seen in the community, a lower proportion of women with HF than men with HF received care from a cardiologist (16 percent versus 22 percent, respectively in hospital (most responsible physician) and 41 percent versus 54 percent, respectively in the community). Older patients (women and men) with HF were less likely to see a cardiologist than younger patients with HF. For both women and men, those from the highest-income neighbourhoods were more likely to see a cardiologist than those from the lowest-income neighbourhoods. There was regional variation in the proportion of HF patients under the sole care of GP/FP while in hospital. Almost all patients (98 percent) discharged from hospital with HF saw a physician within four weeks of discharge, regardless of

sex, neighbourhood income, age or region; 25 percent were managed by a GP/FP, down from 70 percent in the EFFECT study.

Medication Management

- Approximately 70 percent of women and men with HF filled a prescription for an angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARB) or a beta-blocker within 90 days of hospital discharge, with similar rates seen within one year of discharge. Within neighbourhood income quintiles and age groups there were no differences between women and men in filling a prescription for an ACE inhibitors and/or ARBs or beta-blockers with 90 days or one year of discharge from hospital, except that a higher proportion of women (22 percent) than men (15 percent) filled a prescription for an ARB medication within one year of hospital discharge.
- Men aged 80 and older (65 percent) were less likely to fill a prescription for an ACE inhibitor and/or an ARB than men aged 65-79 (72 percent). Patients aged 80 and older (53 percent) were less likely to fill a prescription for a beta-blocker within one year of discharge than patients aged 65-79 (60 percent). In Ontario, there was significant variation across Local Health Integration Networks (LHINs) in the prescribing of ACE inhibitor and/or ARB medications within one year of discharge.
- For HF patients admitted to hospital who also had atrial fibrillation approximately 70 percent received a prescription for warfarin within one year of discharge. However, there were no sex or income differences. Within 90 days of HF discharge, patients aged 80 and older (65 percent) were less likely to fill a prescription for warfarin than patients aged 65-79 (74 percent).

Evaluation of Heart Failure

- While 76 percent of patients with HF had their left ventricular (LV) function evaluated within six months prior to hospitalization to one month post-discharge women were less likely (73 percent) to have an

evaluation of their LV function than men (79 percent). There was little income or LHIN variation for either women or men in the evaluation of LV function. However, HF patients aged 80 and older (69 percent) were less likely to have their LV function evaluated than patients aged 45-64 (85 percent).

- Overall, 68 percent of HF patients had undergone cardiac testing (stress testing, exercise testing and perfusion imaging), 33 percent underwent echocardiography and 14 percent underwent angiography. Women consistently had lower cardiac testing rates than men (65 percent versus 72 percent). There was significant regional variation and HF patients aged 80 and older (62 percent) were less likely to undergo cardiac testing than HF patients aged 45-64 (75 percent). Also men from lower-income neighbourhoods were less likely than men from higher-income neighbourhoods to undergo cardiac testing (70 percent versus 75 percent, respectively), echocardiography (32 percent versus 39 percent, respectively) and angiography (14 percent versus 18 percent, respectively), though the age-adjusted differences were only significant for the last two types of tests. No income variation was seen in cardiac testing rates among women.

Care in Hospital for Heart Failure Patients

- Only 14 percent of patients admitted for HF had their weight measured on at least 50 percent of the days they were in hospital. Women (12 percent) were less likely to have their weight measured than men (16 percent), as were older patients. While 97 percent of HF patients admitted to hospital received at least one discharge instruction, the number of discharge instructions received was low (median of three, inter-quartile range was one to four instructions). This did not vary by sex.

Outcomes Among Heart Failure Patients

- Thirty percent of patients hospitalized for HF visited an emergency department within 30 days of discharge

from hospital and 75 percent had visited an emergency department within one year of discharge. About half of all visits within 30 days and two-thirds of all visits within one year of discharge were related to a diagnosis or symptoms of cardiovascular disease. Women were less likely than men to have used an emergency department within 30 days of discharge. There was no variation in emergency department visits with 30 days of discharge by neighbourhood income, age or region.

- For HF patients admitted to hospital, 20 percent had a non-elective hospital readmission within 30 days and 59 percent were readmitted within one year of discharge. These rates did not vary by sex, neighbourhood income

or region among women. For men, the 30-day all-cause readmission rates increased with age and the one-year readmission rates increased with decreasing neighbourhood income. For both women and men, the one-year readmission rates increase by age.

- For patient admitted to hospital for HF, 35 percent died within one year of their admission. After risk-adjustment for age and comorbidities, women (34 percent) had a lower mortality rate than men (37 percent). While mortality rates increased with age, they did not vary by neighbourhood income. In the overall HF population, risk-adjusted mortality rates varied by LHIN, from 32 percent to 38 percent.





Section 6C

Ischemic Heart Disease (IHD)

INTRODUCTION

Ischemic heart disease (IHD) remains a leading cause of death and disability in Canadian women and men despite advances in prevention and treatment and improvements in outcomes over recent decades.

Mortality from cardiovascular disease (CVD) has declined by 30 percent between 1994 and 2004 and by 38.1 percent for acute myocardial infarction (AMI).⁵ Notwithstanding this large decline, much of the morbidity and mortality from IHD is preventable through population-based interventions aimed at primary prevention, clinical management and improved management of IHD in ambulatory care settings and increased guideline concordant care of acute coronary syndromes (unstable angina, ST segment elevation myocardial infarction (STEMI), and non-STEMI (NSTEMI)). Unfortunately, rising rates of diabetes, hypertension and obesity may reverse these trends.^{8, 125}

Improving IHD Outcomes

For patients with an AMI, prompt treatment with either thrombolytics or primary angioplasty i.e., percutaneous coronary intervention (PCI) when indicated can reduce death and disability related to the event. Current guidelines recommend the use of evidence-based medications in patients with an AMI.¹²⁶ Use of aspirin, beta-blockers, cholesterol-lowering medication and angiotension-converting enzyme (ACE) inhibitors reduce recurrent events and mortality in AMI patients. They may also reduce symptoms and improve quality of life.¹²⁷ Rates of use of these interventions and medications are well accepted indicators of the quality

of care provided to individuals who have had an AMI. Some patients with IHD require coronary artery bypass graft surgery (CABG) to treat their disease. Quality of care for AMI and CABG has improved over time and much work has been done to develop quality indicators for IHD, AMI and CABG.^{10, 39, 128} The Canadian Cardiovascular Outcomes Research Team (CCORT) in conjunction with the Canadian Cardiovascular Society has identified a set of indicators for use in Canada.

Sex Differences in IHD

Women are generally seven to ten years older than men when they present with acute coronary syndromes.¹²⁹ As a result, women are often in worse health and have more comorbid conditions (such as hypertension, diabetes and heart failure with preserved systolic function) than men.¹³⁰ However, over the last two decades, rates of AMI and its risk factors have increased in younger women (aged 35-54) while declining in men in this age group. As a result, age-related differences in AMI prevalence are narrowing. A recent study in the US found younger women (aged 35-54) to be at increasing risk for AMI.¹³¹ Younger women who have an AMI have been found to have higher mortality rates than similarly aged men. However, in the US, AMI mortality rates in women age 55 and younger have declined more rapidly than for men and gender differences in mortality have

narrowed. Much of the observed mortality differences were explained by clinical factors.¹³² Sex differences in mortality rates vary depending on the type of acute coronary syndrome—compared to men, women have higher mortality rate rates for STEMI but lower rates for NSTEMI and unstable angina.¹³³ Other differences include smaller coronary artery size in women than in men.^{134, 135}

Many studies have documented sex differences in the diagnosis and treatment of AMI. Sex disparities in IHD care have narrowed due to increased awareness of the prevalence of IHD in women, evidence of the effectiveness of interventions in women and recognition of gender disparities in care. Nevertheless, sex disparities persist. Women waited longer for urgent care²⁰ and were less likely to be cared for in a monitored intensive care setting.¹³⁶ Women were also less likely to undergo reperfusion therapy including timely delivery of thrombolytics.¹³⁷ After an AMI diagnosis, women were less likely to be referred for revascularization and were more likely than men to be managed with medications alone; this was especially true for elderly women.¹³⁷ Upon discharge women were also less likely to be referred for cardiac rehabilitation than men¹³⁸ which affects quality of life as well as life expectancy.¹³⁹ These differences in care may result in worse cardiac outcomes than could be expected if women received optimal care. Recent Canadian data also suggest differential treatment and poorer quality of life in women compared to men post AMI.^{13, 140} Although some of these differences may be driven by clinical factors, women remain at risk for not receiving optimal care for AMI and there are many opportunities for improvement.

Socioeconomic and Ethnic Differences in IHD

Income and ethnicity also influence the type of care received for AMI. Using data from the National Registry of Myocardial Infarction from 1994 to 2002, Vaccarino and colleagues reported sex and racial differences in the treatment of patients who were deemed to be

ideal candidates for particular treatments including reperfusion therapy, angiography, and the prescription of aspirin and beta-blockers.²⁸ Other studies have reported similar findings; consistently Black patients were less likely to receive clinically appropriate care than their White counterparts.¹⁴¹⁻¹⁴³ After adjustment for other factors, the racial differences persisted for reperfusion therapy and angiography but not for medications.^{141, 144} Recent data from the Women's Ischemia Syndrome Evaluation study¹⁴⁵ found that after adjustment for clinical and demographic factors, the most important demographic predictor of five-year outcomes (AMI or cardiovascular-related death) was income and not race. Low-income women (annual household income of less than \$20,000) had an almost five-fold increased risk of cardiovascular disease- or AMI-related death after five years of follow up compared to higher-income women (annual household income of \$50,000 or more). An Italian study assessing the association between income and outcomes after cardiac surgery reported a similar result. Using hospital discharge data and median neighbourhood income, Agabiti and colleagues¹⁴⁶ reported an increased risk of 30-day in-hospital mortality post coronary artery bypass graft surgery (CABG) in the lowest-income patients as compared to the highest. This difference persisted after adjustment of hospital characteristics using hierarchical modeling methods. In Ontario, AMI patients with lower socioeconomic status were less likely to be followed by a cardiologist, undergo coronary angiography, or receive cardiac rehabilitation.

In this section, we provide an equity-based analysis of clinical indicators for AMI care and examine differences associated with sex, age, income and where one lives. We were not able to assess disparities in care on the basis of ethnicity due to a lack of data. We were also unable to assess the quality of care provided to women and men with ischemic heart disease in ambulatory care settings for the same reason. Several process indicators of AMI care were examined in this section, including the

type of physician providing care in-hospital, follow up of AMI patients post-discharge, guideline concordant medication management, and the use of angiography for diagnostic testing. We examined medication use at 90 days to assess care provided upon hospital discharge and at one year to assess chronic disease management and adherence to therapy over time. Outcome indicators were also examined in this section, including non-elective readmission and mortality post-AMI admission. As well, we reviewed indicators of CABG including surgical method, lengths of stay, medication management and outcomes (revascularization, readmission and mortality) and wait times for CABG, angioplasty and angiography.

Data from a number of sources were used. The Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD) was used to identify patients who had been admitted to hospital during the 2005/06 fiscal year with a most responsible diagnosis of AMI (ICD10 code I21). Physician care, medication management, angiography and outcomes associated with AMI were measured within this population. Data sources used included the Ontario Health Insurance Plan (OHIP) physician claims data, ICES Physician Database

(IPDB), Statistics Canada 2001 Census, Registered Persons Database (RPDB), Cardiac Care Network (CCN), and data from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study phase II.⁴⁰ Data from the Ontario Drug Benefits database was used to evaluate medication use in AMI patients aged 65 and older. The sample was restricted to this age group because of access to provincially funded drug benefits in the senior population. In Ontario, there were 9,882 patients aged 65 and older who were discharged alive from hospital in 2005/06 with a primary diagnosis of AMI. Of these, 7,961 were alive one year post-discharge. Quality of care indicators for CABG were measured using the ICES CABG dataset and included patients who underwent an isolated CABG (first procedure) during the 2005/06 fiscal year.

Data on clinical care and outcomes were first stratified by sex and then further stratified by age, neighbourhood income and Local Health Integration Network (LHIN). Age-adjustment, where appropriate was done using indirect standardization. Risk-adjustment methods, based on previously used adjustment models, were used to assess readmissions and mortality. [Appendix 6.3](#) provides a brief description of research methods.

EXHIBITS AND FINDINGS

ISCHEMIC HEART DISEASE: IN-HOSPITAL PHYSICIAN CARE FOR ACUTE MYOCARDIAL INFARCTION (AMI)

Indicator: This indicator identifies the type of physician(s) providing in-hospital care for patients aged 45 and older admitted for an acute myocardial infarction (AMI).

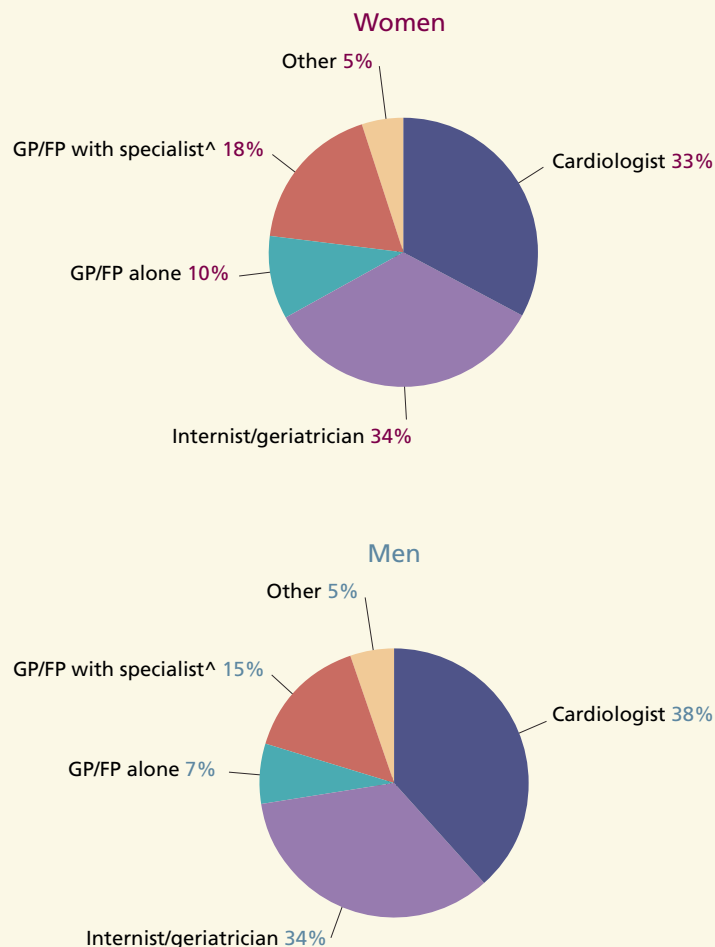
Background: Patients' quality of care and outcomes for AMI can vary by the type of physician providing care. Among AMI patients, hospital care by a cardiologist provides better access to guideline recommended diagnostic testing such as cardiac catheterization and interventions such as percutaneous coronary intervention, when indicated. In addition, cardiologists may also have higher rates of use of guideline recommended medications. Therefore speciality cardiology care may be associated with improved survival when compared to care by general practitioners/family physicians (GP/FP) alone.¹⁴⁷ The CCS¹⁴⁸ and the Cardiovascular Atlas^{110, 111} have reported variations in care providers in-hospital based on patient age and sex; women and older patients were less likely to be under the care of specialists while in hospital.

Findings: In the Ontario population of patients, patients aged 45 and older who were admitted to hospital in 2005/06 with a primary diagnosis of AMI (n=17,446), 36 percent had a cardiologist as their most responsible physician, 34 percent were under the care of an internist or geriatrician and 25 percent were under the care of a GP/FP. Approximately two-thirds of those under the care of a GP/FP received a specialist consultation by a cardiologist, internist or geriatrician. However, eight percent of the AMI patients admitted to hospital in Ontario were under the sole care of a GP/FP.

EXHIBIT 6C.1 | Type of physician providing in-hospital care to adults aged 45 and older hospitalized with an acute myocardial infarction (AMI), by sex, in Ontario, 2005/06

FINDINGS

- A significantly smaller percentage of women than men had a cardiologist as their most responsible physician while in hospital (33 percent versus 38 percent, respectively).
- Conversely, a significantly larger percentage of women than men had a GP/FP as their most responsible physician while in hospital (28 percent versus 22 percent, respectively).
- Among women and men whose most responsible physician was a GP/FP, the proportions who received a cardiology consultation were similar, six percent of women and six percent of men. However, women were more likely than men to receive a consultation from an internist while in hospital (13 percent versus 10 percent, respectively) (data not shown).
- A larger proportion of women than men were under the sole care of a GP/FP without speciality consultation while in hospital (10 percent versus seven percent, respectively).



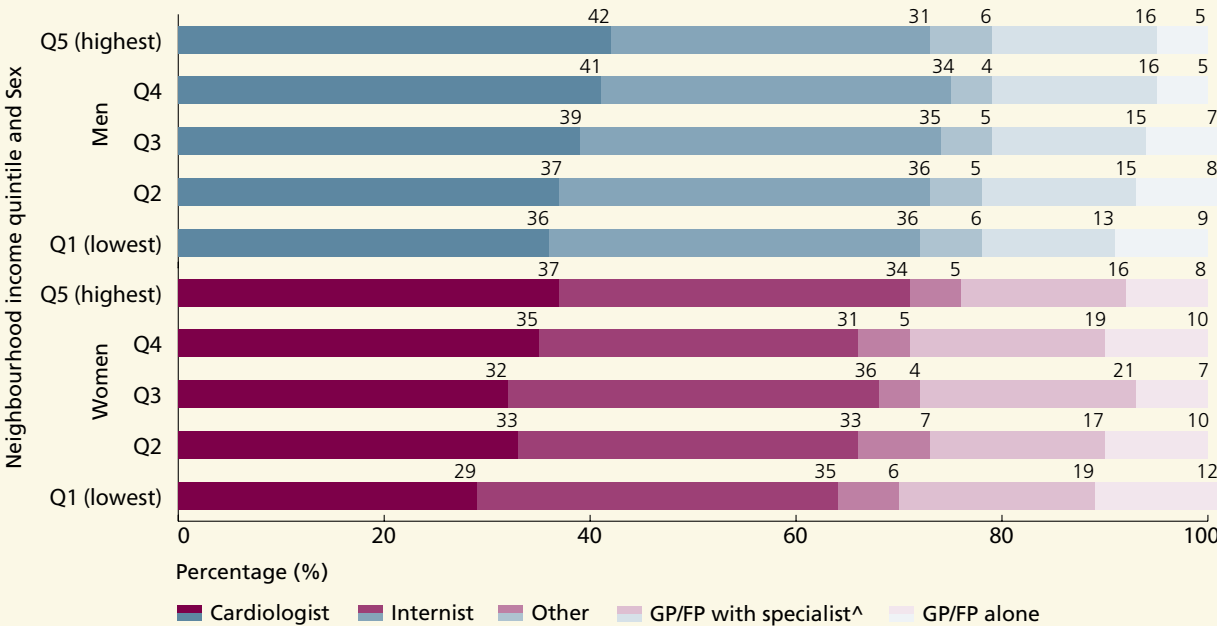
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

[^] Specialist consultation includes consultation by a cardiologist or an internist/geriatrician

GP/FP = General practitioner/family physician

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EXHIBIT 6C.2 | Type of physician providing in-hospital care to adults aged 45 and older hospitalized for an acute myocardial infarction (AMI), by sex and neighbourhood income quintile, in Ontario, 2005/06



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

NOTE: Bars may not add to 100 percent due to rounding

GP/FP = General practitioner/family physician

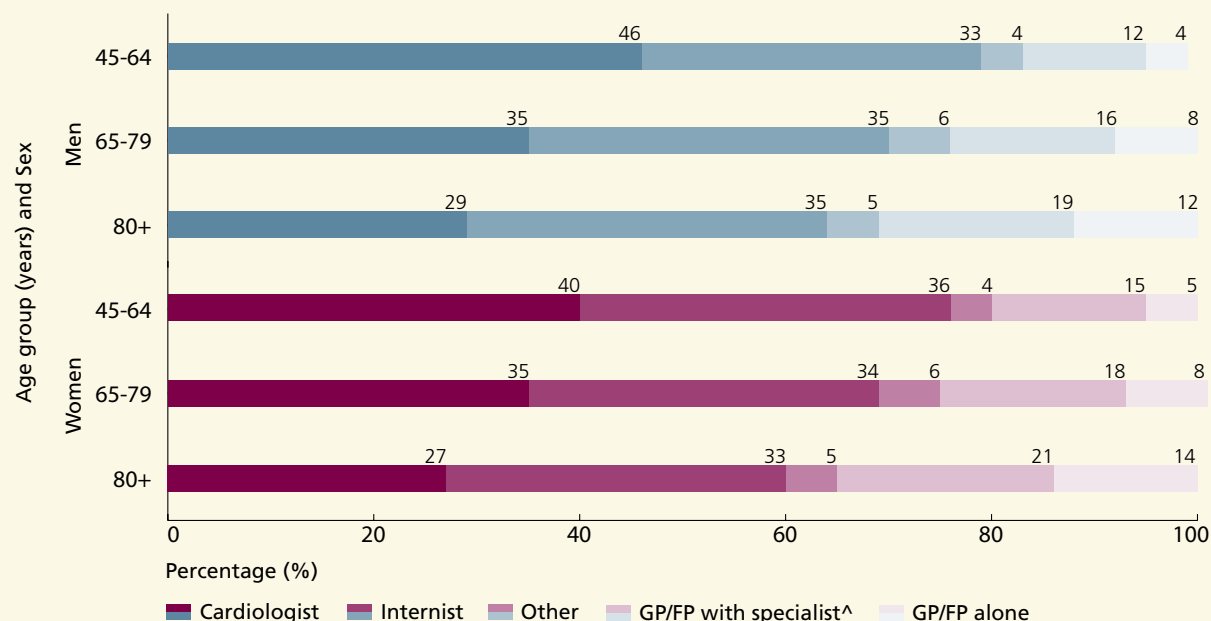
[^] Specialist consultation includes consultation by a cardiologist or an internist/geriatrician

FINDINGS

- Across all income quintiles, a smaller percentage of women than men had a cardiologist as their most responsible physician while in hospital for an AMI.
- Conversely, a larger percentage of women than men across all income levels had a GP/FP as their most responsible physician while in hospital for an AMI.
- Among women and men, there was an income gradient in the type of physician providing care to patients with an AMI. Those from the lowest-income neighbourhoods were more likely to have a GP/FP as their most responsible physician while in hospital for an AMI and less likely to be cared for by a cardiologist as compared to those from the highest-income neighbourhoods.
- Twenty-nine percent of women from the lowest-income neighbourhoods had a cardiologist as their most responsible physician while in hospital for an AMI compared to 37 percent of women from the highest-income neighbourhoods, 36 percent of men from the lowest-income neighbourhoods and 42 percent of men from the highest-income neighbourhoods.
- Care by a GP/FP with specialist consultation did not vary by income for women or men.

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EXHIBIT 6C.3 | Type of physician providing in-hospital care to adults aged 45 and older hospitalized for an acute myocardial infarction (AMI), by sex and age group, in Ontario, 2005/06



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

NOTE: Bars may not add to 100 percent due to rounding

GP/FP = General practitioner/family physician

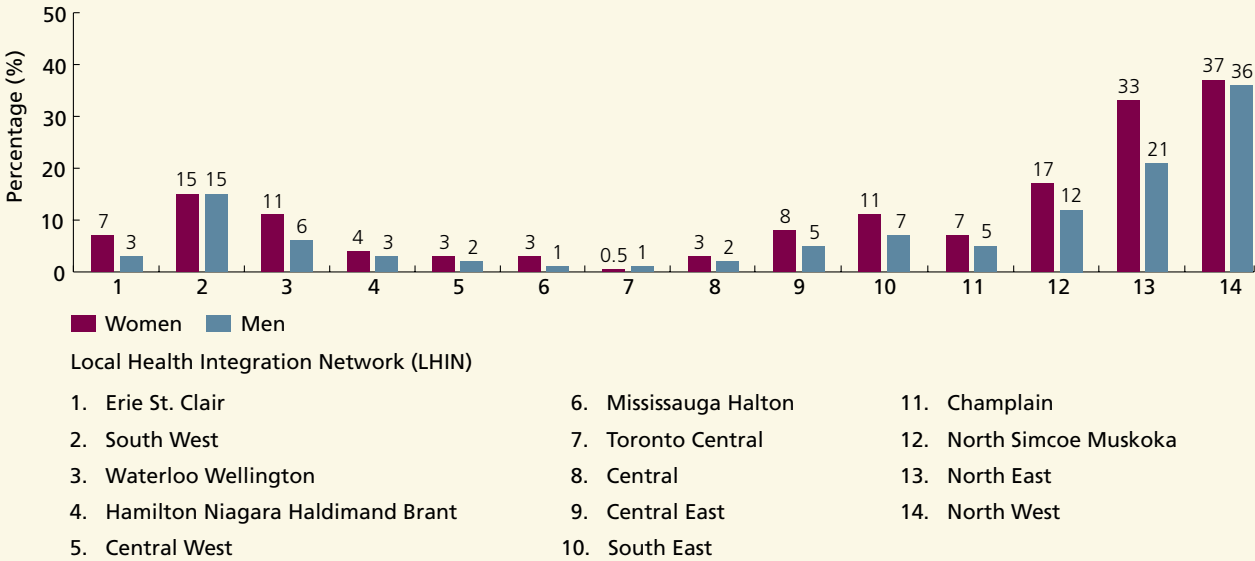
^ Specialist consultation includes consultation by a cardiologist or an internist/geriatrician

FINDINGS

- The type of physician providing in-hospital care for AMI patients varied by age among both women and men. Older AMI patients were less likely to have a cardiologist as their most responsible physician while in hospital and more likely to have been under the sole care of a GP/FP.
- Among those aged 80 and older, 27 percent of women and 29 percent of men had a cardiologist as their most responsible physician compared to 40 percent of women and 46 percent of men aged 45-64.
- Women and men aged 65-79 were also less likely to have had a cardiologist as their most responsible physician and more likely to have been under the sole care of a GP/FP than those aged 45-64.

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EXHIBIT 6C.4 | Percentage of adults aged 45 and older hospitalized for an acute myocardial infarction (AMI) who were under the sole care of a GP/FP while in hospital, by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

GP/FP = General practitioner/family physician

FINDINGS

- Across most LHINs, women were more likely than men to be under the sole care of a GP/FP when admitted to hospital for AMI.
- There was substantial regional variation in the percentage of AMI patients who were cared for solely by a GP/FP while in hospital.
- The percentage of women with an AMI who were under the sole care of a GP/FP while in hospital for an AMI ranged from 0.5 percent (Toronto Central LHIN) to 37 percent (North West LHIN). The rates in men ranged from one percent (Toronto Central LHIN) to 36 percent (North West LHIN).

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PHYSICIAN CARE WITHIN FOUR WEEKS OF HOSPITAL DISCHARGE AFTER AN ADMISSION FOR AN ACUTE MYOCARDIAL INFARCTION (AMI)

Indicator: This indicator measures the percentage of patients aged 45 and older who had a follow up physician visit within four weeks of discharge after a hospital admission for an acute myocardial infarction (AMI).

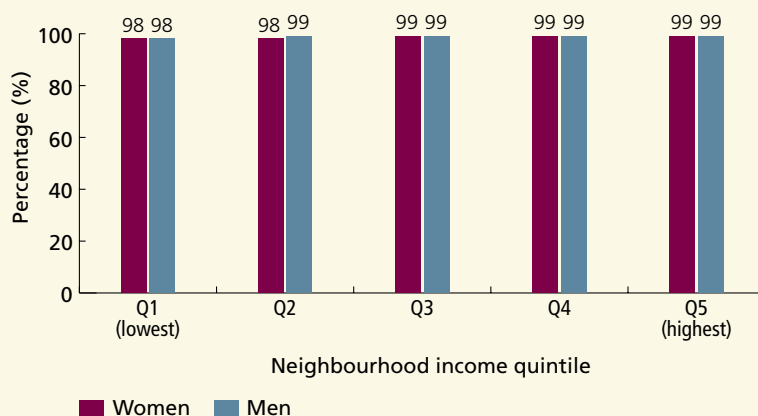
Background: Patients who have been hospitalized with an AMI should be seen by a physician within four weeks of hospital discharge. This visit serves many important functions. At this visit the presence or absence of cardiovascular symptoms and functional status are assessed. Prescription medicines are reviewed to assess adherence and side effects and to optimize therapy if necessary. Discharge plans and secondary prevention strategies are reviewed and this visit provides an opportunity to assess the physical activity level and psychological status of the patient.¹²⁷

Findings: In the Ontario population of patients aged 45 and older who were discharged home from hospital after an admission for an AMI in 2005/06 (n=15,328), 99 percent had seen a physician within four weeks of hospital discharge. This did not vary by sex (99 percent for women and men). Thus, initial follow up care for patients who are discharged home after an AMI is routinely provided in Ontario.

EXHIBIT 6C.5 | Percentage of adults aged 45 and older who were seen by a physician within four weeks of hospital discharge after an admission for an acute myocardial infarction (AMI), by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Nearly all women and men discharged from hospital following an AMI had a follow up physician visit within the recommended time frame.
- There was no income variation in access to follow up physician care post-discharge for women or men who were admitted to hospital with an AMI.
- There was some geographic variation in the percent of patients who had seen a physician within four weeks of discharge. The South East Local Health Integration Network (LHIN) reported the lowest rate (97 percent) while the Central West LHIN had the highest rate (100 percent) (data not shown). However, these differences were small.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

POWER Study

MEDICATION MANAGEMENT

LIPID-LOWERING THERAPY (STATINS) FOR ACUTE MYOCARDIAL INFARCTION (AMI) POST-DISCHARGE

Indicator: This indicator measures the percentage of acute myocardial infarction (AMI) patients aged 65 and older who filled a prescription for a statin post-discharge. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-AMI and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

Background: Reducing lipid levels is beneficial in patients with dyslipidemias for both primary and secondary prevention of coronary heart disease. Statins reduce low-density lipoprotein (LDL) cholesterol and triglyceride levels and have modest high-density lipoprotein (HDL) cholesterol raising properties. There is substantial evidence that the use of statins reduces the risk of recurrent events and improves survival in patients after an AMI. These benefits apply to both women and men, irrespective of age.¹⁴⁹ Previous studies have found that women are less likely to receive statins according to clinical guidelines than men.¹⁵⁰ The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for statin use in AMI patients is 90 percent.¹¹⁵

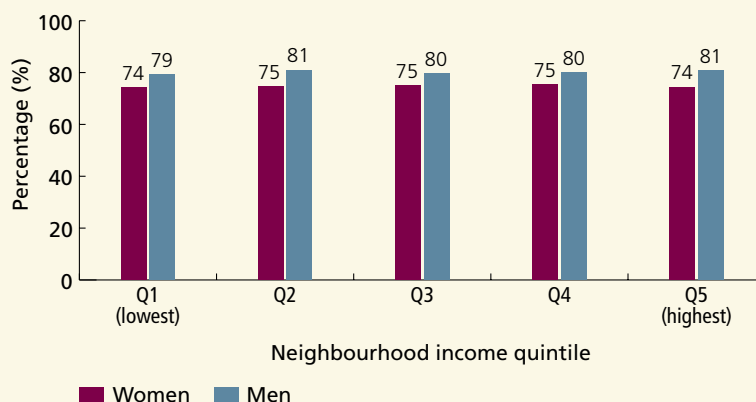
Findings: Within 90 days of discharge, 77 percent of adults aged 65 and older who were admitted for an AMI in 2005/06 and discharged alive (n=9,882) had filled a prescription for a statin. Of those who were alive one year post-discharge (n=7,961), 75 percent had filled a prescription for a statin between nine months and one year post-discharge. A smaller percentage of women than men filled a prescription for a statin within 90 days of discharge (75 percent versus 80 percent, respectively) and one year post-discharge (72 percent versus 78 percent, respectively).

EXHIBIT 6C.6 | Percentage of acute myocardial infarction (AMI) patients aged 65 and older who filled a statin prescription post-discharge from hospital, by sex and neighbourhood income quintile, in Ontario, 2005/06

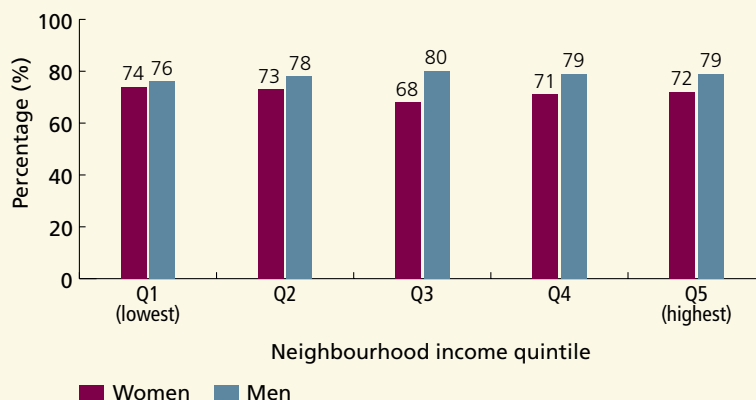
FINDINGS

- Across all neighbourhood incomes and at both time intervals, women who had been admitted to hospital for an AMI were less likely to fill a prescription for a statin than men.
- There was no income variation in statin utilization at either 90 days or one year post AMI discharge among women or men.
- Adults aged 80 and older were less likely than those aged 65-79 to have filled a prescription for a statin within 90 days post-discharge (69 percent versus 83 percent) and at one year post-discharge (67 percent versus 80 percent) (data not shown).

Within 90 days of discharge



One year post-discharge[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

[^] Sample is restricted to patients who were alive one year post-discharge

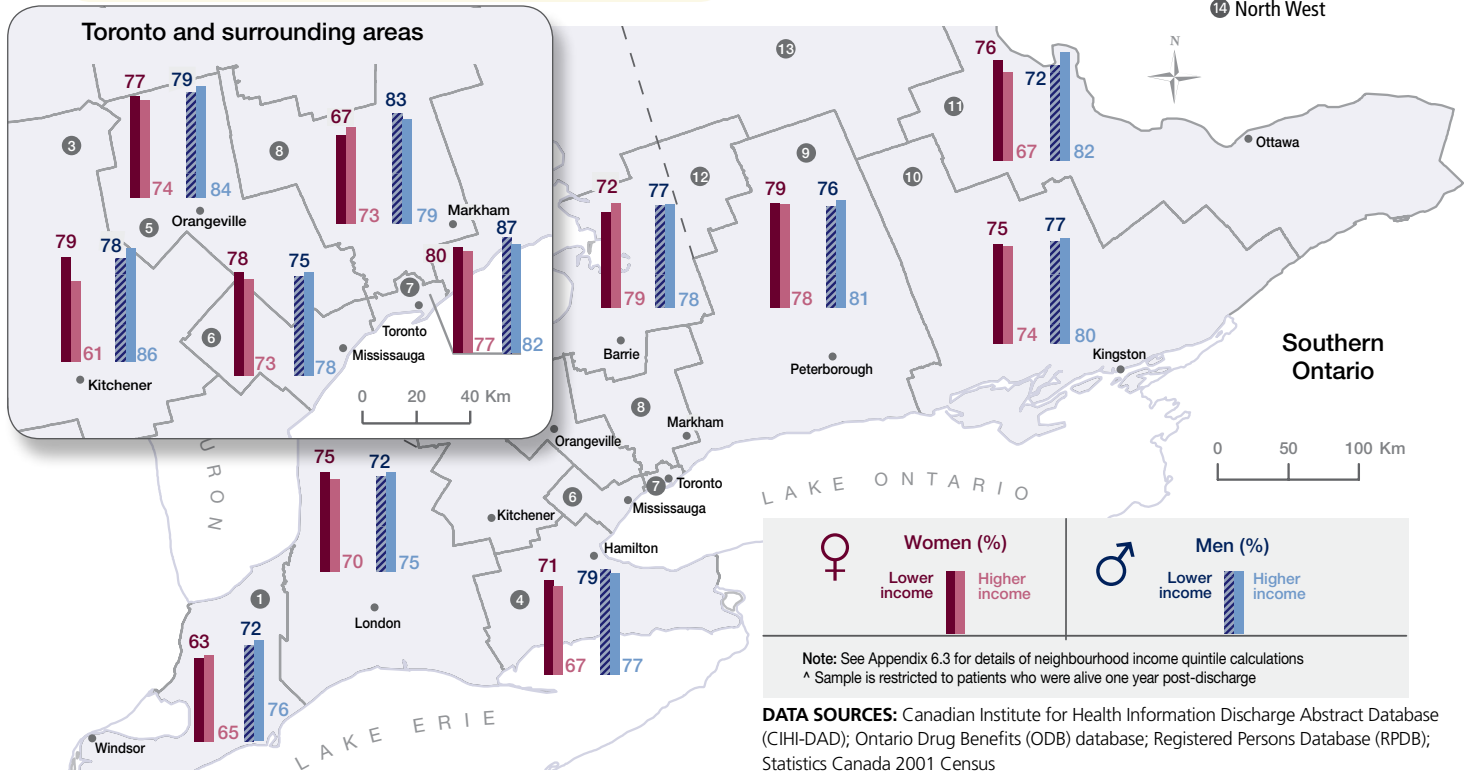
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EXHIBIT 6C.7 | Percentage of acute myocardial infarction (AMI) patients[^] aged 65 and older who filled a statin prescription one year post-discharge from hospital, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

FINDINGS

- There was regional variation in the percentage of patients who filled a statin prescription within 90 days of discharge from hospital after an AMI, ranging from 68 percent in the North East and North West LHINs to 83 percent in the Central West LHIN (data not shown).
- At one year post-discharge, the percentage of patients who had filled a prescription for a statin ranged from 69 percent in the North East and North West LHINs to 81 percent in the Toronto Central LHIN (data not shown).
- Among lower-income women the rates of statin use one year post-discharge ranged from 63 percent (Erie St. Clair LHIN) to 80 percent (Toronto Central LHIN); among higher-income women the rates ranged from 56 percent (North West LHIN) to 79 percent (North Simcoe Muskoka LHIN).
- Among lower-income men the rates of statin use one year post-discharge ranged from 70 percent (North West LHIN) to 87 percent (Toronto Central LHIN); among higher-income men the rates ranged from 74 percent (North East LHIN) to 86 percent (Waterloo Wellington LHIN) among higher-income men.

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BETA-BLOCKER THERAPY FOR ACUTE MYOCARDIAL INFARCTION (AMI) POST-DISCHARGE

Indicator: This indicator measures the percentage of AMI patients aged 65 and older who filled a prescription for beta-blocker post-discharge. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-AMI and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

Background: Beta-blocker use post-AMI can prevent recurrent ischemic events and ventricular arrhythmias. A meta-analysis of the benefits of beta-blocker use suggests that appropriate therapy could result in a 23 percent reduction in mortality.¹⁵¹ There is evidence of effectiveness in broad populations of AMI patients and guidelines recommend the long-term use of beta-blocker therapy for the secondary prevention of subsequent cardiovascular events in patients discharged from hospital after an AMI. The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for beta-blocker use in the “ideal” AMI patient is 90 percent.¹¹⁵ We would expect lower rates of use in our sample as, without clinical data, patients with clinical contraindications to beta-blocker use could not be excluded.

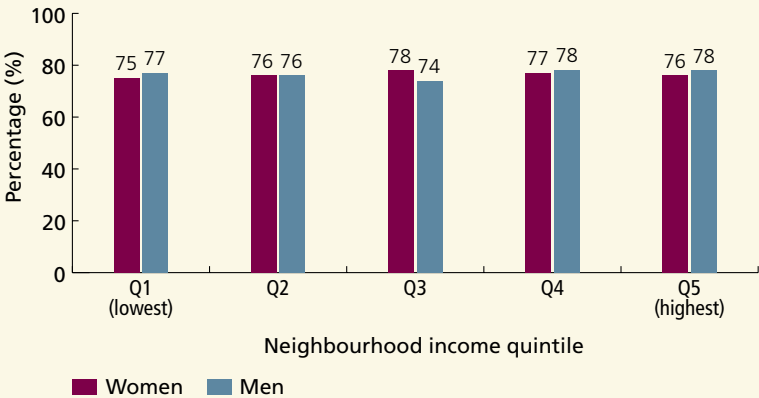
Findings: Within 90 days of discharge, 76 percent of adults aged 65 and older who were admitted for an AMI in 2005/06 and discharged alive (n=9,882) had filled a prescription for a beta-blocker. Women and men had the same rates of beta-blocker use (76 percent for both). Of those who were alive one year post-discharge (n=7,961), 69 percent had filled a prescription for a beta-blocker between nine months and one year post-discharge. This represents a decline over time in the rate of beta-blocker utilization in the post-AMI population under study. Similar to use at 90 days, there was no sex difference in drug utilization at one year (69 percent for both).

EXHIBIT 6C.8 | Percentage of acute myocardial infarction (AMI) patients aged 65 and older who filled a beta-blocker prescription post-discharge from hospital, by sex and neighbourhood income quintile, in Ontario, 2005/06

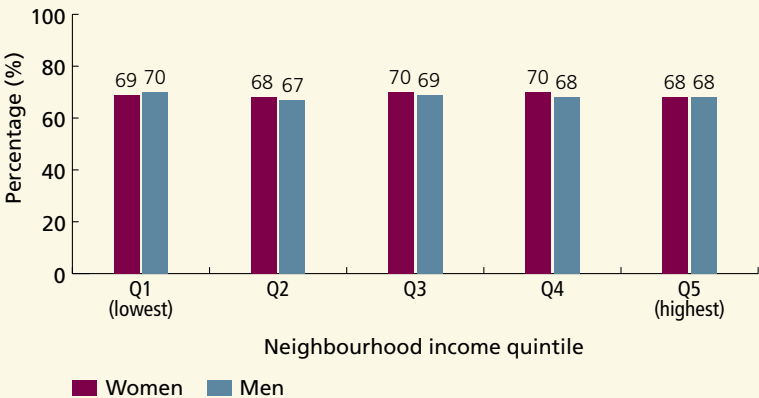
FINDINGS

- Within income quintiles, there were no sex differences in the percentage of adults who filled a prescription for a beta-blocker within 90 days or one year of AMI discharge.
- There was no income gradient in beta-blocker utilization among women or men at either time period.
- Compared to younger patients, men and women aged 80 and older were less likely to fill a prescription for a beta-blocker within 90 days of discharge (data not shown). At one year, the age difference was significant for men but not for women (data not shown).
- There was significant geographic variability in utilization of beta-blockers within 90 days and at one year post-discharge. The rates of beta-blocker use at 90 days post-discharge ranged from 70 percent in the North East and North West Local Health Integration Networks (LHINs) to 83 percent in the Champlain LHIN (data not shown). The rates one year post-discharge ranged from 62 percent (North East LHIN) to 74 percent (Champlain LHIN) (data not shown).

Within 90 days of discharge



One year post-discharge[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Statistics Canada 2001 Census; Registered Persons Database (RPDB)

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

[^] Sample is restricted to patients who were alive one year post-discharge

POWER Study

ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITOR THERAPY AND/OR ANGIOTENSIN II RECEPTOR BLOCKER (ARB) THERAPY FOR ACUTE MYOCARDIAL INFARCTION (AMI) POST-DISCHARGE

Indicator: This indicator measures the percentage of acute myocardial infarction (AMI) patients aged 65 and older who filled a prescription for angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARB) post-discharge. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post AMI and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

Background: ACE inhibitor therapy reduces morbidity and mortality in patients after an AMI. Recent clinical trials have also established ARBs therapy as an alternative to ACE inhibitors in patients who cannot tolerate ACE inhibitors.⁹⁰ ACE inhibitors are recommended for secondary prevention of AMI. The Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study benchmark for ACE inhibitor use in “ideal” AMI patients is 90 percent.¹¹⁵ We would expect lower rates of use in our sample as, without clinical data, patients with clinical contraindications to ACE inhibitor use could not be excluded.

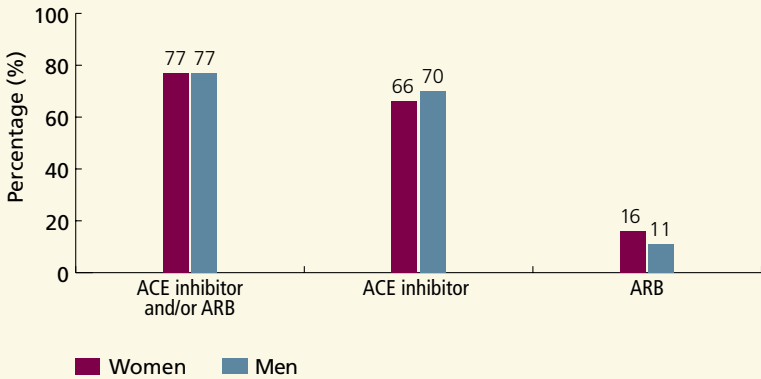
Findings: Within 90 days of discharge, 77 percent of women and 77 percent of men aged 65 and older who were admitted for an AMI in 2005/06 and discharged alive (n=9,882) had filled a prescription for either an ACE inhibitor or an ARB (or both). Of those who were alive one year post-discharge (n=7,961), 73 percent of women and 74 percent of men had filled a prescription for one of these two classes of drugs between nine months and one year post-discharge. The decline in use at one year was not significant.

EXHIBIT 6C.9 | Percentage of acute myocardial infarction (AMI) patients aged 65 and older who filled a prescription for an ACE inhibitor and/or an ARB post-discharge from hospital, by sex, in Ontario, 2005/06

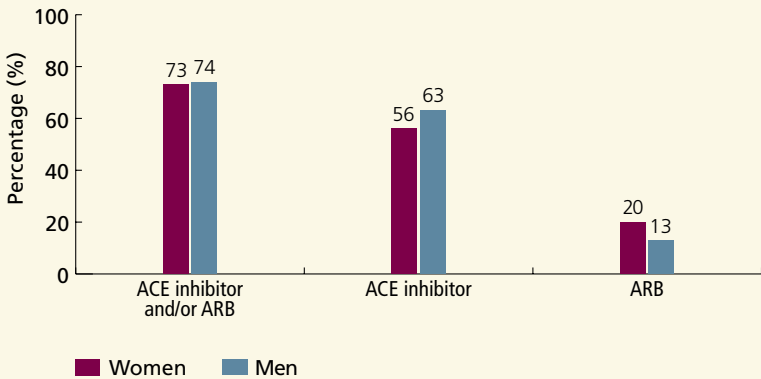
FINDINGS

- There was no sex difference in the percentage of adults who were using either ACE inhibitors and/or ARBs within 90 days or at one year post-discharge.
- Within 90-days of discharge and at one year post-discharge, more women than men were on ARBs and a greater percentage of women than men had switched from an ACE inhibitor to an ARB over the course of the year.
- Similar proportions of women and men were taking either an ACE inhibitor and/or an ARB at 90 days and at one year.

Within 90 days of discharge



One year post-discharge[^]



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

ACE inhibitor = Angiotensin-converting enzyme inhibitor;

ARB = Angiotensin II receptor blocker

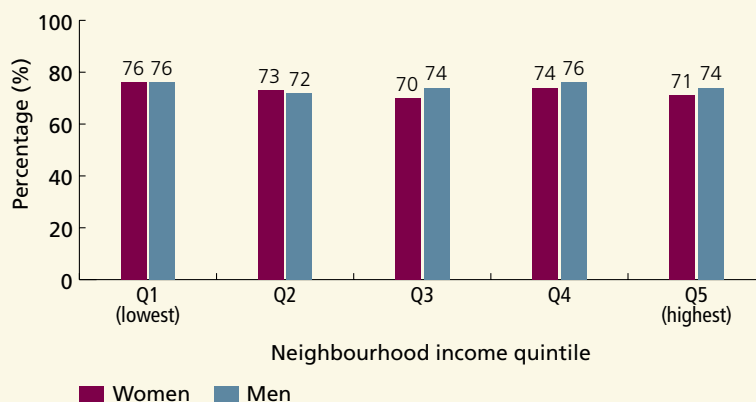
[^] Sample is restricted to patients who were alive one year post-discharge

POWER Study

EXHIBIT 6C.10 | Percentage of acute myocardial infarction (AMI) patients[^] aged 65 and older who filled a prescription for an ACE inhibitor and/or an ARB one year post-discharge from hospital, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- ACE inhibitor and/or ARB use within 90 days or at one year did not differ by neighbourhood income among women or men (one-year data are shown).
- Within age groups, there were no differences in the percentage of women and men that filled a prescription for an ACE inhibitor and/or an ARB within 90 days of discharge or at one year post-discharge (data not shown).
- Women and men, aged 80 and older were less likely than patients aged 65-79 to use ACE inhibitors and/or ARBs at 90 days (73 percent versus 79 percent) and at one year post-discharge (70 percent versus 76 percent) (data not shown).
- There was regional variation in ACE inhibitor and/or ARB use at 90 days and at one year post-discharge. ACE inhibitor and/or ARB use at 90 days ranged from 70 percent of patients in the North West Local Health Integration Network (LHIN) to 81 percent of patients in the Mississauga Halton LHIN (data not shown). At one year, the rates ranged from 67 percent (North West LHIN) to 78 percent (Central West and North Simcoe Muskoka LHINs) (data not shown).
- Across all LHINs, the rates of ACE inhibitor and/or ARB use were similar for women and men (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

ACE inhibitor = Angiotensin-converting enzyme inhibitor;

ARB = Angiotensin II receptor blocker

[^] Sample is restricted to patients who were alive one year post-discharge

POWER Study

EVALUATION OF ISCHEMIC HEART DISEASE

ANGIOGRAPHY FOR ACUTE MYOCARDIAL INFARCTION (AMI)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital for acute myocardial infarction (AMI) who underwent or were referred for coronary angiography within three months of hospital discharge.

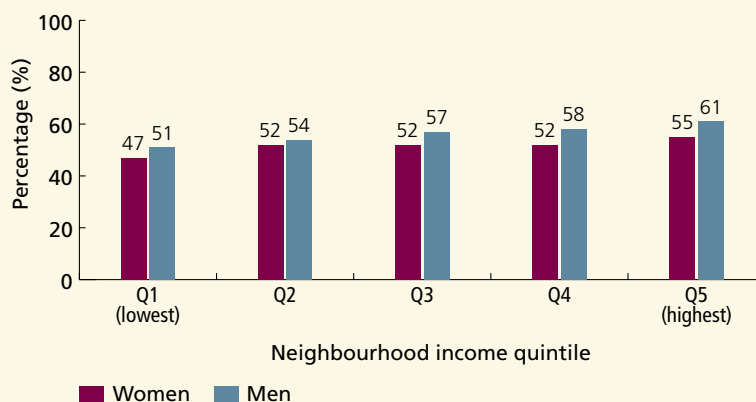
Background: Cardiac catheterization (angiography) is indicated as an important component of patient management after an AMI. Angiography provides an image of the coronary arteries and shows where there are blockages and the severity of these blockages. This information is used to identify patients who may benefit from revascularization using percutaneous coronary interventions or coronary artery bypass graft surgery (CABG). At the time of this study, cardiac catheterization post-AMI was the gold standard of care and was a quality indicator.¹⁵² More recent evidence suggests that there may be a role for risk stratification with stress testing post-AMI, prior to catheterization.¹⁵³ Nevertheless, for many post-AMI patients, catheterization is still recommended and many of those undergoing risk stratification with stress tests will require angiography.

Findings: In the Ontario population, patients aged 45 and older who had been admitted to hospital in 2005/06 with a primary diagnosis of AMI (n=16,580), 54 percent either undergo coronary angiography in hospital or were referred for the test within three months of discharge. Within this time frame, women were significantly less likely to receive or be referred for coronary angiography than men (44 percent versus 61 percent, respectively). After adjusting for age, the sex difference narrowed but persisted (51 percent of women versus 56 percent of men).

EXHIBIT 6C.11 | Age-standardized percentage of adults aged 45 and older admitted to hospital with an acute myocardial infarction (AMI) who underwent coronary angiography[^] within three months of discharge, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Across all income quintiles, women were less likely than men to undergo or be referred for coronary angiography within three months of hospital discharge.
- Angiography rates varied significantly by income. As income decreased, the likelihood of undergoing angiography also decreased for both women and men. Age-adjustment reduced but did not eliminate these income differences.
- There was an absolute difference of eight percent for women and 10 percent for men from the lowest to highest quintiles in the percent of post-AMI patients who underwent angiography.



DATA SOURCES: Cardiac Care Network (CCN); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

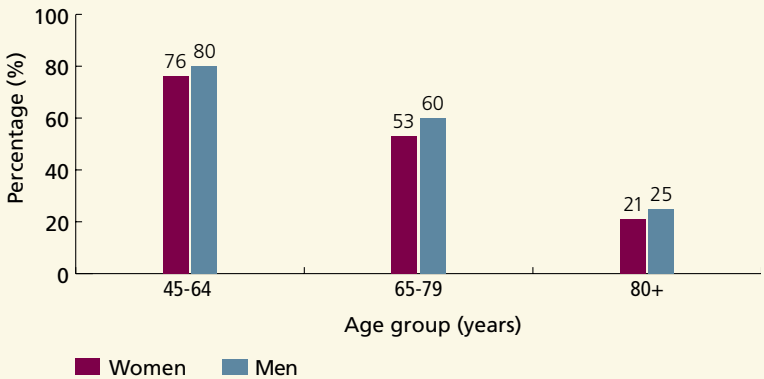
[^] Angiography was measured as in-hospital procedures performed prior to hospital discharge or referral within three months of discharge

POWER Study

EXHIBIT 6C.12 | Percentage of adults aged 45 and older admitted to hospital with an acute myocardial infarction (AMI) who underwent or were referred for coronary angiography^ within three months of discharge, by sex and age group, in Ontario, 2005/06

FINDINGS

- Across all age groups, a smaller percentage of women than men underwent coronary angiography after an AMI. The sex differences were not significant among patients aged 45-64.
- As age increased, coronary angiography rates declined significantly. Approximately four out of five AMI patients aged 45-64 (79 percent) underwent or were referred for coronary angiography within three months of discharge. The angiography rate declined to less than one-quarter (22 percent) in patients aged 80 and older.



DATA SOURCES: Cardiac Care Network (CCN); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

^ Angiography was measured as in-hospital procedures performed prior to hospital discharge or referral within three months of discharge

POWER Study

EXHIBIT 6C.13 | Age-standardized percentage of adults aged 45 and older admitted to hospital with an acute myocardial infarction (AMI) who underwent or were referred for coronary angiography^a within three months of discharge, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

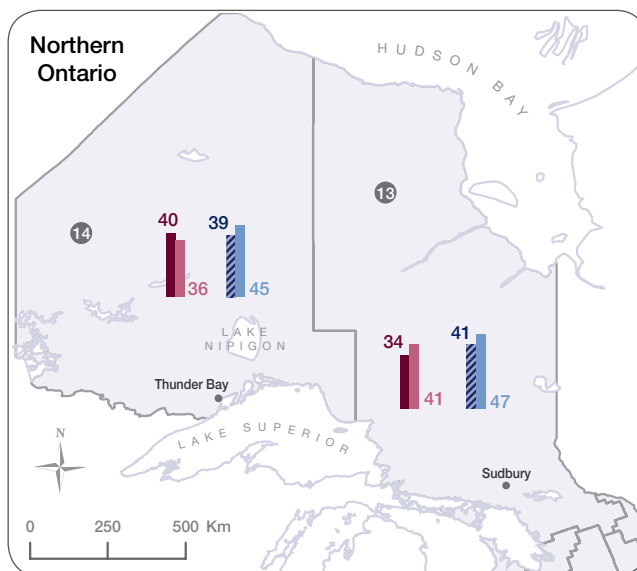
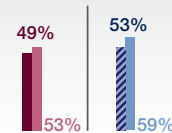
FINDINGS

- There was significant variation in the crude and age-adjusted rates of coronary angiography across LHINs (age adjusted data are shown).
- Age-standardized angiography rates ranged from 34 percent (North East LHIN) to 64 percent (South East and Central West LHINs) among lower-income women and from 34 percent (South West LHIN) to 69 percent (South East LHIN) among higher-income women.
- The rates ranged from 39 percent (South West and North West LHINs) to 67 percent (Central West LHIN) among lower-income men and from 45 percent (North West LHIN) to 70 percent (South East LHIN) among higher-income men.
- The size of the differences in rates between women and men and by income also varied across LHINs and there were a few LHINs where minimal or no sex or income differences were observed.

POWER Study

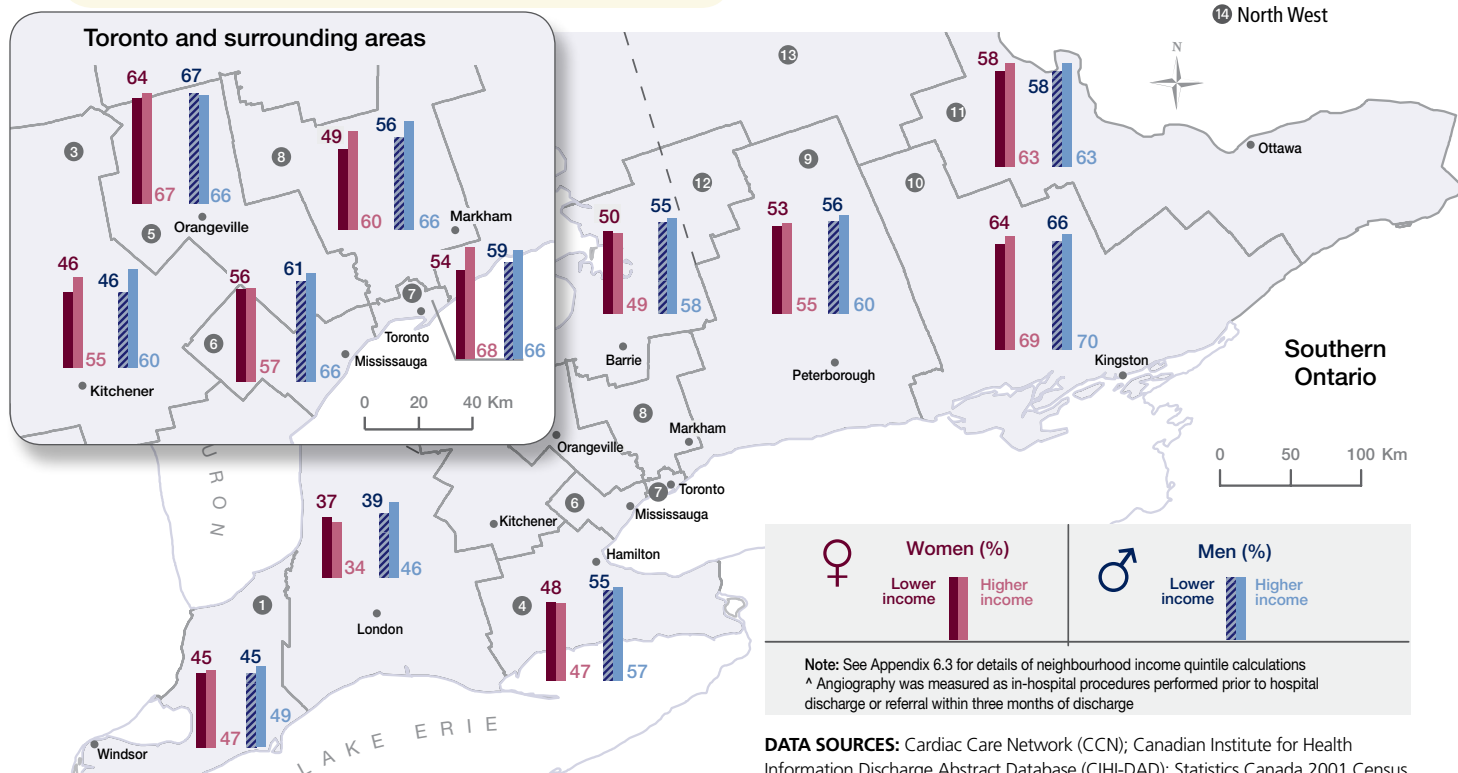
Overall Ontario

In Ontario, 49% of lower-income women, 53% of higher-income women, 53% of lower-income men and 59% of higher-income men received or were referred for coronary angiography within three months of hospital admission for AMI.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Cardiac Care Network (CCN); Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

OUTCOMES IN ACUTE MYOCARDIAL INFARCTION

READMISSIONS AND MORTALITY – RISK-ADJUSTED NON-ELECTIVE READMISSION RATES (PERCENTAGE) FOR ACUTE MYOCARDIAL INFARCTION (AMI) PATIENTS

Indicator: These outcome indicators measure the percentage of acute myocardial infarction (AMI) patients aged 45 and older who were readmitted to hospital within 30 days or one year after an AMI. Only non-elective readmissions were included. We examined non-elective readmission rates for all causes, related to any cardiovascular disease (CVD), and related to an acute coronary artery syndrome (ACS). The results of this analysis were risk-adjusted based on the models developed by the Canadian Institutes for Health Information (CIHI) and used in the 2006 Hospital Report Card.¹²² Rates were adjusted for patient age, sex and comorbidities (see [Appendix 6.3](#) for model details).

Background: Readmission rates are an important indicator of the success or failure of efforts to prevent secondary complications, a subsequent AMI, ongoing chest pain or heart failure (HF). According to the Canadian Cardiovascular Outcomes Research Team (CCORT), approximately 7.7 percent of AMI survivors were readmitted within one year of hospitalization for a second AMI, 12.5 percent for angina and 7.5 percent for HF. Readmission rates increase with age, as would be expected. Also, women were more likely to be readmitted for AMI, angina and HF across most age groups. There was also considerable regional variation in AMI outcomes including one-year readmissions.¹⁵⁴ Variations in readmission rates may be associated with disparities in the quality of care provided or differences in access to care. Recognizing these differences and determining the differences in care that result in differences in outcomes is important for developing strategies to reduce the occurrence of preventable readmissions and improve survival for all patient groups. A significant proportion of readmissions may be preventable with improved discharge planning, multidisciplinary ambulatory medical care and enhanced compliance with therapeutic regimens. In addition, specific barriers to care, adherence to therapy, and risk factor modification for different population groups needs to be addressed.

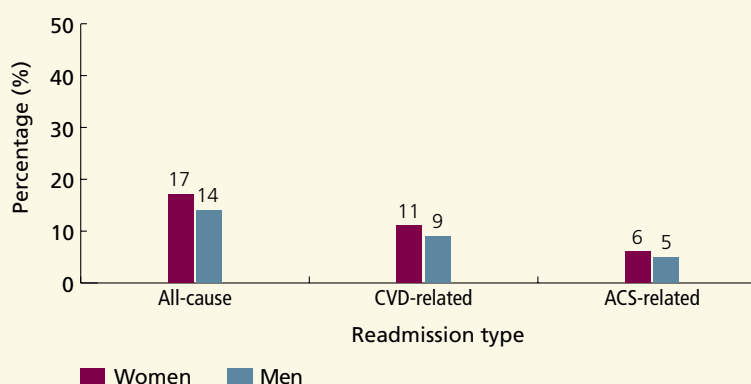
Findings: After risk-adjustment, in the Ontario population of patients aged 45 and older who were admitted to hospital for an AMI in 2005/06 and discharged alive (n=15,339), 15 percent had a non-elective readmission for any reason within 30 days of discharge. Six percent were readmitted for an ACS-related reason (including angina and AMI) and 10 percent were readmitted for CVD-related reasons (including ACS-related readmissions). The one-year readmission rates were substantially higher: 39 percent for all causes, 25 percent related to CVD and 16 percent for ACS. For all readmission types and at 30 days and at one year post-discharge, a significantly higher percentage of women than men were readmitted to hospital.

EXHIBIT 6C.14 | Risk-adjusted percentage of acute myocardial infarction (AMI) patients aged 45 and older who were readmitted to hospital, by sex, readmission type and period, in Ontario, 2005/06

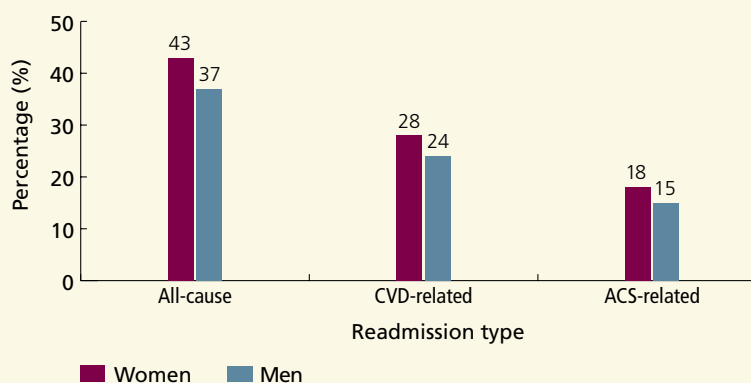
FINDINGS

- Among AMI patients and irrespective of time period and cause of readmission, women were consistently more likely to be readmitted to hospital than men.
- The risk-adjusted 30-day non-elective readmission rates were higher for women than men for all-cause (17 percent versus 14 percent), CVD-related (11 percent versus 9 percent) and ACS-related (6 percent versus 5 percent) readmissions.
- The risk-adjusted one-year non-elective readmission rates were higher for women than men for all-cause (43 percent versus 37 percent), CVD-related (28 percent versus 24 percent) and ACS-related (18 percent versus 15 percent) readmissions.
- Readmission rates within 30 days and within one year post-discharge did not vary by neighbourhood income for women or men. This was true irrespective of reason for readmission (data not shown).
- Readmission rates within 30 days and within one year of discharge increased with age (data not shown).

Readmissions within 30 days



Readmissions within one year



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

NOTE: ACS-related readmissions are part of CVD-related readmissions. All-cause readmissions represent all readmissions including CVD-related readmissions

CVD = cardiovascular disease;

ACS = acute coronary syndrome

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RISK-ADJUSTED MORTALITY (PERCENTAGE) IN ACUTE MYOCARDIAL INFARCTION (AMI)

Indicator: This indicator measures mortality among patients aged 45 and older who were admitted to hospital for an acute myocardial infarction (AMI). The results of this analysis are risk-adjusted based on the Ontario AMI prediction model. Rates were adjusted for patient age, sex and comorbidities (see [Appendix 6.3](#) for details of the full model).

Background: Mortality among patients with an AMI is important and is potentially related to quality of care for the acute treatment of AMI. High mortality rates may indicate a need for improvements in quality of care. Age-standardized, in-hospital case fatality rates for AMI have declined substantially. In Canada in 1994, 14.5 percent of AMI patients died in hospital compared to 9.7 percent in 2004. During the same period, the overall, age- and sex-standardized rate of death from AMI fell 38.1 percent, from 102.5 deaths per 100,000 population to 63.4 deaths per 100,000 population in 2004.⁵ Between 1997 and 2000 in Canada, the in-hospital mortality rate was 12 percent, with higher rates observed among elderly patients.¹⁵⁴ Regional variation in AMI mortality has been observed in Canada¹⁵⁵ and in the US.¹⁵⁶ Adherence to evidence-based guidelines for AMI care results in reduced mortality rates for AMI.

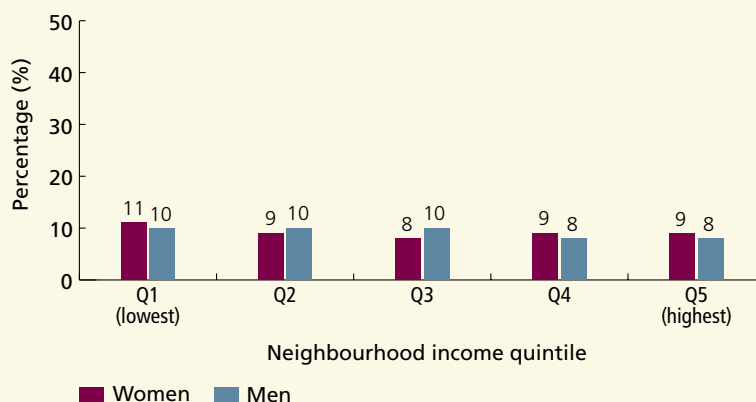
Findings: After risk-adjustment, in the Ontario population of patients aged 45 and older who were admitted to hospital in 2005/06 for an AMI (n=16,580), 9 percent had died within 30 days and 20 percent within one year of hospitalization. Crude mortality varied significantly by patient sex. Twelve percent of women and 8 percent of men died within 30 days of AMI admission and 24 percent of women and 18 percent of men had died within one year of admission. After risk-adjustment, the sex differences at both follow up periods disappeared. The risk-adjusted 30-day mortality rates for women and men were 10 percent and 9 percent respectively, and 20 percent at one year for both women and men.

EXHIBIT 6C.15 | Risk-adjusted mortality (percentage) among adults aged 45 and older who were admitted to hospital for an acute myocardial infarction (AMI), by sex and neighbourhood income quintile, in Ontario, 2005/06

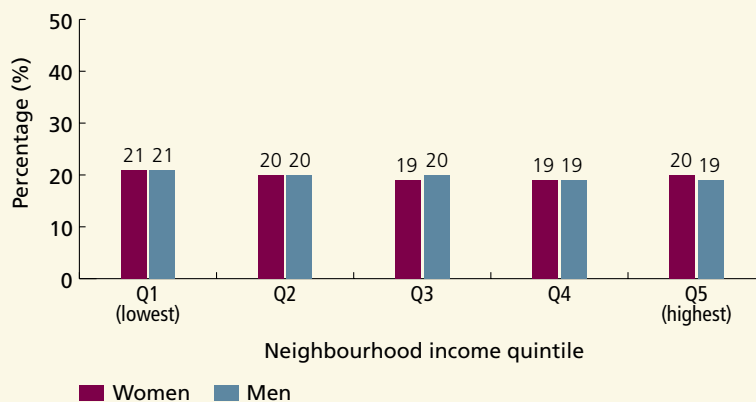
FINDINGS

- While crude mortality within 30 days and within one year were higher in women than in men across all income quintiles (data not shown), these differences did not persist after risk-adjustment.
- The risk-adjusted 30-day and one-year mortality rates did not vary by neighbourhood income among women or men.

30-day mortality



One-year mortality



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

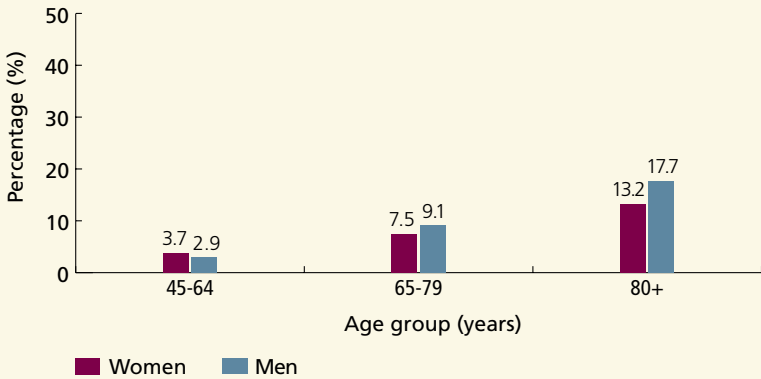
POWER Study

EXHIBIT 6C.16 | Risk-adjusted mortality (percentage) among adults aged 45 and older who were admitted to hospital for an acute myocardial infarction (AMI), by sex and age group, in Ontario, 2005/06

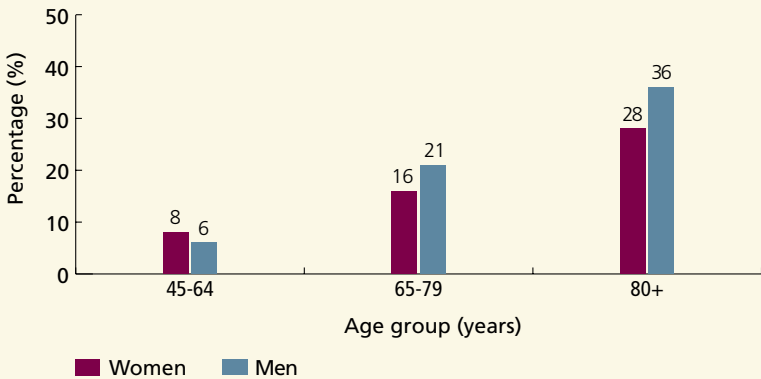
FINDINGS

- Risk-adjusted mortality within 30 days and within one year increased with age for women and men.
- Women aged 45-64 had higher risk-adjusted 30-day and one-year mortality compared to men.
- Men aged 80 and older had higher risk-adjusted 30-day and one-year mortality than women, though the sex difference in mortality within 30 days was not significant.

30-day mortality



One-year mortality



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 6C.17 | Risk-adjusted one-year mortality (percentage) among adults aged 45 and older who were admitted to hospital with an acute myocardial infarction (AMI), by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

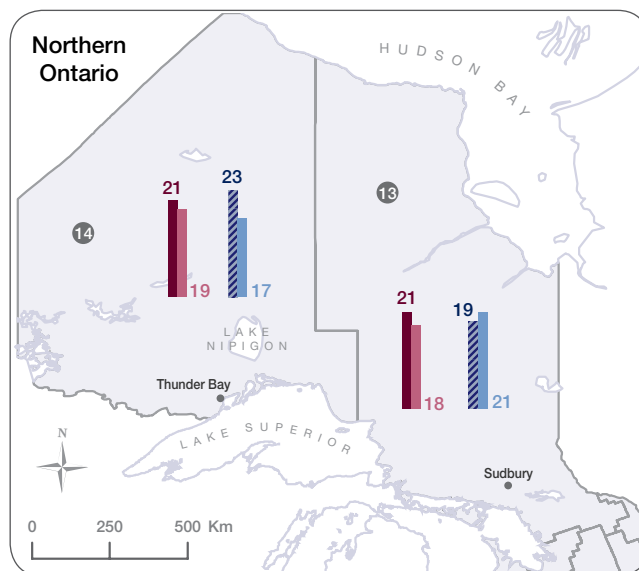
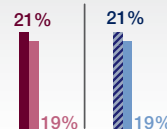
FINDINGS

- Risk-adjusted one-year mortality rates ranged from 17 percent (Mississauga Halton Local Health Integration Network (LHIN)) to 24 percent (North Simcoe Muskoka LHIN) among lower-income women and from 17 percent (North Simcoe Muskoka LHIN) to 21 percent (Mississauga Halton, Central and South East LHINs) among higher-income women.
- Among men, the risk-adjusted one-year mortality rates ranged from 18 percent (Hamilton Niagara Haldimand Brant LHIN) to 24 percent (Champlain LHIN) among lower-income men and from 17 percent (Champlain and North West LHINs) to 21 percent (Hamilton Niagara Haldimand Brant and North East LHINs) among higher-income men.
- Risk-adjusted 30-day mortality rates post AMI admissions ranged from 7 percent (Central West LHIN) to 11 percent (Central and South West LHINs) (data not shown).

POWER Study

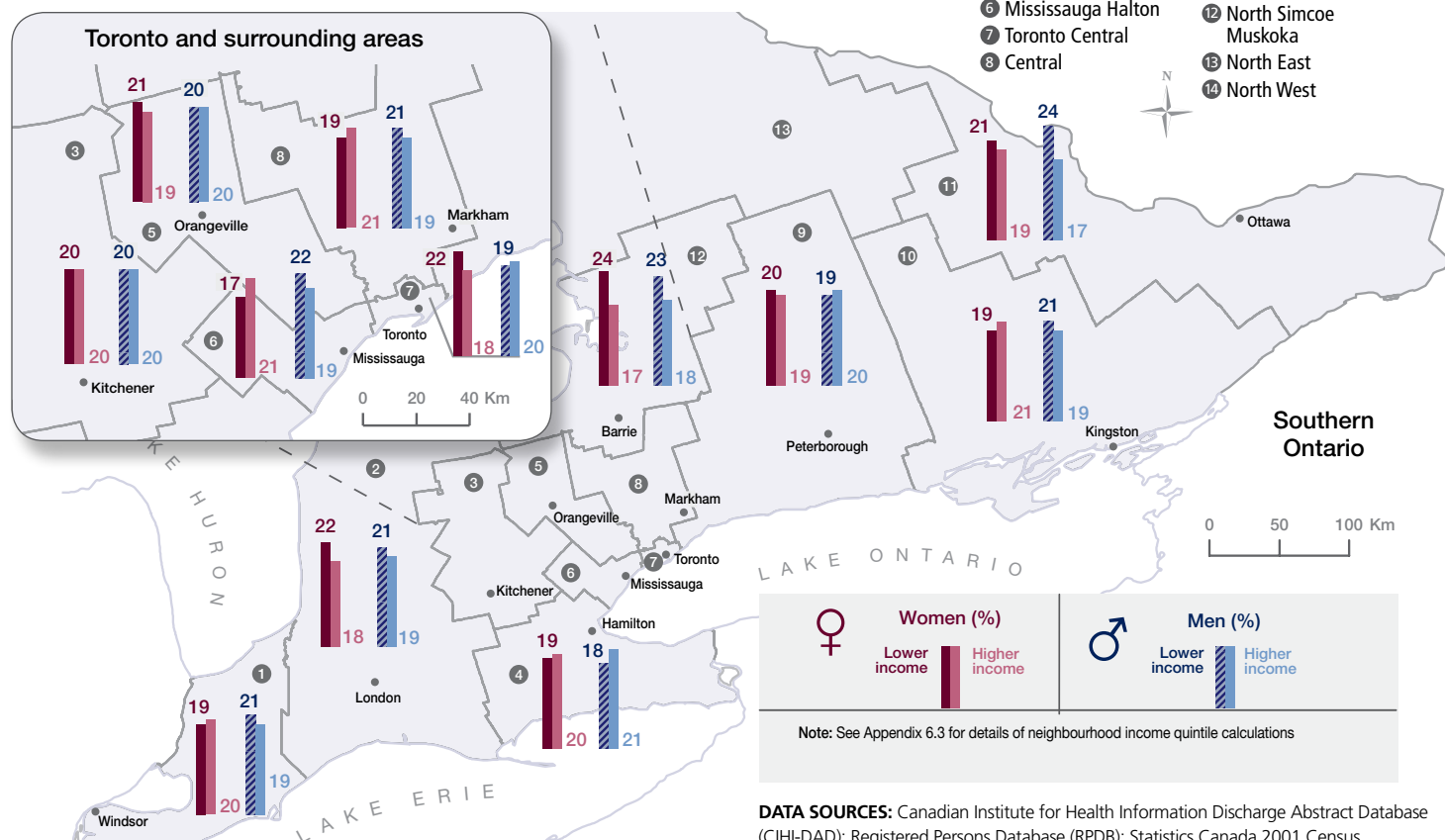
Overall Ontario

In Ontario, 21% of lower-income women, 19% of higher-income women, 21% of lower-income men and 19% of higher-income men died within one year of being admitted to hospital for AMI.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |



Note: See Appendix 6.3 for details of neighbourhood income quintile calculations

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB); Statistics Canada 2001 Census

WAIT TIMES FOR CARDIAC PROCEDURES

Indicator: These indicators measure the median and 90th percentile wait times (days) for angiography, angioplasty and coronary artery bypass graft surgery (CABG) among patients aged 45 and older. Waiting periods are counted from the date a patient is referred for the procedure by a cardiologist or cardiac surgeon. This does not include time spent waiting for evaluation of symptoms of heart disease before a patient is referred to a cardiologist or referred by a cardiologist for the procedure. In addition to measuring median and 90th percentile wait times, we also report the percentage of patients who undergo their procedure within the recommended maximum wait time calculated based on Cardiac Care Network (CCN) urgency rating scores.

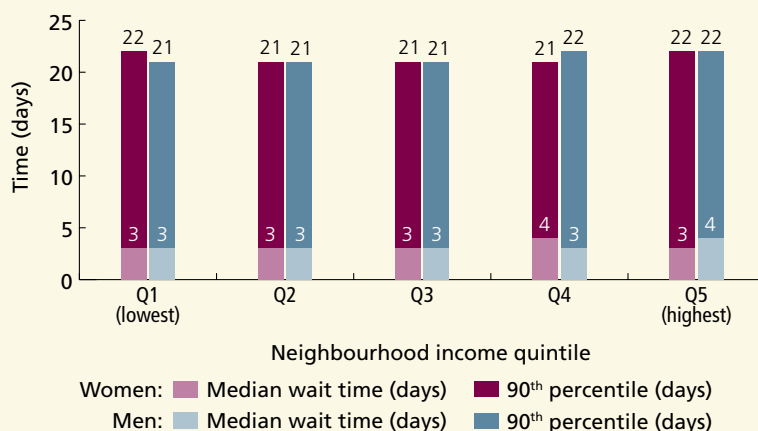
Background: Timely access to cardiac procedures including coronary angiograms, angioplasty, i.e., percutaneous coronary interventions and CABG is important for the detection and treatment of heart disease. Those waiting for advanced cardiac procedures may be at risk of serious complications such as myocardial infarction or death. In addition, uncontrolled cardiac symptoms requiring intervention result in reduced quality of life. The probability of such events occurring depends on the length of time spent waiting and the particular clinical features of each patient. In Ontario, patients waiting for angiography or CABG are assigned an urgency rating score that corresponds to one of three categories: urgent, semi-urgent or elective. Each urgency level has a corresponding recommended maximum wait time.¹⁵⁷ Although wait times for all coronary interventions have decreased over the past few years, there are some people who wait longer than recommended for their interventions; 39 percent of patients waiting for coronary angiography and 19 percent of those waiting for bypass surgery did not undergo their procedure within the recommended maximum wait time (RMWT) in 2004/05.⁴² A limitation of the wait times measures are that they do not capture referral biases or delays in referrals for cardiac procedures. Our objective was to determine whether wait times differed by sex or income. More recent data are now available and reported by the CCN that assess current wait times for these procedures.

Findings: In the Ontario population of patients aged 45 and older who were waiting for cardiac procedures the median and 90th percentile wait times were three days and twenty-one days, respectively, for angiography; two days and seventeen days, respectively, for angioplasty; and seven days and forty days, respectively, for CABG. The median and 90th percentile wait times did not vary by sex for any of the procedures.

EXHIBIT 6C.18 | Median and 90th percentile wait times (days) for angiography among patients aged 45 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- Among those referred for angiography, wait times did not vary by sex.
- Wait times for angiography did not vary by neighbourhood income for women or for men.
- This indicator does not reflect sex and income differences in angiography rates (see [Exhibit 6C.11](#)).
- Among women and men, wait times for angiography varied somewhat by age, with those aged 80 and older having shorter median and 90th percentile wait times than younger patients (data not shown). This may not be a clinically important difference.



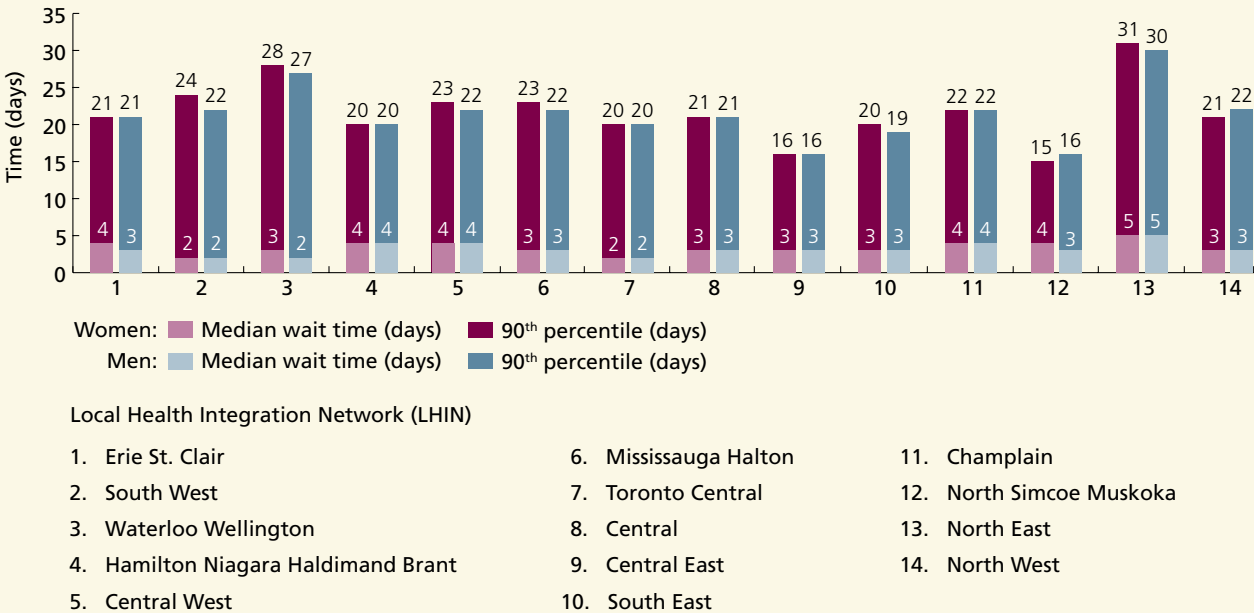
DATA SOURCE: Canadian Cardiac Network (CCN) wait times data

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

NOTE: These graphs will be converted to stacked bars in production

POWER Study

EXHIBIT 6C.19 | Median and 90th percentile wait times (days) for angiography among patients aged 45 and older, by sex and Local Health Integration Network (LHIN), in Ontario, 2006/07



DATA SOURCE: Canadian Cardiac Network (CCN) wait times data

FINDINGS

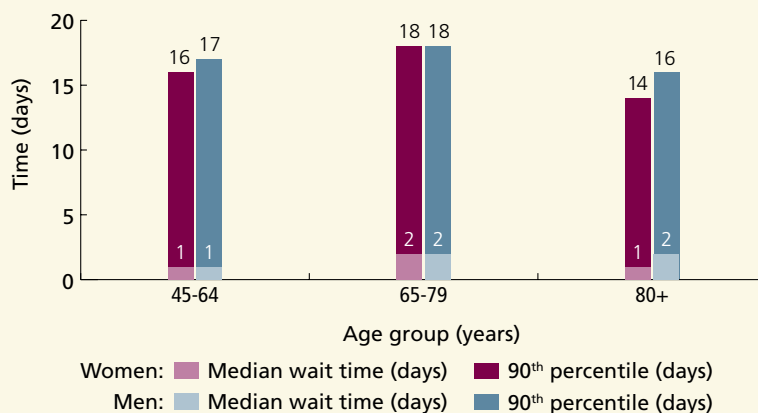
- There was some small variation in median wait times for angiography across LHINs, however, there were larger differences in the 90th percentile wait times with several LHINs having significantly longer wait times at the 90th percentile.
- There was no difference in the percentage of women and men who had their angiography completed within the recommended maximum wait time (RMWT) in any of the urgency categories (data not shown).
- The proportion of women and men who had their angiography within the RMWT did not vary by neighbourhood income, but did vary somewhat by age and LHIN (data not shown).

POWER Study

EXHIBIT 6C.20 | Median and 90th percentile wait times (days) for angioplasty among patients aged 45 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- Among those referred for angioplasty, wait times did not vary by sex (data not shown).
- Patients age 45-64 had shorter median wait times for angioplasty than patients age 65-79. This difference was small (one day versus two days, respectively) and may not be clinically important.
- Wait times for angioplasty did not vary by neighbourhood income but did vary across Local Health Integration Networks (LHINs) (data not shown).
- Seventy-seven percent of women and 80 percent of men underwent angioplasty within the RMWT (data not shown). This difference was not significant.
- The proportion of women and men who underwent angioplasty within the RMWT did not vary by neighbourhood income but did vary somewhat by age and by LHIN (data not shown).



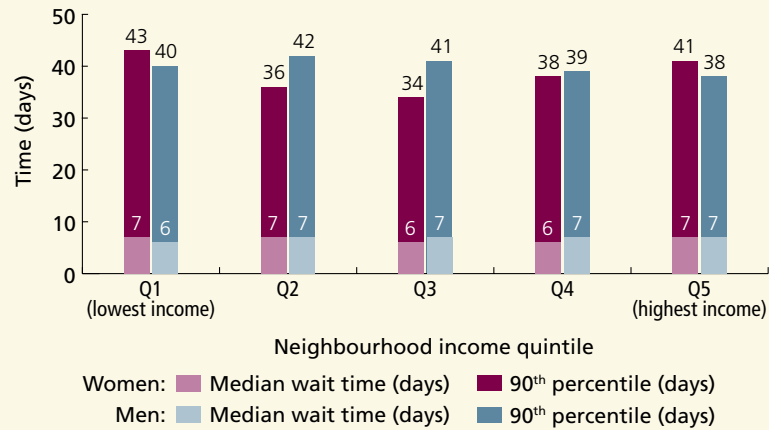
DATA SOURCE: Canadian Cardiac Network (CCN) wait times data

POWER Study

EXHIBIT 6C.21 | Median and 90th percentile wait times (days) for coronary artery bypass graft surgery (CABG) among patients aged 45 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- Among those referred for CABG, wait times did not vary by sex (data not shown).
- There was no clinically relevant income variation in wait times for CABG for women or men.
- There was some small age-related variation in wait times for CABG. Patients aged 80 and older had slightly shorter wait times than younger patients (data not shown).
- Wait times for CABG varied significantly across Local Health Integration Networks (LHINs) (data not shown).
- There was no difference in the percentage of women and men who had their CABG completed within the recommended maximum wait time (RMWT) in any of the urgency categories (data not shown).
- The percentage of patients who had their CABG within the RMWT did not vary by neighbourhood income or age but did vary by LHIN (data not shown).



DATA SOURCE: Canadian Cardiac Network (CCN) wait times data

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

POWER Study

IN-HOSPITAL CARE INDICATORS FOR ACUTE MYOCARDIAL INFARCTION

PERCENTAGE OF ELIGIBLE PATIENTS WITH AN AMI WHO RECEIVED ASPIRIN AT HOSPITAL DISCHARGE

Indicator: This indicator measures the percentage of acute myocardial infarction (AMI) patients aged 45 and older who received aspirin at hospital discharge. The sample excludes patients who received other antiplatelets, had a history of bleeding or coagulopathy, a platelet count of less than 100, an allergy to aspirin or patients who had no medications listed on their hospital chart.

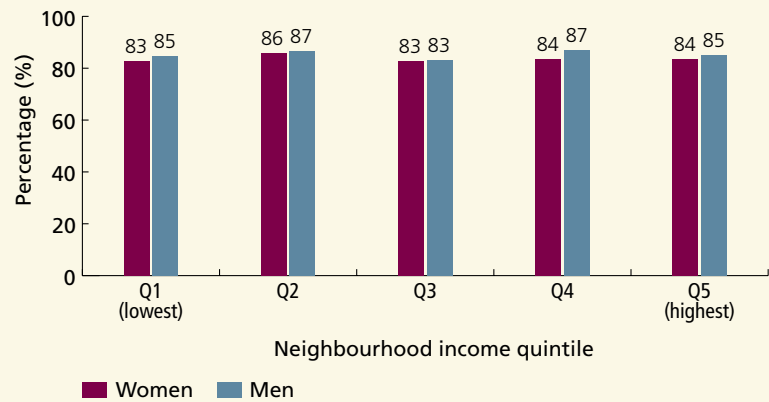
Background: Early use of aspirin in patients with AMI results in a significant reduction in adverse events (including subsequent mortality). Aspirin therapy provides a percent reduction in mortality that is comparable to thrombolytic therapy and the combination provides additive benefit for both patients with ST-elevation and non-ST elevation MI.¹⁵⁸ Since aspirin is available over the counter it is not possible to assess aspirin use using administrative data. The data for this indicator were from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study (see [Appendix 6.3](#) for details). The EFFECT study collected clinical data from hospital charts on patients who were admitted to acute care facilities with a most responsible diagnosis of AMI during the study period. Data used are from the fiscal years 1999/00-2000/01 and practice patterns may have changed over time. However, our primary purpose was to determine whether there were gender and socioeconomic differences in care on this measure.

Findings: In the Ontario population aged 45 and older who had been discharged alive from hospital during the EFFECT study time frame with a primary diagnosis of AMI and who were not excluded based on the criteria described above (n=7,894), 85 percent received aspirin or a prescription for aspirin at discharge. This did not vary by patient sex (84 percent of women and 85 percent of men).

EXHIBIT 6C.22 | Percentage of EFFECT study patients aged 45 and older admitted to hospital for an acute myocardial infarction (AMI) who received aspirin at discharge, by sex and neighbourhood income quintile, in Ontario, 1999/00-2000/01

FINDINGS

- Aspirin use did not differ by sex; 84 percent of women and 85 percent of men were prescribed aspirin upon hospital discharge after an AMI.
- There was no income variation in the percentage of AMI patients who received aspirin at the time of hospital discharge among either women and men.
- There was no age related variation in aspirin use for women or men (data not shown).



DATA SOURCES: Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I; Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

POWER Study

MEDIAN DOOR-TO-NEEDLE TIME (MINUTES) FOR THROMBOLYTIC THERAPY IN ST SEGMENT ELEVATION MYOCARDIAL INFARCTION (STEMI) PATIENTS PRESENTING TO AN EMERGENCY DEPARTMENT (ED)

Indicator: This indicator measures the median door-to-needle time for thrombolytic therapy in ST segment elevation myocardial infarction (STEMI) patients aged 45 and older who presented to an emergency department (ED) and who received thrombolysis within four hours of arrival to an ED.

Background: Timely administration of reperfusion therapy (thrombolysis or clot busting medications) is associated with conservation of heart muscle and a substantial reduction in acute myocardial infarction (AMI) mortality; the target being less than 30 minutes.⁴⁰ Since each minute counts toward a positive outcome for reperfusion strategies, timely reperfusion remains an important goal for improvement in AMI care.³⁹ Time to thrombolytic therapy is a strong predictor of outcome in patients with an AMI. Previous work has shown that women in Ontario had longer door-to-needle times than men, ranging from 5-9 minutes longer.⁴⁰ The data used for this indicator are from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study (see [Appendix 6.3](#) for details). The EFFECT study collected clinical data from hospital charts on patients who were admitted to acute care facilities with a most responsible diagnosis of AMI. Data used are from the fiscal years 1999/00-2000/01 and practice patterns may have changed over time. However, our primary purpose was to determine whether there were gender and socioeconomic differences in care on this measure.

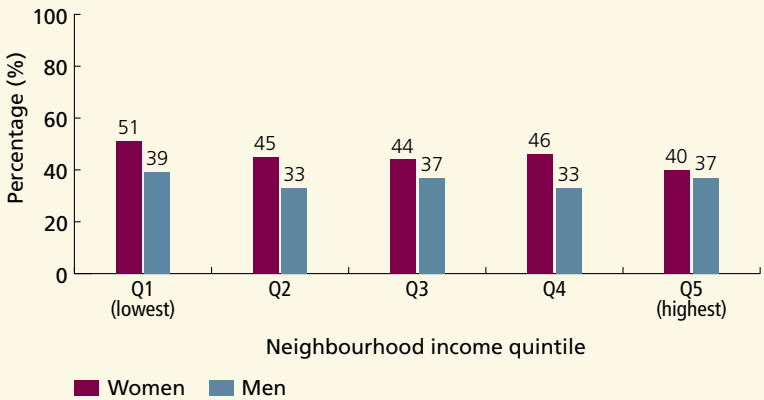
This measure captures only time to treatment among those who received thrombolytic therapy and as such does not reflect differences in who received this treatment. The time period measured for median door-to-needle time is initiated by the patient's arrival in the ED (door) and completed at the time the thrombolytic therapy is administered (needle). Patients with STEMI where thrombolysis was started within four hours of the patient's arrival in the ED were included.⁴⁰

Findings: In the Ontario population aged 45 and older who presented to hospital with STEMI during the EFFECT study time frame and who received thrombolytic therapy within four hours of presenting to the ED, the median door-to-needle time for thrombolytics was 38 minutes (interquartile range: 25 minutes to 64 minutes). Women had significantly longer median door-to-needle times than men (45 minutes versus 35 minutes, respectively).

EXHIBIT 6C.23 | Median door-to-needle time for thrombolytics in EFFECT study patients aged 45 and older presenting to hospital with ST segment elevation myocardial infarction (STEMI), by sex and neighbourhood income quintile, in Ontario, 1999/00-2000/01

FINDINGS

- Women had consistently longer median door-to-needle times than men across all income quintiles.
- While women from the lowest-income neighbourhoods had longer median door-to-needle times than women from the highest-income neighbourhoods, this difference was not significant, possibly due to small sample size and thus limited power to detect differences.
- Among men, there was no income variation in median door-to-needle times.
- In all age groups, women had longer median door-to-needle times than men (data not shown).
- In the overall EFFECT study population, median door-to-needle times varied by age and ranged from 35 minutes in those aged 45-64 to 40 minutes in patients aged 65-79 and to 47 minutes in those aged 80 and older (data not shown).



DATA SOURCES: Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I; Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

POWER Study

CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

We report on clinical care indicators related to coronary artery bypass graft surgery (CABG), including use of internal mammary artery to bypass left anterior descending artery, medications post surgery that have been shown to improve outcomes and outcomes following CABG including: mortality rates, lengths of hospital stay, hospital readmission rates and repeat revascularization within one year.

The early mortality rates for women are known to be greater than the rates for men following CABG based on previous data from Ontario.¹⁵⁹⁻¹⁶³ Factors that may contribute to this sex difference include delayed referral to cardiovascular specialists, older age, urgency, race/ethnicity, socioeconomic status and the presence of more comorbid disease at the time of revascularization.¹⁶⁴⁻¹⁷² Further research has shown that women's smaller body size may be related to increased in-hospital mortality and short- and long-term complications post CABG.¹⁷¹⁻¹⁷³ In fact, the higher early mortality risk for women following CABG in Ontario disappears when body size is taken into account.^{174, 175} Additionally, Ontario women were 1.5 times more likely to have a cardiac readmission for unstable angina and heart failure compared to men in the first year after CABG.¹³⁷

The gender gap in post-operative mortality after CABG has narrowed over time.¹⁷⁵ In order to achieve further reductions in gender differences in outcomes after CABG, the Society of Thoracic Surgeons has developed Gender-Specific Practice Guidelines For Coronary Artery Bypass Surgery.¹⁷⁶ In an evidence-based review they concluded that outcomes in women could be improved by assuring that dosages for anaesthesia and sedation account for body weight and by improved perioperative management of comorbidities commonly seen in women: anemia, diabetes and thyroid disease. They found that the use of internal mammary artery grafts was underutilized in women undergoing CABG procedures. As the internal mammary artery confers a protective effect that is associated with a significant reduction in CABG mortality compared to surgical revascularization with venous conduits alone they recommend that, whenever it is technically possible, at least one internal mammary artery is used.

USE OF INTERNAL MAMMARY ARTERY TO BYPASS LEFT ANTERIOR DESCENDING ARTERY IN CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

Indicator: This indicator measures the percentage of coronary artery bypass graft (CABG) patients aged 45 and older in whom the internal mammary artery was used to bypass the left anterior descending artery.

Background: In every patient undergoing CABG, the left internal mammary artery should be given primary consideration for revascularization of the left anterior descending artery. Empirical evidence suggests that use of the left internal mammary artery is associated with reduced operative mortality and leads to improved long-term survival after CABG.⁴² Use of this method should be encouraged for all patients including elderly, emergent or acutely ischemic patients. Studies have shown that the use of the left internal mammary artery is underutilized in women. While the preferred method would be to use the left internal mammary artery, the data do not distinguish between the left and right artery.

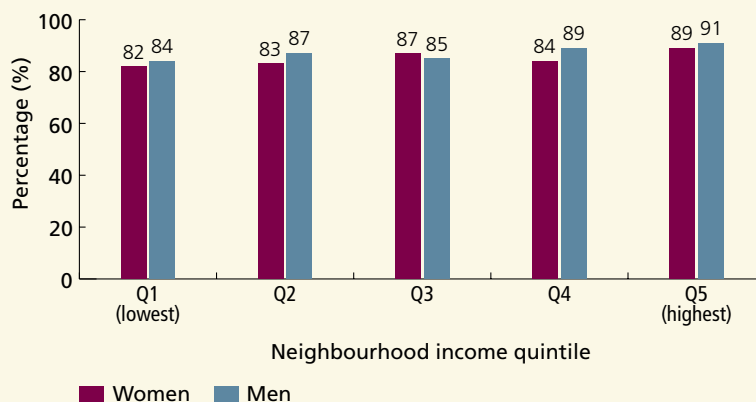
Findings: In the Ontario population aged 45 and older who underwent CABG in 2005/06 (n=6,902), the internal mammary artery was used to bypass the left anterior descending artery in 87 percent of eligible patients. The rates did not vary between women and men (85 percent versus 87 percent, respectively).

According to the methodology used in the Ontario CABG Report,¹⁰ procedures performed at the Kingston General Hospital are regularly excluded because of billing variations. When we excluded these records from the provincial data, the rate in the overall population (n=5,922) increased to 91 percent (89 percent in women and 92 percent in men).

EXHIBIT 6C.24 | Percentage of adults aged 45 and older who underwent coronary artery bypass graft surgery (CABG) in whom the internal mammary artery (IMA) was used to bypass the left anterior descending (LAD) artery[^], by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- The percentage of adults who had their internal mammary artery used to bypass the left anterior descending artery during CABG did not vary by sex.
- There was an income difference among men. Men from the highest-income neighbourhoods were more likely than men from the lowest-income neighbourhoods to have their internal mammary artery used to bypass the left anterior descending artery during CABG (84 percent versus 91 percent, respectively).
- While there was a similar absolute difference among women, the income variation in this group was not significant.
- Men aged 80 and older were less likely than younger men to have their internal mammary artery used to bypass the left anterior descending artery. The age-related variation among women was not significant (data not shown).



DATA SOURCES: CABG Dataset (Cardiac Care Network (CCN) database linked to CIHI-DAD, RPDB, Canadian Census, and OHIP), 2005/06

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

[^] Patients with absolute contraindications were excluded

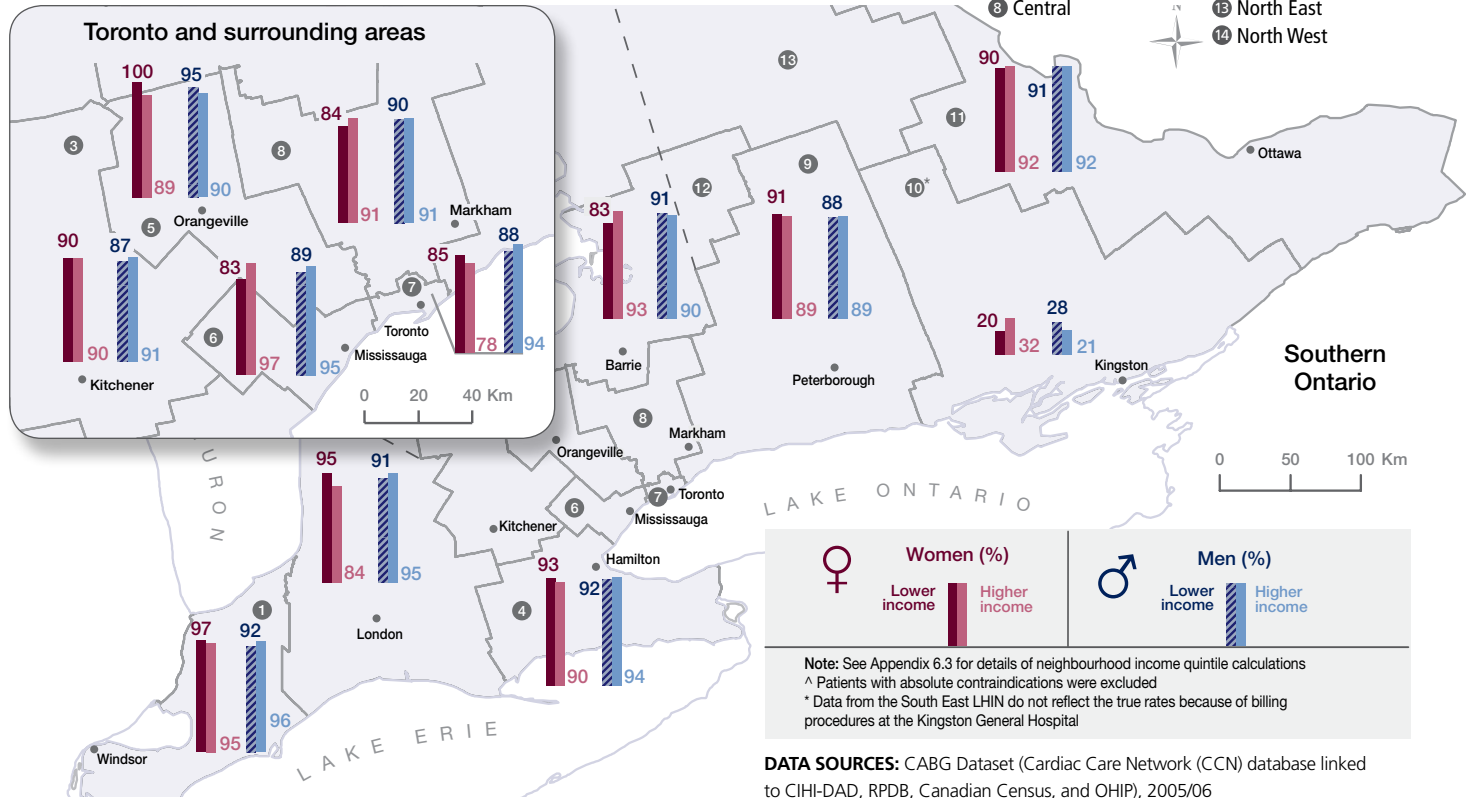
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EXHIBIT 6C.25 | Percentage of adults aged 45 and older who underwent coronary artery bypass graft surgery (CABG) in whom the internal mammary artery (IMA) was used to bypass the left anterior descending (LAD) artery,[^] by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

FINDINGS

- There was substantial regional variation in the use of the internal mammary artery to bypass the left anterior descending artery in CABG. Rates ranged from 95 percent in the Erie St. Clair Local Health Integration Network (LHIN) to 77 percent in the North East LHIN (data not shown).
- Among women, the rates ranged from 67 percent (North East LHIN) to 100 percent (Central West and North West LHINs) among lower-income women and from 63 percent (North East LHIN) to 97 percent (Mississauga Halton LHIN) among higher-income women.
- Among men, the rates ranged from 79 percent (North East LHIN) to 95 percent (Central West LHIN) among lower-income men and from 81 percent (North East LHIN) to 96 percent (Erie St. Clair LHIN) among higher-income men.
- The regional variation may be due to incomplete reporting by some cardiac centres.
- All ranges are reported excluding the South East LHIN.

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LENGTH OF STAY (LOS) FOR PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

Indicator: This indicator measures the mean pre- and post-operative hospital lengths of stay (LOS) for coronary artery bypass graft surgery (CABG) among patients aged 45 and older.

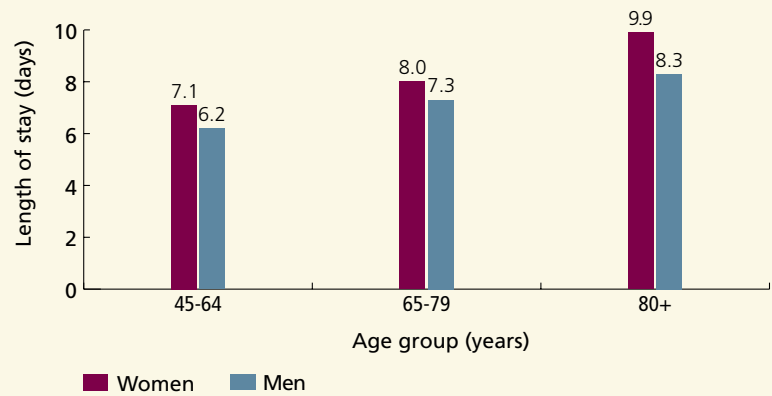
Background: Post-operative CABG LOS has been identified as an indicator of quality of care.^{42, 127} It can indicate areas for quality improvement to increase efficiency, reduce complications that increase LOS or to hasten recovery after surgery. Several factors may contribute to prolonged LOS including age, sex and clinical factors such as disease severity and comorbidity. The results of this analysis were risk-adjusted based on the methods used in the ICES CABG report.⁴² The model adjusts the mean values based on patient age (45-64, 65-74, 75 and older), sex (in the overall sample only), left ventricular function, left main disease, Canadian Cardiovascular Society (CCS) classification of angina, creatinine, previous CABG, and comorbid conditions (see [Appendix 6.3](#)). Mean post-operative LOS were calculated for the Ontario population aged 45 and older who underwent isolated CABG during 2005/06 and who did not die while in hospital (n=6,825). Data that reflected pre- and post-operative LOS greater than the 99th percentile were excluded to reflect more normally distributed data. This resulted in exclusion of 54 records for pre-operative LOS (n=6771) and 66 records for post-operative LOS (n=6759).

Findings: The mean pre-operative LOS was two days and the mean post-operative LOS was seven days. Women had significantly longer mean pre-operative (2.3 days versus 2.0 days) and post-operative (7.9 days versus 6.8 days) lengths of stay than men.

EXHIBIT 6C.26 | Risk-adjusted mean post-operative lengths of stay (LOS) (days) for coronary artery bypass graft surgery (CABG) in adults aged 45 and older, by sex and age group, in Ontario, 2005/06

FINDINGS

- Irrespective of age, women had longer post-operative LOS than men.
- Post-operative LOS increased with age for women and for men.
- There was income-related variation in post-operative LOS for men, from 6.5 days among men from the lowest-income neighbourhoods to 7.0 days for men from higher-income neighbourhoods. However, this difference was small. There was no income-related variation in post-operative LOS for women. (data not shown).
- Risk-adjusted, post-operative LOS varied significantly by Local Health Integration Network (LHIN), from 6.1 days (South East and North Simcoe Muskoka LHINs) to 7.8 days (Champlain LHIN) (data not shown).



DATA SOURCES: CABG Dataset (Cardiac Care Network (CCN) database linked to CIHI-DAD, RPDB, Canadian Census, and OHIP), 2005/06

POWER Study

MEDICATION MANAGEMENT AFTER CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

Indicator: These indicators measure the percentage of patients aged 65 and older who underwent CABG who filled prescriptions for beta-blockers, lipid-lowering therapy, and angiotensin-converting enzyme inhibitors after hospital discharge. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-surgery and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use.

Background: Specific medications have been identified as quality indicators of care post-CABG because they improve health outcomes.⁴²

Lipid-lowering therapy: All patients undergoing CABG should receive statin therapy or some other lipid-lowering agent unless contraindicated.⁴²

Beta-blockers: Pre-operative or early post-operative administration of beta-blockers in patients without contraindications should be used as the standard therapy to reduce the incidence and/or clinical sequelae of atrial fibrillation after CABG. They are also used after discharge to reduce morbidity and mortality from ischemic heart disease.⁴²

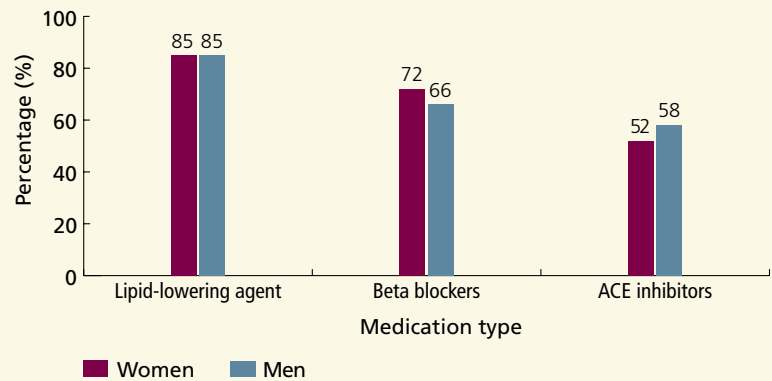
ACE Inhibitors: ACE inhibitors have a vascular protective effect in most patients with established coronary disease. While peri-operatively, their use is controversial; post-operatively—as an outpatient—prescription of ACE inhibitors is a quality indicator of care for CABG.⁴²

Findings: In the Ontario population aged 65 and older who had undergone CABG in 2005/06 and who had been discharged alive (n=3,685), 90 percent had filled a prescription for a lipid-lowering agent, 82 percent had filled a prescription for a beta-blocker and 63 percent had filled a prescription for an ACE inhibitor within 90 days of discharge from hospital. Of those who were still alive one year post-discharge (n=3,567), 85 percent had filled a prescription for a lipid-lowering agent, 68 percent had filled a prescription for a beta-blocker, and 57 percent had filled a prescription for an ACE inhibitor between nine months and one year post-discharge. Medication use did not vary by sex.

EXHIBIT 6C.27 | Prescription rates (percentage) for coronary artery bypass graft surgery (CABG) patients, aged 65 and older, one year post-discharge[^] from hospital, by sex and medication type, in Ontario 2005/06

FINDINGS

- There were no sex differences in the percentage of adults who filled prescriptions for lipid lowering agents, beta-blockers or ACE inhibitors after CABG at either time periods (one year data are shown).
- Receipt of any of these medications at either time period did not vary by neighbourhood income or age group (data not shown).
- Medication use within 90 days of discharge post-CABG did not vary by Local Health Integration Network (LHIN) for beta-blockers or for lipid lowering medications, but did vary by LHIN for ACE inhibitors (data not shown).



DATA SOURCES: CABG Dataset (Cardiac Care Network (CCN) database linked to CIHI-DAD, RPDB, Canadian Census, and OHIP), 2005/06; Ontario Drug Benefits (ODB) database

ACE inhibitor = Angiotensin-converting enzyme inhibitor

[^] Sample is restricted to patients who were alive one year post-discharge

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HOSPITAL READMISSION

Indicator: This outcome indicator measures one-year risk-adjusted readmission rates (percentage) after coronary artery bypass graft surgery (CABG). Data on 30-day readmissions and cause-specific readmissions at one year were also analyzed, however the small number of events resulted in less reliable rates that could not be risk-adjusted.

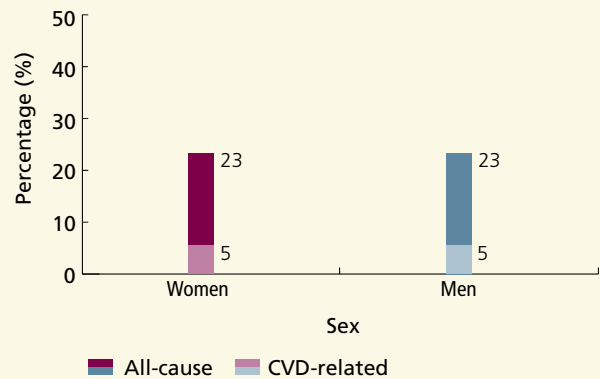
Background: In prior studies, women were more likely than men to be readmitted after CABG for all causes (including cardiac and non-cardiac diagnoses such as acute myocardial infarction (AMI), unstable angina, heart failure and stroke).¹³⁷ This may be due to the fact that women present with a worse risk profile. Ontario women who had CABG between 1991 and 2001 were older, of lower socioeconomic status, and had more comorbid illness (including diabetes, chronic obstructive pulmonary disease, peripheral vascular disease, cerebrovascular disease, and heart failure) than men. However, the sex differences in outcomes persisted even after risk-adjustment.¹³⁷ This could partly be explained by operative differences in the type of bypass graft that women received, as well as factors such as delayed recognition of the disease and delayed referral for women. The results of this analysis were risk-adjusted based on the methods used in the ICES CABG report.⁴¹ The model adjusts the rates for patient age (45-64, 65-74, 75 and older), sex (in the overall sample only), left ventricular function, left main disease, Canadian Cardiovascular Society angina classification, creatinine, previous CABG and comorbid conditions (see [Appendix 6.3](#)).

Findings: In the Ontario population aged 45 and older who were admitted to hospital for CABG in 2005/06 and who were discharged alive (n= 6,825), 23 percent were readmitted within one year of surgery and five percent were readmitted for a cardiovascular disease-related diagnosis (AMI, unstable angina, heart failure). While the crude rates of readmission varied significantly between women and men, these differences did not persist after risk-adjustment.

EXHIBIT 6C.28 | Risk-adjusted percentage of adults aged 45 and older who had a non-elective readmission to hospital within one year of coronary artery bypass graft surgery (CABG), by sex and readmission type, in Ontario, 2005/06

FINDINGS

- There were no sex differences in the risk-adjusted readmission rates for either cardiovascular disease-related or all-cause readmissions within one year of CABG.



DATA SOURCES: CABG Dataset (Cardiac Care Network (CCN) database linked to CIHI DAD, RPDB, Canadian Census, and OHIP), 2005/06

POWER Study

REVASCULARIZATION

Indicator: This outcome indicator measures the percentage of coronary artery bypass graft surgery (CABG) patients aged 45 and older who underwent revascularization within one year of discharge. The small number of events resulted in less reliable rates that could not be risk-adjusted.

Background: This indicator measures the durability of surgical treatment. Such measures can be influenced by several factors including: technical quality of the surgery, effectiveness of the procedure, selection of patients, and quality of post-operative care.^{42, 177, 178} This measure was first reported in the CABG Surgery Report Card.⁴² In 2003, the overall observed rate of repeat vascularization was 3.3 percent. There was large variation between hospitals based on the adjusted rate ranging from 1.2 percent to 5.1 percent.

Findings: In the Ontario population aged 45 and older who were admitted to hospital for CABG surgery in 2005/06 and who were discharged alive (n= 6,825), 1.6 percent underwent revascularization within one year—2.5 percent (37 out of 1487) of women compared to 1.3 percent (70 out of 5,338) of men. The difference in rates of revascularization between women and men was significant, even after adjusting for age. Risk-adjustment of the revascularization data was not possible due to the small number of events. Analysis by income and age was not possible.



MORTALITY

Indicator: This outcome indicator measures mortality following coronary artery bypass graft surgery (CABG) among patients aged 45 and older. In-hospital, 30-day, and one-year mortality were assessed. The small number of events resulted in less reliable rates that could not be risk-adjusted.

Background: Mortality of patients following CABG represents an important outcome that may be related to quality of care. This indicator identifies an undesirable outcome and high rates over time may warrant investigation into the quality of care provided.⁴² Female sex has been identified as a risk factor for mortality and morbidity after CABG, however, recent studies have shown that the comorbid conditions that are particularly associated with the later age at which women present for coronary surgery may explain much of the observed differences.¹³⁷

Findings: In the Ontario population aged 45 and older who underwent isolated CABG in 2005/06 (n=6,902), the crude mortality rates were 1.1 percent (in-hospital), 1.3 percent (within 30 days) and 3.3 percent (within one year). Crude and age-standardized mortality rates were consistently higher in women, but absolute differences were small. These differences were not significant ([Exhibit 6C.29](#)).

EXHIBIT 6C.29 | Age-standardized mortality rate (percentage) in adults aged 45 and older following coronary artery bypass graft surgery (CABG), by sex, in Ontario, 2005/06

Follow up period	Women		Men	
	Crude	Age-Standardized	Crude	Age-Standardized
In-hospital mortality	1.7	1.5	1.0	1.0
Mortality within 30 days	1.9	1.8	1.1	1.1
Mortality within one year	4.3	3.9	3.0	3.1

DATA SOURCES: CABG Dataset (Cardiac Care Network (CCN) database linked to CIHI DAD, RPDB, Canadian Census, and OHIP), 2005/06

FINDINGS

- Mortality rates for women and men after CABG were low.
- There were no sex differences in the age-standardized mortality rates following CABG at any of the follow up intervals.

POWER Study

Section 6C

SUMMARY OF FINDINGS

We found some sex differences in the delivery of quality indicators in patients admitted to hospital for an acute myocardial infarction (AMI). Women were less likely than men to have a cardiologist as their most responsible physician while in hospital, they were also less likely to undergo or be referred for angiography within the recommended period (during admission or within three months of discharge) or to fill a prescription for a statin within the first 90 days post-discharge or at one year post-discharge. Women also had higher risk-adjusted 30-day and one-year non-elective readmission rates than men and higher crude mortality during the same follow up intervals. Women and men experienced similar physician follow up rates within four weeks, use of beta-blockers, angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARBs), and aspirin post-AMI and wait times for coronary procedures. Among patients undergoing coronary artery bypass graft surgery (CABG), women had longer post-operative lengths of stay (LOS) and higher rates of revascularization than men, but other CABG indicators did not vary by sex.

Lower-income women and men were less likely to have a cardiologist as their most responsible physician, more likely to be under the sole care of a general practitioner/family physician (GP/FP) while in hospital and had lower rates of coronary angiography. Performance on other indicators did not differ by neighbourhood income. However, due to data limitations, we could not assess differences in medication use among those under age 65, and it is possible that medication use may differ in this age group due to differential access to prescription drug coverage.

For many measures, rates of performance were lower for older patients. Older patients may have more clinical contraindications for specific treatments so some of these differences are likely justified by clinical factors.

However, under use of effective interventions in this age group may also contribute to these differences. More detailed clinical information is needed to determine the relative contribution of these factors to performance. Findings for the indicators are summarized below.

In-Hospital Physician Care

- Overall, 36 percent of AMI patients admitted to hospital had a cardiologist as their most responsible physician; however, eight percent were under the sole care of a GP/FP. Women were less likely than men to be under the care of a cardiologist while in hospital for an AMI.
- In-patient cardiology care for AMI patients varied significantly by neighbourhood income. Twenty-nine percent of women and 36 percent of men from the lowest-income neighbourhoods had a cardiologist as their most responsible physician compared to 37 percent of women and 42 percent of men from the highest-income neighbourhoods.
- Older patients were less likely to be under the care of a cardiologist while in hospital and had higher rates of GP/FP sole care compared to younger patients.
- There was substantial regional variation in in-hospital physician care. The proportion of AMI patients under the sole care of a GP/FP ranged from less than one percent of patients from the Toronto Central Local Health Integration Network (LHIN) to more than one-third of patients from the North West LHIN.

Physician Follow Up Post-Discharge

- Nearly all women and men discharged from hospital after an AMI had a follow up physician visit within four weeks of discharge (99 percent). This did not vary by sex, neighbourhood income or age, but did show some regional variation. Initial follow up care for AMI patients is routinely provided in Ontario.

Medication Management Post-AMI

- Overall, among AMI patients aged 65 and older, 77 percent were taking a statin, 76 percent were on beta-blockers and 77 percent were using either ACE inhibitors and/or ARBs, based on prescription fill rates within 90 days of discharge. At one year post-discharge, prescription fill rates were 75 percent, 69 percent and 74 percent, respectively.
- Within 90 days and at one year post-discharge, the use of beta-blockers and ACE inhibitors/ARBs did not vary by sex, but women were less likely than men to be using statins.
- Medication use post-AMI did not vary by income, but did vary by LHIN and age. AMI patients aged 80 and older had lower rates of medication use than those aged 65-79 at both follow up periods.

Angiography

- Overall, 54 percent of AMI patients received or were referred for coronary angiography within the prescribed period. Women were significantly less likely than men to undergo angiography; 44 percent versus 61 percent. The sex difference persisted after age adjustment; 51 percent of women versus 56 percent of men.
- Angiography rates also varied significantly by income; AMI patients from lower-income neighbourhoods had significantly lower angiography rates than those from the highest-income neighbourhoods. Again, age-adjustment reduced but did not eliminate these differences.
- Angiography rates declined with increased age, from 70 percent among AMI patients aged 45-64 to 22 percent among patients aged 80 and older.
- Age-adjusted angiography rates varied regionally from 40 percent in the North West LHIN to 69 percent in the South East LHIN.

Outcomes in AMI: Non-Elective Readmissions and Mortality

- Overall, 15 percent of AMI patients were readmitted to hospital within 30 days and 39 percent were readmitted

to hospital within one year for any reason. About two-thirds of all readmissions were related to cardiovascular disease (CVD) and of these more than half were specifically related to angina or AMI.

- At both follow up periods, women were more likely to be readmitted to hospital, based on rates that were risk-adjusted for age and comorbidities.
- Risk-adjusted non-elective readmission rates varied significantly by patient age and LHIN, but not by neighbourhood income.
- Nine percent of AMI patients had died within 30 days and 20 percent had died within one year of hospitalization. Crude mortality varied significantly by sex at 30 days (12 percent of women and 8 percent of men) and at one year (24 percent of women and 18 percent of men), but these differences were eliminated after risk-adjustment based on age and comorbidities.
- Risk-adjusted mortality varied significantly by age and region, but not by neighbourhood income.

Wait Times for Cardiac Procedures: Angiography, Angioplasty and CABG

- Median wait times for cardiac procedures were three days for angiography, two days for angioplasty and seven days for CABG. Wait times did not vary by sex or neighbourhood income, but did vary somewhat by age and region.
- Wait times data were based on patients who were referred for procedures, and as such, are not able to capture referral biases or delays in referrals.

In-Hospital Care: Aspirin and Median Door-to-Needle Times

- Findings on in-hospital quality indicators are based on chart review data from the Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study data from 1999/00-2001/02.
- Of AMI patients who did not have any contraindications to aspirin, 85 percent received aspirin or a prescription

for aspirin at the time of discharge. This did not vary by sex, income or age.

- Of patients with ST-segment elevation myocardial infarction who received thrombolysis within four hours of arrival to hospital, the median door-to-needle time was 38 minutes. Women had significantly longer median door-to-needle times than men; 45 minutes versus 35 minutes, respectively. Median door-to-needle times did not vary by neighbourhood income but did increase with age.

CABG Indicators

- Overall, 87 percent of patients had their internal mammary artery used to bypass their left anterior descending artery and this did not vary by sex, or neighbourhood income, but did show some age-related variation, though only among men.
- There was substantial regional variation in the use of the internal mammary artery to bypass the left anterior descending artery in during CABG. Rates ranged 77 percent in the North East LHIN to 95 percent in the Erie St. Clair LHIN (excluding the South East LHIN, due to incomplete reporting).
- The mean post-operative LOS for CABG patients was 7.0 days. LOS varied significantly by sex (7.9 days for women and 6.8 days for men), age and region, but did not vary by neighbourhood income.
- Medication management for CABG patients aged 65 and older was assessed within 90 days of discharge and at one year post-discharge, based on prescription fill rates for beta-blockers, lipid-lowering agents and ACE inhibitors. Use of these medications did not vary by sex, age group or by neighbourhood income. There was some regional variation in medication use post-CABG; specifically ACE inhibitor use within 90 days of discharge varied regional as did beta-blocker use at one year post-discharge.
- Outcomes post-CABG included revascularization, re-admissions and mortality. Due to small numbers, these indicators are not reported by neighbourhood income, age group or region.
- Women were more likely to undergo revascularization within one year than men (2.5 percent versus 1.3 percent) and this difference persisted after adjusting for age.
- Twenty-three percent of CABG patients were readmitted to hospital within one year of surgery. Women had higher crude readmission rates than men. These differences did not persist after risk-adjustment.
- Among patients undergoing CABG, 1.1 percent died in-hospital, 1.3 percent died within 30 days and 3.3 percent died within one year of surgery.
- Mortality post-CABG was uniformly low and did not vary by sex.

Section 6D

Stroke

INTRODUCTION

Stroke is a leading cause of death and disability in Canada and in other industrialized countries.¹⁸⁰ Fortunately, the past decades have seen the publication of numerous randomized controlled trials of effective interventions for acute stroke therapy and secondary stroke prevention.

In the acute stroke scenario, there is evidence that aspirin, thrombolysis and care in an acute stroke unit can each improve outcomes.^{181, 182} In addition, the effectiveness of a number of therapies for secondary stroke prevention has been established, including antiplatelet therapy, anticoagulation for atrial fibrillation, lipid-lowering therapy, blood pressure control and carotid endarterectomy for carotid stenosis.^{183, 184}

Based in part on these clinical trials, Canadian guidelines have been developed for the provision of evidence-based, high quality stroke care.^{41, 185} Although specific benchmarks for these quality indicators have not yet been established, regional and institutional variations in the quality of stroke care delivery have been documented in many jurisdictions, including Canada.¹⁸⁶⁻¹⁸⁸ This may be because stroke care delivery requires both stroke-specific resources (such as the availability of advanced neuroimaging) and expertise (such as the physicians with training in vascular neurology to determine the appropriateness of thrombolytic therapy) that may not be available at all institutions. In order to help minimize such variations in care, the Ontario Stroke System was initiated in 1999 by the Heart and Stroke Foundation, and is now fully implemented and coordinated through the Ontario Ministry of Health

and Long-Term Care (MOHLTC) and the Ontario Stroke Network. The Ontario Stroke System includes the designation of regional stroke centres which coordinate and manage care throughout an entire region and district stroke centres that help deliver specialized stroke care. The Ontario Stroke System facilitates optimal stroke care delivery through ambulance bypass protocols, transfer agreements and regional quality improvement initiatives. The quality of stroke care delivery in Ontario is measured and monitored through the Registry of the Canadian Stroke Network (www.rcsn.org) and is reported to the Ontario Stroke Evaluation Advisory Committee.¹⁸⁹

In contrast to heart disease, studies of stroke care have not demonstrated consistent gender differences in clinical management. Although some studies have suggested lower use of interventions such as antithrombotic therapy, carotid imaging and carotid surgery in women compared to men, other studies have found no significant gender differences in care.¹⁹⁰⁻²⁰³ Although men have higher stroke incidence rates, women are more likely than men to die from a stroke, primarily because women are over-represented in the older age groups and stroke mortality is higher with increasing age.^{194, 204} In addition, women who survive a stroke may have worse

outcomes than men. Studies have found that women are less likely than men to make a complete recovery; are more likely to be dependent on others for self-care activities; have a longer average length of stay in hospital and are more likely to be transferred to long-term care facilities after stroke admission.^{196, 200, 202, 205-207}

Age is associated with an increased risk of stroke and after age 55, the risk of stroke doubles every 10 years⁸⁷ Using Ontario records from the Registry of the Canadian Stroke Network Canadian, Saposnik and colleagues found patient age to be associated with 30-day and one-year case fatality after stroke even after adjustment for indicators of care and comorbid conditions.²⁰⁸ Clinical decision making becomes more complex in older patients, particularly those over the age of 80, as they have a higher prevalence of comorbidities and pre-existing conditions that needs to be considered in deciding upon a course of treatment. At the same time they may be at risk for under use of effective interventions that would provide benefit.

Socioeconomic status has also been found to be associated with stroke incidence and outcomes, with several studies documenting that people with lower socioeconomic status have a greater risk of stroke incidence, mortality and case fatality rates.²⁰⁹⁻²¹⁴ It is not known whether this is due to differences in risk factors, access to care or other factors. Also, it is not known whether there is an interaction between gender, socioeconomic status and stroke outcomes.

This chapter will present analyses of emergency department visits and hospital admissions for stroke and transient ischemic attack (TIA) in Ontario. Acute stroke interventions (care in a stroke unit, thrombolysis, acute antithrombotic therapy, swallowing assessments), interventions for secondary stroke prevention (anti-hypertensive use, antithrombotic use, lipid-lowering therapy, carotid endarterectomy) and outcomes (death, readmissions, length of stay and discharge destination) will be compared in women and men, with stratification by neighbourhood income quintile, age and Local

Health Integration Network (LHIN), when permitted by sample size.

The patient sample includes adults aged 45 and older with stroke or TIA. The data for most of the indicators in this section were derived from the Registry of the Canadian Stroke Network (RCSN) Ontario Stroke Audit (OSA). The OSA is a chart audit of a random sample of 20 percent of all patients with stroke or TIA, seen in the emergency department or admitted to hospital at every acute care institution across the province of Ontario, Canada. For analyses of processes of stroke care delivery, we used data on patients aged 45 and older captured in the 2004/2005 audit, which included patients seen between April 1, 2004 and March 31, 2005. Using unique patient identifiers, the RCSN database was linked to the Canadian Institutes for Health Information Discharge Abstract Database (CIHI-DAD) to obtain information on carotid endarterectomy procedures (using ICD-10 CCI procedure code 1JE57) and to the Statistics Canada 2001 Census for information on neighbourhood income.

For analyses of mortality and readmissions after stroke, we used the CIHI-DAD to identify all hospital separations for stroke or TIA in the 2005/06 fiscal year (ICD10 codes I60, I61, I63, I64, G45, excluding G45.4), and determined readmissions and mortality through the CIHI-DAD and the Registered Persons Database (RPDB), respectively. The implementation and adherence to secondary risk reduction strategies, including medication management, are critical for reducing the risk of recurrent stroke. The CIHI-DAD cohort was linked to data from the Ontario Drug Benefits (ODB) database to evaluate continuation of medication use in stroke patients aged 65 and older. The sample was restricted to this age group because of access to provincially funded drug benefits in the senior population. Rehabilitation indicators, including wait times and improvements in Functional Independence Measure (FIM) were measured using National Rehabilitation System data maintained by CIHI and restricted to patients who were admitted to an inpatient rehabilitation facility during the 2005/06 fiscal year.

EXHIBITS AND FINDINGS

ACUTE THERAPY

USE OF THROMBOLYTIC THERAPY WITH RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR (rtPA) FOR ISCHEMIC STROKE

Indicator: This indicator measures the percentage of patients aged 45 and older seen in an emergency department (ED) or admitted to hospital with ischemic stroke who received thrombolytic therapy with recombinant tissue plasminogen activator (rtPA).

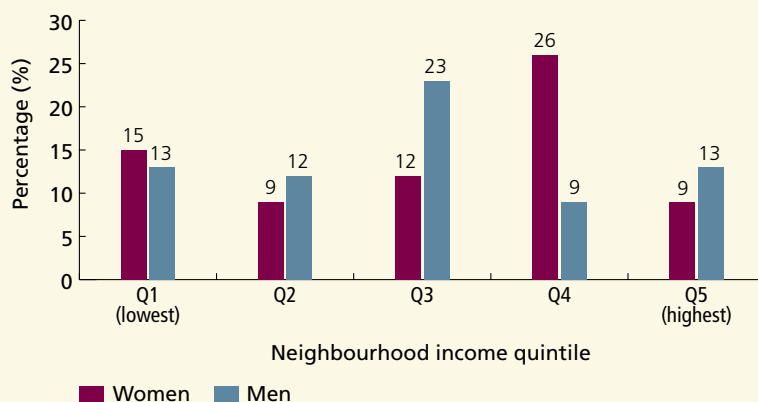
Background: Thrombolysis with rtPA has been studied in several randomized controlled trials. For patients treated within three hours of stroke onset, rtPA reduces the risk of death or dependency at three to six months (odds ratio = 0.66; 95 percent confidence interval = 0.53 to 0.83).²¹⁵ Although more recent data support the effectiveness of rtPA up to 4.5 hours after stroke onset,^{216, 217} practice guidelines in use at the time of this study recommended consideration of thrombolysis for eligible patients presenting within three hours of stroke onset. We analyzed thrombolysis rates in all patients with ischemic stroke, and in the subgroup of patients presenting within 2.5 hours of stroke onset (assuming a minimum of 30 minutes would be required between presentation and thrombolysis administration, in order to complete a neurological assessment and neuroimaging). The present analyses do not exclude patients with potential contraindications to antithrombotic therapy such as bleeding disorders. It also does not exclude patients with neurological deficits considered too mild for treatment.

Findings: In the Ontario population (age-standardized) aged 45 and older who were seen in an ED or admitted to hospital in 2004/05 with a primary diagnosis of ischemic stroke (n=10,309), 4 percent of both women and men received thrombolytic therapy. Among ischemic stroke patients seen in hospital, 26 percent presented within 2.5 hours of stroke onset (period during which stroke patients can benefit from thrombolytic therapy). In the age-standardized population of patients presenting within 2.5 hours of stroke onset (and thus eligible for rtPA according to treatment guidelines during this study period) (n=2,697), 14 percent of both women and men received thrombolytic therapy.

EXHIBIT 6D.1 | Age-standardized percentage of ischemic stroke patients aged 45 and older seen in hospital within 2.5 hours of stroke onset who received thrombolytic therapy, by sex and neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- The use of thrombolysis did not vary by sex.
- The use of thrombolytic therapy did not vary by neighbourhood income quintile in either women or men.
- Use of thrombolytic therapy did not vary by age group in either women or men (data not shown).



DATA SOURCES: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

POWER Study

USE OF ACUTE ANTIPLATELET THERAPY FOR ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received antiplatelet therapy within 48 hours of hospital arrival.

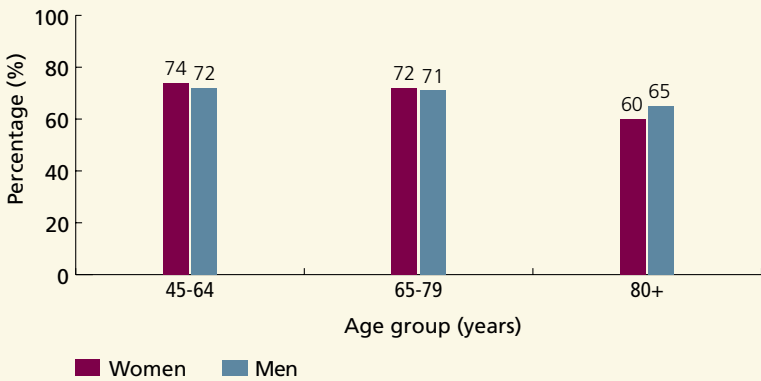
Background: Randomized controlled trials have demonstrated that antiplatelet therapy (e.g. aspirin, clopidogrel) initiated within 48 hours of ischemic stroke onset improves outcomes, with an increased proportion of patients achieving a complete recovery, reduced death or dependency at six months, and a reduced rate of recurrent stroke or death.^{218, 219} In the absence of contraindications, it is recommended that individuals with acute ischemic stroke receive antiplatelet therapy within 48 hours of stroke onset. We analyzed rates of acute antiplatelet administration in patients with ischemic stroke or TIA who were admitted to hospital. The present analyses do not exclude patients with potential contraindications to antiplatelet therapy.

Findings: In the Ontario population aged 45 and older admitted to hospital in 2004/05 with a primary diagnosis of ischemic stroke or TIA (n=11,496), 68 percent received antiplatelet therapy (aspirin or clopidogrel or combination aspirin and dipyridamole) within 48 hours of arrival to hospital, with no significant differences between women and men.

EXHIBIT 6D.2 | Percentage of adults aged 45 and older admitted to hospital for ischemic stroke or transient ischemic attack (TIA) who received antiplatelet therapy within 48 hours of arrival to hospital, by sex and age group, in Ontario, 2004/05

FINDINGS

- Use of antiplatelet therapy within 48 hours of stroke onset did not vary by sex.
- Women aged 80 and older were less likely than younger women to receive antiplatelet therapy within 48 hours of stroke onset. No such age-related variations in use of acute antiplatelet therapy were observed in men.
- The use of antiplatelet therapy within 48 hours did not vary by neighbourhood income among either women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

POWER Study

SECONDARY PREVENTION

USE OF ANTITHROMBOTIC THERAPY FOR SECONDARY PREVENTION OF ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received antithrombotic therapy at the time of discharge from hospital.

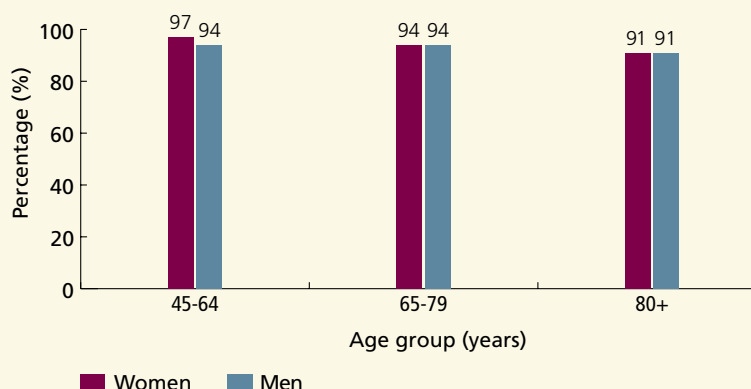
Background: For patients with prior ischemic stroke or TIA, antithrombotic therapy is expected to reduce the risk of non-fatal stroke by one-quarter.²²⁰ Unless contraindicated, it is recommended that patients with an acute ischemic stroke or TIA be discharged on antithrombotic therapy (aspirin, combination aspirin and dipyridamole, clopidogrel or warfarin) to reduce the risk of recurrent stroke or death.^{41, 185} The present analyses do not exclude patients with potential contraindications to antithrombotic therapy.

Findings: In the Ontario population (age-standardized) aged 45 and older admitted to hospital in 2004/05 for stroke or TIA and discharged alive (n=10,326), 93 percent of women and 93 percent of men received antithrombotic therapy at discharge.

EXHIBIT 6D.3 | Percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who were prescribed antithrombotic therapy at hospital discharge, by sex and age group, in Ontario, 2004/05

FINDINGS

- The use of antithrombotic therapy at discharge did not vary by sex.
- Among women, the receipt of antithrombotic therapy at hospital discharge varied by age. Women aged 80 and older were less likely to receive antithrombotic therapy than women aged 45-64. No such age-related differences in antithrombotic therapy were observed in men.
- Antithrombotic therapy prescription at discharge did not vary by neighbourhood income among either women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

POWER Study

WARFARIN THERAPY AT DISCHARGE IN PATIENTS WITH ATRIAL FIBRILLATION AND ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older who were admitted to hospital with ischemic stroke or transient ischemic attack (TIA) and atrial fibrillation who received warfarin therapy at discharge.

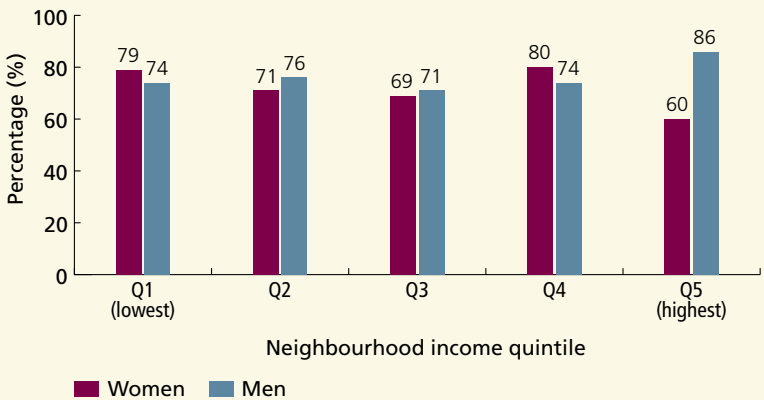
Background: For individuals with prior stroke or TIA and atrial fibrillation, anticoagulation with warfarin is expected to reduce the odds of recurrent stroke by two-thirds (odds ratio = 0.36, 95 percent confidence interval = 0.22-0.58) and reduce the odds of all vascular events by half (odds ratio = 0.55, 95 percent confidence interval = 0.37-0.82).¹⁸⁴ Clinical practice guidelines recommend that patients with ischemic stroke or TIA and atrial fibrillation be treated with warfarin provided they are likely to be compliant with the required monitoring and provided no contraindications exist. The present analyses do not exclude patients with potential contraindications to warfarin therapy.

Findings: Among Ontario patients aged 45 and older who were discharged alive from hospital in 2004/05 with a primary diagnosis of stroke or TIA and with atrial fibrillation (n=2,202), 74 percent were prescribed warfarin at discharge, with no significant differences in prescribing by sex (72 percent of women and 76 percent of men).

EXHIBIT 6D.4 | Percentage of ischemic patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) and atrial fibrillation who were prescribed warfarin at hospital discharge, by sex and neighbourhood income quintile, in Ontario, 2004/05

FINDINGS

- Warfarin prescription at discharge did not vary by sex.
- Warfarin prescription at discharge did not vary by income among women or men.
- Warfarin prescription at discharge did not vary by age among women or men (data not shown).



DATA SOURCES: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

POWER Study

CONTINUATION OF WARFARIN THERAPY IN PATIENTS WITH ATRIAL FIBRILLATION AND ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA): 90 DAYS AND ONE YEAR

Indicator: This indicator measures the percentage of patients aged 65 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) and atrial fibrillation who filled a prescription for warfarin within 90 days of discharge and between nine months and one year post-discharge.

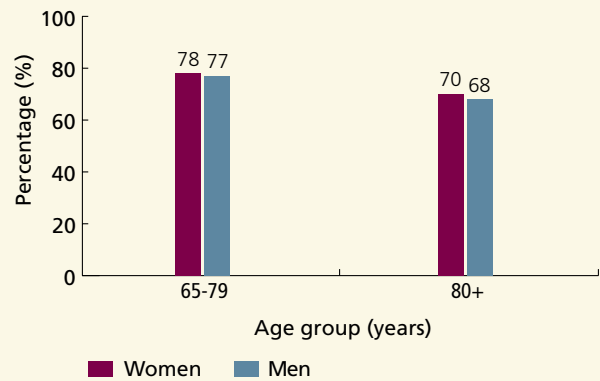
Background: For patients with ischemic stroke and atrial fibrillation, ongoing warfarin therapy is recommended, unless contraindications exist.¹⁸⁴ We evaluated continuation of warfarin use in patients with ischemic stroke or TIA and atrial fibrillation, using prescription claims data on patients aged 65 and older from the Ontario Drug Benefits database. The present analyses do not exclude patients with potential contraindications to warfarin therapy.

Findings: In the Ontario population aged 65 and older who were discharged alive from hospital in 2005/06 with a primary diagnosis of stroke or TIA and with atrial fibrillation (n=1,549), 68 percent filled a prescription for warfarin within 90 days of discharge (67 percent of women and 70 percent of men). Among patients alive one year post-discharge (n=1,208), 73 percent of women and 73 percent of men had filled a prescription for warfarin between nine months and one year post-discharge. Warfarin use did not change over time, did not vary by sex and rates were similar after adjusting for age.

EXHIBIT 6D.5 | Percentage of patients with ischemic stroke or transient ischemic attack (TIA)[^] aged 65 and older with concomitant atrial fibrillation who filled a prescription for warfarin one year post-discharge from hospital, by sex and age group, in Ontario, 2005/06

FINDINGS

- The proportion of people who filled a prescription for warfarin within 90 days and at one year post-discharge did not vary by sex.
- Women and men aged 80 and older had lower rates of warfarin use within 90 days and at one year post-discharge compared to patients aged 65-79 (one year data are shown).
- Rates of warfarin use within 90 days and at one year post-discharge did not vary by neighbourhood income among women or men (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

[^] Sample is restricted to patients who were alive one year post-discharge

POWER Study

MEASUREMENT OF LIPID LEVELS DURING HOSPITALIZATION FOR ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who had lipid measurement performed during hospitalization.

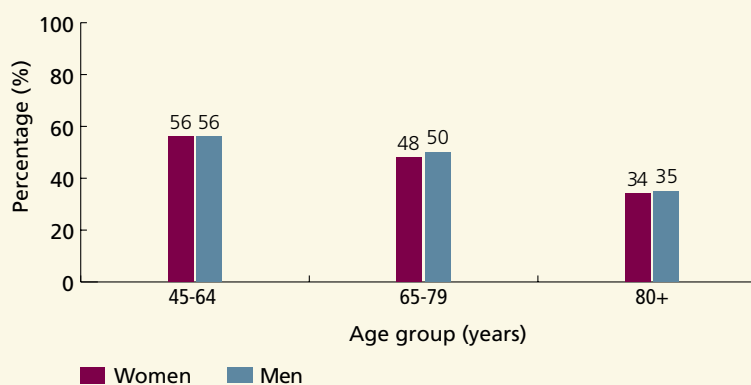
Background: According to the Canadian Best Practice Recommendations for Stroke,²²¹ patients with ischemic stroke and low density lipoprotein cholesterol (LDL-C) levels of less than 2.0 mmol/L should be managed with lifestyle modification, dietary guidelines and medications. In addition, statin agents should be prescribed for all patients who have had an ischemic stroke/transient ischemic attack (TIA) event in order to achieve target LDL-C and total cholesterol/high-density lipoprotein cholesterol (HDL-C) levels. In order to manage patients according to these recommendations, lipid levels must be measured.

Findings: In the Ontario population of adults aged 45 and older hospitalized in 2004/05 with a primary diagnosis of ischemic stroke or TIA (n=11,496), 44 percent had lipid levels measured while in hospital, with no differences between women and men (42 percent of women and 46 percent of men).

EXHIBIT 6D.6 | Percentage of patients admitted to hospital with ischemic stroke or transient ischemic attack (TIA) aged 45 and older who had lipid levels measured while in hospital, by sex and age group, in Ontario, 2004/05

FINDINGS

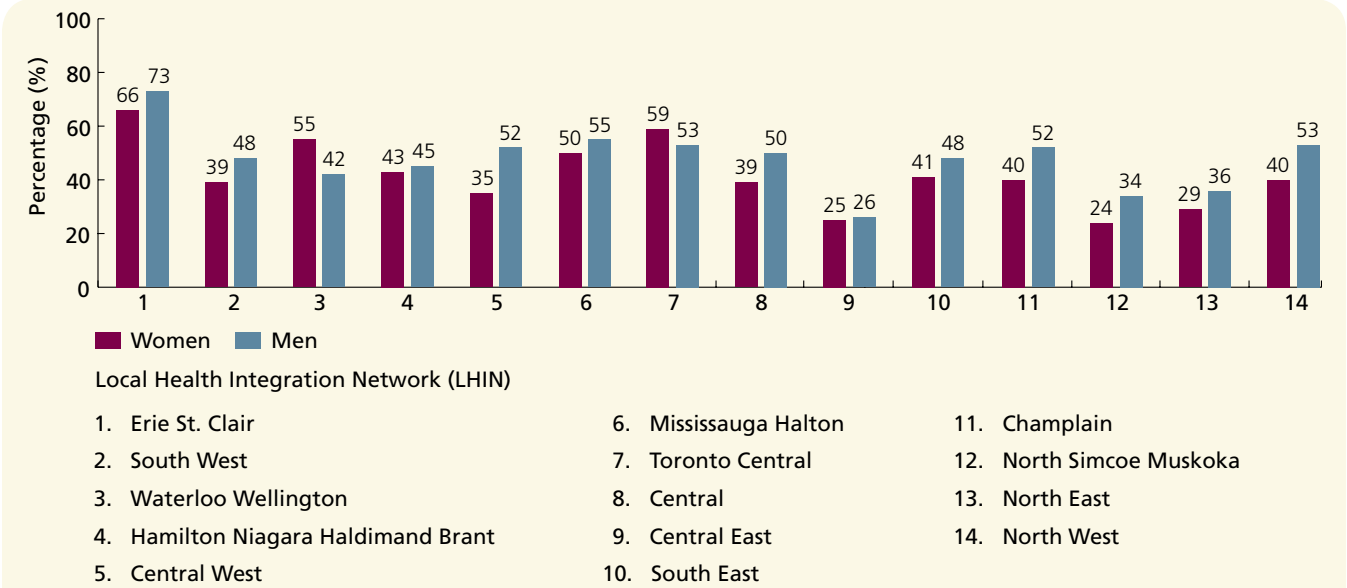
- Lipid measurement during hospitalization did not vary by sex.
- Rates of lipid measurement during hospitalization declined with increasing age, with rates of 56 percent in women and men aged 45-64 compared with 34 percent in those aged 80 and older.
- There were variations in lipid measurement rates by neighbourhood income among men but not among women (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

POWER Study

EXHIBIT 6D.7 | Percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who had their lipid levels measured while in hospital, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- The measurement of lipids while in hospital varied significantly by LHIN among women and men. Among women, the rates ranged from 24 percent (North Simcoe Muskoka LHIN) to 66 percent (Erie St. Clair LHIN). Among men, rates ranged from 26 percent (Central East LHIN) to 73 percent (Erie St. Clair LHIN).

POWER Study

LIPID-LOWERING MEDICATIONS (STATINS) FOR ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA): PRESCRIPTION RATES AT DISCHARGE

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received a prescription for lipid-lowering medications at discharge.

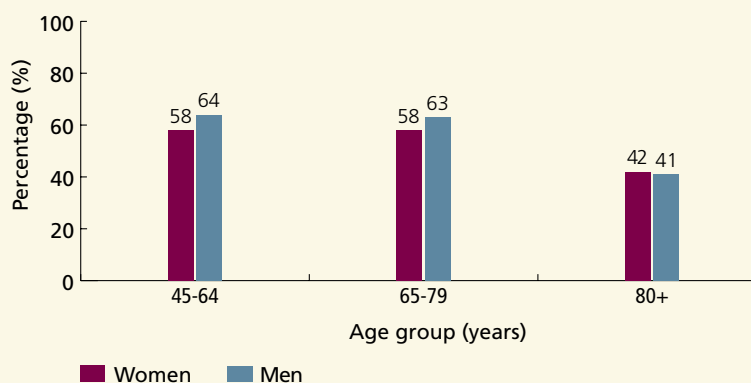
Background: Patients with ischemic stroke or TIA should be assessed for therapy with a lipid-lowering agent. Clinical trial data suggest that therapy with 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitors (statins) may decrease the risk of recurrent stroke in those with TIA and minor stroke²²² and current practice guidelines recommend lipid-lowering therapy to achieve target levels.¹⁸⁵ Of note, the sample used for the current analyses included all patients regardless of lipid levels - not just those with documented lipid levels above target.

Findings: In Ontario, 54 percent of patients aged 45 and older discharged alive from hospital in 2004/05 with a primary diagnosis of ischemic stroke or TIA (n=10,326), were prescribed a lipid-lowering agent at discharge. Women were significantly less likely than men to be prescribed a lipid-lowering agent at discharge (51 percent of women versus 57 percent of men).

EXHIBIT 6D.8 | Percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who were prescribed lipid-lowering therapy at hospital discharge, by sex and age group, in Ontario, 2004/05

FINDINGS

- Women and men aged 80 and older were less likely than younger patients to be prescribed lipid-lowering therapy at discharge.
- Prescription of lipid-lowering agents at discharge did not vary by neighbourhood income for women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

POWER Study

EXHIBIT 6D.9 | Percentage of adults aged 45 and older admitted to hospital for an ischemic stroke or transient ischemic attack (TIA) who were prescribed a lipid-lowering therapy at hospital discharge, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

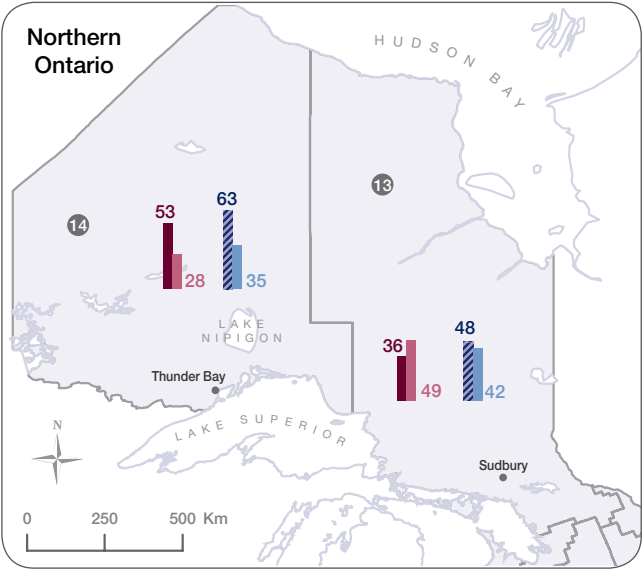
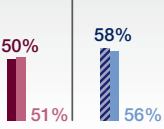
FINDINGS

- There was significant regional variation in prescription of lipid-lowering therapy at discharge.
- The rates of prescription of lipid-lowering therapy ranged from 27 percent (Central West LHIN) to 64 percent (Central LHIN) among lower-income women and from 28 percent (North West LHIN) to 63 percent (Central West LHIN) among higher-income women.
- The rates of prescription of lipid-lowering therapy ranged from 38 percent (Waterloo Wellington LHIN) to 89 percent (Mississauga Halton LHIN) among lower-income men and from 35 percent (North West LHIN) to 69 percent (Toronto Central LHIN) among higher-income men.

POWER Study

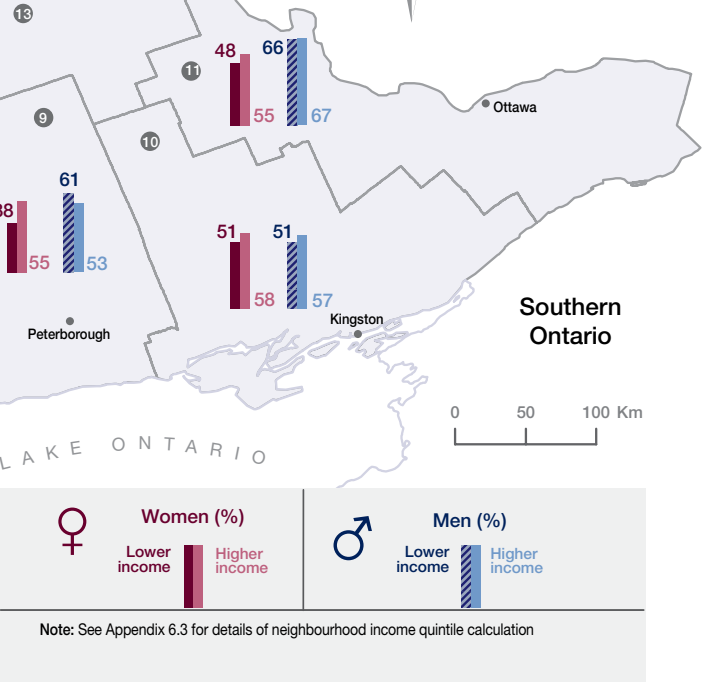
Overall Ontario

In Ontario, 50% of lower-income women, 51% of higher-income women, 58% of lower-income men and 56% of higher-income men hospitalized for ischemic stroke or TIA were prescribed a statin at hospital discharge.



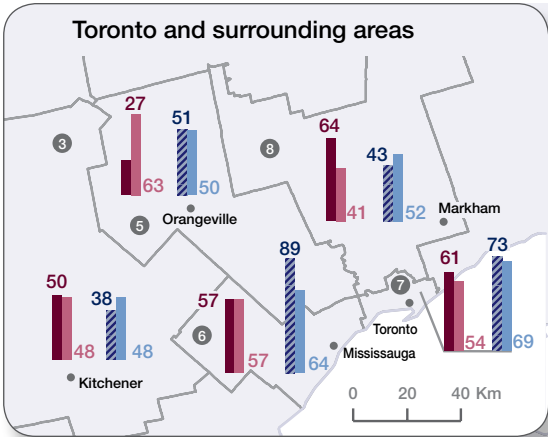
Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-----------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe |
| | 8 Central | 13 North East |
| | | 14 North West |



Note: See Appendix 6.3 for details of neighbourhood income quintile calculation

DATA SOURCES: Registry of the Canadian Stroke Network Ontario Stroke Audit; Statistics Canada 2001 Census



CONTINUATION OF LIPID-LOWERING MEDICATIONS IN PATIENTS WITH ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA): 90 DAYS AND ONE YEAR

Indicator: This indicator measures the percentage of patients aged 65 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received lipid-lowering therapy within 90 days and at one year post-discharge.

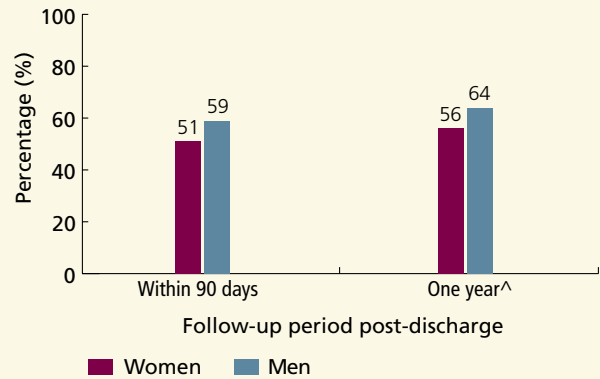
Background: Ongoing lipid-lowering therapy is recommended for secondary stroke prevention in patients with ischemic stroke or TIA.¹⁸⁵ We used data from the Ontario Drug Benefits database to evaluate prescriptions for lipid-lowering therapy at 90 days and one year after hospitalization for ischemic stroke or TIA in patients aged 65 and older.

Findings: Among Ontario patients aged 65 and older discharged alive from hospital in 2005/06 with a primary diagnosis of stroke or TIA (n=9,358), 54 percent filled a prescription for lipid-lowering therapy within 90 days of discharge. Among those patients who were alive one year post-discharge (n=7,615), 59 percent had filled a prescription for lipid-lowering therapy between nine months and one year of discharge. At both time periods, a significantly smaller percentage of women than men had filled a prescription for a lipid-lowering medication, with rates of 51 percent in women versus 59 percent in men within 90 days and 56 percent in women versus 64 percent in men at one year post-discharge.

EXHIBIT 6D.10 | Percentage of patients aged 65 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who filled a prescription for lipid-lowering therapy post-discharge from hospital, by sex and follow up period, in Ontario, 2005/06

FINDINGS

- Women were less likely than men to have filled a prescription for lipid-lowering therapy within 90 days and at one year post-discharge following an admission for ischemic stroke or TIA.
- The proportion of people who filled a prescription for lipid-lowering therapy within 90 days and at one year post-discharge did not vary by neighbourhood income among women or men (data not shown).
- As was the case with prescriptions for lipid-lowering therapy at discharge ([Exhibit 6D.8](#)), women and men aged 80 and older were less likely than those aged 65-79 to fill a prescription for a lipid-lowering medication within 90 days and at one year post-discharge (data not shown).
- As was the case with prescriptions for lipid-lowering therapy at discharge, the proportion of people who filled a prescription for lipid-lowering therapy within 90 days and at one year post-discharge varied by Local Health Integration Network.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

^ Sample is restricted to patients who were alive one year post-discharge

POWER Study

ANTIHYPERTENSIVE THERAPY FOR ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA): RATES AT DISCHARGE

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received antihypertensive therapy at discharge.

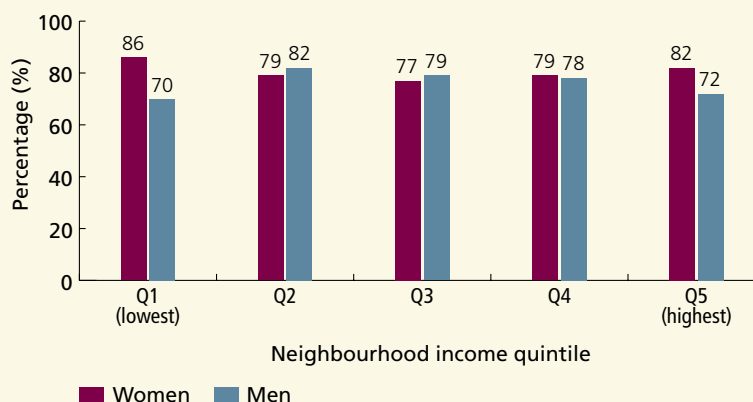
Background: There is strong evidence that high blood pressure is a significant risk factor for primary and recurrent stroke. At the population level, hypertension is believed to account for 60 percent of the attributable risk for cerebrovascular disease. Secondary prevention with angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs) and thiazide diuretics has been shown to reduce recurrent stroke and other vascular events.^{41, 223} Based on this, it is recommended that patients with stroke and elevated blood pressure be prescribed antihypertensive medications as outlined in the Canadian Hypertension Education Program guidelines.²²³

Findings: In Ontario, 79 percent of patients aged 45 and older who were discharged from an acute care hospital in 2004/05 with a primary diagnosis of ischemic stroke or TIA (n=10,326) were prescribed antihypertensive therapy at discharge. Women were more likely than men to receive antihypertensive therapy at discharge: 81 percent versus 76 percent, respectively.

EXHIBIT 6D.11 | Percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who were prescribed antihypertensive therapy at hospital discharge, by sex and neighbourhood income quintile, in Ontario 2004/05

FINDINGS

- The prescription of antihypertensive therapy at discharge did not vary by neighbourhood income among women or men.
- Women aged 65 and older were more likely than those aged 45-64 to receive a prescription for an antihypertensive medication at discharge. Prescription rates did not vary by age among men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

POWER Study

CONTINUATION OF ANTIHYPERTENSIVE THERAPY IN PATIENTS WITH ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA): 90 DAYS AND ONE YEAR

Indicator: This indicator measures the percentage of patients aged 65 and older who were admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received antihypertensive therapy 90 days and one year post-discharge.

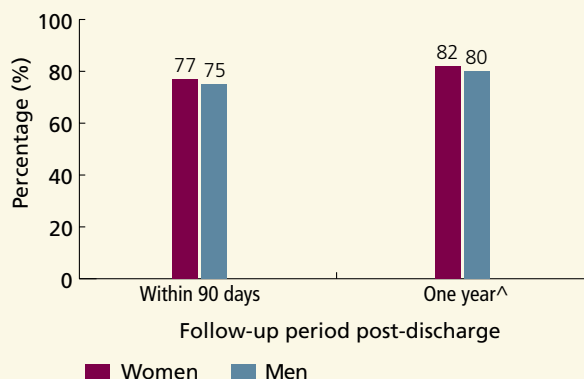
Background: Hypertension is an important modifiable risk factor for stroke, and ongoing blood pressure control post stroke is recommended as per the guidelines of the Canadian Hypertension Education Program.²²³ We used data from the Ontario Drug Benefits database to evaluate the proportion of people who filled prescriptions for antihypertensive medications at 90 days and one year after hospitalization for ischemic stroke or TIA in patients aged 65 and older.

Findings: Among Ontario patients aged 65 and older who were discharged alive from hospital with a primary diagnosis of stroke or TIA (n=9,358), 76 percent filled a prescription for an antihypertensive medication within 90 days of discharge. Among those patients who were alive one year post-discharge (n=7,615), 81 percent had filled a prescription for an antihypertensive medication between nine months and one year post-discharge. There were no sex differences in antihypertensive use at either time period.

EXHIBIT 6D.12 | Percentage of patients aged 65 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who filled prescriptions for antihypertensive therapy post-discharge from hospital, by sex and follow up period post-discharge, in Ontario, 2005/06

FINDINGS

- The percentages of stroke patients who filled a prescription for an antihypertensive medication were similar at 90 days and one year post-discharge for stroke.
- The use of antihypertensive therapy at 90 days and one year did not vary by sex; 77 percent of women and 75 percent of men filled a prescription for an antihypertensive medication within 90 days of discharge and 82 percent of women and 80 percent of men filled a prescription for an antihypertensive medication between nine months and one year post-discharge.
- The use of antihypertensive therapy at either follow up period did not vary by neighbourhood income or age among women or men (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD); Ontario Drug Benefits (ODB) database; Registered Persons Database (RPDB)

^ Sample is restricted to patients who were alive at one year

POWER Study

EVALUATION, SCREENING AND ASSESSMENT

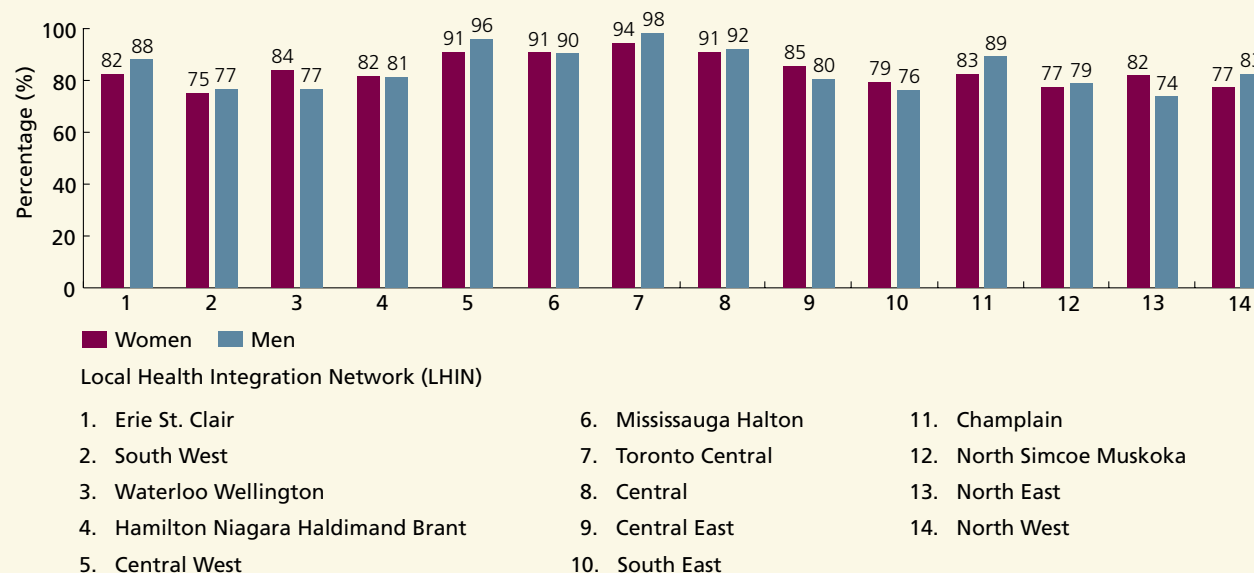
NEUROIMAGING (COMPUTING TOMOGRAPHY (CT) AND/OR MAGNETIC RESONANCE (MR) IMAGING) FOR STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older who were seen in the emergency department (ED) or admitted to hospital with stroke or transient ischemic attack (TIA) who had computed tomography (CT) and/or magnetic resonance (MR) imaging while in hospital.

Background: The Canadian Stroke Best Practice Recommendations¹⁸⁵ advise that all patients presenting with acute stroke symptoms should undergo CT or MR imaging of the brain. In most instances, the initial modality of choice is a non-contrast CT scan. This should be completed before hospital discharge (and ideally within 24 hours) for all patients and within 25 minutes for patients potentially eligible for thrombolytic therapy. The main goal of imaging is to determine whether a stroke is ischemic or hemorrhagic, since this will influence subsequent management. Neuroimaging is important to exclude other non-vascular pathologies (that can mimic stroke), provide information on early ischemic changes in the brain, mass effect from edema, evidence of acute arterial or venous thrombus and show old infarcts or evidence of past hemorrhage.

Findings: In Ontario patients aged 45 and older who were seen in an ED or admitted to hospital in 2004/05 with a primary diagnosis of stroke or TIA (n=19,899), 85 percent of women and 85 percent of men underwent neuroimaging before hospital discharge.

EXHIBIT 6D.13 | Percentage of adults aged 45 and older who were seen in an emergency department (ED) or hospitalized with a stroke or transient ischemic attack (TIA) who underwent neuroimaging before discharge, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- There was significant regional variation in use of neuroimaging during hospitalization.
- Neuroimaging rates among women ranged from 75 percent (South West LHIN) to 94 percent (Toronto Central LHIN). Rates in men ranged from 74 percent (North East LHIN) to 98 percent (Toronto Central LHIN).
- Rates of neuroimaging did not vary by neighbourhood income or by age for either women or men (data not shown).

POWER Study

CAROTID IMAGING FOR ISCHEMIC STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older seen in the emergency department (ED) or admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who underwent or were scheduled to undergo carotid imaging.

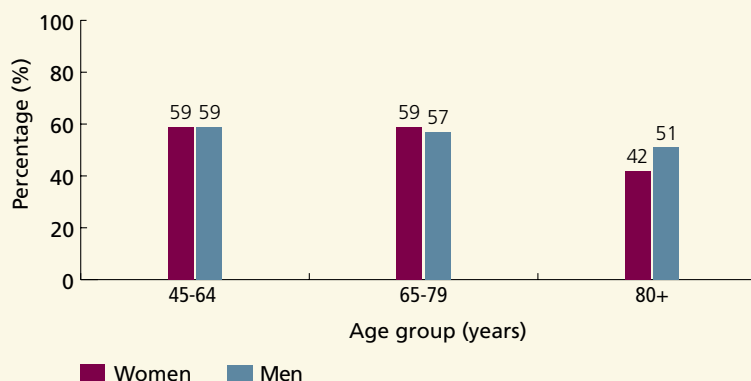
Background: Carotid imaging, either through carotid duplex Doppler ultrasound, computed tomography (CT), angiography, magnetic resonance (MR) angiography or conventional selective catheter angiography is used to screen for carotid artery stenosis and occlusion. Patients with symptomatic moderate or severe carotid stenosis may be candidates for carotid endarterectomy, which is a highly effective treatment for secondary stroke prevention in appropriate patients.²²⁴ The benefits of carotid endarterectomy are highest if performed within two weeks of stroke or TIA, and are lost if surgery is performed more than three months after the index event.²²⁵ In order to facilitate timely surgery in appropriate patients, it is recommended that screening for carotid stenosis be performed as soon as possible after stroke presentation. Some patients (those with posterior circulation strokes, major or disabling strokes or contraindications to surgery) are not candidates for carotid endarterectomy and thus need not be screened with carotid imaging. The present analysis does not exclude patients who may not be eligible for carotid surgery based on stroke territory or contraindications.

Findings: In 2004/05, 53 percent of Ontario patients aged 45 and older seen in an ED or admitted to hospital with a primary diagnosis of ischemic stroke or TIA (n=17,781) had carotid imaging done during their hospital stay or scheduled to be done as an outpatient post-discharge. Women were less likely than men to undergo carotid imaging: 51 percent versus 56 percent, respectively.

EXHIBIT 6D.14 | Percentage of adults aged 45 and older who were seen in an emergency department (ED) or hospitalized with ischemic stroke or transient ischemic attack (TIA) who underwent or were scheduled to undergo carotid imaging, by sex and age group, in Ontario, 2004/05

FINDINGS

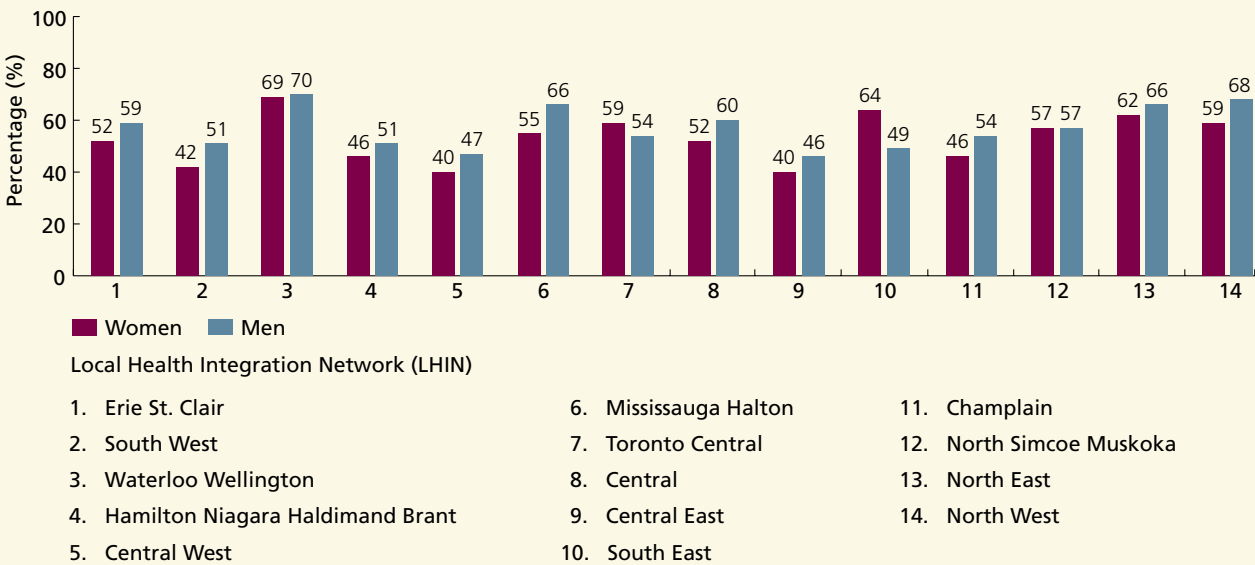
- Carotid imaging rates were lower for women and men aged 80 and older compared to patients aged 45-79.
- Carotid imaging rates did not vary by neighbourhood income for women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

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EXHIBIT 6D.15 | Percentage of adults aged 45 and older who were seen in an emergency department (ED) or hospitalized with an ischemic stroke or transient ischemic attack (TIA) who underwent or who were scheduled to undergo carotid imaging, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- There was significant regional variation in carotid imaging rates across the province.
- Carotid imaging rates ranged from 40 percent (Central West LHIN and Central East LHIN) to 69 percent (Waterloo Wellington LHIN) among women.
- Rates among men ranged from 46 percent (Central East LHIN) to 70 percent (Waterloo Wellington LHIN).

POWER Study

CAROTID ENDARTERECTOMY FOR ISCHEMIC STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who underwent carotid endarterectomy within six months of hospital discharge and the average time to procedure from the date of stroke admission.

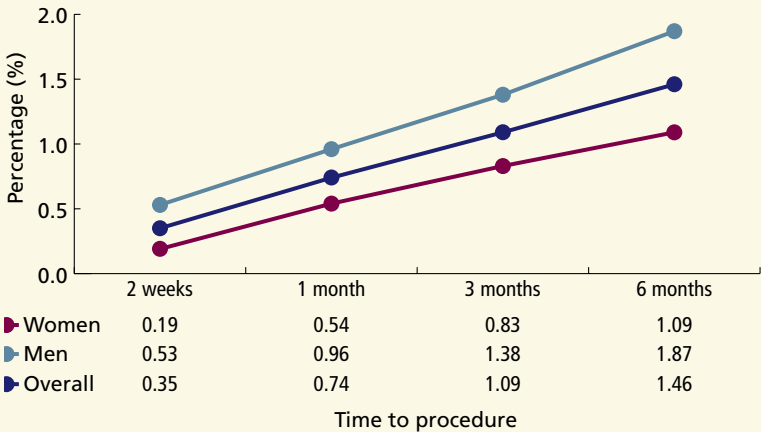
Background: Carotid endarterectomy, a surgical procedure to remove plaque from the carotid artery, has been shown to reduce the risk of disabling stroke or death in patients with symptomatic moderate (50-69 percent) to severe (70-99 percent) stenosis. Sub-analyses of clinical trials have found that both women and men with severe carotid stenosis benefit from carotid endarterectomy, but that the benefits are less clear in women with moderate carotid stenosis.²²⁵ In addition, the benefits of surgery are greatest when the procedure is performed within two weeks of the index event. The benefits decline over time and are essentially lost after three months.²²⁵ The current analysis did not exclude patients with potential contraindications to surgery and is not limited to patients with documented carotid stenosis.

Findings: In the Ontario population aged 45 and older, admitted to hospital in 2005/06 with a primary diagnosis of ischemic stroke or TIA (n=13,284), 1.5 percent underwent carotid endarterectomy within six months of hospitalization. In the age-standardized population, women were about half as likely as men to undergo the procedure. For those who underwent carotid endarterectomy within six months, wait times did not differ between women and men, with mean and median wait times of 53 days and 30 days, respectively, in both women and men.

EXHIBIT 6D.16 | Age-standardized percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who underwent carotid endarterectomy within six months of admission, by sex and time to procedure, in Ontario, 2005/06

FINDINGS

- Within each time interval, a smaller percentage of women than men had undergone carotid endarterectomy.
- Women were significantly less likely than men to undergo carotid endarterectomy within six months of hospital discharge: 1.1 percent versus 1.9 percent respectively.



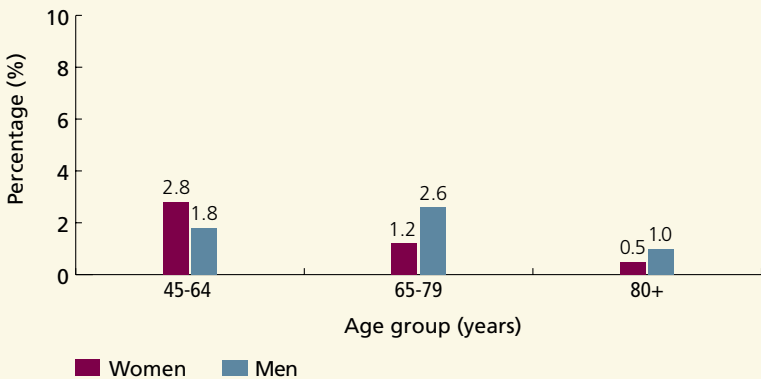
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

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EXHIBIT 6D.17 | Percentage of adults aged 45 and older admitted to hospital for ischemic stroke or transient ischemic attack (TIA) who underwent carotid endarterectomy within six months of admission, by sex and age group, in Ontario, 2005/06

FINDINGS

- With increased age, the likelihood of undergoing carotid endarterectomy declined significantly in women and men.
- Carotid endarterectomy rates did not vary by neighbourhood income among women or men (data not shown).
- Carotid endarterectomy rates varied significantly by Local Health Integration Networks (LHINs) and ranged from 0.4 percent in the Central East LHIN to 2.2 percent in the North West LHIN (data not shown). Some of the LHIN specific estimates were based on small numbers and the results should be viewed with caution.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

HOSPITAL CARE, SCREENING AND ASSESSMENT FOR STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA): ADMISSION OF PATIENTS WITH STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA) TO A DEDICATED STROKE UNIT

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who were cared for in a dedicated stroke unit.

Background: Care of patients in dedicated stroke units has been associated with improved outcomes including reductions in mortality, dependence and institutionalization.^{185, 226} Current practice guidelines recommend that patients with acute stroke be managed in a dedicated, geographically located, interdisciplinary stroke unit.¹⁸⁵

Findings: In Ontario in 2004/05, 19 percent of acute stroke patients aged 45 and older admitted to hospital with a primary diagnosis of stroke or TIA (n=13,167), were cared for in a dedicated stroke unit. The percentage of patients who received care within dedicated stroke units did not vary by sex: 18 percent of women and 21 percent of men.

EXHIBIT 6D.18 | Percentage of adults aged 45 and older admitted to hospital for a stroke or transient ischemic attack (TIA) who were cared for in a dedicated stroke unit while in hospital, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05

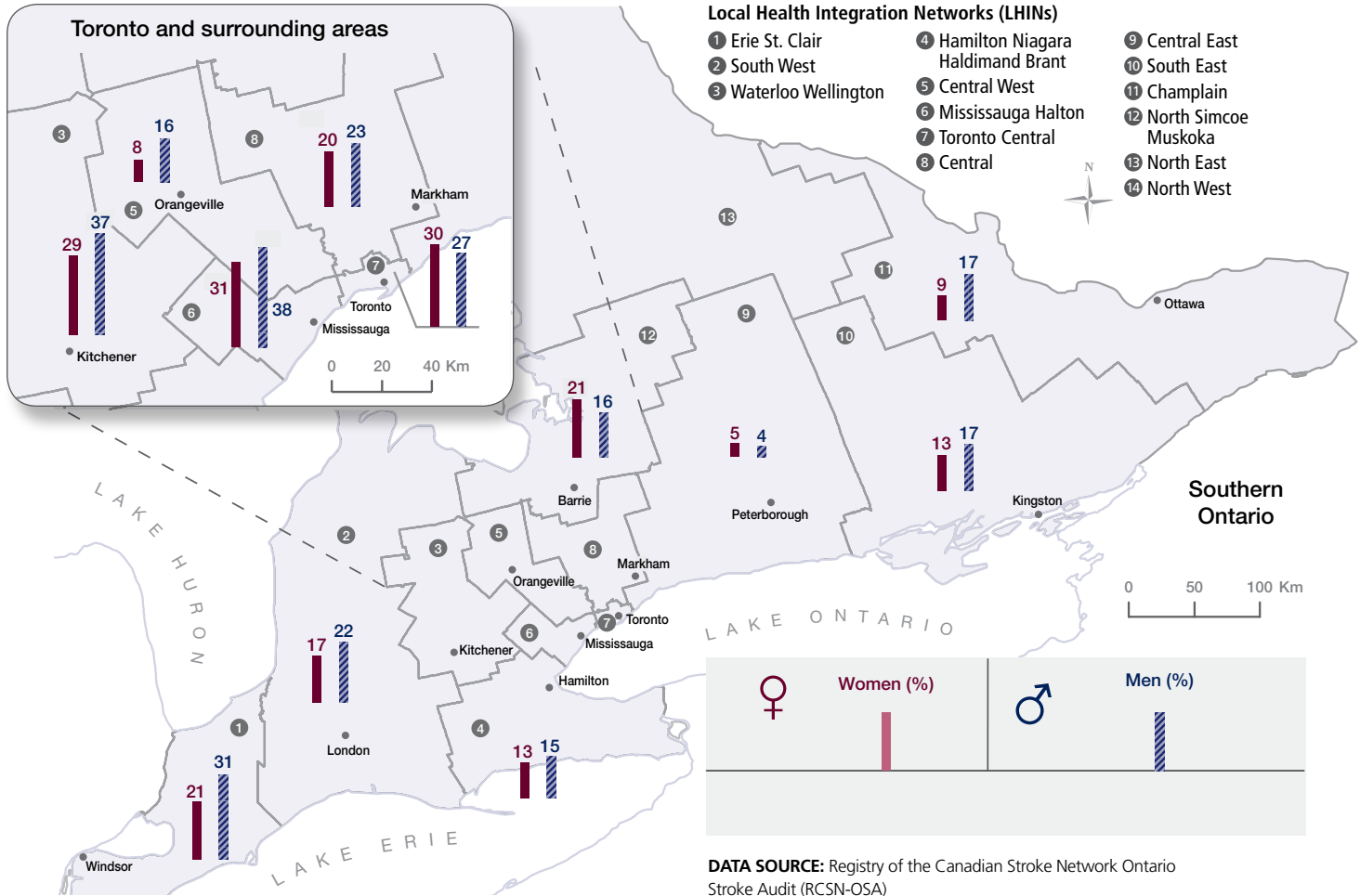
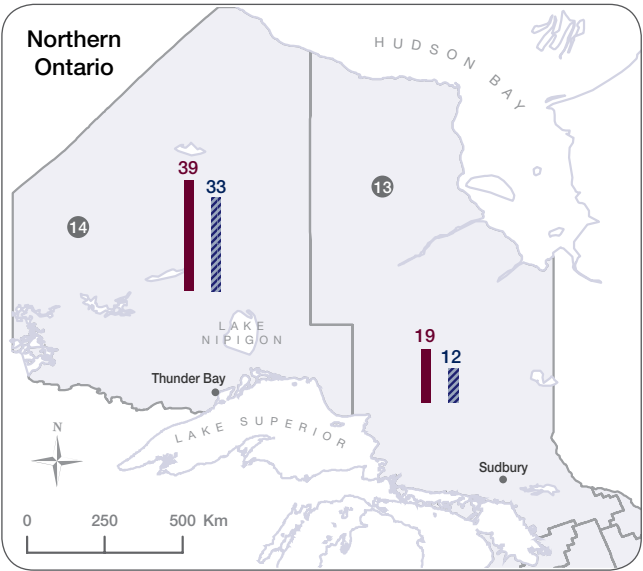
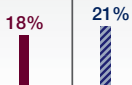
FINDINGS

- There was significant regional variation in the admission rates to acute stroke units for both women and men. The admission rate to acute stroke units for both women and men were generally low.
- Rates among women ranged from 5 percent (Central East LHIN) to 39 percent (North West LHIN). Rates among men ranged from 4 percent (Central East LHIN) to 38 percent (Mississauga Halton LHIN).

POWER Study

Overall Ontario

In Ontario, 18% of women and 21% of men hospitalized for an acute stroke were cared for in a dedicated stroke unit.



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

DYSPHAGIA SCREENING IN PATIENTS WITH STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA) ADMITTED TO HOSPITAL

Indicator: This indicator measures the percentage of patients aged 45 and older admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who were screened for dysphagia while in hospital.

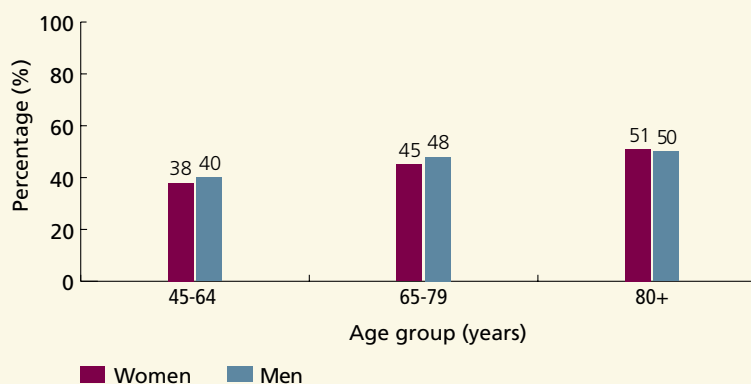
Background: Approximately two-thirds of patients with stroke experience some degree of dysphagia, or difficulty while swallowing (67 percent in the first 72 hours of stroke).¹⁸⁵ This places these individuals at risk for aspiration, which in turn may lead to pneumonia, a potentially life-threatening complication of stroke. Screening for dysphagia is recommended for all stroke patients before oral intake of fluids or food to reduce the risk of aspiration pneumonia. The Ontario Stroke System Regional Education Group¹⁸⁵ recommends four screening tools to assess dysphagia in stroke patients: the Massey Bedside Swallow Screen; Timed Test of Swallowing Questionnaire; Toronto Beside Swallowing Screening Test (TOR-BSST) and Screening Tool for Acute Neurological Dysphagia (STAND). Dysphagia screening may not be required in patients whose neurological deficits are minor, resolving or are located such that they would not affect swallowing.

Findings: In the Ontario population aged 45 and older who were admitted to hospital in 2004/05 with a primary diagnosis of stroke or TIA (n=13,167) 47 percent were screened for dysphagia, with no difference in screening rates between women and men (47 percent for both).

EXHIBIT 6D.19 | Percentage of patients aged 45 and older admitted to hospital with stroke or transient ischemic attack (TIA) who were screened for dysphagia while in hospital, by sex and age group, in Ontario, 2004/05

FINDINGS

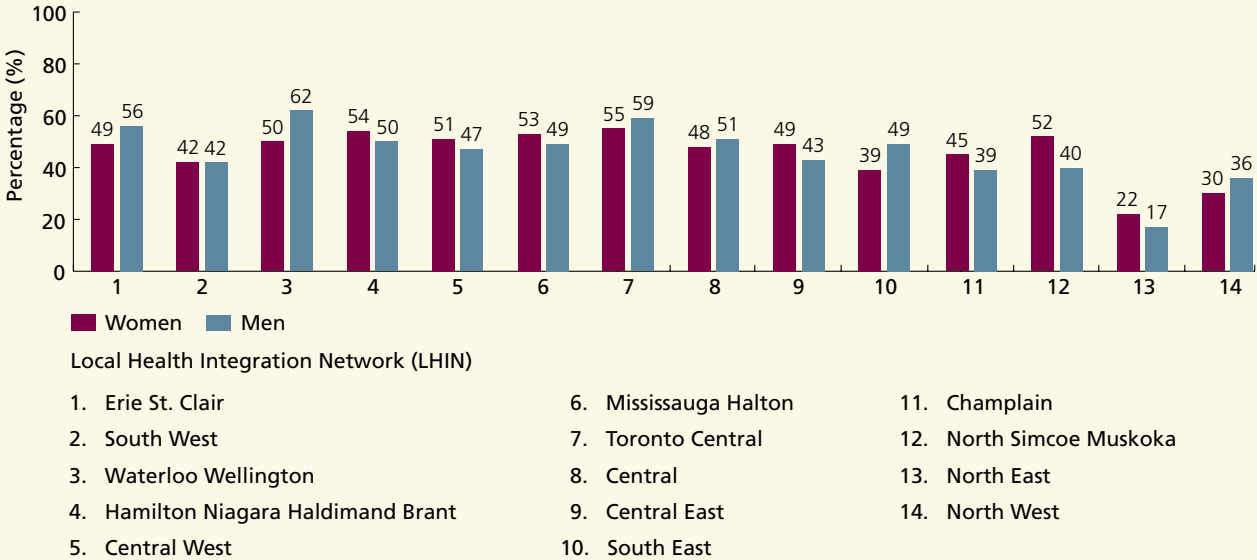
- Rates of dysphagia screening increased significantly with age among women and men; 39 percent of patients aged 45-64 were screened as compared to 47 percent of patients aged 65-79 and 50 percent of patients aged 80 and older. The age-specific variation was significant among both women and men.
- Dysphagia screening did not vary by neighbourhood income among women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

POWER Study

EXHIBIT 6D.20 | Percentage of stroke or transient ischemic attack (TIA) patients aged 45 and older who were screened for dysphagia while in hospital, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- Dysphagia screening rates varied significantly across LHINs.
- Screening rates among women ranged from 22 percent (North East LHIN) to 55 percent (Toronto Central LHIN).
- Screening rates among men ranged from 17 percent (North East LHIN) to 62 percent (Waterloo Wellington LHIN).

POWER Study

IN-HOSPITAL (INPATIENT OR EMERGENCY DEPARTMENT (ED)) NEUROLOGY OR NEUROSURGICAL CONSULTATION FOR STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the percentage of patients aged 45 and older seen in the emergency department (ED) or admitted to hospital with ischemic stroke or transient ischemic attack (TIA) who received a consultation from a neurologist or neurosurgeon while in hospital.

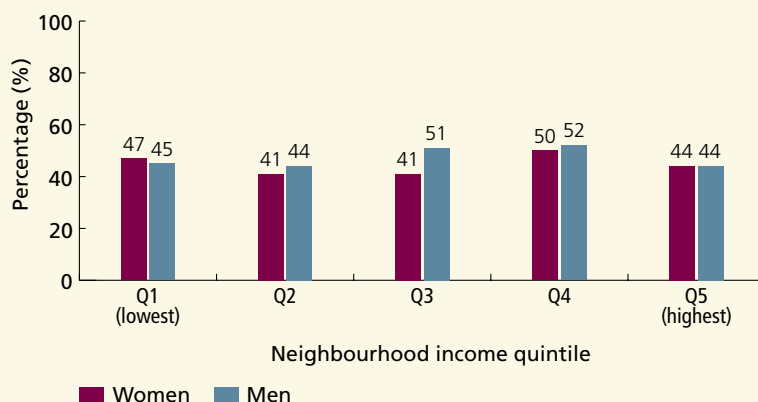
Background: Although neurological and neurosurgical consultations are not included as quality indicators in current stroke best practice guidelines, some data suggest that patients cared for by a vascular neurologist have better outcomes post-stroke compared to those who are cared for by physicians without such expertise.²⁰⁸ Therefore the Technical Expert Panel convened by the POWER Study recommended inclusion of this indicator in this chapter.

Findings: In the Ontario population aged 45 and older seen in an ED or admitted to hospital in 2004/05 with a primary diagnosis of stroke or TIA (n=19,899), 45 percent of women and 47 percent of men received a consultation from a neurologist or neurosurgeon during their hospitalization.

EXHIBIT 6D.21 | Percentage of adults aged 45 and older who were seen in an emergency department (ED) or hospitalized for a stroke or transient ischemic attack (TIA) who received in-hospital neurology or neurosurgical consultation, by sex and neighbourhood income quintile, in Ontario 2004/05

FINDINGS

- Neurology or neurosurgical consultation rates did not vary by neighbourhood income among women or men.
- There was no age variation in neurology or neurosurgical consultation rates among women or men (data not shown).



DATA SOURCES: Registry of the Canadian Stroke Network-Ontario Stroke Audit (RCSN-OSA); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

POWER Study

EXHIBIT 6D.22 | Percentage of adults aged 45 and older who were seen in an emergency department (ED) or hospitalized for a stroke or transient ischemic attack (TIA) who received neurology or neurosurgical consultation, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2004/05

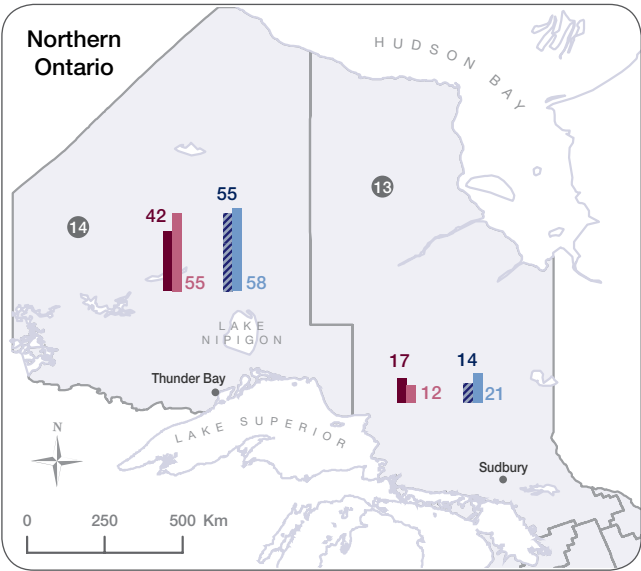
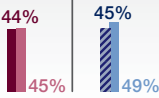
FINDINGS

- There was significant regional variation in the proportion of stroke patients who had neurology or neurosurgical consultation.
- Neurology or neurosurgical consultation rates ranged from 17 percent (North East LHIN) to 78 percent (Mississauga Halton LHIN) among lower-income women and from 12 percent (North East LHIN) to 71 percent (Toronto Central LHIN) among higher-income women.
- The rates ranged from 14 percent (North East LHIN) to 62 percent (Erie St. Clair LHIN) among lower-income men and from 21 percent (North East LHIN) to 69 percent (Mississauga Halton LHIN) among higher-income men.

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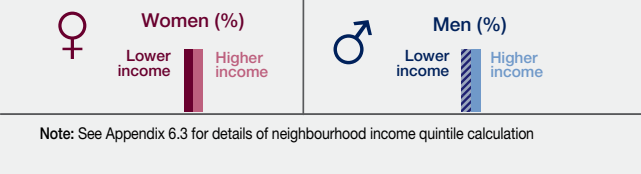
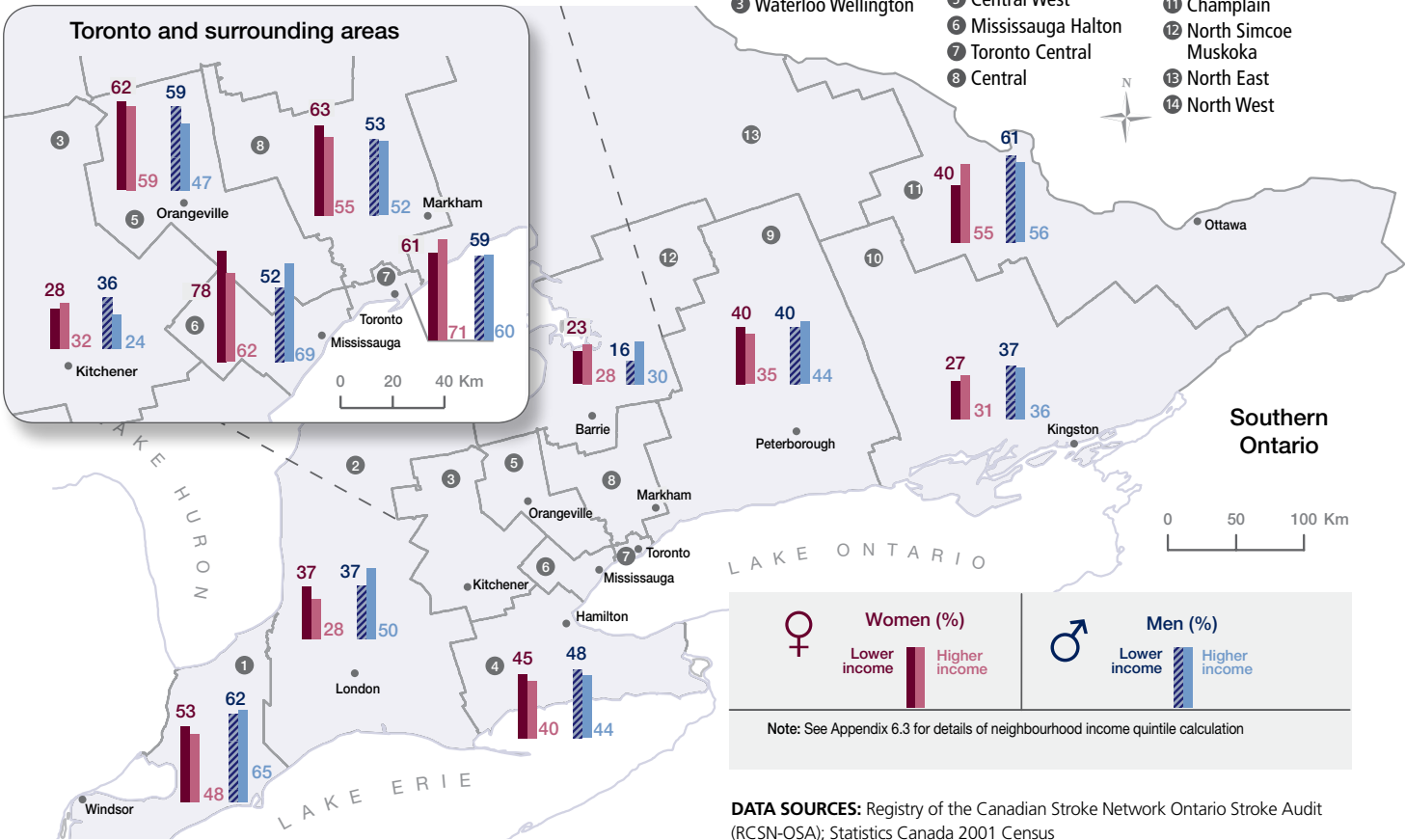
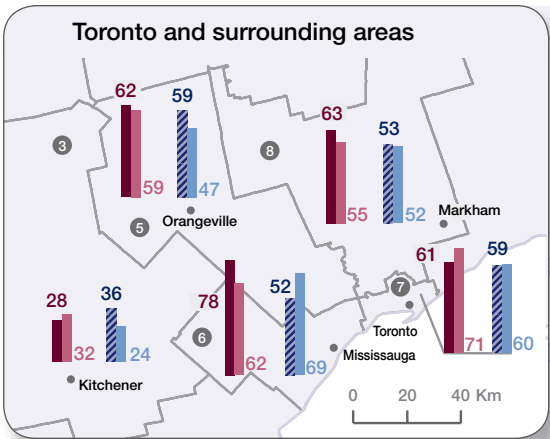
Overall Ontario

In Ontario, 44% of lower-income women, 45% of higher-income women, 45% of lower-income men and 49% of higher-income men who were seen in an ED or who were hospitalized for a stroke or a TIA received neurology or neurosurgical consultation while in hospital



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Statistics Canada 2001 Census

IN-HOSPITAL REHABILITATION AND NUTRITIONAL ASSESSMENT OF STROKE OR TRANSIENT ISCHEMIC ATTACK (TIA) PATIENTS

Indicator: This indicator measures the percentage of ischemic stroke or transient ischemic attack (TIA) patients aged 45 and older who received in-hospital assessments by physiotherapists, occupational therapists, speech language pathologists and/or nutritionists.

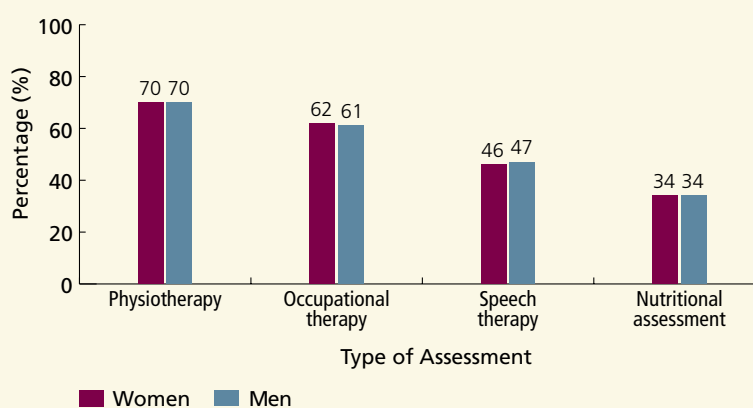
Background: It is recommended that all stroke patients should be screened for ongoing rehabilitation needs during hospitalization. Rehabilitation services can include occupational therapy, physiotherapy, and/or speech and language therapy. In addition, stroke patients may have difficulty swallowing, leading to feeding problems and possibly to malnutrition. Speech language pathologists may be able to screen for swallowing difficulties, and nutritionists can assess patients and recommend appropriate diets.

Findings: In the Ontario population aged 45 and older admitted to hospital with a primary diagnosis of stroke (n=13,167), 70 percent were assessed by a physiotherapist, 61 percent by an occupational therapist, 47 percent by a speech language pathologist and 34 percent by a nutritionist. Assessment rates did not vary by sex.

EXHIBIT 6D.23 | Percentage of stroke or transient ischemic attack (TIA) patients aged 45 and older who underwent rehabilitation and/or nutritional assessment while in hospital, by sex and type of assessment, in Ontario, 2004/05

FINDINGS

- Seven out of ten stroke patients were assessed by a physiotherapist, six out of ten by an occupational therapist, slightly less than half by a speech language pathologist and one in three stroke patients were assessed by a nutritionist.
- There were no sex differences in the rates of in-hospital assessments by physiotherapists, occupational therapists, speech language pathologists or nutritional therapists.
- Rates of assessment did not vary by neighbourhood income in women or men (data not shown).



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

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EXHIBIT 6D.24 | Percentage of adults aged 45 years and older admitted to hospital for a stroke or transient ischemic attack (TIA) who underwent rehabilitation and/or nutritional assessment while in hospital, by sex, age group and type of assessment, in Ontario, 2004/05

By Age Group	Physiotherapy		Occupational therapy		Speech and language therapy		Nutritional assessment	
	Women	Men	Women	Men	Women	Men	Women	Men
45-64	61	62	51	54	33	40	29	26
65-79	72	72	64	64	48	49	35	36
80+	71	73	63	62	50	49	36	36

DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- Across all practitioner types, patients under age 65 had consistently lower assessment rates than those aged 65 and older. This was true for both women and men.

POWER Study

EXHIBIT 6D.25 | Percentage of stroke or transient ischemic attack (TIA) patients aged 45 and older who underwent rehabilitation and/or nutritional assessment while in hospital, by sex, Local Health Integration Network (LHIN) and type of assessment, in Ontario, 2004/05

	Physiotherapy		Occupational therapy		Speech and language therapy		Nutritional assessment	
	Women	Men	Women	Men	Women	Men	Women	Men
Erie St. Clair	75	80	67	73	44	53	12	15
South West	62	64	54	55	39	39	28	31
Waterloo Wellington	72	62	66	54	44	54	58	58
Hamilton Niagara Haldimand Brant	76	78	69	69	58	56	49	48
Central West	66	66	56	56	46	48	49	49
Mississauga Halton	75	68	75	64	52	48	35	35
Toronto Central	82	75	78	73	62	59	46	45
Central	68	74	62	67	48	57	33	30
Central East	69	67	57	56	49	44	26	24
South East	62	81	43	59	41	45	29	35
Champlain	64	66	53	56	40	43	37	32
North Simcoe Muskoka	80	65	56	57	49	41	27	29
North East	55	59	48	36	18	15	16	14
North West	66	66	57	61	29	39	14	17

DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

FINDINGS

- Rates of all assessment types showed regional variation for women and men.
- Physiotherapy assessment rates ranged from 55 percent (North East LHIN) to 82 percent (Toronto Central LHIN) for women and from 59 percent (North East LHIN) to 81 percent (South East LHIN) for men.
- Occupational therapy assessment rates ranged from 43 percent (South East LHIN) to 78 percent (Toronto Central LHIN) for women and from 36 percent (North East LHIN) to 73 percent (Erie St. Clair LHIN and Toronto Central LHIN).
- Speech and language assessment rates ranged from 18 percent (North East LHIN) to 62 percent (Toronto Central LHIN) for women and from 15 percent (North East LHIN) to 59 percent (Toronto Central LHIN) for men.
- Nutritional assessment rates ranged from 12 percent (Erie St. Clair LHIN) to 58 percent (Waterloo Wellington LHIN) for women and from 14 percent (North East LHIN) to 58 percent (Waterloo Wellington LHIN) for men.

POWER Study

REFERRAL TO STROKE PREVENTION CLINICS FOR STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA) PATIENT DISCHARGED DIRECTLY FROM EMERGENCY DEPARTMENTS (ED)

Indicator: This indicator measures the percentage of patients aged 45 and older seen in the emergency department (ED) with stroke or transient ischemic attack (TIA) who were referred to a stroke prevention clinic when discharged directly from an ED.

Background: Patients who have suffered a TIA or a mild stroke may be at increased risk (up to 20 percent) of suffering a subsequent stroke within the following month.^{227, 228} Such individuals are also at increased risk of myocardial infarction and other cardiovascular events. Since the risk of stroke is highest early after the TIA, secondary prevention measures should be initiated as soon as possible to reduce the risk of recurrent stroke. It is recommended that patients with TIA discharged from an ED should receive a referral to a stroke prevention clinic, where available, for investigation and initiation of secondary prevention measures.¹⁸⁵

Findings: In the Ontario population aged 45 and older discharged directly from an ED in 2004/05 with a diagnosis of stroke or TIA (n=6,620), 30 percent (31 percent of women and 29 percent of men) received a referral to a stroke prevention clinic. There was no difference between women and men.

EXHIBIT 6D.26 | Percentage of adults aged 45 and older discharged from an emergency department (ED) with a diagnosis of stroke or transient ischemic attack (TIA) who received a referral to a stroke prevention clinic, by sex and Local Health Integration Network (LHIN), in Ontario, 2004/05

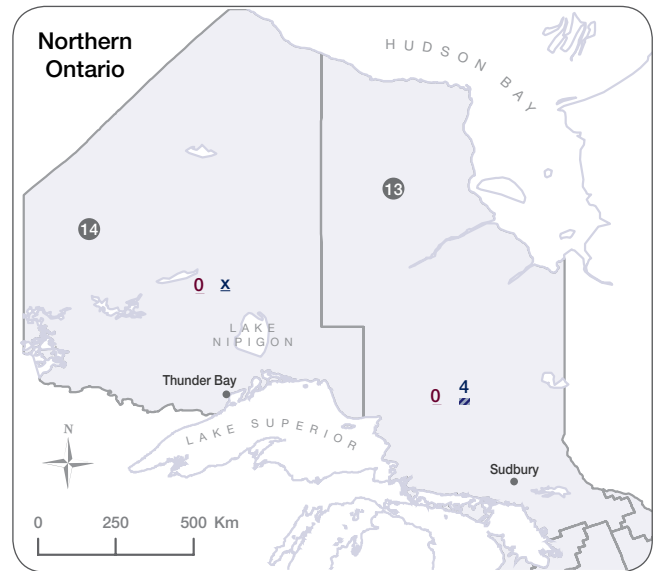
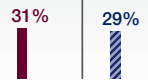
FINDINGS

- There was significant regional variation in the rates of referral to stroke prevention clinics. The rates are highly variable and include extreme values and small cell sizes due to the unavailability of stroke prevention clinics within some LHINs at the time of this study.

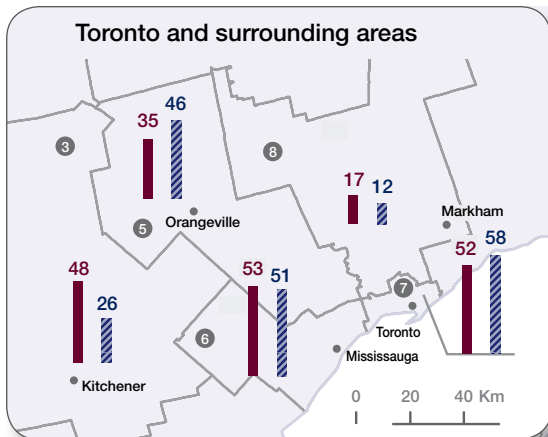
POWER Study

Overall Ontario

In Ontario, 31% of women and 29% of men who had a stroke or TIA were referred to a stroke prevention clinic upon discharge from an ED.

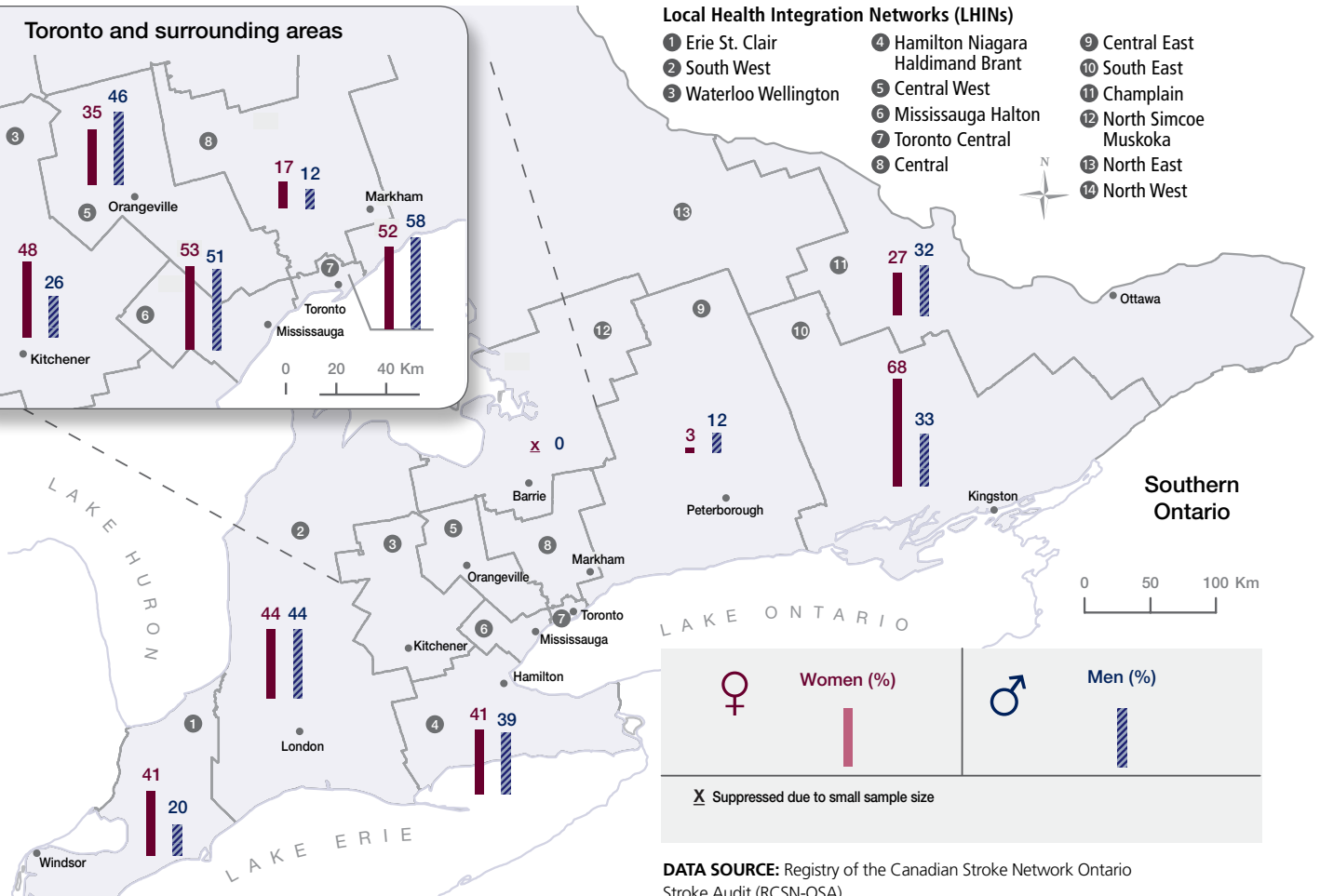


Toronto and surrounding areas



Local Health Integration Networks (LHINs)

- 1 Erie St. Clair
2 South West
3 Waterloo Wellington
4 Hamilton Niagara
Haldimand Brant
5 Central West
6 Mississauga Halton
7 Toronto Central
8 Central
9 Central East
10 South East
11 Champlain
12 North Simcoe
Muskoka
13 North East
14 North West



DATA SOURCE: Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

REHABILITATION FOR STROKE PATIENTS

WAIT TIME FROM STROKE ONSET TO ADMISSION TO INPATIENT REHABILITATION FOR PATIENTS REQUIRING CARE

Indicator: This indicator measures the wait time from stroke onset to admission to inpatient rehabilitation among patients aged 45 and older admitted to hospital with stroke.

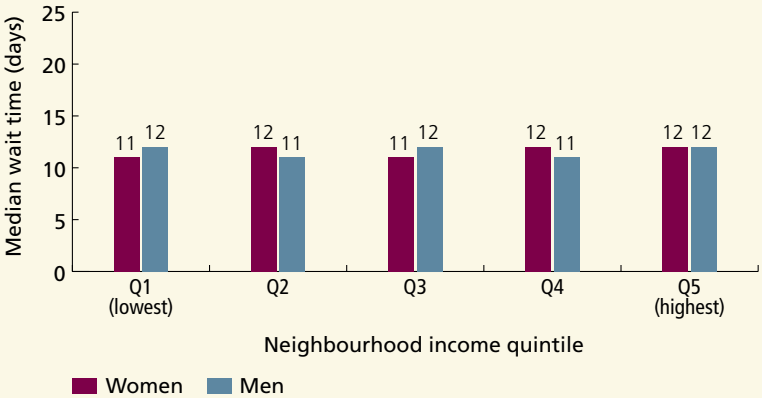
Background: Effective rehabilitation of stroke patients can prevent complications, minimize impairments and maximize functional status and should start as soon as possible after stroke.²²⁹ Rehabilitation is particularly important for women as studies have shown that women usually have worse preadmission functional status than men and may also be more likely to live alone, to lack social supports and to be disabled after stroke.¹⁹⁴

Findings: In the Ontario population aged 45 and older who were admitted to an inpatient rehabilitation facility in 2005/06 with a diagnosis of stroke (n=3,836), the mean wait time for admission was 24 days and the median wait time was 12 days, with no differences in the average wait times experienced by women or men.

EXHIBIT 6D.27 | Median wait time (days) from stroke onset to admission to an inpatient rehabilitation facility for adults aged 45 and older, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- The median wait times from stroke onset to admission to a rehabilitation facility did not vary by income among women or men.
- Across income quintiles, the 90th percentile wait times ranged from 33 to 41 days for women and 36 to 42 days for men (data not shown).
- The median and 90th percentile wait times from stroke onset to admission to a rehabilitation facility did not vary by age among women or men (data not shown).



DATA SOURCES: Canadian Institute for Health Information National Rehabilitation Reporting System (CIHI-NRS); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 6D.28 | Median wait time (days) from stroke onset to admission to an inpatient rehabilitation facility for adults aged 45 and older, by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06

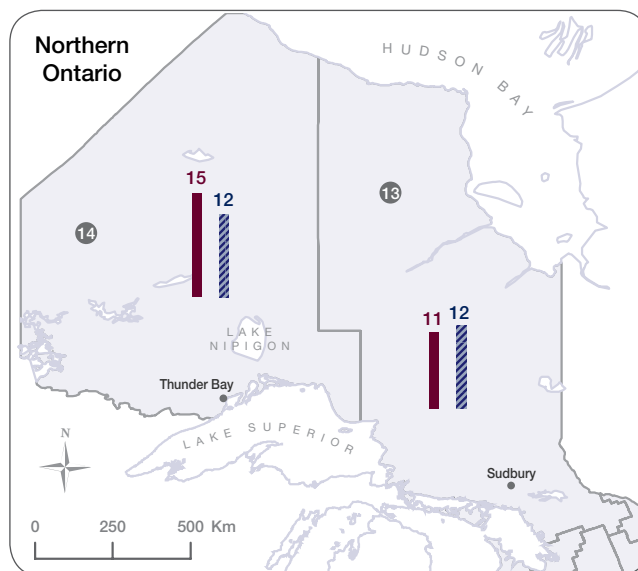
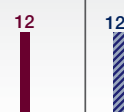
FINDINGS

- Among women and men, the median wait time from stroke onset to admission to a rehabilitation facility varied significantly by LHIN.
- Median wait times ranged from 8 days (Mississauga Halton LHIN) to 16 days (Champlain LHIN) for women and from 8 days (Erie St. Clair and Mississauga Halton LHINs) to 13 days (South West, Hamilton Niagara Haldimand Brant, Central West and Champlain LHINs) for men.

POWER Study

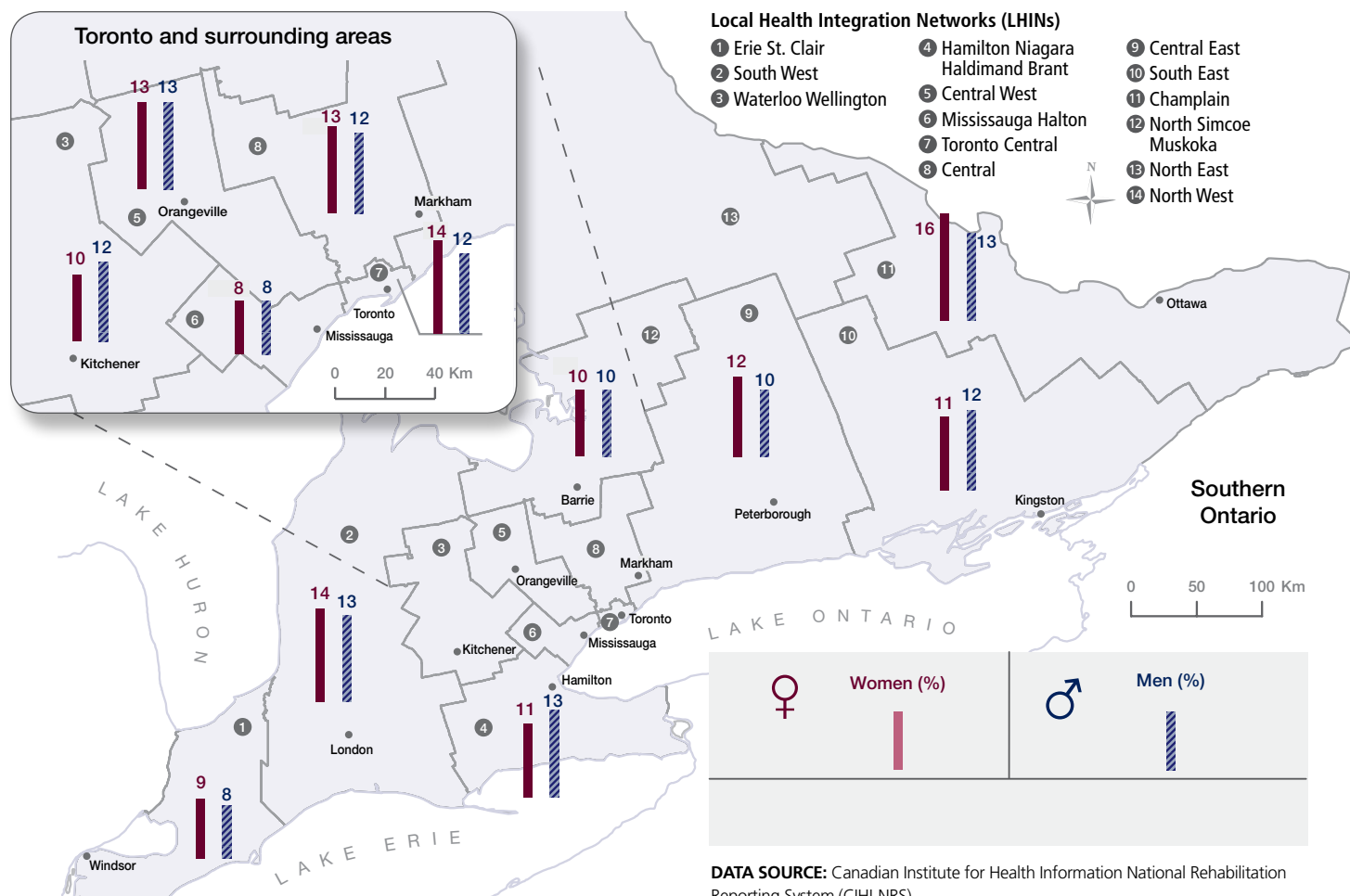
Overall Ontario

In Ontario, the median wait time from stroke onset to inpatient rehabilitation facility admission was 12 days for women and 12 days for men.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|------------------------|
| ① Erie St. Clair | ④ Hamilton Niagara Haldimand Brant | ⑨ Central East |
| ② South West | ⑤ Central West | ⑩ South East |
| ③ Waterloo Wellington | ⑥ Mississauga Halton | ⑪ Champlain |
| | ⑦ Toronto Central | ⑫ North Simcoe Muskoka |
| | ⑧ Central | ⑬ North East |
| | | ⑭ North West |



DATA SOURCE: Canadian Institute for Health Information National Rehabilitation Reporting System (CIHI-NRS)

MEAN CHANGE IN FUNCTIONAL INDEPENDENCE MEASUREMENT (FIM) SCORE FROM ADMISSION TO DISCHARGE FROM AN INPATIENT REHABILITATION FACILITY

Indicator: This indicator measures the mean change in Functional Independence Measurement (FIM) score from admission to discharge among patients aged 45 and older who were admitted to an inpatient rehabilitation facility.

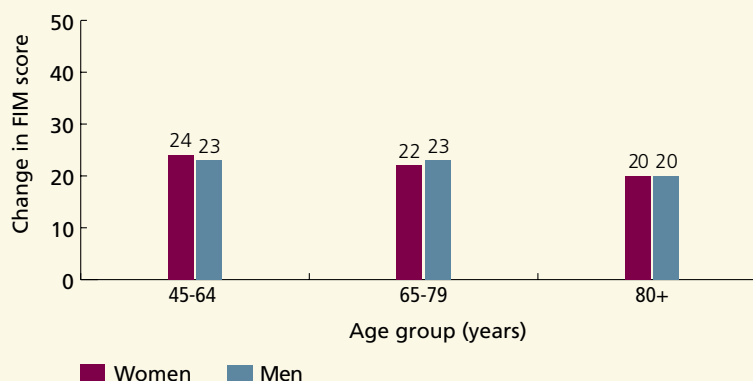
Background: Effective rehabilitation of stroke patients can help prevent complications, minimize impairments and maximize functional status. Functional Independence Measure (FIM) assessments help to identify and track rehabilitation outcomes. A positive change in the FIM is an indicator of improvement in functional status. The FIM instrument is a seven-level ordinal scale used to measure functional performance on 18 activities considered essential for daily living with scores ranging from 18 to 126. The activities encompass personal care, sphincter control, mobility, locomotion and communication.^{230, 231} The FIM is used as a measure of functional status and disability, as well as a measure reflecting the minutes of care necessary to support a person with disability in his/her activities of daily living. A positive change in the FIM is an indicator of improvement in functional status. The FIM has been assessed for reliability and validity and was found to distinguish well between patients with different levels of impairment and to have negligible floor or ceiling effects within most patients.²³¹

Findings: In the Ontario population aged 45 and older who were admitted in 2005/06 to an inpatient rehabilitation facility with a diagnosis of stroke and who had FIM scores at admission and discharge (n=3,464), the mean change in FIM score from the time of admission to discharge was 22. The mean change in score did not vary by sex; 21 for women and 22 for men.

EXHIBIT 6D.29 | Mean change in Functional Independence Measure (FIM) score[^] in stroke and transient ischemic attack (TIA) patients aged 45 and older admitted to an inpatient rehabilitation facility, by sex and age group, in Ontario, 2005/06

FINDINGS

- There was an age gradient in the mean change in FIM score among women and men. As age increased, the mean change in score decreased.
- The mean change in FIM scores did not vary by income among women or men (data not shown).
- The mean change in FIM score from admission to discharge among stroke patients who were admitted to inpatient rehabilitation showed significant regional variation among women and men (data not shown).



DATA SOURCE: Canadian Institute for Health Information National Rehabilitation Reporting System (CIHI-NRS)

[^] Change in score is measured from admission to discharge

POWER Study

OUTCOMES IN STROKE AND TRANSIENT ISCHEMIC ATTACK

READMISSION AND MORTALITY: RISK-ADJUSTED NON-ELECTIVE READMISSION RATES (PERCENTAGE) FOR STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the seven-day, 30-day and one-year, risk-adjusted, non-elective readmission rate among patients aged 45 and older initially admitted to hospital with stroke or transient ischemic attack (TIA).

Background: Hospital readmissions can reflect the clinical care provided in hospital, in the community as well as self-management and other factors. All-cause readmissions, stroke specific readmissions and readmissions related to cardiovascular disease (CVD) (including stroke, acute myocardial infarction, heart failure and unstable angina) are reported separately at three follow up intervals: seven days, 30 days and one year post-discharge.

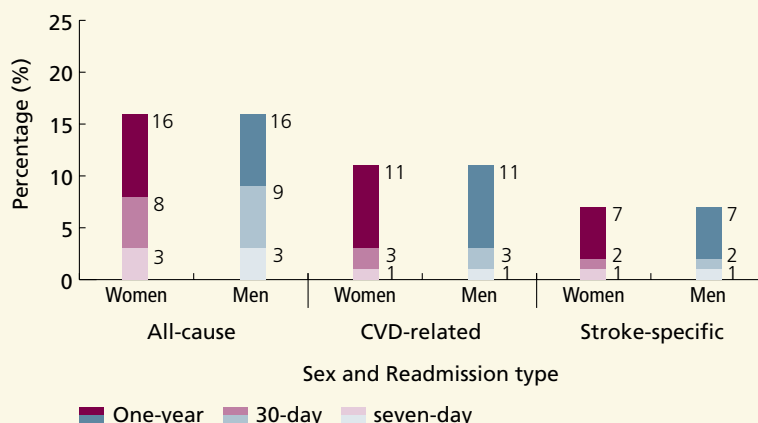
The Discharge Abstract Database maintained by the Canadian Institute for Health Information was used to identify patients age 45 and older discharged from hospital alive after an admission with a primary diagnosis of stroke or TIA in 2005/06, and to identify readmissions within one year of discharge. The risk-adjusted model used for this analysis is one used by the Registry of the Canadian Stroke Network (RCSN) for analyses, and includes patient age group (45-64, 65-79, 80 and older), sex (in the overall sample only), Charlson-Deyo comorbidity index (0,1 versus 2 or more)²³² and stroke type (TIA and ischemic stroke versus hemorrhagic stroke).

Findings: In the Ontario population aged 45 and older who were admitted to hospital in 2005/06 with a primary diagnosis of stroke or TIA and discharged alive (n=13,145), 3.2 percent, 8.4 percent and 15.7 percent had a non-elective readmission within seven, 30 and 365 days of discharge, respectively. Readmission rates did not vary by sex.

EXHIBIT 6D.30 | Risk-adjusted readmission rates (percentage) among adults aged 45 and older discharged alive from hospital with a primary diagnosis of stroke or transient ischemic attack (TIA), by sex, readmission type and follow up period, in Ontario 2005/06

FINDINGS

- At all three time intervals (seven-day, 30-day, one-year) all-cause, cardiovascular disease (CVD)-related and stroke-specific readmission rates did not vary by sex.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

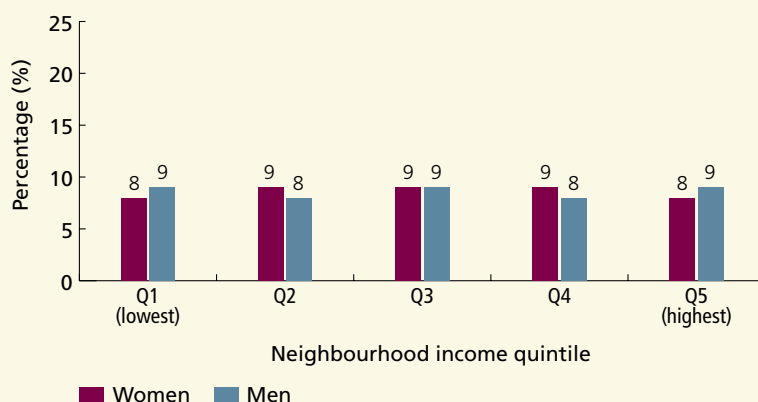
CVD = cardiovascular disease

POWER Study

EXHIBIT 6D.31 | Risk-adjusted, 30-day, all-cause readmission rates (percentage) among adults aged 45 and older discharged alive from hospital with a primary diagnosis of stroke or transient ischemic attack (TIA), by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- Across all income quintiles, women and men had similar risk-adjusted hospital readmission rates. This was true irrespective of cause of readmissions and follow up interval (data on 30-day, all-cause readmissions are shown).
- Risk-adjusted readmission rates did not vary by neighbourhood income among women or men regardless of period of follow up or cause (data on 30-day, all-cause readmissions are shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Statistics Canada 2001 Census

NOTE: See [Appendix 6.3](#) for details of neighbourhood income quintile calculation

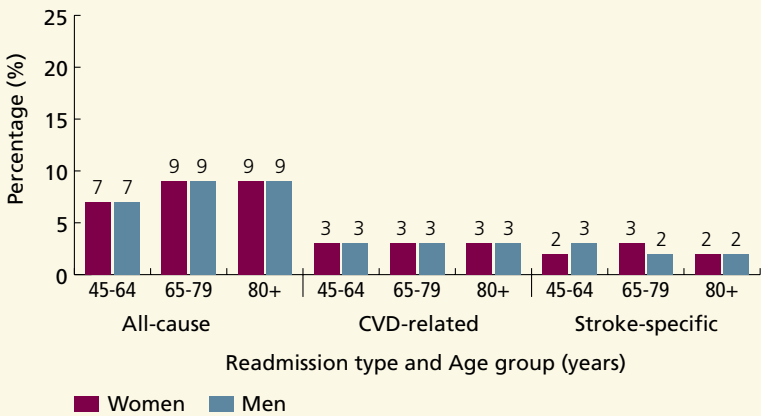
POWER Study

EXHIBIT 6D.32 | Risk-adjusted readmission rates (percentage) among adults aged 45 and older discharged alive from hospital with a primary diagnosis of stroke or transient ischemic attack (TIA), by sex, age group and readmission type, in Ontario, 2005/06

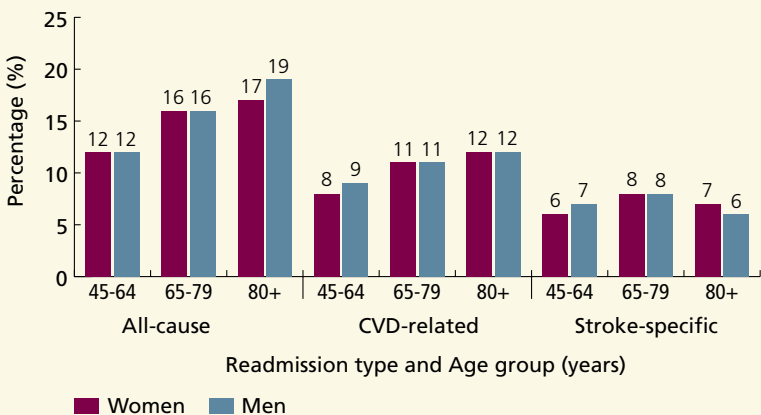
FINDINGS

- Men aged 65 and older had higher risk-adjusted 30-day all-cause readmission rates than younger men. Stroke-specific readmissions within 30 days were highest among men aged 45-64. Cardiovascular disease (CVD)-related readmissions did not vary by age among men.
- Among women, there were no age-related differences in 30-day risk-adjusted readmission rates.
- At one year post-discharge, risk-adjusted readmissions for all causes and for CVD-related reasons increased with age for women and men. Stroke-specific readmissions at one year did not vary by age among women or men.
- Risk-adjusted readmission rates within the first seven days did not vary by age for women or men, regardless of cause (data not shown).
- Risk-adjusted, all-cause readmissions within one year differed across Local Health Integration Networks (LHINs). The overall rates ranged from 13 percent (Waterloo Wellington and Hamilton, Niagara Haldimand Brant LHINs) to 19 percent (Erie St. Clair and North East LHINs).

30-day readmissions



One-year readmissions



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)

CVD = cardiovascular disease

POWER Study

RISK-ADJUSTED MORTALITY (PERCENTAGE) FOR STROKE AND TRANSIENT ISCHEMIC ATTACK (TIA)

Indicator: This indicator measures the seven-day, 30-day and one-year mortality rates for stroke or transient ischemic attack (TIA) patients aged 45 and older who were admitted to hospital.

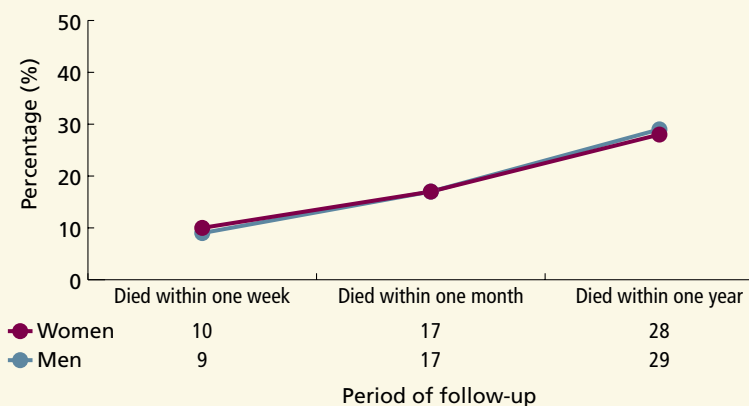
Background: Mortality following acute stroke has been identified as an indicator of quality of care. In theory, better processes of care may reduce both short-term and long-term mortality following stroke.²¹⁴ Although some studies have suggested lower one-year stroke mortality in women compared to men, other reports have found no sex differences in survival after stroke onset.²¹⁴ The results of this analysis are risk-adjusted for patient age (45-64, 65-79, 80 and older), sex (in the overall sample only), the Charlson-Deyo comorbidity index (0,1 versus 2 or more)²³² and stroke type (TIA and ischemic stroke versus hemorrhagic stroke).

Findings: In the Ontario population aged 45 and older admitted to hospital in 2005/06 with a primary diagnosis of stroke or TIA (n=15,378) mortality rates were 9 percent within seven days, 17 percent within 30 days and 28 percent within one year of discharge. Mortality rates did not vary by sex at any point.

EXHIBIT 6D.33 | Risk-adjusted mortality (percentage) among adults aged 45 and older seen in hospital[^] with a primary diagnosis of stroke or transient ischemic attack (TIA), by sex and period of follow up, in Ontario, 2005/06

FINDINGS

- The risk-adjusted mortality rates of patients did not differ by sex, irrespective of follow up interval.
- Among women and men, mortality rates did not vary by income, regardless of follow up interval (data not shown).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

[^] Includes patients who were seen in an emergency department (ED) or admitted to hospital

POWER Study

EXHIBIT 6D.34 | Crude mortality (percentage) among patients aged 45 and older seen in hospital[^] with a primary diagnosis of stroke or transient ischemic attack (TIA), by stroke type and period of follow up, in Ontario, 2005/06

Crude mortality	All stroke types	Hemorrhagic stroke	Ischemic Stroke	TIA
1-week	9.4%	27.4%	8.2%	X
1-month	16.7%	37.1 %	16.6%	1.1%
1-year	28.0%	45.0%	29.3%	9.5%

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

[^] Includes patients who were seen in an emergency department (ED) or admitted to hospital

X Suppressed due to small sample size

FINDINGS

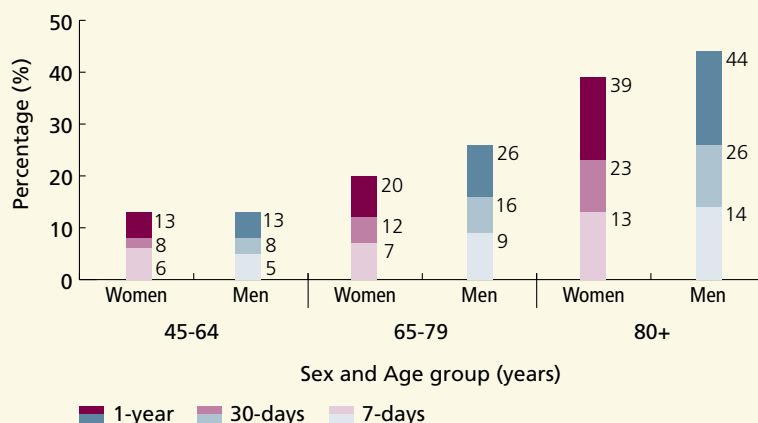
- Mortality rates at all time intervals were significantly higher for patients with hemorrhagic stroke.
- Greater than one-quarter of hemorrhagic stroke patients died within seven days of stroke admission compared to 8.2 percent of ischemic stroke patients. One-year mortality for hemorrhagic stroke patients was 45.0 percent as compared to 29.3 percent among ischemic stroke patients and 9.5 percent among patients who had suffered a TIA.

POWER Study

EXHIBIT 6D.35 | Risk-adjusted mortality (percentage) among adults aged 45 and older seen in an emergency department (ED) or admitted to hospital with a primary diagnosis of stroke or transient ischemic attack (TIA) by sex, age group and period of follow up, in Ontario, 2005/06

FINDINGS

- Risk-adjusted mortality rates at all time intervals increased with age.
- Among women, seven-day mortality rates ranged from six percent among those aged 45-64 to 13 percent among women aged 80 and older. One-year mortality rates for women were 13 percent (age 45-64), 20 percent (age 65-79) and 39 percent (aged 80 and older).
- Among men, seven-day mortality rates ranged from five percent among those aged 45-64 to 14 percent among men aged 80 and older. One-year mortality rates for men were 13 percent (age 45-64), 26 percent (age 65-79) and 44 percent (aged 80 and older).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

POWER Study

EXHIBIT 6D.36 | Risk-adjusted 30-day mortality (percentage) among adults aged 45 and older seen in an emergency department (ED) or admitted to hospital with a primary diagnosis of stroke or transient ischemic attack (TIA) by sex and Local Health Integration Network (LHIN), in Ontario, 2005/06

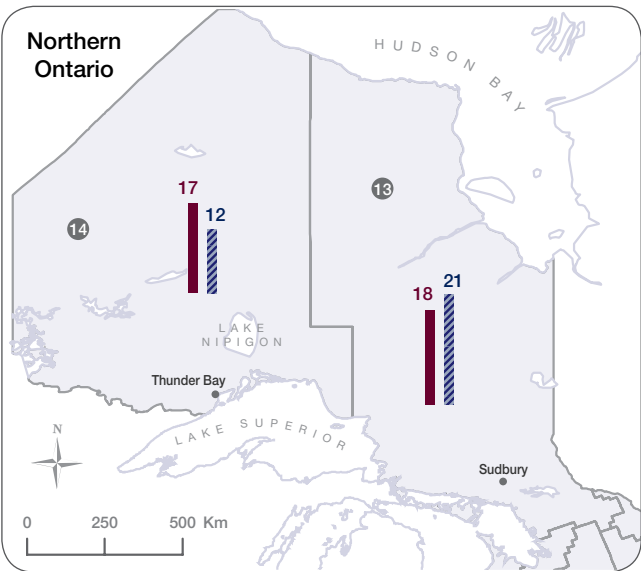
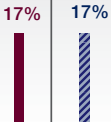
FINDINGS

- Among women, 30-day mortality rates ranged from 12 percent (Central West LHIN) to 20 percent (South East LHIN). The regional variations in 30-day and one-year mortality rates were not significant among women, however seven day mortality rates among women did vary significantly by LHIN (data not shown).
- Among men, mortality rates at all time periods varied significantly across LHINs (30-day data are shown). The 30-day mortality rates ranged from 12 percent (North West LHIN) to 21 percent (South East and the North East LHINs).

POWER Study

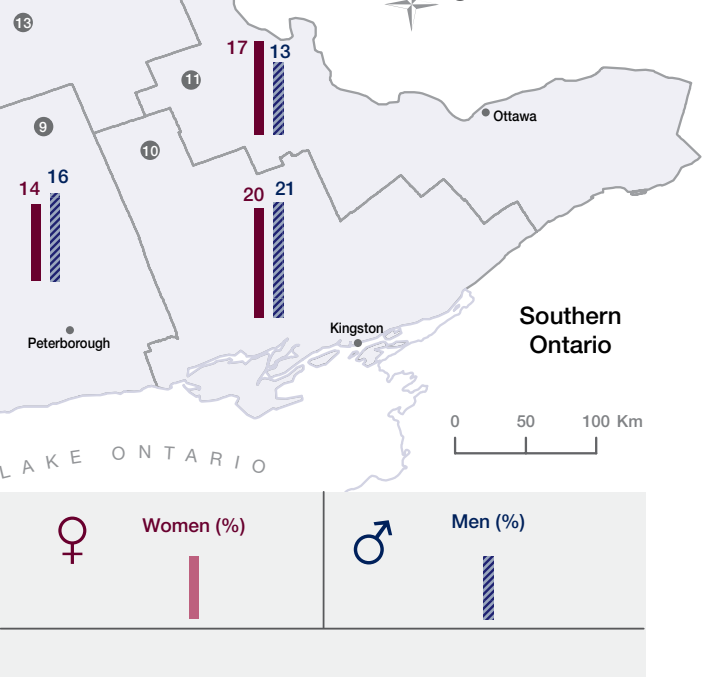
Overall Ontario

In Ontario 17% of women and 17% of men who were either seen in an ED or hospitalized for a stroke or TIA died within 30 days of their visit.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

Section 6D

SUMMARY OF FINDINGS

We found no sex differences in the delivery of key stroke care quality indicators, including thrombolysis, neuroimaging, dysphagia screening, stroke unit admission, use of antithrombotic therapy and consultations from neurology, neurosurgery, physiotherapy, occupational therapy, speech language pathology and nutrition. However, women were less likely than men to be prescribed lipid-lowering therapy (at discharge and at 90 days and one year post-discharge), to undergo carotid imaging and to be treated with carotid endarterectomy within 6 months of the index stroke event, and were more likely to receive antihypertensive therapy (at discharge, but not at 90 days or one year post-discharge). There were no sex differences in risk-adjusted 30-day all-cause readmission or mortality rates after stroke.

We found no significant differences in the quality of stroke care by neighbourhood income, but did find substantial variation for some indicators by age group and by region. Findings for the indicators reported in this section are summarized below.

Acute Therapy

- Overall, thrombolysis was administered to four percent of all patients with acute ischemic stroke who presented to hospital, and 14 percent of those presenting within 2.5 hours of stroke onset, with no differences in rates of thrombolysis administration by sex, income or age.
- Sixty-eight percent of patients with ischemic stroke or transient ischemic attack (TIA) were treated with antiplatelet therapy within 48 hours of presentation. There were no differences in the use of acute antiplatelet therapy by sex, income or age.

Secondary Prevention

- The majority of patients (93 percent) with ischemic stroke or TIA were prescribed antithrombotic therapy (aspirin,

clopidogrel, combination aspirin and dipyridamole or warfarin) at the time of discharge, with no differences in prescribing rates by sex, income or age. Note that our analyses did not exclude those with potential contraindications to therapy.

- Of those with atrial fibrillation and ischemic stroke or TIA, 74 percent were prescribed warfarin at discharge. There were no differences in warfarin prescribing by sex or income at discharge, 90 days or one year post-discharge. Older women (aged 80 and older) were less likely than their younger counterparts to be prescribed warfarin at one year post-discharge. Our analysis did not exclude patients with contraindications to warfarin, and thus we did not expect prescribing rates to approach 100 percent.
- Fifty-four percent of patients with ischemic stroke or TIA were prescribed lipid-lowering therapy at discharge, with lower rates of prescribing in women compared to men and in older (aged 80 and older) compared to younger patients. There was also significant regional variation in prescribing rates but no variation by neighbourhood income. The measurement of lipid levels also varied significantly by age, with lower assessment rates in older patients. This may partially explain variations in prescription rates by age. We did not have information on actual lipid levels, so we cannot report on rates of prescription in patients with lipid levels above target; in addition, our analyses do not exclude those with potential contraindications to therapy.
- Women were slightly more likely than men to receive antihypertensive therapy at discharge (81 percent versus 76 percent), this difference did not persist past 90 days post-discharge. Our analyses included all patients, regardless of baseline blood pressure measurement and we do not have information on whether or not patients reached target blood pressure levels.

Imaging

- A majority of patients with stroke or TIA underwent computed tomography (CT) or magnetic resonance (MR) imaging before hospital discharge (85 percent), with variations in imaging rates by region but no differences by sex, income or age. Imaging rates may be affected by both appropriate patient selection (such as opting to avoid investigations in patients with terminal illness) and by the availability of imaging equipment. We did not account for these factors in our analyses.
- Fifty-three percent of patients had carotid imaging (including carotid Doppler ultrasound, CT angiography, MR angiography or catheter angiography) either performed during their hospital stay or scheduled to be done as an outpatient post-discharge. Women were less likely to undergo carotid imaging than men. Carotid imaging rates were lower in older adults (aged 80 and older) compared to younger patients. There was significant variation in carotid imaging rates by region but not by income.

Carotid Endarterectomy

- Less than two percent of patients with ischemic stroke or transient ischemic attack underwent carotid endarterectomy within six months of hospitalization. There were no significant differences in surgical rates by income, but rates were lower in women than in men, and in older compared to younger patients. Rates also varied significantly by region, but some LHIN estimates were based on small numbers and the results should be viewed with caution. For those who underwent carotid endarterectomy, median and 90th percentile wait times were similar for women and men.

In-Hospital Care

- Fewer than one in five stroke or TIA patients were cared for in a dedicated stroke unit. There were regional variations in rates of admission to stroke units, but no differences by sex, income or age.

- Almost half of all stroke patients (47 percent) were screened for dysphagia, with regional variation in screening rates and higher rates of screening with increasing age but no differences by sex or neighbourhood income.
- Forty-six percent of patients received a consultation from a neurologist or neurosurgeon, with regional variations but no differences in consultation rates by sex, income or age.
- Seventy percent of patients with stroke were assessed by a physiotherapist, 61 percent by an occupational therapist, 47 percent by a speech language pathologist and 34 percent by a nutritionist. There were variations in assessment rates by region and age (with lower assessment rates in younger compared to older patients), but there were no differences by sex or income. Higher assessment rates in older individuals may be appropriate based on comorbid illness and functional status both before and after stroke.

Referrals to Secondary Prevention Clinics

- Among patients with stroke or TIA who were discharged directly from the emergency department, 30 percent were referred to a stroke prevention clinic. There were no differences in referral rates by sex, income or age, however there were significant regional differences, however regional rates are highly variable and include extreme values and small cell sizes due to the unavailability of stroke prevention clinics within some LHINs.

Rehabilitation

- For patient referred for inpatient rehabilitation, the mean waiting time from stroke onset to admission to an inpatient rehabilitation facility was 24.1 days. There was significant regional variation in waiting times for rehabilitation admission, but no differences by sex, income and age.
- The mean change in the Functional Independence Measurement (FIM) score between admission and

discharge from a rehabilitation facility was 22, and did not vary by sex. Older patients (aged 80 and older) had a lower mean change in FIM score compared to younger patients. There was regional variation in mean change in FIM scores, but no income-related differences.

Outcomes

- For patients discharged alive after an admission for ischemic stroke or TIA, non-elective, risk-adjusted, all-cause readmission rates were 3.2 percent (within seven days), 8.4 percent (within 30 days) and 15.7 percent (within one year). Readmission rates did not vary by sex, neighbourhood income or age, but did vary by region for readmissions within one year.
- Risk-adjusted mortality rates were 9 percent, 17 percent and 28 percent within seven, 30 and 365 days of stroke or TIA admission, respectively. Mortality was significantly higher for patients suffering from a hemorrhagic compared to ischemic stroke. There were regional variations in stroke case-fatality rates but no significant variation by sex, age or neighbourhood income.



Chapter Summary of Findings

In this chapter, we present results pertaining to the performance of Ontario's health care system on indicators of care cardiovascular disease (CVD).

In addition, we also report the findings on the health and functional status of Ontarians with heart disease or who have had a stroke.

The chapter includes the following four sections:

- A. Health and Functional Status
- B. Heart Failure (HF)
- C. Ischemic Heart Disease (IHD)
- D. Stroke

Figure 1 | Factors associated with differences in cardiovascular disease (CVD) care

Indicator	Overall Result	Stratification Factor			
		Sex	Age	Income	Education
Health and Functional Status of Adults with Self-reported Heart Disease or Stroke (10 Indicators)					
Percentage who reported their health to be fair or poor	45%	N	N	Y	Y
Percentage who reported their health was somewhat or much worse than their health the year prior	25%	N	Y	Y	N
Activity limitation: the percentage who reported that their activities at home, school or work were limited due to a long-term physical or mental condition or health problem	58%	Y	Y	Y	N
Prevalence of limitations					
Limitations in Instrumental Activities of Daily Living (IADL) and/or Activities of Daily Living (ADL)	49%	Y	Y	Y	Y
IADL limitations only	36%	Y	Y	Y	N
ADL limitations with or without IADL limitations	13%	Y	Y	Y	Y
Any disability days in the previous 2 weeks	24%	Y	N	N	N
Functional status					
Percentage who reported that at least some of their activities were prevented due to pain or discomfort	33%	Y	N	Y	Y
Percentage who reported problem with mobility including inability to walk around the neighbourhood or an ability to walk with difficulty, requiring help of others or mechanical support	22%	Y	Y	Y	Y
Socioeconomic risk factors for CVD					
Lower-income (the two lowest household income categories)	37%	Y	Y	•	Y
Less education (secondary school education or less)	48%	Y	Y	Y	•

Chronic disease risk factors for CVD

Diabetes	22%	Y	Y	Y	N
Hypertension	59%	N	Y	N	N
Behavioural risk factors for CVD					
Physical inactivity (physical activity index of <1.5 kcal/kg/day)	59%	Y	Y	Y	Y
Inadequate fruit and vegetable intake (less than five servings per day)	54%	Y	Y	N	N
Being overweight or obese (BMI > 25 calculated from self-reported height and weight)	61%	Y	N	N	Y
Smoking (current daily or occasional smoking)	15%	N	Y	Y	Y
Percentage who reported making changes in the last year to improve their health	55%	N	Y	Y	N

Heart Failure (HF) (13 Indicators)

In-hospital physician care for HF by a cardiologist (most responsible physician)	19%	Y	Y	Y	Y
Physician care within 4 weeks of hospital discharge for HF	98	N	N	N	Y
ACE inhibitor and/or ARB therapy for HF post-discharge					
Within 90 days of discharge	70%	N	Y	N	Y
Between nine months and one year post-discharge	69%	N	Y	N	Y
Beta-blocker therapy in HF post hospital discharge					
Within 90 days of discharge	57%	N	Y	N	Y
Between nine months and one year post-discharge	57%	N	Y	N	Y
Warfarin therapy in HF patients with atrial fibrillation post-discharge					
Within 90 days of discharge	69%	N	Y	N	N
Between nine months and one year post-discharge	68%	N	N	N	N
Left ventricular function evaluation in HF during the period six months before hospital admission to one month post-discharge	76%	Y	Y	N	Y
Cardiac testing in HF during the period six months before hospital admission to one month post-discharge					
Non-invasive cardiac testing (stress testing, exercise testing and perfusing imaging)	68%	Y	Y	N	Y
Echocardiography	33%	Y	Y	Y	Y
Angiography	14%	Y	Y	Y	Y
Age-standardized emergency department visits in HF patients post-discharge (all-cause)					
Within 30 days	30%	Y	N	N	Y
Within one year	75%	N	N	N	N

Risk-adjusted readmission rates in HF post-discharge (all-cause)

Within 30 days	20%	N	Y	N	N
Within one year	58%	N	Y	N	Y
Risk-adjusted, one-year mortality in HF patients	35%	Y	Y	N	Y
Weight measurement on 50 percent of inpatient days [¥]	14%	Y	Y	N	•
Provision of any discharge instructions to HF patients ^{¥†}	97%	N	•	•	•
Cardiology care for newly identified HF patients	47%	Y	Y	Y	Y

Ischemic Heart Disease (IHD) (20 indicators)

In-hospital physician care by a cardiologist (most responsible physician) for acute myocardial infarction (AMI) patients	36%	Y	Y	Y	Y
Physician care within 4 weeks of hospital discharge for AMI patients	99%	N	N	N	Y
Beta-blocker therapy for AMI post-discharge					
Within 90 days of discharge	76%	N	Y	N	Y
Between nine months and one year post-discharge	69%	N	N	N	Y
ACE inhibitor and/or ARB therapy for AMI post-discharge					
Within 90 days of discharge	77%	N	Y	N	Y
Between nine months and one year post-discharge	74%	N	Y	N	Y
Statin therapy for AMI post-discharge					
Within 90 days of discharge	77%	Y	Y	N	Y
Between nine months and one year post-discharge	75%	Y	Y	N	Y
Age-standardized angiography rates in AMI patients within three months of discharge (underwent or referred)	54%	Y	Y	Y	Y
Risk-adjusted non-elective, all-cause readmission rates in AMI					
Within 30 days	15%	Y	Y	N	Y
Within one year	39%	Y	Y	N	Y
Risk-adjusted mortality rate in AMI					
Within 30 days	9%	N	Y	N	Y
Within one year	20%	N	Y	N	Y
Aspirin therapy for AMI patients at hospital discharge [¥]	85%	N	Y	N	•
Median door-to-needle time for thrombolytics therapy in STEMI patients ^{¥#}	38 mins	Y	Y	N	•

Coronary Artery Bypass Graft surgery (CABG) Indicators

Use of internal mammary artery to bypass left anterior descending artery	87%	N	N	N	Y
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Risk-adjusted median post-operative length of stay for CABG	7 days	Y	Y	Y	Y
Medication management after CABG					
Statins					
Within 90 days of discharge	90%	N	N	N	Y
Between nine months and one year post-discharge	85%	N	N	N	N
Beta-blockers					
Within 90 days of discharge	82%	N	N	N	Y
Between nine months and one year post-discharge	68%	N	N	N	Y
ACE inhibitors					
Within 90 days of discharge	63%	N	N	N	Y
Between nine months and one year post-discharge	57%	N	N	N	N
Risk-adjusted, one year CVD-related readmissions after CABG	5.1%	N	Y	N	Y
Revascularization post hospital discharge^	1.6%	Y	•	•	•
Age-standardized mortality^					
In-hospital	1.1%	N	•	•	•
Within 30 days	1.3%	N	•	•	•
Within one year	3.3%	N	•	•	•
Median and 90 th percentile wait times					
Angiography	3 days	N	Y	N	Y
Angioplasty	2 days	N	Y	N	Y
Coronary Artery Bypass Graft (CABG) surgery	7 days	N	Y	N	Y

Stroke (22 indicators)

Thrombolytic therapy with rtPA for ischemic stroke within 2.5 hours of stroke onset (age-standardized)					
For all stroke patients	4	N	N	N	•
For patient presenting within 2.5 hours of stroke onset	14%	N	N	N	•
Antiplatelet therapy for ischemic stroke or TIA within 48 hours of admission (age-standardized)	68%	N	Y	N	N^
Antithrombotic therapy prescribed at discharge for secondary prevention of stroke	93%	N	N	N	N^
Warfarin therapy at discharge	74%	N	N	N	•
Continuation of warfarin therapy					
Within 90 days of discharge	68%	N	Y	N	•
Between nine months and one year post-discharge	73%	N	N	N	•

Measurement of lipid levels during hospitalization	44%	N	Y	N	Y^
Prescription rates of statins at discharge	54%	Y	Y	N	Y^
Continuation of statins					
Within 90 days of discharge	54%	Y	Y	N	Y^
Between nine months and one year post-discharge	59%	Y	Y	N	Y^
Prescription of antihypertensive therapy at discharge	79%	Y	Y	N	Y^
Continuation of antihypertensive therapy					
Within 90 days of discharge	76%	N	Y	N	Y^
Between nine months and one year post-discharge	81%	N	N	N	N^
Neuroimaging (CT and/or MR imaging) for stroke	85%	N	N	N	Y
Carotid imaging for stroke	53%	Y	Y	N	Y^
Carotid endarterectomy for stroke (within 6 months of hospitalization)	1.5%	Y	Y	N	Y^
Admission of stroke patients to a stroke unit	19%	N	N	N	Y^
Dysphagia screening in stroke patients	47%	N	Y	N	Y^
In-hospital neurology or neurosurgical consultation	46%	N	Y	N	Y^
In-hospital assessment by					
Physiotherapist	70%	N	Y	N	Y^
Occupational therapist	61%	N	Y	N	Y^
Speech and language therapist	47%	N	Y	N	Y^
Nutritionist	34%	N	Y	N	Y^
Referral to stroke prevention clinics for stroke and TIA patients discharged directly from an emergency department	30%	N	N	N	Y^
Median wait time for admission to inpatient rehabilitation (for patients requiring admission)	12 days	N	N	N	Y^
Mean change in Functional Independence Measurement (FIM) score	22	N	Y	N	Y^
Risk-adjusted non-elective readmission rates (all-cause)					
Within one week	3.2%	N	N	N	•
Within 30 days	8.4%	N	Y	N	•
Within one year	15.7%	N	Y	N	Y
Risk-adjusted mortality					
Within one week	9%	N	Y	N	•
Within 30 days	17%	N	Y	N	•
Within one year	28%	N	Y	N	Y

¥ Data are from the EFFECT study and were not available by LHIN

† Provision of any discharge instructions was not analysed by age or income

Sample is limited to patients who received thrombolytic therapy within four hours of presentation to hospital

^ Estimates are based on small numbers, estimates lack precision

• Not applicable

POWER Study

A summary of the key findings from the four chapter sections follows:

Health and Functional Status

- Almost half (45 percent) of adults who have heart disease or who have had a stroke reported that their health status was fair or poor, compared to 13 percent in the general population in Ontario (see [Burden of Illness, chapter 3](#)).
- Adults with heart disease or who have had a stroke who were from lower-income households or who had less than a secondary education were between one and a half to twice as likely to report fair or poor health as compared to those from higher-income neighbourhoods or with a Bachelor's degree or higher, respectively.
- Among adults with heart disease or who have had a stroke, 58 percent reported having activity limitations due to their health problem, 49 percent reported have limitations in their Limitations in Instrumental Activities of Daily Living (IADL) and/or Activities of Daily Living (ADL) and 25 percent had taken at least one disability day in the two weeks prior to survey.
- Women were more likely to report activity limitations than men; 63 percent of women versus 55 percent of men reported activity limitations due to a chronic health problem; 59 percent of women versus 40 percent of men reported IADL and/or ADL limitations and 28 percent of women versus 21 percent of men reported disability days.
- Women with CVD were more likely than men to report living with pain (38 percent versus 29 percent, respectively) or problems with mobility (26 percent versus 19 percent, respectively). Both of these indicators also varied by household income and educational attainment. Lower socioeconomic status adults were more likely to report living with pain and mobility limitations than those with higher socioeconomic status.
- Forty-eight percent of individuals living with heart disease or the effects of a stroke had less than secondary education and 37 percent were from lower-income households and both socioeconomic risk factors were more common in women than in men. Women were more likely than men to live in a lower-income household (46 percent versus 31 percent, respectively) or to have lower educational attainment (55 percent versus 43 percent, respectively).
- Slightly less than one-quarter of adults with heart disease or who have had a stroke also reported having physician diagnosed diabetes and 59 percent reported having hypertension. Women with CVD were less likely to report diabetes than men, but both women and men reported similar rates of physician diagnosed hypertension.
- More than half of adults with heart disease or who have had a stroke reported being overweight or obese (61 percent), physically inactive (59 percent) or inadequate fruit and vegetable intake (54 percent). Women reported higher rates of physical inactivity while men reported higher rates of the other two risk factors. Fifteen percent of adults with heart disease or who have had a stroke reported being daily or occasional smokers. This did not vary by sex.
- Lower-income women were more likely than higher-income women to report physical inactivity (72 percent versus 60 percent, respectively) or daily or occasional smoking (18 percent versus 10 percent, respectively).
- Just over half of adults (55 percent) with heart disease or who have had a stroke reported making at least one behavioural change over the previous year to improve their health. This did not vary by sex, but did vary by income and age.

Heart Failure (HF)

- Among adults with HF, the type of physician providing care in hospital (most responsible physician for patients admitted to hospital with HF) or in the community (among newly diagnosed HF patients) varied by sex. Sixteen percent of women versus 22 percent of men

were under the care of a cardiologist while in hospital and 41 percent of women versus 54 percent of men saw a cardiologist in the community within one year of diagnosis.

- Receipt of cardiology specialty care, both in hospital and in the community varied by age, region and by income. For both women and men, those from the highest-income neighbourhoods were more likely to be under the care of a cardiologist than those from the lowest-income neighbourhoods.
- Almost all HF patients (98 percent) saw a physician within four weeks of hospital discharge, regardless of sex, neighbourhood income, age or region.
- Medication management for HF patients aged 65 and older, was similar for women and men and across income for use of angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARBs), beta-blockers and warfarin in patients with atrial fibrillation. Older adults, aged 80 and older were less likely than those aged 65-79 to have filled prescriptions for any of the medications. This may be due to more contraindications to therapy in older HF patients well as potential under use.
- Among patients admitted to hospital with HF, 76 percent had their left ventricular (LV) function evaluated, 33 percent underwent echocardiography, 68 percent underwent cardiac stress testing and 14 percent underwent angiography during the prescribed period (between six months prior to admission to one month post-discharge).
- Women were less likely than men to receive any of these diagnostic tests: 73 percent versus 79 percent (LV function assessment), 30 percent versus 35 percent (echocardiography); 65 percent versus 72 percent (stress tests, exercise tests and perfusion imaging); and 12 percent versus 17 percent (angiography). These differences remained significant after adjusting for age.
- Emergency department (ED) use and readmissions

among HF patients was high. Within 30 days of discharge, 30 percent of patients hospitalized for HF visited an ED and 20 percent were readmitted to hospital. Within one year, 75 percent had visited an ED and 59 percent had been readmitted. About a third of hospital readmissions within 30 days and within one year among both women and men were for non-CVD related causes.

- For patient admitted to hospital for HF, 35 percent died within one year of their admission. After risk-adjustment for age and comorbidities, women had a slightly lower mortality rate than men (34 percent versus 37 percent, respectively).

Ischemic Heart Disease (IHD)

- Among adults who had been admitted to hospital with an acute myocardial infarction (AMI), 36 percent had a cardiologist as their most responsible physician however eight percent were under the sole care of a general practitioner/family physician (GP/FP). The type of physician providing care in hospital varied by sex, income and age. Twenty-nine percent of women from the lowest-income neighbourhoods were under the care of a cardiologist compared to 37 percent of women from the highest-income neighbourhoods, 36 percent of men from the lowest-income neighbourhoods and 42 percent of men from the highest-income neighbourhoods.
- There was substantial regional variation in in-hospital physician care. The proportion of AMI patients under the sole care of a GP/FP ranged from less than one percent of patients from the Toronto Central Local Health Integration Network (LHIN) to more than one third of patients from the North West LHIN.
- Initial follow up care for AMI patients is routinely provided in Ontario; 99 percent of women and men discharged from hospital following an AMI had a follow up physician visit within four weeks of discharge.
- Medication management for AMI patients aged 65

and older, was similar for women and men and across income for ACE inhibitors and/or ARBs, and beta-blockers. However, women were less likely than men to be using statins within 90 days of discharge and at one year post-discharge. Medication use post-AMI did not vary by income, but did vary by LHIN and age. AMI patients aged 80 and older had lower rates of medication use than those aged 65-79 at both follow up periods.

- Overall, 54 percent of AMI patients received or were referred for coronary angiography within three months of discharge. Women were less likely than men to undergo angiography; 44 percent versus 61 percent, respectively. This difference was reduced but not eliminated after adjusting for age (51 percent of women versus 56 percent of men). AMI patients from lower-income neighbourhoods had lower rates than those from the highest-income neighbourhoods. Age-adjustment reduced but did not eliminate these differences.
- Age-adjusted angiography rates varied regionally from 40 percent in the North West LHIN to 68 percent in the South East LHIN.
- Overall, 15 percent of AMI patients were readmitted to hospital within 30 days and 39 percent were readmitted to hospital within one year for any reason. At both follow up periods, women were more likely to be readmitted to hospital, after risk-adjustment for age and comorbidities.
- Nine percent of AMI patients had died within 30 days and 20 percent had died within one year of hospitalization. Crude mortality rates were higher in women than in men at both follow up periods, but these differences were eliminated after risk-adjustment based on age and comorbidities.
- Median wait times for cardiac procedures were three days for angiography, two days for angioplasty and seven days for CABG surgery. Wait times did not vary by sex or neighbourhood income, but did vary somewhat by age and region. Wait times data are based on

patients who are referred for procedures, and as such, are not able to capture referral biases or delays in referrals.

- Median door-to-needle time for patients with ST-segment elevation myocardial infarction who received thrombolysis within four hours of arrival to hospital was 38 minutes. Women had significantly longer median door-to-needle times than men; 45 minutes versus 35 minutes, respectively.
- Overall, 87 percent of patients had their internal mammary artery used to bypass their left anterior descending artery and this did not vary by sex or income. There was substantial regional variation in the use of the internal mammary artery to bypass the left anterior descending artery in CABG surgeries. Rates ranged from 77 percent in the North East LHIN to 95 percent in the Erie St. Clair LHIN (excluding the South East LHIN, because of incomplete reporting due to billing procedures at the Kingston General Hospital).
- The mean post-operative lengths of stay for CABG surgery patients was seven days. Lengths of stay varied significantly by sex (7.9 days for women and 6.8 days for men).
- Women were more likely to undergo revascularization within one year than men (2.5 percent versus 1.3 percent) and this difference persisted after adjusting for age. Revascularization rates could not be risk-adjusted and are based on a small number of events and should be viewed with caution.

Stroke

- For stroke or transient ischemic attack (TIA), administration of acute therapy did not differ by sex, income or age. Overall, thrombolysis was administered to 14 percent of stroke patients presenting to hospital within 2.5 hours of stroke onset, and 68 percent of patients with ischemic stroke or TIA were treated with antiplatelet therapy within 48 hours of presentation.
- With respect to secondary prevention for stroke,

93 percent of ischemic stroke or TIA patients were prescribed antithrombotic therapy (aspirin, clopidogrel, combination aspirin and dipyridamole or warfarin) at the time of discharge and 79 percent were prescribed antihypertensive therapy. Of those with atrial fibrillation and ischemic stroke or TIA, 74 percent were prescribed warfarin at discharge.

- Fifty-four percent of patients with ischemic stroke or TIA were prescribed lipid-lowering therapy at discharge, with lower rates of prescribing in women compared to men and in older (aged 80 and older) compared to younger patients. There was also significant regional variation in prescribing. The measurement of lipid levels also varied significantly by age, with lower assessment rates in older patients. This may partially explain variations in prescription rates by sex and age.
- Fifty-three percent of patients had carotid imaging either performed during their hospital stay or scheduled to be done as an outpatient post-discharge. Women were less likely to undergo carotid imaging than men and rates were lower in older adults (aged 80 and older) compared to younger patients. There was also regional variation in carotid imaging rates.
- Fewer than one in five stroke or TIA patients were cared for in a dedicated stroke unit, 47 percent were screened for dysphagia and 46 percent received a consultation from a neurologist or neurosurgeon while in hospital. All these indicators varied significantly by region, but did not vary by sex or income. Dysphagia screening rates increased with increasing age, but no age-related

differences were observed in the other indicators.

- Seventy percent of patients with stroke were assessed by a physiotherapist, 61 percent by an occupational therapist, 47 percent by a speech language pathologist and 34 percent by a nutritionist. There were variations in assessment rates by region and age (with lower assessment rates in younger compared to older patients), but there were no differences by sex or income. Higher assessment rates in older individuals may be appropriate based on comorbid illness and functional status both before and after stroke.
- Among patients with stroke or TIA who were discharged directly from the ED, 30 percent were referred to a stroke prevention clinic, with significant regional variations but no differences in referral rates by sex, income or age.
- Non-elective, risk-adjusted readmission rates after an admission for ischemic stroke or TIA were 3.2 percent (seven days), 8.4 percent (30 days) and 15.7 percent (one year), with no significant variation by sex, neighbourhood income or age, but some regional variation in readmission rates at one year.
- All-cause mortality rates were 9 percent, 17 percent and 28 percent within seven, 30 and 365 days of admission for stroke or TIA, respectively. Mortality was significantly higher for patients suffering a hemorrhagic compared to ischemic stroke. There were regional variations in stroke mortality rates, but no significant variation by sex, neighbourhood income or age.

Discussion

Cardiovascular disease (CVD) is the leading cause of death among Canadian women and men and places an enormous burden on individuals, their families and the health system.

While death rates from CVD have declined in recent decades, the proportion of these deaths that occur in women has risen.⁵ Importantly there is concern that rising rates of diabetes and obesity will reverse declines in mortality.⁸ In this chapter we examined gender differences in the health and functional status of individuals with heart disease or who have had a stroke and quality and outcomes of care for heart failure (HF), ischemic heart disease (IHD) and stroke. We also assessed how income, age and where one lives affected women and men differently.

There is some good news. We identified a number of areas where care received by women and men is comparable, particularly medication management among those age 65 and older, with the exception of statins (cholesterol-lowering medications) and management of the majority of indicators of stroke care in the acute setting. There are however a number of areas of concern. First, we found large gender and income differences in health and functional status among individuals who reported having heart disease or a stroke, drawing attention to the need to address the social determinants of health in efforts to reduce the burden of CVD. Second, we found a high prevalence of modifiable risk factors among individuals with CVD, underscoring the need for increased emphasis on secondary prevention. Third, there were high rates of potentially avoidable emergency department visits and hospital readmissions among individuals with HF, emphasizing the need for the widespread implementation of effective chronic disease management programs integrated across settings of care.

Fourth, gender disparities in care remain—particularly in acute myocardial infarction (AMI) care—calling attention to the need to close this gap by explicitly addressing the needs of women in quality improvement efforts and by stratifying indicators by sex to track progress. Finally, performance on many measures varied across the province, highlighting the need for innovative interventions to standardize care, taking into account regional needs and differences.

We provide a comprehensive picture of CVD in Ontario. However, the picture we developed of Ontario women's CVD care is by no means complete. The data in this chapter come primarily from administrative and survey data, which do not provide detailed insights into patient experiences with care or treatment decision-making processes. Nevertheless, we identify many opportunities for improvement, present objective evidence to inform priority setting and provide a baseline from which to measure progress. The key findings from the chapter are discussed below.

Women who reported they had heart disease or a stroke consistently reported worse functional status and higher rates of disability than men.

Women were more likely to report activity limitations, limitations in Instrumental Activities of Daily Living (IADLs) and/or limitations in Activities of Daily Living (ADLs), mobility problems and activities prevented by pain. Women were more likely than men to report disability days in the previous two weeks. Women were also more likely to be readmitted to hospital after

an AMI, which may be a marker for worse health-related quality of life after an acute episode. Data on functional status linked to data on processes of care for individuals living with heart disease could provide important information to help improve these outcomes. Secondary prevention, optimizing chronic disease management and cardiac rehabilitation can all help reduce rates of CVD-related disability.

Lower socioeconomic status was also associated with worse functional status and higher rates of disability among women and men with CVD.

Low-income and less educated adults were more likely to report fair or poor health, declining health status, activity limitations, IADL and/or ADL limitations, disability days, mobility limitations, limitations in their activities due to pain and CVD risk factors than adults with higher income or more education. Women with CVD were more likely than men to live in low-income households and had lower levels of educational attainment. Thus, poverty reduction and other interventions to address the social determinants of health are central to reducing the CVD burden in the population.

The prevalence of CVD risk factors was high among both women and men and across income categories, underscoring the need for secondary prevention.

Women were more likely to be physically inactive, but less likely than men to report being overweight or obese or to report inadequate fruit and vegetable intake. Smoking rates were similar among women and men. A larger percentage of women than men reported low socioeconomic status as measured by less education and lower annual household income, which is associated with higher risk for CVD and for risk factors for CVD. Lower-income women and men with CVD were less likely to report making changes to improve their health.

Rates of potentially avoidable emergency department use and hospital readmission were high for both women and men after a hospital admission for HF.

Within 30 days of discharge, 30 percent of patients hospitalized for HF visited an emergency department and 20 percent were readmitted to hospital. Within one year, 75 percent had visited an emergency department and 59 percent had been readmitted. About a third of all hospital readmissions within 30 days and within one year were for non-CVD related causes. Implementation of effective chronic disease management programs integrated across settings of care could reduce emergency department use and hospital admissions, relieving the burden on hospitals and contributing to health system sustainability.

Despite progress, gender gaps in care persist.

Women and men had similar rates of physician follow up within 30 days, medication use (beta-blocker, ACE inhibitor and/or ARB, among those age 65 and older) and aspirin use post-AMI and wait times for coronary procedures. Medication management for HF also did not vary by sex among those aged 65 and older. However, women with HF were less likely than men to have a cardiologist as their most responsible physician while in hospital and more likely to be under the sole care of a general practitioner/family physician (GP/FP). This pattern was also seen for outpatient care in newly diagnosed HF patients. Women were less likely than men to undergo evaluation and cardiac testing for HF, including left ventricular function evaluation, cardiac stress testing, echocardiography and angiography. These differences were reduced, but not eliminated, with age-adjustment. Women who had an AMI were less likely than men to have a cardiologist as their most responsible physician while in hospital, undergo or be referred for angiography within the recommended period, or fill a prescription for statins within the first

90 days post-discharge or at one year post-discharge. Women also had higher risk-adjusted 30-day and one-year non-elective readmission rates than men and higher crude but not risk-adjusted mortality during the same follow up intervals. We found no significant sex differences in the delivery of the majority of acute stroke care quality indicators. However after a stroke, women were less likely to be prescribed statins at the time of discharge from hospital, within 90 days, and at one year post-discharge than men.

Income was associated with some differences in care.

Lower-income women and men with HF were less likely to have a cardiologist as their most responsible physician, and more likely to be under the sole care of a GP/FP while in hospital or while being cared for in the community for newly diagnosed HF. Lower income was also associated with lower rates of angiography and echocardiography among men but not among women with HF. Low-income women and men who had an AMI were also less likely to have a cardiologist as their most responsible physician, more likely to be under the sole care of a GP/FP while in hospital and had lower rates of coronary angiography.

Age was associated with differences in performance on many measures.

Older women and men, particularly those aged 80 and older were less likely to receive guideline concordant care on many measures including most indicators of medication management and diagnostic testing for all conditions examined. They were also less likely to receive care from a cardiologist for AMI or HF. After a stroke, older age was associated with lower rates of use of antithrombotic therapy, warfarin for atrial fibrillation, statins, lipid measurement, carotid imaging and carotid endarterectomy and with higher rates of dysphagia screening, consultations from rehabilitation services and higher stroke mortality at one week, one

month and one year for both women and men. There are multiple possible explanations for these differences. It is not known whether the reduced use of some interventions in older patients is explained by contraindications or other appropriate patient selection criteria, and these findings require further study. Clinical decision making for treatment becomes more complex with age as life expectancy, co-existing illnesses, and functional status all need to be considered.^{124, 233} It is likely that some older patients choose not to have aggressive treatment,²³⁴ but prior studies also suggest physicians may have a bias toward undertreating the elderly.²³⁵ In addition, evidence shows that older adults can benefit from guideline concordant management of CVD. With the aging of the population, an increased focus on the needs of older persons with CVD will be necessary. Older women are more likely to have lower incomes, live alone, be caregivers and have multiple chronic conditions and comorbidities than men (see [Burden of Illness, chapter 3](#)). Addressing age-related issues in CVD care will require addressing these gender differences in health and social circumstances.

Performance on many measures varied across the province.

For example, less than one percent of patients in the Toronto Central Local Health Integration Network (LHIN) were under the sole care of a GP/FP when hospitalized for AMI compared to 36 percent of patients in the North West LHIN, which reflects regional differences in the types of physicians providing in-hospital care, as well as access to cardiologists. While medication management for HF and AMI did not differ on most measures by sex and income, there were regional variations in use of these medications. There were also regional variations in stroke care including access to stroke units, medication management, neurologist or neurosurgery consultation, dysphagia screening, access to rehabilitation and nutritional assessment and referral to stroke prevention clinics for patients

discharged directly from an emergency department. While development and implementation of the Ontario Stroke System has improved stroke care in the province, regional variations persist. There is need to develop, implement, and evaluate innovative interventions to standardize care across the province, taking into account regional needs and differences.

Our report illustrates the **importance of looking at subgroups of individuals** when evaluating quality of care. Stratification by age, sex, income or other factors allows us to identify specific subgroups of individuals who are more vulnerable which in turn can identify areas for further study or facilitate targeted improvement efforts.

REDUCING CVD BURDEN AND IMPROVING CVD CARE: DIFFERENT APPROACHES

We have reported the results of these analyses so that the findings can be used to inform and guide efforts to reduce CVD burden, improve CVD care, and reduce associated health inequities. Doing so can support health system sustainability by reducing demand. A number of different approaches can be used to effect improvement both at the population and health system levels. There are many innovative models to draw upon in Ontario, across Canada and internationally. (see [Reducing CVD Burden and Improving CVD Care: Different Approaches](#)). In Ontario, the Cardiac Care Network (CCN) has reduced wait times for cardiac procedures.¹⁵⁷ The Ontario Stroke System has implemented a regional system of stroke care with well-defined strategic goals for continued improvement.¹⁸⁵ Two provincial efforts, one from the Ontario Ministry of Health Promotion—the Healthy Eating and Active Living Action Plan²³⁶ and one from the Ontario Ministry of Education—the Healthy Schools' Recognition Program²³⁷—are focused on modifying important risk factors for CVD.

The Canadian Heart Health Strategy and Action Plan lays out a comprehensive multipronged strategy for reducing CVD burden.²³⁸ The indicators we report support the objectives of these strategies (see [Appendix 6.1](#)). Attention to gender-related issues and the unique needs of women with CVD is needed to address gender disparities in health status and health care.

Interventions may occur at policy, community, health system, provider and patient levels. Policy interventions can support improvement at the population and health system levels. For example, a recent meta-analysis found that the number of AMIs dropped by an average of 17 percent a year after smoking bans were put into effect, compared with communities with no such smoking restrictions. The decline in heart attacks continued in subsequent years, with rates dropping by about 36 percent within three years of smoking prohibitions taking effect.²³⁹ Policy interventions can support a whole government approach to risk reduction by encouraging cross-sectoral collaboration as well as by implementing strategies to address the broader determinants of health (i.e. poverty reduction, education and food policy).²³⁸ In British Columbia, ActNow BC, a cross-government health promotion initiative is seeking to reduce chronic disease risk factors using a population-based approach.²⁴⁰

Innovations in care delivery within and across settings of care can improve quality and outcomes of CVD care. Knowledge translation activities comprise an important component of these efforts. Adoption of the Chronic Disease Model in primary care can improve quality and outcomes of care for CVD.^{241, 242} Recently, the Ontario Ministry of Health and Long Term Care (MOHLTC) set up a program to provide financial incentives to GP/FPs participating in certain primary care delivery models to complete HF flow sheets. Whether these HF flow sheets lead to better adherence to guidelines has yet to be determined.

Shared care models between primary care physicians and specialists can improve care coordination and delivery of guideline concordant care. Avoidable hospitalizations place an enormous demand on the system and are costly,²⁴³ however improved care coordination between hospital and home has been shown to reduce readmission rates in a number of different models.²⁴⁴⁻²⁴⁶ Other strategies to reduce avoidable hospitalizations and improve care include designated HF clinics which may benefit complex patients²⁴⁷ and improved patient self-management for patients, which can reduce burden on the health system and also improve the quality of life of patients.²⁴⁸ Wider adoption of information technology including electronic medical records and disease registries can also support providers in their efforts to manage, improve and coordinate care.

Measurement of quality is only the first step towards improving care, however, it plays an indispensable role. Once gaps in care are found, identification and implementation of interventions to improve care are essential next steps. By stratifying quality indicators by sex and income we can monitor progress in reducing inequities. Many quality improvement initiatives and innovations aimed at improving CVD care are underway across the province in diverse settings. By studying what works (and what doesn't), in what settings and with which populations we can build the evidence base for effective interventions to improve CVD outcomes and reduce CVD-related health inequities.

LIMITATIONS

Our study has a number of limitations. Indicators measured using the Canadian Community Health Survey (CCHS) are based upon self-report. Self-reports of chronic disease are widely used for reporting prevalence and have been well-validated as a measure.²⁴⁹ Nevertheless, they are subject to

reporting error. Importantly, many chronic conditions such as hypertension or diabetes can be present for years without causing symptoms. If persons who are socioeconomically disadvantaged encounter more barriers to access to care, they may be more likely to go undiagnosed which would result in an underestimation of prevalence in this population and an underestimation of the differences between the most and least advantaged groups. Some indicators are more subject to measurement error than others. For example, the overweight and obesity indicator is particularly subject to measurement error as people may under- or over-report their height and weight. In other circumstances important questions may not be asked. The measure of disability we used assesses the prevalence of the population who need the assistance of another person to carry out IADLs and/or ADLs. Survey respondents were not asked whether they received this assistance. We therefore were not able to assess unmet need for assistance with these activities.

Data limitations, inherent in administrative data include limited clinical information and not knowing when patient preference plays a role in treatment decisions. Due to lack of clinical details in the administrative data, we were not able to identify "ideal" patients for specific medications or interventions.¹³ We could not reliably identify contraindications to specific medications or distinguish between types of heart failure (systolic or diastolic) or different types of AMI (ST segment elevation MI (STEMI) or non-STEMI). We did not assess all medications indicated for the treatment of AMI, for example clopidogrel or Glycoprotein IIb/IIIa antagonists. Inpatient indicators requiring chart review were assessed using EFFECT data collected between 1999/00-2000/01 and practice patterns may have changed over time. However, our primary purpose was to assess whether there were gender or socioeconomic differences on these measures. The Registry

of the Canadian Stroke Network (RCSN) performs a periodic chart audit on the quality of stroke care in Ontario, including detailed clinical data. Web-based data collection systems are available through the RCSN for interested institutions to collect real-time clinical data on stroke patients for quality improvement. However, there are no similar mechanisms to routinely collect these data for cardiac care.

Ontario Drug Benefit (ODB) data were used to assess patterns of medication use. This database does not cover the population under age 65 with few exceptions. Thus, we could not assess whether there were disparities in medication use in those under age 65. Also, the ODB only includes claims when a prescription has been filled. Therefore, we could not assess whether a prescription was given but not filled by the patient. However, in the absence of alternatives, the ODB provides the best estimate for medication utilization in the community. We were unable to assess processes of care for CVD in outpatient settings and therefore could not determine whether inequities in care exist in these settings.

Wait times indicators were based on data from 2006/07 and more current data are available. Once again, our primary purpose was to assess whether there were gender or socioeconomic differences on these measures. In addition, there are a number of methodologic challenges related to the use of Recommended Maximum Wait Times as calculated by the CCN. For example, changes in clinical status can result in a patient moving between urgency categories and accompanying changes in recommended wait times. While we found that once on the wait list, sex and income did not affect wait times, we could not assess delays in diagnosis and referral that may occur before being placed on the list. Thus, we could not assess sex and income variations in total wait time for these procedures from the time of clinical presentation. For indicators using administrative data, income level was assessed using neighbourhood income quintiles.

This measure captures the impact on health of living in a low-income neighborhood. This measure has also been well-validated as a proxy for individual income. It is subject to measurement error in neighbourhoods where households with a mix of income levels reside.

This chapter is an extensive but not completely comprehensive look at CVD burden and CVD care in the province. The indicators we used were selected using a rigorous and systematic process, but there were many others we could have used. Most of the data we report are from 2005/06. There is a need for real time data on quality to assess performance and to evaluate the effectiveness of improvement interventions. We have provided a baseline from which to monitor progress that can be updated as newer data become available.

WHAT WE CAN'T MEASURE

There were many important areas where well validated indicators exist that we were unable to measure due to data limitations. There is a risk that lack of measurement might lead to relative inattention to these issues so it is important to highlight them. CVD is a chronic disease and most care for these conditions is provided in ambulatory settings. Furthermore, care in these settings is critical to improving health outcomes. We were unable to assess the clinical management and processes of care for HF, IHD or stroke in primary care or out-patient specialty settings though long-term adherence to medications, emergency department use, readmissions and mortality rates may be markers of these types of care. Survey data were used to assess functional status and health behaviours among individuals with CVD. However, data are not available to assess these factors after an acute episode, or linked to specific processes of care in ambulatory settings. In addition, data are unavailable on control of symptoms related to the specific condition such as chest pain or shortness of breath.

Drug data were not available for those under age 65. Therefore, we can not determine whether sex and income differences in medication management were present in this age group. This is especially important to assess since prescription drug coverage is not universal among those under age 65. In addition, while we were able to assess use of lipid-lowering therapy, due to lack of clinical detail, we were unable to assess whether target lipid levels were achieved.

While we were able to assess a wide range of measures in acute care settings, there were important data gaps in this setting as well. Due to lack of clinical detail, we could not distinguish between types of HF (systolic or diastolic) or different types of AMI (STEMI or non-STEMI). Having these data would allow assessment of more refined indicators of care. Data on medication management or counseling in the acute hospital setting are not collected routinely and we were limited to using older data from the EFFECT study for these measures. We were also unable to assess the quality of care transitions between settings of care.

Data on gender specific issues that impact outcome such as caregiving and depression were also unavailable. Importantly, income, education, ethnicity, language and geography do not operate alone to influence health and well-being. Rather they operate together and interact to shape the health of women and men. We were only able to examine these factors separately. Thus, we do not capture the impact of their intersectionality. We were unable to assess differences on these measures by ethnicity. Sample size among those reporting heart disease or a stroke was too small in the CCHS and administrative data do not include information on ethnicity. Better data on ethnicity and language can be obtained through oversampling specific populations in surveys to increase sample size, targeted surveys specifically assessing the health of populations of interest, collecting data on ethnicity and language in administrative data, or linking data sets containing this information to health data.

Data development is needed in all of these areas to improve measurement capacity.

KEY MESSAGES

We took a broad look at the burden of CVD and quality and outcomes of care for heart disease and stroke in the province, focusing on gender, socioeconomic and regional variations. While much progress has been made in improving quality and outcomes of care for CVD as well as narrowing gender gaps in care, much work remains to be done. Inequities in health and functional status associated with gender and socio-economic status were much greater than inequities in the provision of acute care services underscoring the need to address the social determinants of health to reduce the burden of CVD. Our findings point to a number of key areas for intervention and improvement.

For many indicators, there were sizable variations across the LHINs. The Cardiac Care Network and the Ontario Stroke System among others are working to reduce regional variations in CVD care. The results of our analyses are available for the LHINs to use in their priority setting, planning and quality improvement activities. By implementing interventions at the policy, population health and practice levels and coordinating these interventions for maximum impact, it will be possible to hasten progress.

The following six actions can help accelerate progress in reducing the burden of CVD, improve health outcomes

among women and men with CVD and reduce health inequities related to CVD. For these actions to be truly successful, gender and socioeconomic differences in the prevalence of CVD and experiences with care will need to be addressed.

Reduce health inequities associated with CVD by focusing upstream.

- Upstream causes such as poverty, low levels of educational attainment, access to healthy foods, and neighbourhood and work place characteristics that increase CVD risk all contribute to increasing the population burden of CVD and CVD-related health inequities. Focusing efforts upstream through cross-sectoral collaboration can serve to address the root causes of these health inequities while reducing the burden of CVD in the population.
- Women are more likely to live in low-income households than men, thus contributing to their risk of developing CVD. To be most effective, upstream approaches will need to address the factors that lead to increased rates of poverty among women.

Prevention (primary and secondary) is key to reducing the burden of illness due to CVD.

- The prevalence of behavioural risk factors for CVD remains high in Ontario—smoking, physical inactivity, obesity and poor diets (see [Burden of Illness, chapter 3](#)). Thus, primary prevention, or reducing risk among those who do not yet have CVD, is key to reducing illness burden. Prevention interventions need to address the social determinants of health, be gender sensitive and target those who are socioeconomically disadvantaged and therefore at greatest risk. Increased emphasis on prevention and integrated approaches at the population health, community and clinical levels is essential to reduce the burden of illness due to CVD in Ontario.

- The same risk factors—smoking, physical inactivity, obesity, and poor diets—lead to worse health outcomes among women and men once they have developed CVD. Interventions to modify these risk factors among those with the disease—secondary prevention—reduce CVD-related morbidity and mortality. The high prevalence of these risk factors among women and men with CVD underscores the need for increased emphasis on secondary prevention to improve CVD outcomes.

Close the gender gap in care for CVD.

- Gender gaps in care for CVD have narrowed due to an increased awareness of the importance of CVD to women's health as well as recognition of gender disparities in care combined with many activities to close these gaps including gender-specific guidelines. We found no gender differences in medication management with the exception of statin use. We found few gender differences in stroke care. Gender differences on other quality indicators were modest. Nevertheless, women are still less likely to receive care from a cardiologist, to undergo or be referred for angiography after an AMI, to undergo diagnostic testing for IHD and HF, and more likely to be readmitted to the hospital after an admission for an AMI. There is a need to develop and implement targeted interventions to eliminate gender gaps in care.
- Women with CVD consistently reported worse functional status and higher rates of disability than men. Women were more likely to report activity limitations, limitations in IADLs and/or ADLs, mobility problems, activities prevented by pain, and more disability days. Gender sensitive models of care that focus on disability prevention and improving functional status are needed to improve the quality of life of women with heart disease.

Comprehensive patient-centred chronic disease management can improve quality and outcomes of care for CVD.

- CVD is a chronic disease requiring coordination of primary and speciality care across settings of care. Individuals with CVD often have multiple chronic conditions because the risk factors for CVD are also risk factors for other chronic conditions such as diabetes and because CVD is more prevalent with increasing age. Therefore, implementation of a comprehensive and coordinated patient-centred chronic disease prevention and management strategy—one that addresses the need of at-risk populations—is the key to improving quality and outcomes of care for CVD.
- Rates of emergency department use and hospital readmission for both HF and non HF-related reasons are very high after a hospital admission for HF for both women and men. Additionally, women are more likely than men to be readmitted to the hospital after an AMI. An effective chronic disease management strategy could help prevent both emergency department use and hospital readmissions, thus reducing the burden on the hospital sector and freeing needed resources.

Province-wide, integrated, organized models of care delivery can improve health outcomes and reduce inequities in care.

- The Ontario Stroke System—which targets activities across the continuum of stroke care from prevention,

prehospital care, acute care rehabilitation and reintegration—provides an example of such a model that could be applied to other types of CVD such as HF and IHD.

- We found sizable regional variations in care likely due to differences in human resources and regional capacity, as well as regional difference in practice patterns. Interventions such as those used by the Ontario Stroke System such as regionalization of care, use of telemedicine, performance measurement and improvement, and training local practitioners are all approaches that can reduce regional variations in care.

Improve quality, availability and timeliness of data to assess CVD and CVD care in the province.

- While data quality and availability to assess CVD care in the province has improved, there is still much to be done to improve the quality, availability and timeliness of data. Specifically, medication data on those under age 65, data on management of CVD in ambulatory care settings, and datasets that capture clinical factors are needed.
- Data on ethnicity would allow us to assess disease burden as well as access, quality, and outcomes of care to Ontario's diverse communities.

Reducing CVD Burden and Improving CVD Care: Different Approaches

In this chapter we present results pertaining to cardiovascular disease (CVD) burden and CVD care in Ontario with a focus on gender and equity issues. We identified a number of opportunities for improvement, however measurement is only the first step towards improving care.

Once gaps in care are found, identification and implementation of interventions to improve care are essential next steps. There is evidence that performance measurement when linked to effective quality improvement interventions can improve CVD care in both ambulatory and acute hospital settings.^{158, 250, 251} Quality improvement interventions can take many forms, but are usually targeted at the policy, practice, provider or patient levels, or some combination of these. There are a number of evidence-based interventions available to improve CVD care. In addition, much work in Ontario and internationally is aimed at developing new approaches to improving access, quality and outcomes of care among individuals with CVD.

Below we provide selected examples of well studied, evidence-based interventions to improve CVD care as well as emerging models where there is evidence that they can lead to improvements in care, but the evidence is limited. Much work has been done in this area, so the examples below are not meant to provide a comprehensive review, but rather serve as examples of diverse approaches to improvement. In addition, some approaches included in our Burden of Illness and Cancer chapters are applicable to CVD.

Bridging the Evidence-Practice Gap

One of the many challenges of providing evidence-based care is access to appropriate, updated evidence-based guidelines. To facilitate this process, the Public Health Agency of Canada launched the “Canadian Best Practices Portal for Health Promotion and Chronic Disease Prevention.” This website has 253 interventions and 97 resources from around the world on a wide range of issues from primary to secondary prevention programs. The resources include decision support tools and best practices evidence (<http://cbpp-pcpe.phac-aspc.gc.ca/index-eng.html>).

Reducing CVD Risk: Population-Based Health Promotion

Population-based health promotion efforts are an important component of efforts to reducing CVD risk. In British Columbia, ActNow BC is a provincial, cross-sectoral, health promotion initiative working to improve the health of the population by targeting reductions in the prevalence of common risk factors for chronic disease including physical inactivity, poor nutrition, overweight and obesity and tobacco use. ActNow BC is supporting programs in communities and schools aimed at increasing physical activity, smoking cessation

and healthy diets. They have set targets for measurable reduction of these risk factors.²⁴⁰

Reducing CVD Burden: A Comprehensive, Integrated Approach

The Champlain Cardiovascular Disease Prevention Network (CCPN) has implemented a five-year strategy to significantly reduce the burden of CVD in the Champlain District of Ontario. This strategy uses evidence-based best practice approaches and innovative models to improve disease prevention and promotion and eliminate disparities in the health status of people with CVD. The CCPN includes partners from public health, specialty care, primary care, hospitals, community health and academia. The CCPN is using a comprehensive, integrated approach to population-risk reduction with the goal of increasing the proportion of Champlain residents with healthy blood pressure, cholesterol, glucose and body weight who are smoke-free, physically active and making healthy food choices. To achieve these goals they have undertaken a group of initiatives targeting community-based health promotion; improved delivery of CVD care in primary care; secondary prevention through hospital-based smoking cessation programs and improved care of acute coronary events through guidelines implementation in hospitals. In addition the Champlain Community Heart Health Survey is collecting data on the cardiovascular health of residents of the region.²⁵²

Quality Improvement in Primary Care

Implementation of quality improvement interventions in primary care through the use of collaboratives can improve the prevention and management of CVD in ambulatory care settings. These programs commonly include implementation of the chronic care model. (see [Burden of Illness, chapter 3](#)). In Ontario, one of the CCPN initiatives is the “Improved Delivery of Cardiovascular Care (IDOCC) through Outreach Facilitation.” This program has developed a network of primary care

physicians committed to providing evidence-based care for the prevention and management of heart disease, stroke and diabetes and the associated risk factors (hypercholesterolemia, hypertension, diabetes, renal impairment, smoking, obesity and physical inactivity). The IDOCC program uses an Outreach Facilitation Model, in which skilled health professionals known as facilitators serve as an expert resource to primary care practices and work with care providers to implement evidence-based guidelines for the prevention and management of coronary artery disease, stroke and diabetes. IDOCC facilitators provide support for primary care practices to organize their offices in order to integrate prevention and disease management into their routine operation: they help identify specific care gaps and provide primary care physicians with the tools to improve care; they promote the use of evidence-based guidelines and they coordinate continuity of care between primary care physicians and other specialists services in the community.²⁵³

In Alberta, Toward Optimized Practice (TOP) is a health care quality improvement initiative sponsored by the Alberta Medical Association, Alberta Health Services, the Alberta College of Physicians and Surgeons and Alberta Health and Wellness. TOP “supports physician practices, and the teams they work with, by fostering the use of evidence-based best practices and quality initiatives in medical care in Alberta. The program offers a variety of tools and services to help physicians and their colleagues meet the challenge of keeping practices current in an environment of continually emerging evidence.”²⁵⁴ To improve CVD care, TOP has developed guidelines and tools emphasizing the importance of follow up and monitoring to identify and manage modifiable CVD risk factors in practice, including a chart to identify individuals at high risk for developing CVD, a checklist to identify modifiable risk factors and assist physicians to manage them (i.e., smoking cessation, sedentary lifestyle changes, controlling dyslipidemia) and medications indicated for the management of

modifiable risk factors. TOP is a partner in the Alberta Access-Improvement-Measures (AIM) which supports quality improvement collaboratives and guidelines implementation in office practices.²⁵⁵

Improving Care Transitions

Lack of service integration and care coordination places patients at risk for adverse events as they move between settings of care. A number of interventions focused on the transition from hospital to home have been shown to improve outcomes and reduce readmission rates. One successful approach is the use of comprehensive discharge planning and home follow up of hospitalized elders by an advance practice nurse who helps coordinate care, monitors patients' status post-discharge and educates patients in self-management.²⁴⁵ A similar comprehensive transitional care intervention for elders hospitalized with heart failure (HF) increased the length of time between hospital discharge and readmission or death, reduced total number of readmissions and decreased healthcare costs.²⁴⁶ Another approach is to focus primarily on patient activation and education in self-management skills. In a randomized control trial, intervention patients received tools to promote cross-site communication, encouragement to take a more active role in their care and to assert their preferences and guidance from a "transition coach" to ensure continuity across settings. Intervention patients had lower readmission rates at 30 and 90 days post-discharge.²⁴⁴

Integrated Systems of Care: The Ontario Stroke System

Organized stroke care, an integrated evidence-based approach to managing stroke, has been shown to reduce mortality and morbidity and improve functional ability and quality of life for stroke patients. Organized stroke care includes the entire continuum of care, from

prevention to community reengagement. The objective of organized stroke care is to improve stroke outcomes by ensuring that the time to definitive diagnosis and treatment is minimized and that optimal treatment is offered. Ontario has become a leader in organized stroke care through the evolution of the Ontario Stroke System (OSS). The OSS is a client-centred, collaborative network that leads, plans, coordinates and delivers stroke prevention and care across the life course continuum and across the continuum of stroke care. Within the OSS there are 11 regions. Each region has a Regional Stroke Steering Committee that provides leadership and regional planning across the continuum of care. The OSS is based on a three-tiered model consisting of Regional Stroke Centres (RSCs), District Stroke Centres (DSCs) and community hospitals. There are nine RSCs, 18 DSCs and 24 stroke prevention clinics (SPCs). Each RSC, DSC and SPC must meet guidelines and readiness criteria and has responsibility for leading the implementation of best practices across the stroke continuum. Ongoing evaluation of the OSS is overseen by the Stroke Evaluation Advisory Committee (SEAC) with staff support coordinated through the Canadian Stroke Network (CSN) and working with the Institute for Clinical Evaluative Sciences (ICES). The Registry of the CSN collects data from RSCs on a variety of indicators. A broader Ontario Stroke Audit is completed on a regular basis. Evaluation results indicate that a greater proportion of patients are getting to a stroke centre for care and that the average length of stay, in-hospital mortality rates and hospital readmissions have decreased. In addition, despite the aging population, there has been a decrease in stroke admissions. These results suggest that the efforts of the OSS to prevent and reduce the complications of stroke and implement best practices are effective.²⁵⁶⁻²⁶⁰ The OSS strategic plan identifies and provides a roadmap for continued improvement.²⁶¹

Appendix 6.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6A – Health and Functional Status			
Overall Health and Functional Status			
Self-rated health (global health)	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Provide integrated patient-centred cardiovascular care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes
Self-rated health as compared to a year ago (health transition)	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Provide integrated patient-centred cardiovascular care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes
Activity limitations	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6A – Health and Functional Status (Continued)			
Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Provide integrated patient-centred cardiovascular care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes
Disability days in the previous two weeks	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Provide integrated patient-centred cardiovascular care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes • Improve health status of Ontarians
Activities prevented by pain	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Create heart healthy environments (A) • Provide integrated patient-centred cardiovascular care (A) • Build the knowledge infrastructure to enhance prevention and care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes • Improve health status of Ontarians

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6A – Health and Functional Status (Continued)			
Problems with mobility	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Create heart healthy environments (A) • Provide integrated patient-centred cardiovascular care (A) • Build the knowledge infrastructure to enhance prevention and care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes • Improve health status of Ontarians
Risk Factors for Cardiovascular Disease			
Social determinants of health: <ul style="list-style-type: none"> • Low income • Low education 	<ul style="list-style-type: none"> • Address social determinants of health (A) 	<ul style="list-style-type: none"> • Equitable • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Influence broader determinants of health • Improve clinical and population health outcomes
Chronic conditions: <ul style="list-style-type: none"> • Diabetes • Hypertension 	<ul style="list-style-type: none"> • Help Canadians lead a healthier life (A) • Create heart healthy environments (A) • Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) • Build the knowledge infrastructure to enhance prevention and care (A) • Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> • Effective • Equitable • Focused on population health 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve healthy behaviours, health promotion and disease prevention • Influence broader determinants of health • Improve health status of Ontarians • Increase sustainability of the health system

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6A – Health and Functional Status (Continued)			
Health behaviours: <ul style="list-style-type: none"> Physical inactivity Inadequate fruit and vegetable intake Being overweight or obese Smoking 	<ul style="list-style-type: none"> Help Canadians lead a healthier life (A) Improve the nutritional quality of Canada's food supply and access to healthy foods (A) Create more opportunities for physical activity (A) Reduce exposure to and use of tobacco (A) Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> Equitable Focused on population health 	<ul style="list-style-type: none"> Improve chronic disease management Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes
Changes to improve health	<ul style="list-style-type: none"> Help Canadians lead a healthier life (A) Improve the nutritional quality of Canada's food supply and access to healthy foods (A) Create more opportunities for physical activity (A) Reduce exposure to and use of tobacco (A) Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Comprehensive: improve stroke services across the continuum of care (B) 	<ul style="list-style-type: none"> Patient-centred Focused on population health 	<ul style="list-style-type: none"> Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6B – Heart Failure			
In-hospital physician care for heart failure	<ul style="list-style-type: none"> • Develop the right service providers with the right education and skills (A) • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Equitable • Appropriately resourced • Integrated 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services • Improve clinical and population health outcomes • Increase equity of the health system
Physician care within four weeks of hospital discharge for heart failure	<ul style="list-style-type: none"> • Develop the right service providers with the right education and skills (A) • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Equitable • Appropriately resourced • Integrated 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services • Improve clinical and population health outcomes • Increase equity of the health system
Medication Management			
Angiotensin-converting enzyme (ACE) inhibitor therapy for heart failure patients post-discharge	<ul style="list-style-type: none"> • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6B – Heart Failure (Continued)			
Beta-blocker therapy for heart failure patients post-discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
Warfarin therapy in heart failure patients with atrial fibrillation post-discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
Evaluation of Heart Failure			
Left ventricular function evaluation in heart failure	<ul style="list-style-type: none"> Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve integration of health services providers, processes, and systems Improve chronic disease management Improve clinical and population health outcomes
Cardiac testing in heart failure: <ul style="list-style-type: none"> Echocardiography Cardiac stress testing Angiography 	<ul style="list-style-type: none"> Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6B – Heart Failure (Continued)			
Outcomes in Heart Failure			
Emergency department visits following hospital discharge for heart failure	<ul style="list-style-type: none"> • Help Canadians lead healthier lives (A) • Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management • Improve clinical and population health outcomes
Non-elective hospital readmission following hospital discharge for heart failure	<ul style="list-style-type: none"> • Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) • Build the knowledge infrastructure to enhance prevention and care (A) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Efficient • Integrated 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6B – Heart Failure (Continued)			
One-year mortality following hospital discharge for heart failure	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Equitable Integrated 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
In-Hospital Care for Heart Failure			
Weight measurement in hospital among patients admitted for heart failure	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective 	<ul style="list-style-type: none"> Improve chronic disease management Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes
Provision of discharge instructions to heart failure patients	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Patient-centred Integrated 	<ul style="list-style-type: none"> Improve chronic disease management Improve healthy behaviours, health promotion and disease prevention Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6B – Heart Failure (Continued)			
Outpatient Care			
Type of physician providing care to newly diagnosed heart failure in the community	<ul style="list-style-type: none"> Develop the right service providers with the right education and skills (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable Integrated 	<ul style="list-style-type: none"> Improve integration of health services providers, processes, and systems Improve chronic disease management Improve clinical and population health outcomes
Section 6C – Ischemic Heart Disease			
Type of physician providing in-hospital care for acute myocardial infarction	<ul style="list-style-type: none"> Develop the right service providers with the right education and skills (A) Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Equitable Appropriately resourced Integrated 	<ul style="list-style-type: none"> Increase productive use and appropriate distribution of resources across the system Improve access to appropriate health services Improve clinical and population health outcomes Increase equity of the health system
Physician care within four weeks of hospital discharge after an admission for an acute myocardial infarction	<ul style="list-style-type: none"> Develop the right service providers with the right education and skills (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Equitable Appropriately resourced Integrated 	<ul style="list-style-type: none"> Increase productive use and appropriate distribution of resources across the system Improve access to appropriate health services Improve clinical and population health outcomes Increase equity of the health system

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6C – Ischemic Heart Disease (Continued)			
Medication Management			
Lipid-lowering therapy (statins) for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
Beta-blocker therapy for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
Angiotensin-converting enzyme (ACE) inhibitor therapy and/or angiotensin II receptor blocker (ARB) therapy for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
Diagnostic Testing			
Angiography for acute myocardial infarction	<ul style="list-style-type: none"> Develop the right service providers with the right education and skills (A) Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve integration of health services providers, processes, and systems Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6C – Ischemic Heart Disease (Continued)			
Outcomes after Acute Myocardial Infarction			
Non-elective hospital readmission following hospital discharge for acute myocardial infarction	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) Build the knowledge infrastructure to enhance prevention and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable Efficient Integrated 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Mortality following hospital discharge for acute myocardial infarction	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Equitable Integrated 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6C – Ischemic Heart Disease (Continued)			
Wait times for cardiac procedures: • Coronary angiography • Angioplasty • Coronary artery bypass graft surgery	<ul style="list-style-type: none"> • Develop the right service providers with the right education and skills (A) • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management • Improve clinical and population health outcomes
Hospital Care for Acute Myocardial Infarction			
Eligible patients with an AMI who received aspirin at hospital discharge	<ul style="list-style-type: none"> • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management • Improve clinical and population health outcomes
Median door-to-needle time for thrombolytics therapy in ST segment elevation myocardial infarction (STEMI) patients presenting to an emergency department	<ul style="list-style-type: none"> • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6C – Ischemic Heart Disease (Continued)			
Coronary Artery Bypass Graft Surgery (CABG)			
Use of internal mammary artery to bypass left anterior descending artery in CABG	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Length of stay for patients undergoing CABG	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Safe Efficient 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Medication management after CABG: <ul style="list-style-type: none"> Lipid-lowering therapy Beta-blockers Angiotensin-converting enzyme inhibitors 	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6C – Ischemic Heart Disease (Continued)			
Outcomes after CABG			
Hospital readmission following hospital discharge for CABG	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) Build the knowledge infrastructure to enhance prevention and care (A) 	<ul style="list-style-type: none"> Accessible Effective Equitable Efficient Integrated 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Revascularization following hospital discharge for CABG	<ul style="list-style-type: none"> Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Safe Efficient 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Mortality following hospital discharge for CABG	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) 	<ul style="list-style-type: none"> Effective Equitable Integrated 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke			
Acute Therapy for Ischemic Stroke and Transient Ischemic Attack			
Use of thrombolytic therapy with recombinant tissue plasminogen activator for ischemic stroke	<ul style="list-style-type: none"> • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Accessible • Effective • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve clinical and population health outcomes
Use of acute antiplatelet therapy for ischemic stroke or transient ischemic attack	<ul style="list-style-type: none"> • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Effective • Efficient 	<ul style="list-style-type: none"> • Improve safety and effectiveness of health services • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Secondary Prevention for Ischemic Stroke and Transient Ischemic Attack			
Use of antithrombotic therapy for secondary prevention of ischemic stroke or transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Effective Safe 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Warfarin therapy at discharge in patients with atrial fibrillation and ischemic stroke or transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Safe Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Continuation of warfarin therapy in patients with atrial fibrillation and ischemic stroke or transient ischemic attack following hospital discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Safe Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Measurement of lipid levels during hospitalization for ischemic stroke or transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Effective Equitable 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Lipid-lowering medications (statins) for ischemic stroke or transient ischemic attack: prescription rates at discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Continuation of lipid-lowering medications in patients with ischemic stroke or transient ischemic attack following hospital discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Antihypertensive therapy for ischemic stroke or transient ischemic attack rates at discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes
Continuation of antihypertensive therapy in patients with ischemic stroke or transient ischemic attack following hospital discharge	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve chronic disease management Improve clinical and population health outcomes

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Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Imaging in Stroke and Transient Ischemic Attack			
Neuroimaging (computing tomography (CT) and/or magnetic resonance (MR) imaging) for stroke and transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve clinical and population health outcomes
Carotid imaging for ischemic stroke and transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve clinical and population health outcomes

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Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Carotid endarterectomy for ischemic stroke and transient ischemic attack	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Equitable 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve clinical and population health outcomes
Assessment of Stroke and Transient Ischemic Attack			
Admission of patients with stroke or transient ischemic attack to a dedicated stroke unit	<ul style="list-style-type: none"> Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) Comprehensive: improve stroke services across the continuum of care (B) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Efficient Appropriately resourced 	<ul style="list-style-type: none"> Improve safety and effectiveness of health services Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Dysphagia screening in patients with stroke or transient ischemic attack admitted to hospital	<ul style="list-style-type: none"> Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Effective Appropriately resourced 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes
In-hospital (inpatient or emergency department) neurology or neurosurgical consultation for stroke or transient ischemic attack	<ul style="list-style-type: none"> Develop the right service providers with the right education and skills (A) Comprehensive: improve stroke services across the continuum of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Accessible Appropriately resourced 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
In-hospital rehabilitation and nutritional assessment of stroke or transient ischemic attack patients: <ul style="list-style-type: none"> • Physiotherapy • Occupational therapy • Speech therapy • Nutritional assessment 	<ul style="list-style-type: none"> • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) • Comprehensive: improve stroke services across the continuum of care (B) • Create an integrated system of care (B) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve chronic disease management • Improve clinical and population health outcomes
Referral to stroke prevention clinics for stroke and transient ischemic attack patient discharged directly from emergency departments	<ul style="list-style-type: none"> • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) • Comprehensive: improve stroke services across the continuum of care (B) • Create an integrated system of care (B) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes, and systems • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Rehabilitation for Stroke			
Wait time from stroke onset to admission to inpatient rehabilitation for patients requiring care	<ul style="list-style-type: none"> • Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) • Create an integrated system of care (B) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Accessible • Equitable • Efficient • Appropriately resourced 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes, and systems • Improve chronic disease management • Improve clinical and population health outcomes
Mean change in Functional Independence Measurement (FIM) score from admission to discharge from an inpatient rehabilitation facility	<ul style="list-style-type: none"> • Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) • Create an integrated system of care (B) • Promote evidence-based practices (B) • Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> • Effective • Patient-centred • Equitable 	<ul style="list-style-type: none"> • Improve patient-centeredness • Improve chronic disease management • Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Outcomes in Stroke and Transient Ischemic Attack			
Non-elective readmission following hospital discharge for stroke and transient ischemic attack	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Establish, maintain, promote and evaluate the use of updated, evidence-based, interprofessional clinical guidelines in preventing and managing cardiovascular risk and disease, treatment, rehabilitation and end of life planning and care (A) Comprehensive: improve stroke services across the continuum of care (B) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Effective Equitable Efficient 	<ul style="list-style-type: none"> Improve chronic disease management Improve clinical and population health outcomes

APPENDIX 6.1 | Indicators and their link to provincial strategic objectives including Canadian Heart Health Strategy, Ontario Stroke Strategy, Attributes of a High Performing Health System and Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives

Indicator	Link(s) to Cardiovascular Strategies	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 6D – Stroke (Continued)			
Mortality following hospital discharge for stroke and transient ischemic attack	<ul style="list-style-type: none"> Accelerate the implementation of chronic disease prevention and management as the preferred model for delivering most cardiovascular care in Canada (A) Improve access to high quality, appropriate, coordinated specialized cardiovascular care, including diagnostics, acute care, cardiac rehabilitation and end of life planning and care (A) Comprehensive: improve stroke services across the continuum of care (B) Create an integrated system of care (B) Promote evidence-based practices (B) Benefit all Ontarians regardless of their geographic location (B) 	<ul style="list-style-type: none"> Effective Patient-centred Equitable 	<ul style="list-style-type: none"> Improve patient-centeredness Improve chronic disease management Improve clinical and population health outcomes

A. Canadian Heart Health Strategy and Action Plan: Building a Heart Healthy Canada (2009). Accessed June 4, 2009 at <http://www.chhs-scsc.ca/web/wp-content/uploads/60408strategyeng.pdf>

B. Ontario Stroke System Strategic Plan: 2007-2012. Accessed November 6, 2009 at [http://profed.heartandstroke.ca/ClientImages/1/Strategic_Plan_\(Approved\)_June_19_2007.pdf](http://profed.heartandstroke.ca/ClientImages/1/Strategic_Plan_(Approved)_June_19_2007.pdf)

Appendix 6.2

INDICATORS AND THEIR SOURCES

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6A – Health and Functional Status		
Overall Health and Functional Status		
Self-rated health (global health)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario²⁶⁴ Australia: Report of New South Wales Chief Health Officer: Burden of Disease²⁶⁵ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Self-rated health as compared to a year ago (health transition)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² 	Canadian Community Health Survey (CCHS), Cycle 3.1
Activity limitations	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario²⁶⁴ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Disability days in the previous two weeks	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Canadian Institute for Health Information²⁶⁶ 	Canadian Community Health Survey (CCHS), Cycle 3.1

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6A – Health and Functional Status (Continued)		
Activities prevented by pain	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001²⁶⁷ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Problems with mobility	<ul style="list-style-type: none"> ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001²⁶⁷ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Cardiovascular Disease Risk Factors		
Social determinants of health: <ul style="list-style-type: none"> Low income Low education 	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Chronic conditions: <ul style="list-style-type: none"> Diabetes Hypertension 	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario²⁶⁴ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Health behaviours: <ul style="list-style-type: none"> Physical inactivity Inadequate fruit and vegetable intake Being overweight or obese Smoking 	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² Association of Public Health Epidemiologist in Ontario (APHEO)²⁶³ 	Canadian Community Health Survey (CCHS), Cycle 3.1
Changes to improve health	<ul style="list-style-type: none"> Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004²⁶² 	Canadian Community Health Survey (CCHS), Cycle 3.1

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6B – Heart Failure (HF)		
In-hospital physician care for heart failure	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Physician care within four weeks of hospital discharge for heart failure	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)
Medication Management		
Angiotensin-converting enzyme (ACE) inhibitor therapy for heart failure patients post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Beta-blocker therapy for heart failure patients post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Warfarin therapy in heart failure patients with atrial fibrillation post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Evaluation of Heart Failure		
Left ventricular function evaluation in heart failure	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6B – Heart Failure (HF) (Continued)		
Cardiac testing in heart failure: • Echocardiography • Cardiac stress testing • Angiography	<ul style="list-style-type: none"> • Access to Health Services in Ontario Atlas (ICES)²⁶⁹ • Women's Health Surveillance Report: Health Canada²⁷⁰ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)
Outcomes in Heart Failure		
Emergency department visits following hospital discharge for heart failure	• Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure ³⁸	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)
Non-elective hospital readmission following hospital discharge for heart failure	• Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure ³⁸	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
One-year mortality following hospital discharge for heart failure	• Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure ³⁸	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
In Hospital Care for Heart Failure		
Weight measurement in hospital among patients admitted for heart failure	<ul style="list-style-type: none"> • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ • Enhanced Feedback for Effective Cardiac Treatment⁴⁰ 	Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I
Provision of discharge instructions to heart failure patients	<ul style="list-style-type: none"> • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ • Enhanced Feedback for Effective Cardiac Treatment⁴⁰ 	Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6B – Heart Failure (HF) (Continued)		
Outpatient Care		
Type of physician providing care to newly diagnosed heart failure patients in the community	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Congestive Heart Failure³⁸ 	Ontario Congestive Heart Failure Database (OCHFDB); ICES Physician Database (IPDB)
Section 6C – Ischemic Heart Disease		
Type of physician providing in-hospital care for acute myocardial infarction	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Physician care within four weeks of hospital discharge after an admission for an acute myocardial infarction	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Ontario Health Insurance Plan (OHIP)
Medication Management		
Lipid-lowering therapy (statins) for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Beta-blocker therapy for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6C – Ischemic Heart Disease (Continued)		
Angiotensin-converting enzyme (ACE) inhibitor therapy and/or angiotensin II receptor blocker (ARB) therapy for acute myocardial infarction post-discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Diagnostic Testing		
Angiography for acute myocardial infarction	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Cardiac Care Network (CCN)
Outcomes after Acute Myocardial Infarction		
Non-elective hospital readmission following hospital discharge for acute myocardial infarction	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Canadian Institute for Health Information²⁶⁶ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Mortality following hospital discharge for acute myocardial infarction	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Canadian Institute for Health Information (CIHI, 2005) Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Wait Times for Cardiac Procedures		
Wait times for cardiac procedures: <ul style="list-style-type: none"> Coronary angiography Angioplasty Coronary artery bypass graft surgery 	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Canadian Cardiac Network wait times data

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6C – Ischemic Heart Disease (Continued)		
Hospital Care for Acute Myocardial Infarction		
Eligible patients with an AMI who received aspirin at hospital discharge	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I
Median door-to-needle time for thrombolytics therapy in ST segment elevation myocardial infarction (STEMI) patients presenting to an emergency department	<ul style="list-style-type: none"> Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study, Phase I
Coronary Artery Bypass Graft Surgery (CABG)		
Use of internal mammary artery to bypass left anterior descending artery in CABG	<ul style="list-style-type: none"> Canadian CABG Surgery Quality Indicators⁴² 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP))
Length of stay for patients undergoing CABG	<ul style="list-style-type: none"> Canadian CABG Surgery Quality Indicators⁴² 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP))

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6C – Ischemic Heart Disease (Continued)		
Medication management after CABG: <ul style="list-style-type: none"> • Lipid-lowering therapy • Beta-blockers • Angiotensin-converting enzyme inhibitors 	<ul style="list-style-type: none"> • Canadian CABG Surgery Quality Indicators⁴² • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP)); Ontario Drug Benefit (ODB) database
Outcomes after CABG		
Hospital readmission following discharge for CABG	<ul style="list-style-type: none"> • Canadian CABG Surgery Quality Indicators⁴² • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP))
Revascularization following discharge for CABG	<ul style="list-style-type: none"> • Canadian CABG Surgery Quality Indicators⁴² • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ • Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP))
Mortality following discharge for CABG	<ul style="list-style-type: none"> • Canadian CABG Surgery Quality Indicators⁴² • Canadian Cardiovascular Outcomes Research Team (CCORT)/Canadian Cardiovascular Society (CCS) Quality Indicators for Acute Myocardial Infarction Care³⁹ • Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Coronary Artery Bypass Graft (CABG) Database (Cardiac Care Network (CCN) database linked to Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Registered Persons Database (RPDB), Canadian Census, and Ontario Health Insurance Plan (OHIP))

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6D – Stroke		
Acute Therapy for Ischemic Stroke and Transient Ischemic Attack		
Use of thrombolytic therapy with recombinant tissue plasminogen activator for ischemic stroke	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Use of acute antiplatelet therapy for ischemic stroke or transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Secondary Prevention for Ischemic Stroke and Transient Ischemic Attack		
Use of antithrombotic therapy for secondary prevention of ischemic stroke or transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Warfarin therapy at discharge in patients with atrial fibrillation and ischemic stroke or transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Continuation of warfarin therapy in patients with atrial fibrillation and ischemic stroke or transient ischemic attack following hospital discharge	• The Canadian Stroke Strategy ^{41, 271}	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Measurement of lipid levels during hospitalization for ischemic stroke or transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Lipid-lowering medications (statins) for ischemic stroke or transient ischemic attack at discharge	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Continuation of lipid-lowering medications in patients with ischemic stroke or transient ischemic attack following hospital discharge	• The Canadian Stroke Strategy ^{41, 271}	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6D – Stroke (Continued)		
Antihypertensive therapy for ischemic stroke or transient ischemic attack at discharge	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA); Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Continuation of antihypertensive therapy in patients with ischemic stroke or transient ischemic attack following hospital discharge	• The Canadian Stroke Strategy ^{41, 271}	Ontario Drug Benefit (ODB) database; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Imaging in Stroke and Transient Ischemic Attack		
Neuroimaging (computing tomography (CT) and/or magnetic resonance (MR) imaging) for stroke and transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Carotid imaging for ischemic stroke and transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Carotid endarterectomy for ischemic stroke and transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
Assessment of Stroke and Transient Ischemic Attack		
Admission of patients with stroke or transient ischemic attack to a dedicated stroke unit	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Dysphagia screening in patients with stroke or transient ischemic attack admitted to hospital	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
In-hospital (inpatient or emergency department) neurology or neurosurgical consultation for stroke or transient ischemic attack	• The Canadian Stroke Strategy ^{41, 271}	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)

APPENDIX 6.2 | Cardiovascular Diseases—indicator source(s), data source(s)

Indicator	Indicator Source(s)	Data Source(s)
Section 6D – Stroke (Continued)		
In-hospital rehabilitation and nutritional assessment of stroke or transient ischemic attack patients: • Physiotherapy • Occupational therapy • Speech therapy • Nutritional assessment	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} • Danish National Indicators Project: Stroke⁴³ 	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Referral to stroke prevention clinics for stroke and transient ischemic attack patient discharged directly from emergency departments	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} 	Registry of the Canadian Stroke Network Ontario Stroke Audit (RCSN-OSA)
Rehabilitation for Stroke		
Wait time from stroke onset to admission to inpatient rehabilitation for patients requiring care	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} 	Canadian Institute for Health Information National Rehabilitation Reporting System (CIHI-NRS)
Mean change in Functional Independence Measurement (FIM) score from admission to discharge from an inpatient rehabilitation facility	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} 	Canadian Institute for Health Information National Rehabilitation Reporting System (CIHI-NRS)
Outcomes in Stroke and Transient Ischemic Attack		
Non-elective readmission following hospital discharge for stroke and transient ischemic attack	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} • Canadian Institute for Health Information²⁶⁶ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS)
Mortality following hospital discharge for stroke and transient ischemic attack	<ul style="list-style-type: none"> • The Canadian Stroke Strategy^{41, 271} • Canadian Institute for Health Information²⁶⁶ • Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries²⁶⁸ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); National Ambulatory Care Reporting System (NACRS); Registered Persons Database (RPDB)

Appendix 6.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators we report are the result of a rigorous selection process which included an extensive literature review of peer-reviewed and grey literature (see [Introduction to the POWER Study, chapter 1](#) for a more detailed description of the indicator selection process). The review of literature identified approximately 200 indicators. The working group reviewed the indicators using defined indicator selection criteria and prepared a list containing potential indicators for inclusion for review by a Technical Expert Panel (TEP). Indicators were then selected through a modified Delphi process by the TEP using a two step process—first through an online questionnaire and then at a face-to-face meeting on February 14, 2007. The final list included 8 indicators that apply to overall cardiovascular disease (CVD), 13 indicators for heart failure (HF), 17 indicators for ischemic heart disease (IHD) and 19 indicators for stroke. (See [Appendix 6.1](#) for a complete indicator list).

All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators were first stratified by sex, and then further stratified by socioeconomic variables (age, income level, education level, ethnicity and years since immigration) as allowed by sample size and data availability. At the LHIN level, indicators were stratified by sex and then by age and income level as allowed by sample size and data availability. Age-adjustment was done using indirect standardization.

2A. Datasets—Survey Data

Canadian Community Health Survey (CCHS)

The CCHS is a nationally representative cross-sectional survey of the Canadian community-dwelling

population conducted every two years by Statistics Canada. It is conducted via face-to-face interviews and covers material that alternates between a general overview of the health of Canadians (the x.1 cycle surveys) and more in-depth issues (the x.2 cycle surveys). Residents living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded from the survey. The Ontario share files for the survey were used for all analyses. The analyses for the health and functional status of individuals who self-reported CVD were based on data from the CCHS, Cycles 1.1, and 3.1.

For all the CCHS-based indicators, we included all respondents who reported that they had heart disease or a stroke and who were aged 25 and older. Using these inclusion criteria allowed us to assess the relationship between the determinants of health, including education, income, age, immigrant status, language skills and self-reported CVD. Cycle 1.1 (2000/01), was used to assess the quality of life among those with self-reported CVD. Cycle 3.1 (2005), was used to assess self-rated health status, functional status, risk factors and behavioural changes among those with self-reported CVD.

In analyses that use the CCHS, income levels were based on information collected about annual household income, a variable derived by Statistics Canada that accounts for total household income and household size. Income data were missing for 17 percent of the sample. The studentized range test was used to assess the significance of differences among the rates. For the indicators based on the CCHS, Cycle 1.1 data, the standard errors of the rates and 95

percent confidence intervals were calculated using 500 bootstrap weights provided by Statistics Canada. In addition, relative rates were calculated for women-to-men and lowest-to-highest neighbourhood income quintile.

Statistics Canada rules were followed in the reporting of estimates using the Ontario share file as follows:

- Estimates should not be reported if the unweighted sample is less than 10;
- Estimates are adequate and can be reported if the coefficient of variation is 16.5 or less;
- Estimates should be reported with caution if the coefficient of variation is between 16.6 and 33.3;
- Estimates should be suppressed if the coefficient of variation is greater than 33.3.

2B. Datasets—Administrative and Research Data

Canadian Institute of Health Information Discharge Abstracts Database (CIHI-DAD)

The CIHI-DAD is a database of information abstracted from hospital records. It includes patient-level data for acute and chronic care hospitals, rehabilitation hospitals and day surgery clinics in Ontario. The CIHI-DAD database at ICES contains encrypted patient identifier, patient demographics (age, sex, geographic location), diagnoses, procedures, and administrative information (institution number, admission category, length of stay).

Ontario Health Insurance Plan (OHIP)

The OHIP claims database covers all reimbursement claims to the Ontario Ministry of Health and Long-Term Care made by fee-for-service physicians, community-based laboratories and radiology facilities. The OHIP database at ICES contains encrypted patient and physician identifiers, code for service provided, date of service and the associated diagnosis and fee paid. Services which are missing from the OHIP claims data include some lab services, services received in provincial

psychiatric hospitals, services provided by health service organizations and other alternate funding plans, diagnostic procedures performed on an inpatient basis and lab services performed at hospitals (both inpatient and same day). Also excluded is remuneration to physicians through Alternate Fee Plans (AFPs). Their concentration in certain specialties or geographic areas could distort some analyses.

National Ambulatory Care Reporting System (NACRS)

NACRS is a data collection tool used to capture patient and clinical information on visits to hospital and community based ambulatory care including: day surgery, outpatient clinics and emergency departments. Client visit data are collected at the time of service in participating facilities, but data collection methods may vary by facility.

Ontario Drug Benefit (ODB) program

The ODB database contains information about the use of medications in seniors aged 65 and older as well as individuals on welfare assistance who are covered by the ODB. The ODB tracks all filled prescriptions for medications listed in its formulary and each record represents a unique drug claim (i.e. a dispensed prescription) paid for by the Ministry of Health and Long-Term Care. The ODB database at ICES contains patient, pharmacy and physician identifiers, drug identifiers (drug identification numbers) quantity supplied, cost and dispensing date.

National Rehabilitation Reporting System (NRS)

The NRS contains client data collected from participating adult inpatient rehabilitation facilities and programs across Canada. The NRS data elements include socio-demographic information, administrative data such as referral, admission and discharge; activities and participation (e.g. ADL, communication, social interaction) and interventions.

Cardiac Care Network (CCN)

The CCN is a centralized province wide registry of all patients waiting for cardiac surgery. For this chapter, the sample was limited to Ontario patients who were waiting for angiography, angioplasty and coronary artery bypass graft surgery (CABG). CCN includes all 11 CABG hospitals and all 12 percutaneous coronary intervention (PCI) hospitals in Ontario. A patient is added to the list when she or he is referred for cardiac surgery; and removed from the list at the time of surgery, death, or a decision not to pursue surgery. Wait times are calculated based on the difference from when a patient was added to the list to when the patient was removed from the list. The CCN contains a prioritization system (urgency rating score) for patients awaiting bypass surgery and coronary angiography. Each type of cardiac patient is assigned a score indicating how urgently a procedure should be received and a Recommended Maximum Wait Time (RMWT).

The Ontario Congestive Heart Failure Database (OCHFDB), 2005/06

The OCHFDB contains all Ontario individuals identified as having HF since 1991. Based on a validated administrative algorithm, a patient is said to have HF if she or he had one hospital admission with an HF diagnosis or an OHIP claim or NACRS record with an HF diagnosis followed by a second OHIP claim, NACRS record or hospital admission for HF within two years of the first claim. The incident date is determined based on the date of the first claim. The database was created using the CIHI-DAD (including same day surgery), physician service claims from the OHIP database supplemented with emergency department records from NACRS and information regarding the demographics of persons eligible for health care coverage in Ontario from the Registered Persons Database (RPDB). For this chapter, incident claims within the 2005/06 fiscal year were included.

Coronary Artery Bypass Surgery (CABG)

This dataset links 4 administrative databases through the use of unique encrypted identifiers. All patients who underwent isolated CABG performed in the 2005/06 fiscal year in Ontario identified in the CCN were included. The CCN data were then linked to the CIHI-DAD for information on patient's discharge, and readmissions for acute myocardial infarction (AMI), HF, unstable angina and stroke. Patients who had a valid health card number in the linked CCN/CIHI dataset were also linked to the RPDB to identify deaths that occurred outside hospitals. The Canadian Census database was used to estimate each patient's income quintile by the linkage to postal code of primary residence. Finally, the OHIP database was used to determine the type of grafts used and repeat revascularization procedures (angioplasty or repeat CABG).

Registered Persons Database (RPDB)

The RPDB is a historical listing of the unique health numbers issued to each person eligible for Ontario health services. This listing includes corresponding demographic information such as date of birth, sex, address, date of death (where applicable) and changes in eligibility status. When new RPDB data arrive at ICES, personal information such as name and street address is removed, and each unique health number is converted into an anonymous identifier, ensuring the protection of each individual's privacy. The RPDB overestimates the number of people living in Ontario for several reasons. Although improvements have been made in recent years, the RPDB still contains a substantial number of individuals who are deceased or no longer living in Ontario. To ensure that rates and estimates are correct, a methodology has been developed to adjust the RPDB so that regional population counts by age and sex match estimates from Statistics Canada.²⁷² The adjusted dataset was used to determine population denominators.

ICES Physician Database (IPDB)

The IPDB contains information on physician demographics and specialty training. The IPDB incorporates information from the Corporate Provider Database (CPDB), the Ontario Physician Human Resource Data Centre (OPHRDC) database and the OHIP database of physician billings. The CPDB contains information about physician demographics, specialty training and certification and practice location. This information is validated against the OPHRDC database, which verifies this information through periodic telephone interviews with all physicians practicing in Ontario.

The Registry of the Canadian Stroke Network-Ontario Stroke Audit (RCSN-OSA), 2004/05

The RCSN is a national stroke registry established in 2001. The data collected characterize the entire stroke event from the onset of symptoms to the patient's status post stroke to hospital discharge. The goals are: to determine the characteristics of patients with stroke and transient ischemic attack (TIA) presenting to participating institutions; to document the care that such patients receive with a specific focus on recognized stroke care quality indicators including neuroimaging, thrombolysis, stroke unit care, and antithrombotic agents; to determine the impact on patient outcomes; to evaluate outcomes in patients after stroke. Since its inception, the RCSN went through different phases of data collection. The Ontario Stroke Audit (OSA) represents phase three of the RCSN. These data capture all consecutive stroke or TIA patients seen at the 12 participating institutions in Ontario. It is a retrospective data collection and covers all individuals who visited Ontario emergency departments from the fiscal year 2002/03 onwards. In phase three, the RCSN also included population-based sampling of stroke patients seen at every acute care institution in Ontario, in the 2002/03 and 2004/05 fiscal years. This report uses the 2004/05 RCSN-OSA data.

Enhanced Feedback for Effective Cardiac Treatment (EFFECT) Phase 1

The EFFECT database is an annual retrospective chart abstraction of hospitalizations from 1999/00 to 2000/01 conducted in 85 hospital corporations (consisting of 103 acute care hospitals) in Ontario. The study sample consists of approximately 125 AMI and 125 HF patients per hospital base per year. This database is collected in three phases. The study sample included in this chapter consisted of 11,524 AMI and 9,945 HF abstracted charts. The data elements included demographic characteristics and treatment information on evidence-based therapy. The data focuses on two sets of quality indicators—one for AMI care and one for HF care.

3. Analyses and Regional and Socioeconomic Variables

Analysis

For survey data, analyses were conducted at the provincial level, first by sex and then by annual household income, educational attainment, age group, length of time since immigration and LHIN. Where possible, relative rates were calculated for women-to-men and lowest-to-highest income groups; 95 percent confidence intervals were calculated for all rates and rate comparisons. Stratified analyses at the LHIN level could not be conducted because of limited power due to small numbers.

For administrative and study data, analyses were conducted at the provincial level, first by sex and then by income quintile, age group and LHIN. Analyses at the LHIN level were stratified first by sex and then by neighbourhood income and age group. Where possible, relative rates were calculated for women to men and lowest to highest income groups; 95 percent confidence intervals were calculated for all rates and rate comparisons.

Standardization

Depending on the indicator and its purpose, we reported crude rates, age-adjusted rates and/or risk-adjusted rates. When age-adjusted rates were reported, we used indirect standardization which compares the age specific rates to the provincial average for that age group. The observed over the expected rate tells us how a particular stratum compares to the overall population and the relative risk tells us how a specific stratum compares to another (i.e. women versus men or low versus high income).

Income Quintile

Average neighbourhood income is calculated by Statistics Canada and is updated every five years when new Census data become available. Income was calculated using the neighbourhood income per person equivalent (IPPE), which is a household size adjusted measure of household income based on 2001 Census summary data at the dissemination area and using person-equivalents implied by the 2006 low-income cut-offs. In 2001, average income estimates were calculated by dissemination area. Ontario neighbourhoods are classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are used as proxy for overall socioeconomic status, which has been shown to be related to population health status and levels of health care utilizations. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to enumeration areas or dissemination areas (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. enumeration areas and dissemination areas are small adjacent geographic areas, designated for collection of census data. Dissemination areas replaced enumeration areas in 2001 and have a population of 400–700 persons.

Patients' Residence

For all analyses presented in the report, the definition of "LHIN of patient residence" is based on where each person lived when he or she was diagnosed with CVD or stroke.

4. Indicators

Functional and Health Status Indicators

The CCHS survey data, cycle 1.1 (2000/01) were used to identify individuals who self-reported having heart disease or a stroke. Within this sample the following indicators were measured based on respondent self-report:

- The percentage who reported that at least some of their activities were prevented due to pain and discomfort;
- The percentage who reported problems with mobility including an inability to walk around the neighborhood or an ability to walk with difficulty, requiring help of others or mechanical supports such as braces, a cane, crutches or a wheelchair.

The CCHS survey data, cycle 3.1 (2005) were used to identify individuals who self-reported having heart disease or a stroke. Within this sample the following indicators were measured based on respondent self-report:

- The percentage who reported that their health was fair or poor compared to others their own age;
- The percentage who felt that their self-rated health was somewhat or much worse than their health from one year ago;
- The percentage who reported that their activities at home, school or work were limited due to a long-term (one that is expected to last or has already lasted six months or more) physical or mental condition or health problem;
- The percentage who reported having IADL (Instrumental Activities of Daily Living) and/or ADL (Activities

of Daily Living) limitations. ADLs include washing, dressing, eating and moving about inside the house. IADLs include housework, laundry, meal preparation, transportation, grocery shopping, using the telephone and money management. IADL limitations represent difficulties in carrying out routine life activities and are generally interpreted as an indicator of mild to moderate disability. Limitations in ADLs reflect difficulty in carrying out self-care activities, and therefore represent a more severe disability;

- The percentage who reported any disability days in the previous two weeks;
- The percentage who reported socioeconomic risk factors for CVD
 - Living in lower-income households, defined as the two lowest levels of annual household income;
 - Having lower educational attainment, defined as secondary school graduation or less;
- The percentage who reported having physician diagnosed diabetes and/or hypertension. These are chronic conditions that increase the risk for CVD and for adverse events among individuals with heart disease or who have had a stroke;
- The percentage who reported health behaviours that increase the risk of CVD and of adverse outcomes among individuals with heart disease or who have had a stroke
 - Physical inactivity defined as a Physical Activity Index of < 1.5 kcal/kg/day;
 - Inadequate fruit and vegetable consumption defined as a daily consumption of less than five servings of fruits and vegetables;
 - Being overweight or obese defined as a Body Mass Index (BMI) ≥ 25 , calculated from self-reported height and weight;
 - Smoking defined as current daily or occasional smoking;

- The percentage who reported making positive lifestyle changes in the previous year intended to improve their health. Changes included increasing physical activity, weight loss, dietary changes, reducing alcohol consumption, reducing stress levels, quitting smoking, receiving medical treatment or taking vitamins.

We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Heart Failure (HF)

A number of indicators were measured in a cohort of patients who were admitted to an acute care hospital for a most responsible diagnosis of HF (ICD10 diagnostic code, I50). The CIHI-DAD (2005/06) was used to identify the first admission per patient. Patients were included if they had a valid health card number, were age 45 and older and if they were not transferred from another acute care facility or were not admitted to surgical service. Records were excluded if they were missing information on patient LHIN.

In-Hospital Physician Care

The CIHI-DAD database was used to identify the most responsible physician providing care to HF patients while in hospital. Cardiologists, general internists and general practitioners/family physicians (GP/FP) were each identified. Other types of physicians were classified as 'other'. When the most responsible physician was a GP/FP, other provider service codes were checked to see if patients also received care from a cardiologist or an internist while in hospital. If this was the case, care was classified as 'GP/FP with specialist follow up.' For patients who were not seen by a specialist at all, care was classified as 'GP/FP sole care.' Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Physician Follow Up Care Within Four Weeks

OHIP physician claims data were used to determine what percentage of patients discharged home from

hospital after an admission for HF who were seen by a physician within four weeks of discharge. To determine the type of physician providing care, the OHIP data were linked to the IPDB to identify physician type. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Medication Management

ODB data were used to measure medication management of patients discharged home from hospital after an admission for HF. The sample was restricted to patients aged 65 and older because of access to provincially funded drug benefits in this population. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use. The data do not include sufficient clinical information to exclude those with contraindications to medication use. The use of angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARBs) and beta-blockers was measured in all patients discharged alive from hospital. For HF patients with atrial fibrillation, the percentage of patients who received a prescription for warfarin within the same time frames were also measured. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Evaluation of Heart Failure

OHIP physician claims data were used to determine the percentage of patients discharged from hospital after an admission for HF who received evaluation for HF including left ventricular function tests, cardiac testing, echocardiography and angiography. OHIP fee codes were used to identify which tests were performed on

patients within the period six months prior to admission to one month post-discharge. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the crude and age-adjusted rates and the 95 percent confidence intervals.

Outcomes

Emergency department visits: NACRS data were used to determine the percentage of patients discharged home from hospital after an admission for HF who were seen in an emergency department at least once within 30 days of discharge and within one year of discharge. For this analysis, only the first visit per patient was counted. The reason for the visit was identified based on the main problem for the visit. Visits were classified as being related to HF, related to CVD or not related based on a panel review of all diagnoses by two physicians (a cardiologist and an internist/geriatrician). Where there was disagreement in coding, the final decision was based on discussion and resolution. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the crude and age-adjusted rates and the 95 percent confidence intervals.

Readmissions: The CIHI-DAD was used to determine the percentage of patients discharged home from hospital after an admission for HF who were non-electively readmitted to hospital within 30 days of discharge and within one year of discharge. The first visit per patient was counted. The reason for the visit was identified based on the most responsible diagnosis code in the CIHI-DAD. Visits were classified as being related to HF, related to CVD or not related based on a panel review of all diagnoses by two physicians (a cardiologist and an internist/geriatrician). Where there was disagreement in coding, the final decision was based on discussion and resolution. Readmission rates were risk-adjusted based on the model developed by the CIHI and used in the 2006 Hospital Report Card.¹²² The

model adjusts readmission rates based on patient sex, age (under age 65 versus 65 and older for women and under age 55 and 55 and older for men) and comorbidities including conduction disorders, atherosclerosis, hypertension (uncomplicated), hypertension (complicated), chest conditions, diabetes, hypothyroidism, renal failure and anemia. Age was excluded from the risk-adjustment model when reporting rates by age group. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

Mortality: The RPDB was used to determine the percentage of patients who were admitted to hospital for HF who died within one year following their admission. We calculated the crude and risk-adjusted rates. We used the Ontario AMI prediction model.²⁷² The model adjusts the rates for sex, age (50-64, 65-74, 75 and older) and comorbidities including shock, diabetes with complications, cancer, cerebrovascular disease, pulmonary edema, acute renal failure, chronic renal failure and cardiac dysrhythmias. Age was excluded from the risk-adjustment model when reporting rates by age group. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

Clinical Care

Data from the EFFECT study Phase I (1999/00–2000/01) were used to measure in-hospital care indicators including the percentage of HF patients who had their weight measured on 50 percent of inpatient days and the percentage of HF patients who received discharge instructions. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Physician Care for Incident HF

Using data from the OCHFDB, Ontarians with incident HF diagnosed in the 2005/06 fiscal year were followed for one year to determine the proportion that were seen by a physician for HF and the types of physicians providing care. Physician visits were identified by linking the OCHFD to OHIP physician claims and the type of physician providing care was identified by linking physician visits to the IPDB to determine specialization. Given that patients may see more than one physician during the course of one year, care was viewed hierarchically. All patients were first classified as receiving care from a cardiologist and then by an internist and/or geriatrician. Patients who have seen a cardiologist and an internist and/or geriatrician were classified as having seen a cardiologist, based on the hierarchy. For these analyses, patients who were classified as having seen a GP/FP were seen only by a GP/FP during the year. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Ischemic Heart Disease (IHD)

A number of indicators were measured in a cohort of patients who were admitted to an acute care hospital for a most responsible diagnosis of an AMI (ICD10 diagnostic code, I21). The CIHI-DAD (2005/06) was used to identify the first admission per patient. Patients were included if they had a valid health card number, were aged 45 and older and if they were not transferred from another acute care facility or were not admitted to surgical service. Records were excluded if they were missing information on patient LHIN.

In-Hospital Physician Care

The CIHI-DAD database was used to identify the most responsible physician providing care to AMI patients while in hospital. Cardiologists, general internists and GP/FP were each identified. Other types of physicians

were classified as 'other'. When the most responsible physician was a GP/FP, other provider service codes were checked to see if patients also received care from a cardiologist or an internist while in hospital. If this was the case, care was classified as 'GP/FP with specialist follow up.' For patients who were not seen by a specialist at all, care was classified as 'GP/FP sole care.' Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Physician Follow Up Care Within Four Weeks

OHIP physician claims data were used to determine the percentage of patients discharged home from hospital after an admission for an AMI who were seen by a physician within four weeks of discharge. To determine the type of physician providing care, the OHIP data were linked to the IPDB to identify physician type. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Medication Management

ODB data were used to measure medication management of patients discharged home from hospital after an admission for an AMI. The sample was restricted to patients aged 65 and older because of access to provincially funded drug benefits in this population. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use. The data do not include sufficient clinical information to exclude those with contraindications to medication use. The use of statins, beta-blockers, ACE inhibitors and/or ARBs was measured in all patients discharged alive from hospital. Statistics Canada was used to identify the neighbourhood income quintile of the

patient. We report the crude rates and the 95 percent confidence intervals.

Angiography

CCN data were used to identify the percentage of patients who had been admitted to hospital with an AMI who received or were referred for angiography within three months of the date of their AMI admission, including those who received angiography while in hospital. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude and age-adjusted rates and the 95 percent confidence intervals.

Outcomes

Readmissions: The CIHI-DAD was used to determine the percentage of patients discharged home from hospital after an admission for an AMI who were non-electively readmitted to hospital within 30 days of discharge and within one year of discharge. The first visit per patient was counted. The reason for the visit was identified based on the most responsible diagnosis code in the CIHI-DAD. Visits were classified as being related to acute coronary syndrome (ACS), related to CVD or not related based on a panel review of all diagnoses by two physicians (a cardiologist and an internist/geriatrician). Where there was disagreement in coding, the final decision was based on discussion and resolution. Readmission rates were risk-adjusted based on the model developed by the CIHI and used in the 2006 Hospital Report Card.¹²² The model adjusts readmission rates based on patient sex, age (under age 65 versus 65 and older for women and under age 55 and 55 and older for men) and comorbidities including HF, conduction disorders, atherosclerosis, hypertension (uncomplicated), hypertension (complicated), chest conditions, diabetes, hypothyroidism, renal failure and anemia. Age was excluded from the risk-adjustment model when reporting rates by age group. Statistics Canada was used to allocate the neighbourhood

income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

Mortality: The RPDB was used to determine the percentage of patients who were admitted to hospital for an AMI who died within 30 days and within one year following their admission. We calculated the crude rate and risk-adjusted rates. We used the Ontario AMI prediction model.²⁷³ The model adjusts the rates for sex, age (50-64, 65-74, 75 and older) and comorbidities including shock, diabetes with complications, cancer, cerebrovascular disease, pulmonary edema, acute renal failure, chronic renal failure and cardiac dysrhythmias. Age was excluded from the risk-adjustment model when reporting by age group. Statistics Canada was used to allocate neighbourhood income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

Wait Times for Cardiac Procedures

CCN data were used to measure the median and 90th percentile wait times for patients who had been referred for angiography, angioplasty or CABG. Wait times are calculated from the time a person is placed on the list for a cardiac procedure to the time when they are removed from the list. For this analysis, only patients who underwent the procedure were included. We also report the percentage of patients who underwent their procedure within the recommended maximum wait time as established by CCN urgency rating scores. CCN classifies patients waiting for procedures as urgent, semi-urgent or elective based and recommended maximum wait times are based on individual urgency rating scores.

Clinical Care

Data from the EFFECT study, phase I, were used to measure in-hospital care indicators including the percentage of AMI patients who received aspirin at the time of discharge from hospital, (excluding patients

with contraindications) and the door-to-needle time for patients with ST-segment elevation myocardial infarction who received thrombolytic therapy within four hours of arrival to hospital. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Coronary Artery Bypass Graft Surgery (CABG)

The CABG database was used to measure quality indicators for CABG including use of the internal mammary artery to bypass the left anterior descending artery, mean pre- and post-operative lengths of stay, medication management for CABG patients post-discharge, readmissions, revascularization and mortality.

Crude rates were reported for bypass of the left anterior descending artery using the internal mammary artery and medication management of CABG patients post-discharge including prescriptions filled for lipid-lowering medications, beta-blockers and ACE inhibitors within 90 days of discharge and at one year post-discharge. Data on medication management were based on linkage of the CABG dataset with the ODB. As such, data were restricted to patients aged 65 and older because of access to provincially funded drug benefits in this population.

Readmission rates and lengths of stay were risk-adjusted using the CABG risk-adjustment model which includes: sex, age (under 65, 65-74, aged 75 and older), previous CABG, left ventricular function, left main disease, Canadian Cardiovascular Society (CCS) classification of angina (1 and 2 versus 3, 4A, 4B, 4C and 4D), peripheral vascular disease, CVD, chronic obstructive pulmonary disease, diabetes, dialysis and creatinine. Because of limited sample size, revascularization rates and mortality could not be risk-adjusted; however mortality rates were age-adjusted using indirect standardization. Statistics Canada was used to allocate the neighbourhood income quintile of the

patient. We report the crude, age-adjusted and risk-adjusted rates and the 95 percent confidence intervals as described above.

Stroke

Many of the indicators of stroke care were measured using data from the RCSN-OSA (2004/05) as this dataset includes data on clinical care. Selected indicators were measured in a cohort of patients who were admitted to an acute care hospital for a most responsible diagnosis of stroke or transient ischemic attack (TIA) (ICD10 diagnostic codes I60, I61, I63, I64, H341, G45, excluding G454). The CIHI-DAD (2005/06) was used to identify the first admission per patient. Patients were included if they had a valid health card number, were aged 45 and older and if they were not transferred from another acute care facility or were not admitted to surgical service. Records were excluded if they were missing information on patient LHIN.

Acute Therapy

The percentage of patients who presented to hospital with an ischemic stroke who received thrombolytic therapy with recombinant tissue plasminogen activator (rtPA) was measured using data from the RCSN-OSA. The indicator was measured in all ischemic stroke patients presenting to hospital and a sub-sample of patients presenting to hospital within 2.5 hours of stroke onset. We report the crude rates and the 95 percent confidence intervals. The percentage of patients who presented to hospital with an ischemic stroke or TIA who received antiplatelet therapy within 48 hours of arrival was measured using data from the RCSN-OSA. We report the crude rates and the 95 percent confidence intervals.

Secondary Prevention

The percentage of patients who presented to hospital with an ischemic stroke or TIA who received medications at discharge for secondary prevention was

measured using data from the RCSN-OSA. We assessed the percentage of patients who were discharged from hospital after an admission for ischemic stroke or TIA who received antithrombotic therapy, lipid-lowering therapy and/or antihypertensive therapy. For patients with atrial fibrillation, the percentage of patients who received a prescription for warfarin at discharge was also measured.

Continuation of Medications for Secondary Prevention

Medication use within 90 days of discharge and at one year post-discharge was measured using the cohort identified through CIHI-DAD and linking to the ODB database to assess medication management of patients discharged home from hospital after an admission for ischemic stroke or TIA. The sample was restricted to patients aged 65 and older because of access to provincially funded drug benefits in this population. Medication use was measured based on filled prescriptions, at two time intervals: within 90 days of discharge to determine initiation of therapy post-discharge and then measured again between nine months and one year post-discharge (among patients who were alive at one year) to assess continued medication use. The data do not include sufficient clinical information to exclude those with contraindications to medication use. The use of antithrombotic therapy, lipid-lowering therapy and/or antihypertensive therapy was measured in the total sample. For patients with atrial fibrillation, the percentage of patients who received a prescription for warfarin was also determined. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Hospital Care, Screening and Assessment

The percentage of patients who presented to hospital with an ischemic stroke or TIA who were admitted to

a dedicated stroke unit, assessed by a neurologist or neurosurgeon, screened for lipid levels, dysphagia and/or who underwent rehabilitation and/or nutritional assessment while in hospital was measured using data from the RCSN-OSA. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95% confidence intervals.

Neuroimaging (Computed Tomography (CT) and/or Magnetic Resonance (MR) Imaging)

The percentage of patients who presented to hospital with a stroke or TIA who underwent neuroimaging (CT or MR imaging) while in hospital was measured using data from the RCSN-OSA. The RCSN-OSA database was used to calculate the crude rates of in hospital imaging procedures. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Carotid Imaging

The percentage of patients who presented to hospital with an ischemic stroke or TIA who underwent carotid imaging while in hospital or who were scheduled to return for imaging as an outpatient was measured using data from the RCSN-OSA. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Carotid Endarterectomy

The percentage of patients who presented to hospital with an ischemic stroke or TIA who underwent carotid endarterectomy within six months of their index stroke admission was measured using the cohort identified through CIHI-DAD and based on in-hospital procedures (CCI code 1JE57). As well, among ischemic stroke or TIA patients, the time to carotid endarterectomy

was measured in increments based on the difference between admission date and procedure date. The percentage of patients who underwent the procedure within two weeks, one month, three months and six months was reported. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Referral to Stroke Prevention Clinics for Patients Discharged Directly from an Emergency Department

The percentage of patients who presented to hospital with a stroke or TIA and who were discharged home directly from an emergency department who were referred to a stroke prevention clinic was measured using data from the RCSN-OSA. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the crude rates and the 95 percent confidence intervals.

Wait Times for Admission to Rehabilitation and Mean Change in Functional Independence Measurement (FIM) Score

The median wait time to admission to a rehabilitation facility for stroke patients who were admitted to inpatient rehabilitation was measured using the CIHI-NRS database. Wait times were calculated from the date of stroke onset until the date of admission to an inpatient rehabilitation facility. Patients who are admitted to inpatient rehabilitation undergo a Functional Independence Measurement (FIM) at the time of admission and again at the time of discharge. The mean change in FIM scores is a measure of change in functional independence and was measured using the CIHI-NRS in patients who had scores at both time periods. Statistics Canada was used to identify the neighbourhood income quintile of the patient. We report the median, 90th percentile, 10th percentile wait

times to inpatient rehabilitation and the interquartile range and we report the mean change in FMI scores from admission to discharge.

Outcomes

Readmissions: The cohort of index patients identified through the CIHI-DAD was followed in the CIHI-DAD to determine the percentage of patients discharged home from hospital after an admission for a stroke or TIA who were non-electively readmitted to hospital within seven days, 30 days and within one year of discharge. The first visit per patient was counted. The reason for the visit was identified based on the most responsible diagnosis code in the CIHI-DAD. Visits were classified as being specifically for stroke or TIA, related to CVD or not related based on ICD10 codes. Readmission rates were risk-adjusted for sex, age (45-64, 65-79, aged 80 and older), Charlson-Deyo comorbidity index (0, 1 versus 2 or more) and stroke type (TIA, ischemic stroke versus

hemorrhagic stroke) based on a model developed by the RCSN. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

Mortality: The cohort identified through the CIHI-DAD was linked to the RPDB to determine the percentage of patients who were admitted to hospital for a stroke or TIA who died within seven days, 30 days and within one year following admission. Mortality rates were risk-adjusted for sex, age (45-64, 65-79, aged 80 and older), Charlson-Deyo comorbidity index (0, 1 versus 2 or more) and stroke type (TIA, ischemic stroke versus hemorrhagic stroke) based on a model developed by the RCSN. Statistics Canada was used to allocate the neighbourhood income quintile of the patient. We report the risk-adjusted rates and the 95 percent confidence intervals.

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Echo's mission is to improve the health and well-being of Ontario women and to reduce health inequities. We believe that through knowledge transfer and gender-based analysis, Echo will improve the health of women and overall quality of life, relationships, families and communities in Ontario. Echo is an agency of the Ministry of Health and Long-Term Care and is working to ensure Ontario is at the forefront of improving women's health.



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ONTARIO WOMEN'S
HEALTH EQUITY REPORT

Access to Health Care Services *Chapter 7*

AUTHORS

Arlene S. Bierman, MD, MS, FRCPC

Jan Angus, RN, PhD

Farah Ahmad, MBBS, MPH, PhD

Naushaba Degani, PhD

Mandana Vahabi, RN, MHSc, PhD

Richard H. Glazier, MD, MPH, FCFP

Yingzi Li, MSc

Stephanie Ross, BSc, MSc

Doug Manuel, MD, MSc, FRCPC

INSIDE

- Access to Primary Care
- Access to Care for Chronic Disease
- Access to Specialized Services and Home Care



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The POWER Study

Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital

30 Bond St. (193 Yonge St., 6th floor)

Toronto, ON, M5B 1W8

Tel: (416) 864-6060, Ext 3946

Fax: (416) 864-6057

POWERStudy@smh.ca

www.powerstudy.ca

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Executive Summary

ISSUE

A primary objective of the POWER Study is to provide actionable data and analyses and to develop tools that can be used to improve health and well-being and reduce health inequities among the women and men in Ontario.

Universal access to health care services is a fundamental principle of the Canadian health care system. While the system is based on the premise of equal access for all people, there are a wide range of constraining, enabling and need-related factors that affect access to care. These include (but are not limited to) gender,^{1, 2} socioeconomic position,^{3, 4} citizenship or immigration,⁵ health status⁶ and geographic location.^{7, 8} In this chapter, we will report on Ontarians' access to health care services and how it differs by sex, age, socioeconomic status, ethnicity, immigration, language and where one lives. In doing so, we identify opportunities for improvement and provide a baseline from which to measure progress.

'Access' is a complex and multidimensional concept. Many attempts have been made to define and measure it. For example, an early behavioural model suggests that actual use of health services is determined by individual health needs, the predisposition to seek care and a range of enabling or impeding factors.^{9, 10} Other approaches have placed greater emphasis on the mismatch between available health services and the needs or expectations of subpopulations.^{11, 12} Some expand the definition of access by drawing attention to structural barriers posed by the health care system (secondary access), or the ability of providers to provide effective care to diverse patient populations with specific needs (tertiary access).¹³ Finally, there are many calls for a holistic view when conceptualizing access to health care because many of the determinants of health and illness are situated

outside the health care sector, but they exert an impact on the need for, and access to care.¹⁴⁻¹⁶ This is one of the concepts underlying the POWER Study Gender and Equity Health Indicator Framework (see [chapter 2, The POWER Study Framework](#)).

Timeliness is an important dimension of access to care. Ontario's Wait Time Strategy has had success in reducing wait times in some areas.¹⁷ However, access involves much more than just wait times. In this chapter, we chose to emphasize important aspects of access that have received less attention.

Gender influences access to care and women are particularly at risk for encountering certain barriers to care. Women are more likely to be poor and have greater caregiver responsibilities than men. Both factors present barriers to accessing health care services. Furthermore, because women are more likely to have multiple chronic conditions and disabilities, the mismatch between the way health care is organized and women's health care needs creates a barrier to accessing effective care. Thus, it is important to assess gender differences in access to care and to develop gender sensitive interventions to make health care access more equitable. While gender comparisons will reveal important information about access disparities between women and men, it is important to analyze differences among subpopulations of women. Improving access to effective care for disadvantaged populations is an important lever for reducing inequities in health and health care.

ABOUT THIS CHAPTER

The chapter has three sections:

- A. Access to Primary Care
- B. Access to Care for Chronic Disease
- C. Access to Specialized Services and Home Care

In the first section, the **access to primary care** of Ontario women and men is profiled including: measures of unmet health care needs; access to a regular primary care physician; difficulties accessing primary care for routine, chronic and urgent problems; difficulties accessing health information; satisfaction with access to care and with the care received; and access to dental care. This is important because primary care has been shown to lower the overall costs of care, improve health through access to more appropriate services and reduce health inequalities at the population level.

Management and monitoring of chronic conditions in primary care is crucial for preventing these problems from getting worse and for helping people improve their health. The second section reports on **access to care for chronic diseases**, including the types of physician providing care to adults with diabetes and the rates of hospital admissions for ambulatory care sensitive conditions including congestive heart failure, diabetes, asthma and chronic obstructive pulmonary disease. In the final section, we report on **access and wait times for specialized services** including specialist care, diagnostic testing and non-emergent surgery. This section also reports on wait times for home care assessment among new home care clients. In

addition, wait time data for particular conditions can be found in their specific chapters (see [chapters 4, Cancer](#) and [6, Cardiovascular Disease](#)).

STUDY

The indicators we report on are the result of a rigorous selection process involving an extensive literature review of existing indicators as well as input and agreement from experts in the field (see [chapter 1, Introduction](#) to the POWER Study). At the provincial level, these indicators of access to health care services were first stratified by sex, and then further stratified by age, income, education, ethnicity, language, time since immigration and rural/urban residency as allowed by sample size and data. At the Local Health Integration Network (LHIN) level, indicators were stratified by sex, and then by age, income and education level whenever possible. The indicator of home care assessment was additionally stratified by MAPLe (Method of Assigning Priority Levels) score which provides a comparative measure of need for patients waiting for home care services. Age-adjustment was done using indirect standardization. Data from several sources were used to produce this chapter including: Statistics Canada's Canadian Community Health Survey (CCHS) 2005 (Cycle 3.1) and 2007; the Primary Care Access Survey (PCAS), Waves 4-11; the Home Care Reporting System (HCRS); the Ontario Diabetes Database (ODD); the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Ontario Health Insurance Plan (OHIP) data, ICES Physician Database (IPDB) and Statistics Canada 2001 Census. Both the CCHS and the PCAS are offered in English and in French. The CCHS additionally recruits interviewers with a wide range of language competencies to address the issue of language barriers and the survey is administered in multiple languages. The variable measuring language in the CCHS refers to knowledge of Canada's official languages, i.e., English and French. In the PCAS, the variable measuring language refers to language spoken most often at home.

KEY FINDINGS

Access to Primary Care

- While 93 percent of Ontarians reported having a primary care doctor, this varied by sex, neighbourhood income, age, time since immigration and LHIN. Individuals living in lower-income neighbourhoods ([Exhibit 7A.1](#)), younger adults ([Exhibit 7A.2](#)) and men were less likely than their counterparts to have a primary care doctor. Immigrants who had been in Canada for less than five years were less likely to have a primary care doctor than those who had been in Canada for 10 or more years and Canadian born respondents; 85 percent versus 94 percent and 93 percent, respectively ([Exhibit 7A.4](#)).
 - Six out of ten Ontarians were very satisfied with their experience getting an appointment for a regular check-up, however less than half of South and West Asian or Arab adults and East and Southeast Asian adults reported being very satisfied with their experience getting an appointment ([Exhibit 7A.8](#)). Time since immigration was also associated with satisfaction in getting an appointment for a regular check-up; immigrants who had been in Canada for less than 10 years were much less likely to be satisfied with their experience getting an appointment for a regular check-up compared to adults who had been in the country for 10 or more years and those who were Canadian born ([Exhibit 7A.9](#)). Adults who did not speak English or French most often at home were less likely to be satisfied with their experience getting an appointment for a regular check-up than those who spoke English or French ([Exhibit 7A.10](#)).
 - The majority of Ontarians (85 percent) who had sought care from a family doctor to monitor health problems reported no difficulties with access, however one in three South and West Asian or Arab women reported difficulties accessing care to monitor health problems as compared to less than one in five White women ([Exhibit 7A.15](#)). Women who had been in Canada for less than 10 years reported more difficulties accessing care from a family doctor to monitor health problems than those who had been here longer or who were Canadian born ([Exhibit 7A.16](#)).
- Women who indicated that they did not speak English or French most often at home also reported more difficulties accessing care from a family doctor to monitor health problems than those who spoke English or French ([Exhibit 7A.17](#)).
- Nearly one in five adults who needed to see their doctor for an urgent, non-emergent health problem reported difficulties getting an appointment with a family doctor. Immigrants who had been in the country for less than 10 years were more likely to report having difficulties getting an appointment with a family doctor for an urgent, non-emergent health problem than those who had been here longer or who were Canadian born ([Exhibit 7A.21](#)). Women and men living in low-income neighbourhoods were more likely to report problems than those living in higher-income neighbourhoods ([Exhibit 7A.19](#)). Black women and men were less likely to report no difficulties getting an appointment for an urgent, non-emergent health problem than White adults; 70 percent versus 83 percent, respectively. South and West Asian or Arab women reported the most difficulty getting this type of care; only 64 percent reported no difficulties ([Exhibit 7A.20](#)).
 - Among those who had seen a doctor for urgent, non-emergent primary health care, 67 percent of Ontarians reported being very satisfied with the care they received from their doctor. Satisfaction with the care received varied by income, ethnicity, time since immigration and language spoken most often at home. Forty-four percent of women and men who had been in Canada for less than 10 years ([Exhibit 7A.28](#)), 52 percent of those who spoke neither French or English most often at home ([Exhibit 7A.29](#)) and 51 percent of South and West Asian or Arab adults and 48 percent of East, Southeast Asian and other Asian adults were very satisfied with care received ([Exhibit 7A.27](#)).
 - Unmet need was ascertained by asking respondents if there was a time in the last year when they required care but did not receive it. Patient reports of perceived unmet health care needs, while not specific, are often used as an indicator of access. In Ontario, 14 percent of women and 10 percent of men reported unmet health

care needs. Nearly one in four Aboriginal women (24 percent) reported unmet health care needs, as compared to 14 percent of White women and 10 percent of East and Southeast Asian women ([Exhibit 7A.35](#)). Immigrants who had been in the country for less than 10 years were more likely to report having unmet health care needs than those who had been in the country longer and those who were born in Canada.

- Access to dental care was problematic; 30 percent of women and 35 percent of men had not seen a dentist in the previous 12 months. Over half of low-income women and men had not seen a dentist in the last year ([Exhibit 7A.38](#)). Access to dental care varied by ethnicity. Over half of South and West Asian or Arab women in Ontario had not visited a dentist in the previous 12 months compared to slightly more than one-quarter of White women. Among men, 45 percent of Black men, 43 percent of South and West Asian or Arab men and 42 percent of Aboriginal men had not seen a dentist in the previous 12 months compared to 33 percent of White men ([Exhibit 7A.39](#)). Immigrants who had been in Canada for less than 10 years were less likely to have seen a dentist than those who were here longer or who were Canadian born ([Exhibit 7A.40](#)). Forty-three percent of adults aged 65-79 and over half of adults age 80 and older had not seen a dentist in the last year.

Access to Care for Chronic Disease

- Acute care hospitalizations for ambulatory care sensitive conditions (ACSCs) can be prevented or reduced through effective primary and specialty care in outpatient settings. In Ontario, the age-standardized rates of hospitalizations for ACSCs were 217 per 100,000 adults for congestive heart failure (CHF), 273 per 100,000 adults for chronic obstructive pulmonary disease (COPD), 27 per 100,000 adults for asthma and 79 per 100,000 adults for diabetes. Women had higher rates of hospitalizations for asthma and men were more likely than women to be hospitalized for CHF, COPD and diabetes. For all four ACSCs, women and men living in the lowest-income neighbourhoods

were significantly more likely to be hospitalized than those living in the highest-income neighbourhoods ([Exhibits 7B.5, 7B.9, 7B.13, 7B.17](#)). The age-standardized admission rates for all four ACSCs varied significantly across LHINs; sex and income patterns noted at the provincial levels persisted almost uniformly within LHINs ([Exhibits 7B.8, 7B.12, 7B.16, 7B.20](#)).

- Rates of hospitalizations for ACSCs increased significantly with age for CHF, COPD and diabetes ([Exhibits 7B.6, 7B.10, 7B.18](#)); 90 percent of CHF admissions ([Exhibit 7B.7](#)), 78 percent of COPD admissions ([Exhibit 7B.11](#)) and 50 percent of diabetes admissions ([Exhibit 7B.19](#)) occurred in women aged 65 and older. Among men, 81 percent of CHF admissions, 80 percent of COPD admissions and 41 percent of diabetes admissions occurred in those aged 65 and older.

Access to Specialized Services

- In Ontario, 31 percent of adults indicated that they needed to see a specialist for a new or existing condition of which 76 percent reported no difficulties accessing care. Twelve percent of adults needed a specialized diagnostic test (magnetic resonance (MR) imaging, computed tomography (CT) scanning or angiography) of which 81 percent reported no difficulties accessing care. Eight percent of adults needed elective surgery of which 85 percent reported no difficulties with access ([Exhibit 7C.1](#)). Access to specialized services did not vary by sex but did vary somewhat by age and LHIN ([Exhibits 7C.4, 7C.6](#)).
- East and Southeast Asian adults and Aboriginal adults were more likely to report difficulties getting access to a specialist than White adults ([Exhibit 7C.2](#)). Recent immigrants were also more likely to report difficulties accessing specialist care for diagnosis or consultation than adults who had been in Canada for 10 or more years and those who were born in Canada ([Exhibit 7C.3](#)). We were not able to assess variations in access to specialized diagnostic testing or elective surgery by ethnicity, language or time since immigration on this indicator because of small numbers.



KEY MESSAGES

There are enormous opportunities to improve access to health services while at the same time reducing inequities in access to health care in Ontario. Improved access to effective, comprehensive, coordinated and culturally sensitive primary care can make an important contribution to health system sustainability. While a large majority of Ontarians have a primary care physician, many do not. Ontarians living in lower-income neighbourhoods were more likely than those living in higher-income neighbourhoods to not have a primary care physician. Immigrants who have been in Ontario less than 10 years were the least likely to have a primary care physician; nearly one in six did not have one. In addition, there were significant variations in the proportion of the population who did not have a primary care physician across regions and LHINs. Most Ontarians who reported not having a primary care physician, had one in the past. The most common reasons for currently not having a doctor was that either they had moved or their physician had moved or retired.

Assuring access to a primary care physician is only the first step in assuring access to effective primary care, highlighting the need for quality improvement and practice redesign in primary care to facilitate access. Many who had a primary care physician reported difficulties getting an appointment for a check-up or monitoring of ongoing problems. One in five Ontarians reported difficulty in accessing care for urgent, non-emergent problems. Immigrants, specific ethnic groups, and Ontarians who did not speak either English or French most often at home were most likely to report these problems. South and West Asian or Arab women were more likely to report difficulties accessing care than other ethnic groups. When specialty care is required, primary care providers refer patients to specialists. One in four Ontarians reported difficulty seeing a specialist. Immigrants and specific ethnic groups were also more likely to report this as a problem.

Effective primary care can reduce rates of hospitalization for common chronic conditions including congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), asthma and diabetes. Ontarians living in lower-income neighbourhoods were much more likely than those living in higher-income neighbourhoods to be admitted to the hospital for these problems and there was an income gradient in admission rates for all four conditions.

Finally, access to dental care, a service not covered by OHIP, was a problem for many Ontarians; particularly for low-income Ontarians, older adults, immigrants, specific ethnic groups and Aboriginal women and men. Oral health is an important component of general health and well-being. Poor oral health can lead to systemic infections and has been associated with chronic diseases (e.g. heart disease) and poor pregnancy outcomes. In addition, lack of access to dental care may result in use of emergency departments for oral health problems that could have been prevented or treated in a dentist's office.¹⁸

Improving access to care and primary care reform have been priorities of the Ontario Ministry of Health and Long-Term Care (MOHLTC) and a number of important initiatives are underway to improve access and quality of primary care services in the province. The following seven actions can accelerate progress in improving access to care for all Ontarians and reducing inequities in access to care among Ontario's diverse population. Improved access to effective, comprehensive, coordinated and culturally sensitive primary care can make an important contribution to health system sustainability.

Facilitate Access to a Primary Care Provider for all Ontarians

- Efforts are underway in Ontario to increase the proportion of the population who have a regular primary care provider. It will be important to specifically target low-income individuals and recent immigrants as

a component of these efforts as well as those living in communities where access to a primary care provider is more challenging. This action aligns with the mandates of Community Health Centres (CHCs) which explicitly include reducing health inequities and serving disadvantaged populations. Increased access to CHCs is one way to improve access to primary care.

- Regular monitoring of this indicator by income and time in Canada is needed to assess the effectiveness of these efforts.

Design Innovations in Primary Care Practice to Help Ensure Timely Access to Effective Care

- Practice innovations such as "Advanced Access" can help assure appointments are available in a timely manner for those who need them. Patient self-management education, as part of chronic disease management strategies, together with quality improvement interventions can improve patient quality of life and reduce the need for urgent services. Thus, primary care innovation is key to assuring timely access to effective care.
- Improving timely access to effective primary care can contribute to health system sustainability by leading to reduced demand on emergency departments and hospitals for care that can be provided and managed in primary care settings.

Address Cultural and Linguistic Barriers to Care

- Our findings highlight the need to address cultural and linguistic barriers to care among Ontario's diverse population. There are models to draw upon internationally and locally that, with wider implementation and adaptation to the needs of specific communities, can help meet this objective. Because barriers encountered by women and men in cultural and linguistic minority communities differ, these interventions need to be gender sensitive.
- Community engagement and partnership along with increased diversity in the health care workforce, with

the explicit goal of addressing these barriers, can help to ensure access to effective care among Ontario's diverse communities.

Focus on Patient-Centred Care to Improve Satisfaction with Health Care Access

- Patient-centred care is care that is respectful of and responsive to individual patient preferences, needs and values and ensures that patient values guide all clinical decisions. It is care that addresses an individual's constellation of problems rather than being disease specific. Patient-centred models of care that address the multiple health care needs of individuals and are sensitive to gender and cultural differences can improve patients' experiences with care and increase satisfaction with access to care and the care received.
- Patient-centred models of care that integrate and coordinate care across care settings are central to improving satisfaction with health care access.

Reduce Avoidable Hospital Admissions for Common Chronic Conditions through Quality Improvement in Primary Care

- Quality improvement interventions aimed at chronic disease prevention and management in primary care can reduce rates of potentially avoidable hospitalizations for common chronic conditions, contributing to health system sustainability and improving the quality of life of patients. These interventions need to be gender and culturally sensitive and address barriers encountered by low-income women and men. Care coordination between primary and speciality care and across settings of care can also help reduce avoidable hospitalizations.
- The majority of potentially avoidable hospitalizations for common chronic conditions occur in older adults. Patient-centred, integrated models of care that meet

the specific needs of older adults are needed to reduce rates of potentially avoidable hospitalizations.

Develop Strategies to Improve Access to Dental Care

- Oral health affects both physical and mental health. While access to dental care has been expanded for children in the province, many Ontarians are not receiving routine dental care and there are sizable inequities in access to these services. There is a great need to improve access to dental care for low-income Ontarians, recent immigrants, ethnic minorities and older adults.

Increase the Capacity to Assess and Monitor Access to Care in Diverse Communities

- Our findings highlight the importance of routinely assessing gender, ethnic, language and socioeconomic differences in health care access as well as barriers in accessing care encountered by recent immigrants. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities. However, there is limited data capacity to measure access, quality and outcomes of care by ethnicity, language or time in Canada. Adding this information to administrative data and oversampling minority communities in population-based surveys would provide this needed capacity. Improvements in data quality, availability and timeliness are all needed to support monitoring and reporting strategies.
- Providers can collect these data in their practices and institutions and use them to assure that their efforts to improve quality and access are effective and meet the needs of all of their patients. Standardized tools and methods for data collection can assure data quality and allow benchmarking and comparisons.



Introduction

A primary objective of the POWER Study is to provide actionable data and analyses and to develop a tool that can be used to improve health and well-being and reduce health inequities among the women and men in Ontario.

In this chapter, we will report on Ontarians' access to health care services and how it differs by sex, age, socioeconomic status, ethnicity, time since immigration, language and where one lives. In doing so, we identify opportunities for improvement and provide a baseline from which to measure progress.

'Access' is a complex and multidimensional concept. Many attempts have been made to define and measure it. For example, an early behavioural model suggests that actual use of health services is determined by individual health needs, the predisposition to seek care and a range of enabling or impeding factors.^{9, 10} Other approaches have placed greater emphasis on the mismatch between available health services and the needs or expectations of subpopulations.^{11, 12} Some expand the definition of access by drawing attention to structural barriers posed by the health care system (secondary access), or the ability of providers to provide effective care to diverse patient populations with specific needs (tertiary access).¹³ Finally, there are many calls for a holistic view when conceptualizing access to health care because many of the determinants of health and illness are situated outside the health care sector, but they exert an impact on the need for, and access to, care.¹⁴⁻¹⁶ This is one of the underlying concepts of the POWER Study Gender and Equity Health Indicator Framework (see [chapter 2, The POWER Study Framework](#)).

The chapter has three sections:

- Access to Primary Care
- Access to Care for Chronic Disease
- Access to Specialized Services and Home Care

Timeliness is an important dimension of access to care. Ontario's Wait Time Strategy has had success in reducing wait times in some areas.¹⁷ However, access involves much more than just wait times. Therefore, we chose to emphasize important aspects of access to care that have received less attention.

In the first section, the **access to primary care** of Ontario women and men is profiled including: access to a regular primary care physician; difficulties accessing primary care for routine, chronic and urgent problems; difficulties accessing health information; satisfaction with access to care and with the care received; unmet health care needs and access to dental care. These are important because primary care has been shown to lower the overall costs of care, improve health through access to more appropriate services and reduce health inequalities at the population level. Management and monitoring of chronic health conditions in primary care is crucial for preventing these problems from getting worse and for helping people improve their health. The second section reports on **access to care for chronic diseases** including the types of physicians providing care to adults with diabetes and the rates of hospital admissions for ambulatory care sensitive

conditions including congestive heart failure, diabetes, asthma and chronic obstructive pulmonary disease. In the final section, we report on **access and wait times for specialized services** including specialist care, diagnostic testing and non-emergent surgery. This section also reports on wait times for home care assessment among new home care clients. In addition, wait time data for particular conditions can be found in their specific chapters (see [chapters 4, Cancer](#) and [6, Cardiovascular Disease](#)).

The indicators we report are the result of a rigorous selection process which included an extensive literature review of existing indicators as well as input and agreement from experts in the field (see [chapter 1, Introduction to the POWER Study](#)). Some indicators included in this chapter are also used by other reporting projects internationally (e.g., Healthy People 2010, Agency for Healthcare Research and Quality), nationally (e.g., Statistics Canada, Health Canada, the Canadian Institute for of Health Information) and provincially (e.g., the Ministry of Health and Long-Term Care Health System Scorecards, the Institute for Clinical Evaluative Sciences, the Ontario Health Quality Council annual reports and the core indicator set recommended by the Association of Public Health Epidemiologists of Ontario). In this chapter we comparatively examine access to health care among subpopulations of women and men in Ontario. This is a critically important matter, because equitable access to health care can reduce the social and economic burdens imposed by ill health, including death, disability and loss of income.

Overall, a wide range of constraining, enabling and need-related factors affect access to care. These include (but are not limited to) gender,^{1, 2} socioeconomic position,^{3, 4} citizenship or immigration,⁵ health status⁶ and geographic location.^{7, 8} We discuss how various combinations of these factors contribute to disparities in health and health care access for women and men in Ontario. Important dimensions of access are not captured in the survey and administrative data used to assess indicators and these data do not allow assessment

of all population subgroups at risk for encountering access barriers. Therefore, to complement the analysis of performance indicators, we carried out an extensive review of recently published qualitative studies that explored issues related to health care access for women in Ontario. Qualitative methods provide detailed descriptions of the everyday conditions that may contribute to health and access to health care, so they can enhance our understanding of women's access to health care. Our review identified 33 qualitative, peer-reviewed articles that addressed health care access issues for Ontario women. Samples represented women with a diverse range of life circumstances, including lesbian, low-income, disabled, rural and/or homeless women. These subpopulations are among the most vulnerable to problems with access to health care and their views were reported in the studies.

Women live within complex and differing social, economic and environmental circumstances that influence options for health behaviour and access to health care. These conditions interact to form health disparities in those women who already face significant barriers to full participation in society and create advantages for some women and constraints for others when health care is sought. Furthermore, health services are commonly designed and provided in ways that are not always sensitive to important differences in women's health care needs. This means that depending on their contexts and characteristics, some women will be more vulnerable than others to illness, access barriers and suboptimal care. Hence, while gender comparisons will reveal important information about access disparities between men and women, it is important to analyze differences among subpopulations of women.

Our review of the qualitative literature highlighted the interplay between structure and delivery of health care services and women's complex, differing life circumstances. Our analysis of the combined findings indicated that access to health care is shaped by four major forces. **Contextual conditions** may protect health or predispose to illness in identifiable subgroups of women.

Low-income women are susceptible to nutritional deficiencies, inadequate and insecure housing arrangements and poor employment opportunities.^{19, 20} Homeless women, in addition to living in poverty, are vulnerable to gender-based violence or they may engage in 'survival sex', which places them at risk for sexually transmitted diseases and HIV.¹⁹ **Constraints** to accessing health care are similarly linked with women's social, economic and environmental contexts, independent of the health care system. Recent immigrants from India, China or Vietnam found transportation difficulties constrained access to health information and primary or prenatal care. Their incomes were lower and employment hours were longer since moving to Canada, so the time and financial costs of seeking care were burdensome. Major problems were costs of traveling, not having a car, as well as lack of familiarity and the inability to communicate in English.^{21, 22} **Barriers** posed by the social and institutional organization of health care make it difficult for women to benefit from available services. Long waiting periods for specialist appointments or test results and even time spent in clinic waiting rooms with restless or sick children are barriers to access, contribute to worry or anxiety and may discourage further use of needed health care.^{21, 23-30} Older women and those with disabilities had to manage without assistance or rely on informal caregivers while on waiting lists for supportive services or residential care.^{23, 31} Language barriers were numerous for immigrant women, who were unsure if they fully understood information and advice.^{21, 22} **Deterrents** to access are created as widespread normative assumptions about women which become embedded in the design and provision of health services. Homeless women's negative experiences with public services may prompt them to avoid health care until a problem is unbearable; the emergency department is their most common point of access.¹⁹ Similar vulnerabilities and past instances of social surveillance, cultural insensitivity, silencing and negative stereotyping were deterrents to health care access described by aboriginal mothers,³⁰ women of

colour,³² lesbian women,^{33, 34} mothers with low income or mental illness³⁵⁻³⁷ and women experiencing partner violence.³⁸ These issues may deter women from seeking health care even when it is available.

Interactions between these forces, chronic illness and disability are particularly problematic in women. For example, many women with disabilities and chronic illnesses occupy the lowest-income brackets with annual incomes of less than \$20,000.²³ They encounter numerous physical and social barriers to chronic disease prevention behaviours, including lack of appropriate recreation opportunities, limited assistance with shopping and food preparation and inadequate accommodations for special needs at dental or primary care clinics.^{23, 26} Women with disabilities and chronic illnesses may find themselves caught in a cycle that erodes full social participation. Low personal incomes when combined with rationing of assistive services and home care, may lead to increased dependence on family or friends for care and personal support. This in turn can strain personal relationships and damage self-esteem.^{23, 31, 39, 40}

There are regional differences in the availability of care which strongly affect quality of care for some residents of Ontario. In remote or rural areas of the province, women encounter additional geographic barriers that limit and structure their treatment choices. They face additional access issues to tertiary care services, including travel costs, employment disruptions, child care considerations and separation from support networks.^{24, 41, 42} Maternity care options are very limited for those in some communities and women have to travel considerable distances for prenatal care.⁴² Some women intentionally schedule inductions or caesarean sections to ensure delivery takes place in their local community.⁴² Rural women with cancer or heart disease have limited access to information and supportive services and their primary care providers may also face communication barriers when dealing with tertiary care services.^{24, 25} Finally, low income is often a barrier to quality cancer care in any

region of the province. For example, uninsured costs of breast cancer treatment are difficult for some women to manage.⁴³ They may expend time and energy seeking help with these costs at times when they are feeling vulnerable and unwell.

Even within densely populated urban centres there are areas where a consistent source of primary care is unavailable, particularly to immigrants with language barriers or sociocultural preferences for male or female providers.⁵ Use of walk-in clinics or emergency rooms for acute episodes of illness may lead to discontinuities in care and lost opportunities for health promotion.⁵ Immigrant women or those from non-dominant ethnic groups describe a lack of fit between their own cultural health practices and beliefs and those of health providers; this undermines communication, information exchange and satisfaction with care.⁴⁴⁻⁴⁹

In this chapter, we assess the inequities in access to health care services in Ontario associated with gender, socioeconomic position, age, ethnicity, language, immigration and where one lives. As Ontario grows more diverse, it becomes increasingly important to understand and improve the health and well-being of the ethnically diverse groups in the province. So, when possible, we analyzed survey data from Ontarians who self-identified as being from different ethnic groups. While health inequities are present in all societies, the size of the gap in access to health care services between the most advantaged and disadvantaged members of society not only varies greatly between and within countries but changes over time in response to changing political policies and social conditions. The inequities in access to care reported here are amenable to change, as political, social and health policies may lead to more or less equitable access to care among women and men.

Data from several sources were used to produce this chapter. These include: Statistics Canada's Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1) and 2007, the Primary Care Access Survey (PCAS), Waves 4-11; the Home Care Reporting System (HCRS); the

Ontario Diabetes Database (ODD); the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), Ontario Health Insurance Plan (OHIP) data, ICES Physician Database (IPDB) and Statistics Canada 2001 Census. Both the CCHS and the PCAS are offered in English and in French. The CCHS additionally recruits interviewers with a wide range of language competencies to address the issue of language barriers and the survey is administered in multiple languages. The variable measuring language in the CCHS refers to knowledge of Canada's official languages (i.e., French and English). In the PCAS, the variable measuring language refers to language spoken most often at home.

We report on adults age 25 and older. For the home care indicator, the sample is restricted to adults aged 18 and older. All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators of access to health care services were first stratified by sex, and then further stratified by age, income, education level, ethnicity, language, time since immigration and rural/urban residency as allowed by sample size. At the LHIN level, indicators were stratified by sex, and then by age, income and education whenever possible. The indicator of home care assessment was additionally stratified by MAPLe (Method of Assigning Priority Levels) score which provides a comparative measure of the health status of patients waiting for home care services. Age-adjustment was done using indirect standardization. [Appendix 7.3](#) provides a brief description of research methods.

A complete list of the indicators reported in this chapter and their data sources can be found in [Appendix 7.2](#). [Appendix 7.1](#) indicates which of the Ontario Health Quality Council's nine attributes of a high-performing health system each indicator assesses, and also which of the strategic objectives included in the Ministry of Health and Long-Term Care strategy map would be met through improvement on each indicator.

A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 2, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 3, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be compared visually to the bars on the map.

Figure 2: Example of a Two Bar Map

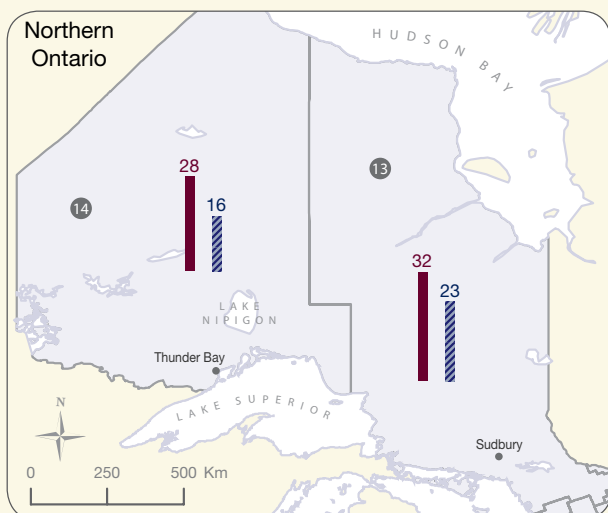
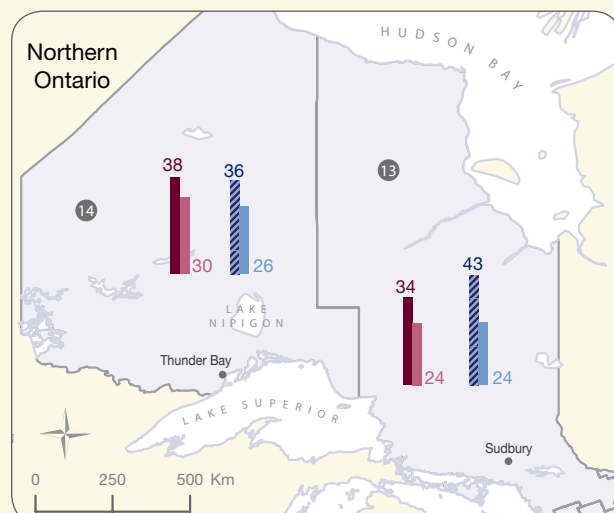


Figure 3: Example of a Four Bar Map

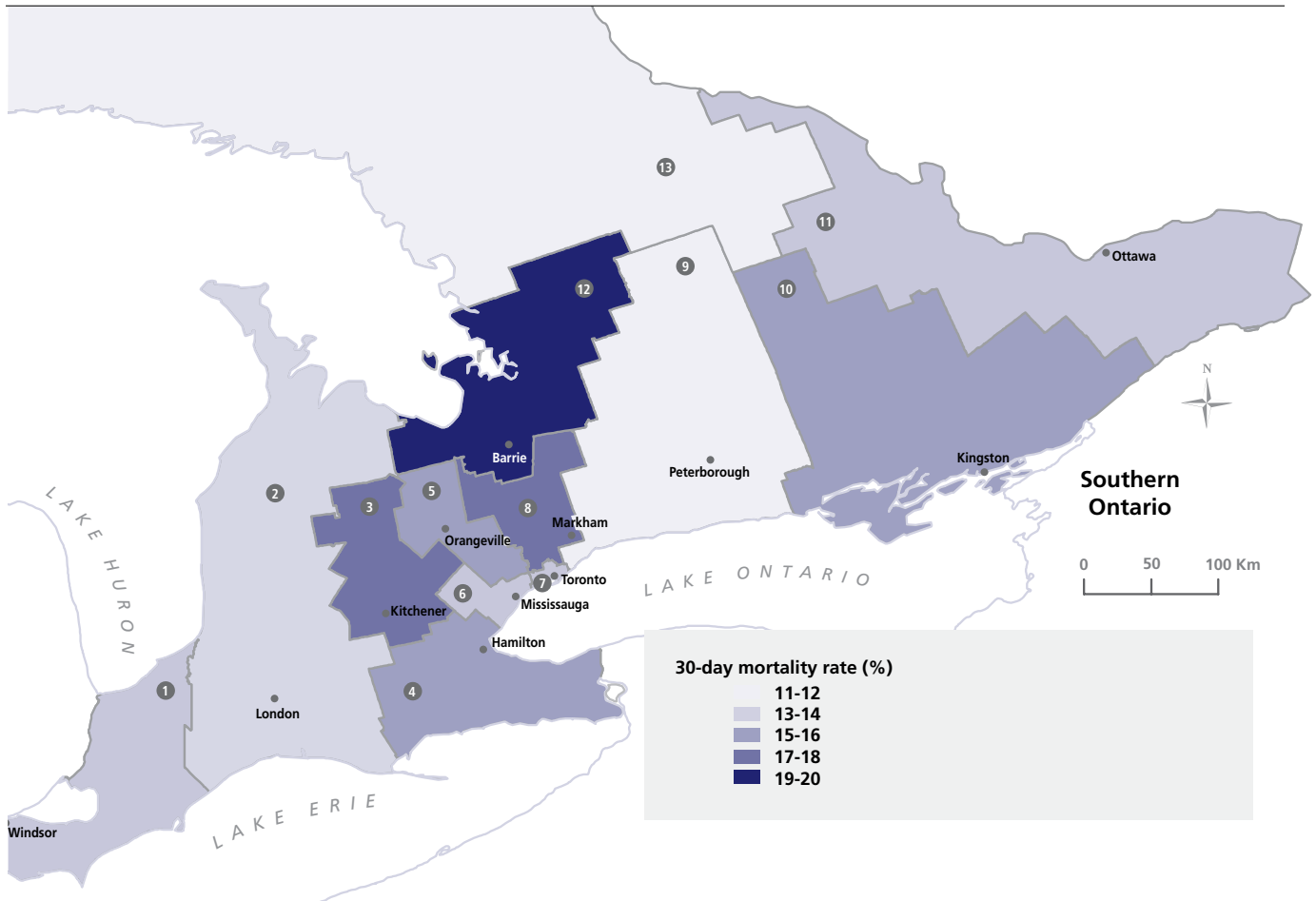


CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is

proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

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Section 7A

Access to Primary Care

INTRODUCTION

Here we examine access to primary health care services in Ontario. We focus on indicators that measure the accessibility and acceptability of primary care services and the types of access barriers that adults face in Ontario.

Under the Canada Health Act, all provinces and territories must abide by five principles: universality, comprehensiveness, portability, public administration and accessibility.

The characteristics of primary care include “first contact care, person-focused care over time, comprehensive care and coordinated care as well as family orientation and community orientation.”⁵⁰ Primary health care has been shown to lower the overall costs of care, improve health through access to more appropriate services and reduce health inequalities at the population level.⁵⁰ Primary health care “is primary care applied on a population level. As a population strategy, it requires the commitment of governments to develop a population-oriented set of primary care services in the context of other levels and types of services.”⁵¹

Women have different health needs than men, encounter different barriers to accessing primary care and have different experiences with the care they receive.^{52, 53} Low-income individuals encounter more financial and non-financial barriers to accessing primary care and women are more likely than men to have low incomes.⁵⁴ Furthermore, women often have greater competing demands placed on their time, such as employment, domestic responsibilities and caregiving responsibilities which can present barriers to accessing health care services for themselves.^{1, 55} As such, women's experiences

with care and access to care are often different from the experiences of men.

Indicators that measure patients' experiences with accessing care or the quality of care received can help assess the degree to which care is patient-centred. Patient-centredness is an important attribute of effective primary care and one of the Ontario Health Quality Council's (OHQC) nine attributes of a high performing health system. The Institute of Medicine's definition of patient-centred care includes “providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions.”^{56, 57} Factors such as linguistic access and cultural appropriateness may influence satisfaction with access to care and quality of care received and will differ for different populations. Satisfaction is also influenced by expectations, so that individual who have higher expectations, such as those with higher education, may report lower satisfaction with care.

There is evidence for interventions that can improve access and efficiency of primary care services as well as patient experiences of care. Examples include “Advanced Access” models to facilitate timely appointments, use of interdisciplinary teams to better meet patient needs, implementation of chronic care models

and quality improvement interventions to improve patient experiences as well as health care outcomes in primary care. In the US, National Standards on Culturally and Linguistically Appropriate Services (CLAS) have been developed to improve access to care for diverse populations.⁵⁸ Tailoring interventions to the needs of the community being served can help improve access to care, as well as experiences of care, among culturally diverse communities.

In this section, we provide an analysis of indicators for access to primary health care and examine the differences associated with sex, age, income, education, ethnicity, immigration status, language, rural/urban residency and Local Health Integration Network (LHIN). The indicators include:

- Access to a primary care doctor
- Satisfaction with the experience getting an appointment for a regular check-up
- Difficulties accessing routine or ongoing care
- Difficulties obtaining monitoring of ongoing problems from a family doctor
- Difficulties with access to primary care for an urgent, non-emergent health problem
- Satisfaction with access to primary care for an urgent, non-emergent health problem
- Satisfaction with care for urgent, non-emergent health problem
- Difficulties accessing health information or advice
- Percentage of the population reporting unmet health care needs
- Dental care

Data from a number of sources were used in this section. The Primary Care Access Survey (PCAS), Waves 4-11 was used to measure access to a primary care doctor; difficulties obtaining monitoring of ongoing problems from a family doctor; satisfaction with the experience getting an appointment for a regular check-up; difficulties accessing urgent, non-emergent care from a family doctor; satisfaction with the experience getting to see a doctor for an urgent, non-emergent health problem; satisfaction with care a doctor provided for an urgent, non-emergent health problem and difficulties accessing health information or advice. The Canadian Community Health Survey (CCHS), 2007 was used to measure difficulties accessing routine or ongoing care and difficulties accessing health information or advice. The CCHS, 2005 (Cycle 3.1) was used to measure the percentage of the population reporting unmet health care needs and access to dental care. Due to small numbers, we were unable to report the percentage of the population who reported difficulties accessing primary health care services. Instead, we reported the proportion of adults who did not experience difficulties accessing primary care services.

Both the CCHS and the PCAS are offered in English and in French. The CCHS additionally recruits interviewers with a wide range of language competencies to address the issue of language barriers and is administered in multiple languages. The variable measuring language in the CCHS refers to knowledge of Canada's official languages (i.e., French and English). In the PCAS, the variable measuring language refers to language spoken most often at home.

EXHIBITS AND FINDINGS

ACCESS TO A PRIMARY CARE DOCTOR

Indicator: This indicator measures the percentage of the population aged 25 and older who reported having a primary care doctor (family doctor, family physician, general practitioner or medical doctor). We also present the reasons for not having a family doctor among people who indicated they had a doctor in the past.

Background: A primary care doctor is a patient's first point of entry into the health care system.^{59, 60} Ideally, the family doctor should provide the majority of care for common health problems and coordinate ongoing care for more complex health conditions.⁵⁹ When a family doctor is unable to diagnosis or address a patient's health problems, they can refer their patient to an appropriate medical specialist.⁵⁹ Family doctors deliver preventive care and their practices often provide health education and health promotion.⁵⁹ Access to a regular primary care provider is associated with better health outcomes, regardless of a person's initial health status, demographic characteristics or socioeconomic status.^{50, 61}

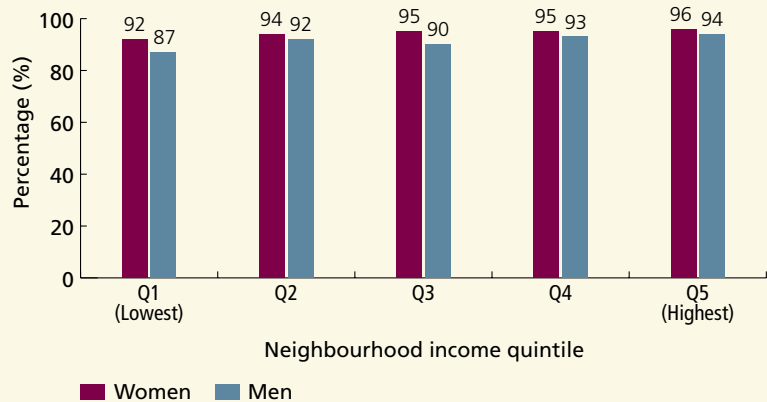
Data for this indicator were derived from the Primary Care Access Survey (PCAS) Waves 4-11, from the October 2006–September 2008 survey period. Participants were asked if they had a family doctor, general practitioner, family physician or medical doctor and if they thought of this doctor as their regular doctor. Based on the PCAS derived variable, 'family doctor' could include a nurse practitioner. The PCAS asked those who did not currently have a family doctor but did have one previously the reasons for no longer having one. This represents 88 percent of those who reported not currently having a regular family doctor.

Findings: Overall, 93 percent of the Ontario population aged 25 and older reported having a primary care doctor between October 2006–September 2008. Women were more likely to report having a primary care doctor than men (94 percent versus 91 percent, respectively), though this difference was small.

EXHIBIT 7A.1 | Percentage of adults aged 25 and older who reported having a primary care doctor,[¥] by sex and neighbourhood income quintile, in Ontario, 2006–08[^]

FINDINGS

- Neighbourhood income was associated with having a primary care doctor. Overall, 90 percent of adults living in the lowest-income neighbourhoods reported having a primary care doctor as compared to 95 percent of those living in the highest-income neighbourhoods (data not shown).
- Ninety-two percent of women living in the lowest-income neighbourhoods as compared to 96 percent of women living in the highest-income neighbourhoods reported having a primary care doctor.
- The income difference was greater among men; 87 percent of men living in the lowest-income neighbourhoods reported having a primary care doctor as compared to 94 percent of those living in the highest-income neighbourhoods.
- There was no meaningful difference in the percentage of adults who reported having a primary care doctor associated with education (data not shown).



DATA SOURCES: Primary Care Access Survey (PCAS), Waves 4–11; Statistics Canada 2001 Census

NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

[¥] Includes family doctor, family physician, general practitioner or medical doctor (could include nurse practitioner)

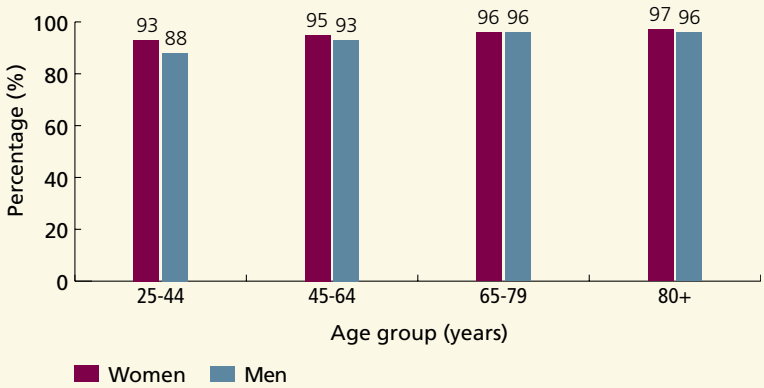
[^] The survey period was from October 2006–September 2008

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EXHIBIT 7A.2 | Percentage of adults aged 25 and older who reported having a primary care doctor,[¥] by sex and age group, in Ontario, 2006–08[^]

FINDINGS

- The percentage of women and men who had a primary care doctor increased with age.
- Ninety-three percent of women aged 25-44 reported having a primary care doctor as compared to 96 percent of women aged 65-79 and 97 percent of women aged 80 and older.
- Eighty-eight percent of men aged 25-44 reported having a primary care doctor compared to 96 percent of men aged 65 and older.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[¥] Includes family doctor, family physician, general practitioner or medical doctor (could include nurse practitioner)

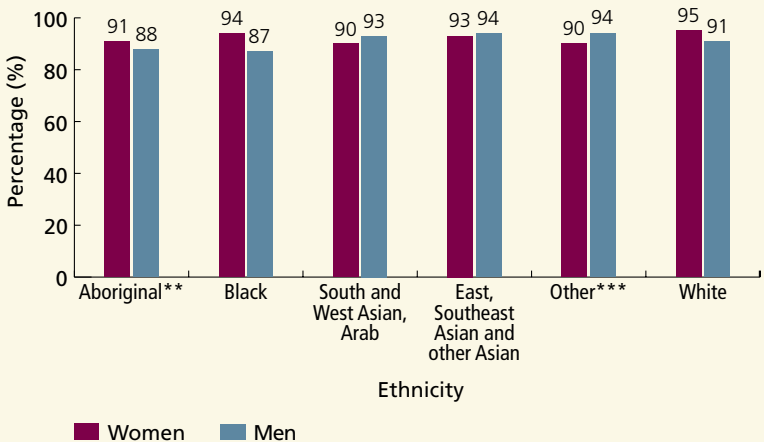
[^] The survey period was from October 2006–September 2008

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EXHIBIT 7A.3 | Percentage of adults aged 25 and older who reported having a primary care doctor,[¥] by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- Across most ethnic groups, at least 90 percent of women and men reported having a primary care doctor.
- Only, 88 percent of Aboriginal men and Black men reported having a primary care doctor. These differences were not significant, possibly due to small sample size in these population subgroups and thus limited power to detect differences.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[¥] Includes family doctor, family physician, general practitioner or medical doctor (could include nurse practitioner)

[^] The survey period was from October 2006–September 2008

** Includes North American Indian, Métis, Inuit

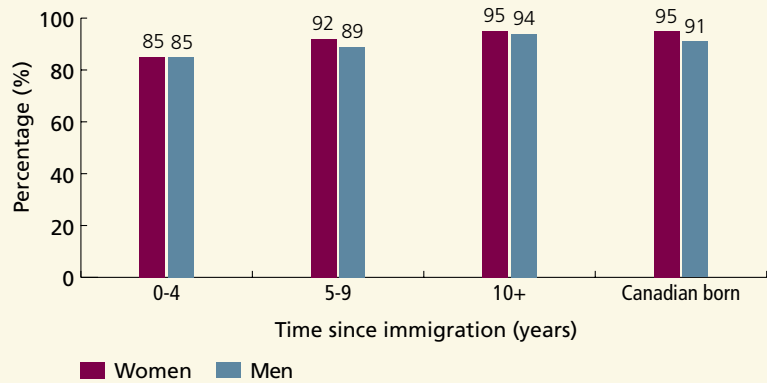
*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

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EXHIBIT 7A.4 | Percentage of adults aged 25 and older who reported having a primary care doctor,[¥] by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- Immigrants who had been in the country for less than five years were significantly less likely to report having a primary care doctor (85 percent) than immigrants who had been in Canada for at least 10 years (94 percent) and individuals who were born in Canada (93 percent) (data not shown).
- Eighty-five percent of women who had lived in Canada for less than five years reported having a primary care doctor compared to 95 percent of women who had been in Canada at least 10 years or who were born in Canada.
- Eighty-five percent of men who had lived in Canada for less than five years reported having a primary care doctor as compared to 94 percent of men who had lived in Canada for at least 10 years and 91 percent of men who were born in Canada.



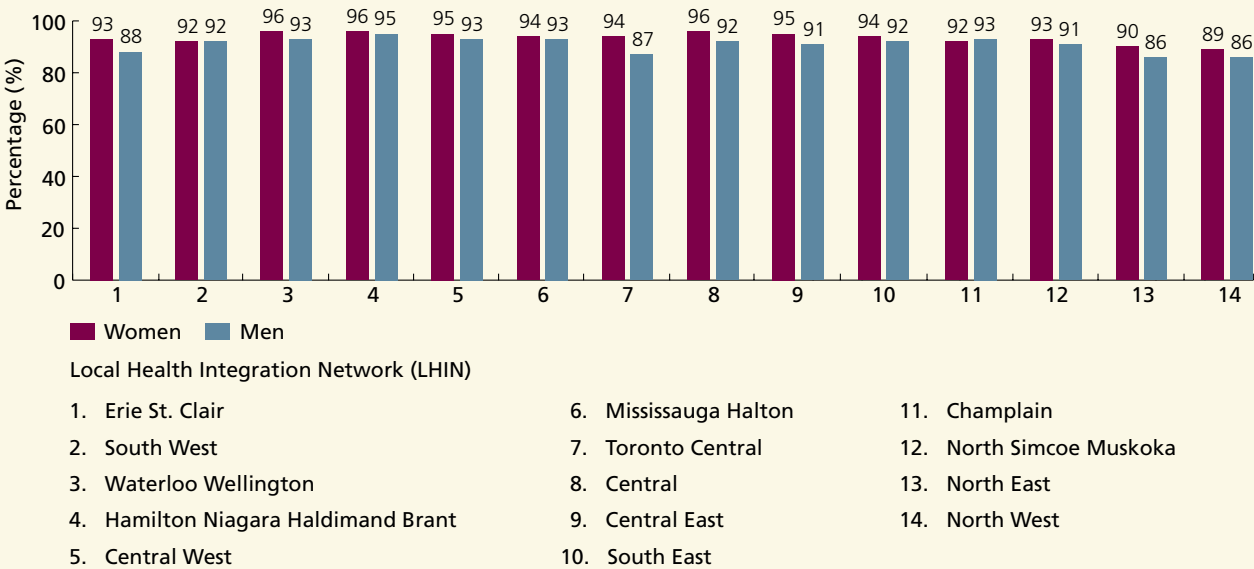
DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[¥] Includes family doctor, family physician, general practitioner or medical doctor (could include nurse practitioner)

[^] The survey period was from October 2006–September 2008

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EXHIBIT 7A.5 | Percentage of adults aged 25 and older who reported having a primary care doctor,[¥] by sex and Local Health Integration Network (LHIN), in Ontario, 2006–08[^]



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[¥] Includes family doctor, family physician, general practitioner or medical doctor (could include nurse practitioner)

[^] The survey period was from October 2006–September 2008

FINDINGS

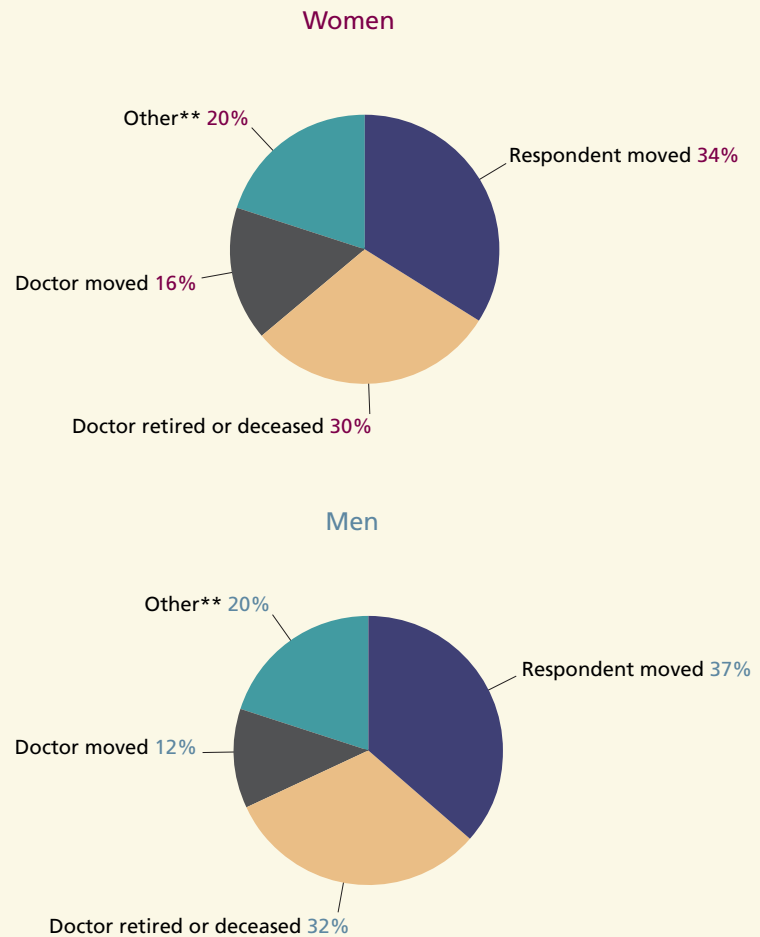
- The percentage of adults who reported that they had a primary care doctor varied across LHINs.
- The percentage of women who reported that they had a primary care doctor ranged from 89 percent (North West LHIN) to 96 percent (Waterloo Wellington, Hamilton Niagara Haldimand Brant and Central LHINs).
- The percentage of men who reported that they had a primary care doctor ranged from 86 percent (North East and North West LHINs) to 95 percent (Hamilton Niagara Haldimand Brant LHIN).

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EXHIBIT 7A.6 | Reasons for not having a primary care doctor,[¥] by sex, in Ontario, 2006–08[^]

FINDINGS

- Overall, eighty-eight percent of people who did not currently have a family doctor had one previously (data not shown).
- Most women (80 percent) and men (81 percent) did not have a family doctor because either they moved or their doctor was no longer in practice or had moved. Thirty-four percent of women and 37 percent of men reported that they had moved; 30 percent of women and 32 percent of men reported that their doctor had retired or was deceased and 16 percent of women and 12 percent of men reported that their doctor had moved.
- The remaining 20 percent of women and 20 percent of men indicated other reasons for not having a family doctor, including dissatisfaction with prior experiences or none available.
- Data were not available on the reasons for not having a primary care doctor among the 12 percent of Ontarians who reported that they did not have one in the past.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[¥] Among those who previously had a family doctor

[^] The survey period was from October 2006–September 2008

^{**} Other reasons include: respondent was not satisfied with family doctor; they decided not to see him/her again; switched to using some form of clinic including walk-in clinics or hospital clinics; they did not see the doctor often or for a long time and doctor dropped patient; negative experience with family/other doctor/health care system; or other reason or none available.

POWER Study

SATISFACTION WITH THE EXPERIENCE OF GETTING AN APPOINTMENT FOR A REGULAR CHECK-UP

Indicator: This indicator measures the percentage of the population aged 25 and older who were very satisfied with their experience getting an appointment for a regular check-up. The sample was limited to adults who had seen a doctor for at least one regular check-up in the past 12 months.

Background: Patient satisfaction indicators provide information about a patient's experience of health care, reflect problems in health care delivery and are part of the evaluation of health care.⁶² Getting an appointment for a regular check-up is an important component of accessing routine primary health care in Ontario; it is a determinant of use of recommended preventive services and an indicator of care.^{63, 64}

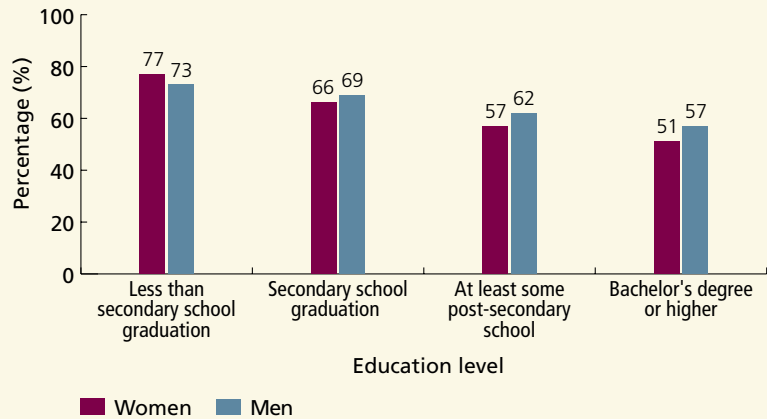
Data for this indicator were derived from the Primary Care Access Survey (PCAS), Waves 4-11, from the October 2006–September 2008 survey period. Adults who responded that they had seen a doctor for a regular check-up in the past 12 months were asked, “How satisfied were you with your experience in getting an appointment for your check-up?” We report the proportion of respondents who were “very satisfied” with their experience. A regular check-up was defined as a routine physical check-up, as opposed to seeing a doctor for a specific reason such as being sick or concerned about a problem. Women were asked not to include regular visits for prenatal or postnatal care.

Findings: Among those who had seen a doctor for a regular check-up, 61 percent of Ontarians aged 25 and older reported being very satisfied with their experience getting an appointment for a regular check-up between October 2006–September 2008. Women were less likely than men to report being very satisfied with their experience (59 percent versus 63 percent, respectively).

EXHIBIT 7A.7 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting an appointment for a regular check-up, by sex and education level, in Ontario, 2006–08[^]

FINDINGS

- Women and men with a higher level of education were less likely to report being very satisfied with their experience getting an appointment for a regular check-up. Differences in expectations may contribute to these differences.
- Among those with a Bachelor's degree or higher, 51 percent of women and 57 percent of men were very satisfied with their experience getting an appointment as compared to 77 percent of women and 73 percent of men with less than a high school education.
- The percentage of Ontarians who were very satisfied with their experience getting an appointment for a regular check-up did not vary by neighbourhood income for women or for men (data not shown).



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

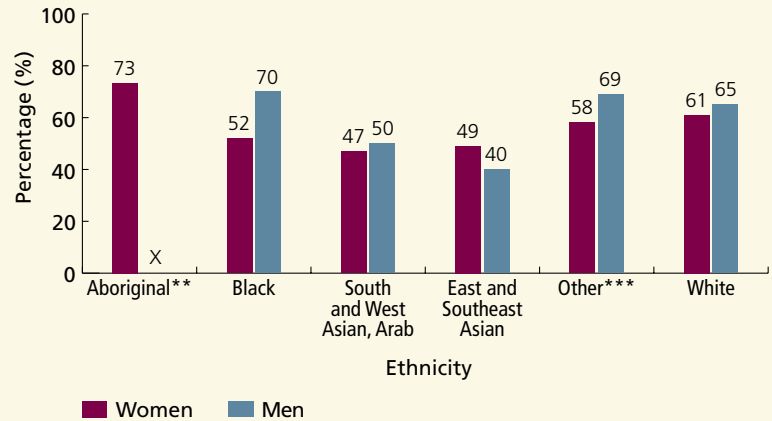
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.8 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting an appointment for a regular check-up, by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported being very satisfied with their experience getting an appointment for a regular check-up varied significantly by ethnicity.
- Forty-seven percent of South and West Asian or Arab women reported being very satisfied with getting an appointment for a regular check-up as compared to 61 percent of White women and 73 percent of Aboriginal women.
- Forty percent of East and Southeast Asian men reported being very satisfied with getting an appointment for a regular check-up compared to 65 percent of White men and 70 percent of Black men.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

** Includes North American Indian, Métis, Inuit

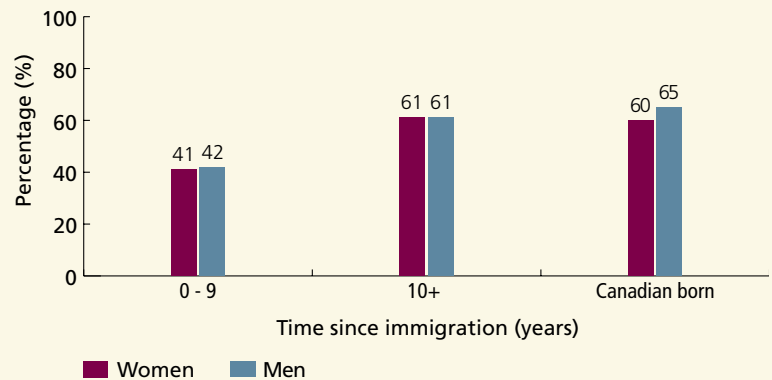
*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

POWER Study

EXHIBIT 7A.9 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting an appointment for a regular check-up, by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- Among immigrants who had been in the country for less than 10 years, 41 percent of women and 42 percent of men reported being very satisfied with getting an appointment compared to 61 percent of women and men who had been in the country for 10 or more years and 60 percent of women and 65 percent of men who were born in Canada.
- Because of small numbers, we could not report the rates among the most recent immigrants, those who had been in Canada for less than five years.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

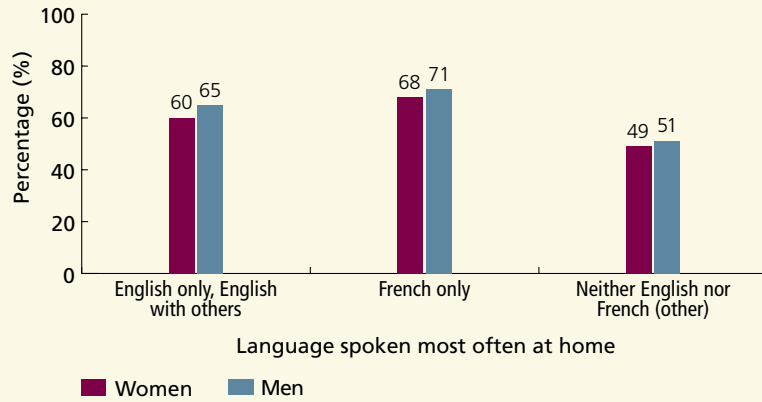
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.10 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting an appointment for a regular check-up, by sex and language spoken most often at home, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported being very satisfied with their experience getting an appointment for a regular check-up varied significantly by language spoken most often at home.
- Forty-nine percent of women who did not speak English or French most often at home reported being very satisfied with their experience getting an appointment for a regular check-up as compared to 60 percent of women who spoke English and 68 percent of women who spoke only French.
- Fifty-one percent of men who did not speak English or French most often at home reported being very satisfied with their experience getting an appointment for a regular check-up as compared to 65 percent of men who spoke English and 71 percent of men who spoke only French.
- The percentage of adults who reported being very satisfied with their experience getting an appointment for a regular check-up varied by rural/urban residency; rural residents were more likely to be very satisfied than urban residents (65 percent versus 60 percent, respectively) (data not shown).

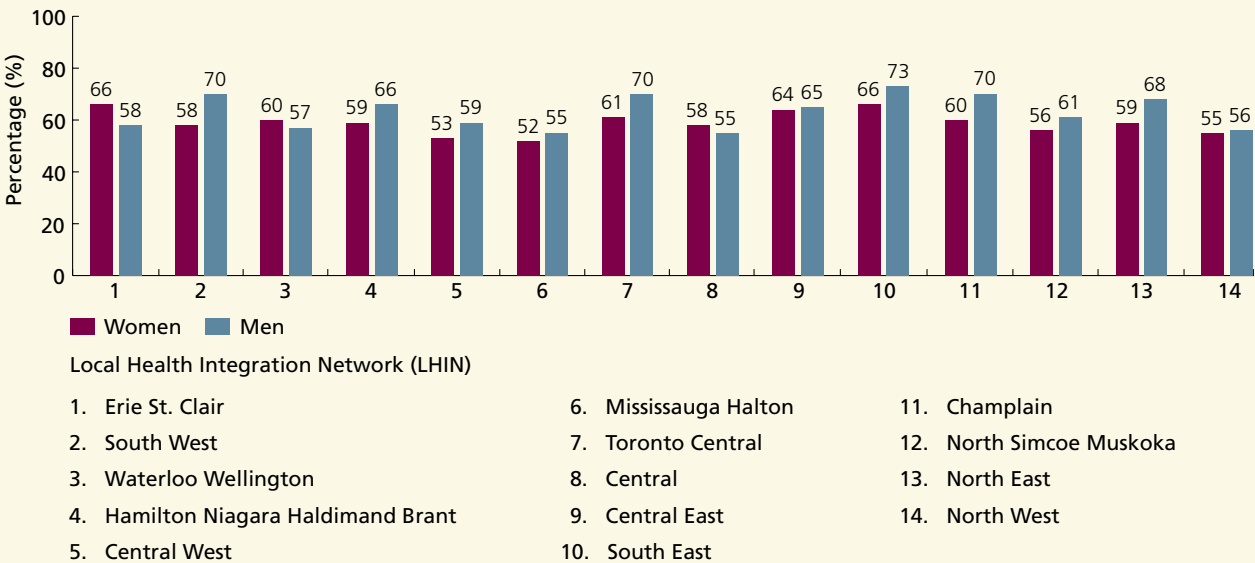


DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

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EXHIBIT 7A.11 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting an appointment for a regular check-up, by sex and Local Health Integration Network (LHIN), in Ontario, 2006–08[^]



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

FINDINGS

- The percentage of women and men who were very satisfied with their experience getting an appointment for a regular check-up varied significantly across LHINs.
- Among women, the percentage who reported being very satisfied with their experience getting an appointment for a regular check-up ranged from 52 percent (Mississauga Halton LHIN) to 66 percent (Erie St. Clair and South East LHINs).
- Among men the percentage who reported being very satisfied with their experience getting an appointment for a regular check-up ranged from 55 percent (Mississauga Halton and Central LHINs) to 73 percent (South East LHIN).

POWER Study

DIFFICULTIES ACCESSING ROUTINE OR ONGOING CARE

Indicator: This indicator measures the percentage of the population aged 25 and older who reported no difficulties obtaining routine or ongoing care for themselves or their family members over the previous 12 months.

Background: Routine or ongoing care includes the use of medical services, such as medical exams or follow up visits over time, for single or multiple health care episodes or for chronic problems. Individuals need to be able to readily access routine primary health care services. Adults who are able to successfully access primary care are more likely to: receive appropriate preventive care, receive more accurate diagnoses, require fewer diagnostic tests and prescriptions, have fewer hospitalizations and have lower costs of care.^{50, 65, 66} Their health care provider can manage their health problems before they become serious enough to require hospitalizations or emergency services.⁵⁰

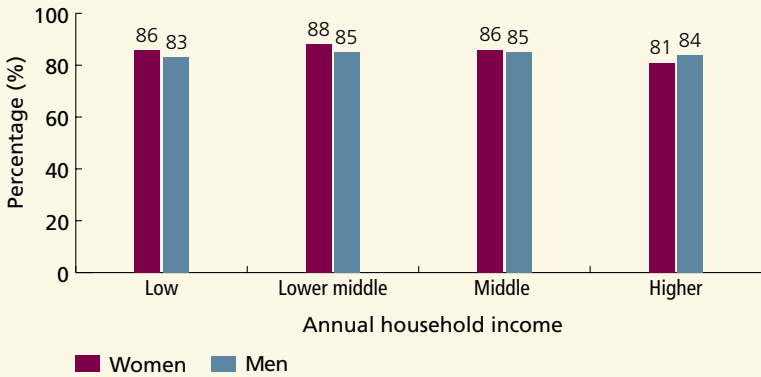
Data for this indicator were derived from the Canadian Community Health Survey (CCHS), 2007. Participants who reported that they required any routine or ongoing care for themselves or a family member in the past year were asked, “In the past 12 months, did you ever experience any difficulties getting the routine or ongoing care you or a family member needed?” We report the proportion of adults who did not experience any difficulties accessing routine primary health care. We are unable to determine whether the participant was referring to care for themselves or for their family members, who may be adults or minors.

Findings: Among Ontario adults aged 25 and older who required routine or ongoing care for themselves or for a family member, 84 percent of women and 84 percent of men reported no difficulties accessing routine or ongoing primary health care in 2007. However, 16 percent—or one in six adults—reported difficulties obtaining routine or ongoing care.

EXHIBIT 7A.12 | Percentage of adults aged 25 and older who reported no difficulties accessing routine or ongoing care for themselves or a family member, by sex and annual household income, in Ontario, 2007

FINDINGS

- Higher-income women were somewhat less likely to report having no difficulties accessing routine primary health care than lower-income women; 81 percent did not report difficulties (i.e. 19 percent reported having difficulties), however this difference was not significant.
- Annual household income was not associated with reporting difficulties accessing ongoing routine primary health care among men.
- Among both women and men, those with lower educational attainment were somewhat more likely to report no difficulties accessing ongoing routine primary health care. However, these differences were not significant (data not shown).
- As age increased, the proportion of respondents who reported no difficulties accessing routine or ongoing care for themselves or a family member increased, from 82 percent among those aged 25-44 to 93 percent among adults aged 80 and older. This difference was significant for women and for men (data not shown).



DATA SOURCE:: Canadian Community Health Survey (CCHS), 2007

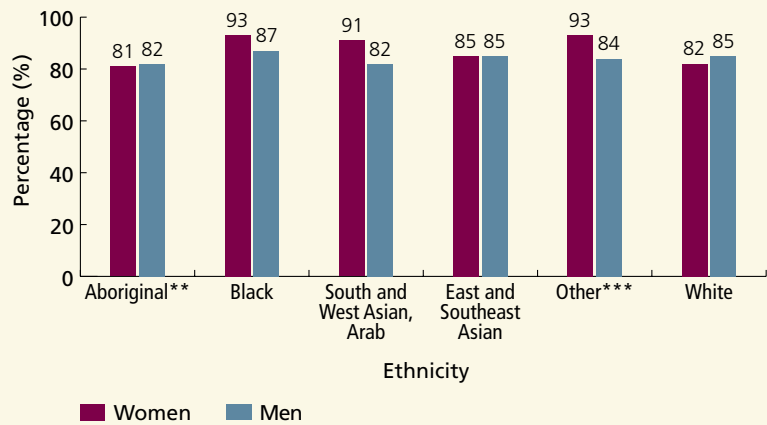
NOTE: See [Appendix 7.3](#) for definitions of annual household income categories

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EXHIBIT 7A.13 | Percentage of adults aged 25 and older who reported no difficulties accessing routine or ongoing care for themselves or a family member, by sex and ethnicity, in Ontario, 2007

FINDINGS

- Eighty-one percent of Aboriginal women and 82 percent of White women reported no difficulties accessing routine or ongoing care for themselves or a family member as compared to 93 percent of Black women and women who identified themselves as being of other ethnicity.
- Eighty-two percent of Aboriginal men and South and West Asian or Arab men reported no difficulties accessing routine or ongoing care for themselves or for a family member as compared to 85 percent of White men. The difference among men was not significant.
- The percentage of adults who reported no difficulties accessing routine or ongoing care for themselves or a family member, varied across Local Health Integration Networks (LHIN), however the variation was not significant. The percentages among women ranged from 75 percent (North West LHIN) to 87 percent (Toronto Central and Central East LHIN). The percentages among men ranged from 75 percent (Central West and North West LHIN) to 92 percent (Toronto Central LHIN) (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

** Includes off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

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DIFFICULTIES OBTAINING MONITORING OF HEALTH PROBLEMS FROM A FAMILY DOCTOR

Indicator: This indicator measures the percentage of adults aged 25 and older who reported no difficulties obtaining monitoring for a health problem from a family doctor. The sample was limited to adults who indicated they had seen a family doctor in the past 12 months to obtain monitoring for their health or a specific health issue.

Background: Ongoing health problems may become worse if they are not properly monitored. Ongoing monitoring is a key component of chronic disease management and a standard of care for chronic conditions including diabetes, heart failure, asthma and high blood pressure. Difficulties obtaining regular monitoring from primary care settings may lead to an increased use of emergency and inpatient services, increased health care costs and more severe patient outcomes.⁵⁰ Studies show an association between individuals who report receiving ongoing care from their family doctor and increased patient satisfaction, better medical compliance and lower hospitalization and emergency room use.^{50, 66-69}

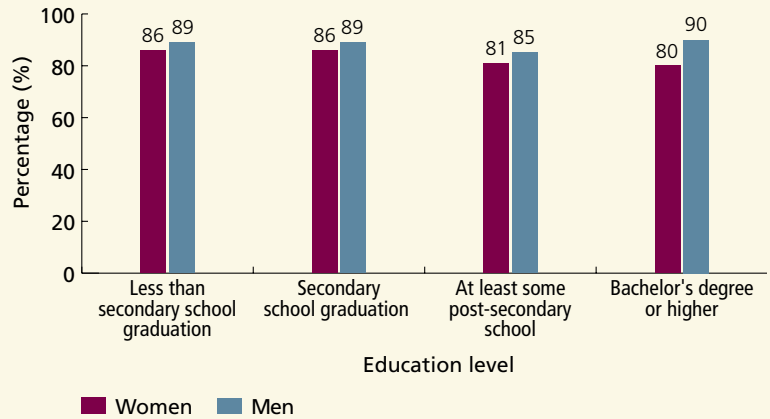
Data for this indicator were derived from the Primary Care Access Survey (PCAS), Waves 4-11, from the October 2006–September 2008 survey period. Adults who responded that they had seen a family doctor to monitor their health or a specific health issue during the past year were asked, “Did you have problems making an appointment, getting to the doctor’s office, waiting for the doctor and so on?” This may include participants who saw a family doctor for follow up after an operation, after being put on medication for a disease or for an illness. We report the proportion that did not have any problems obtaining monitoring of ongoing problems.

Findings: Among Ontario adults aged 25 and older who had seen a family doctor to monitor a health problem, 85 percent reported no difficulties obtaining care from a family doctor from October 2006–September 2008. Women were less likely than men to report no difficulties obtaining monitoring for a health problem; 82 percent versus 88 percent, respectively.

EXHIBIT 7A.14 | Percentage of adults aged 25 and older who reported no difficulties obtaining monitoring of health problems from a family doctor, by sex and education level, in Ontario, 2006–08[^]

FINDINGS

- Eighty-one percent of women with some post-secondary education and 80 percent of women with a Bachelor's degree or higher reported no difficulties obtaining monitoring of health problems, compared to 86 percent of those with a secondary school education or less.
- Among men, educational attainment was not associated with difficulties obtaining monitoring of health problems from a family doctor.
- The percentage of adults reporting difficulties obtaining monitoring of health problems from a family doctor did not vary by neighbourhood income (data not shown).
- The proportion of women and men who reported no difficulties obtaining monitoring of health problems from a family doctor increased with age, from 81 percent in adults aged 25–44 to 92 percent for those aged 80 and older (data not shown).



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

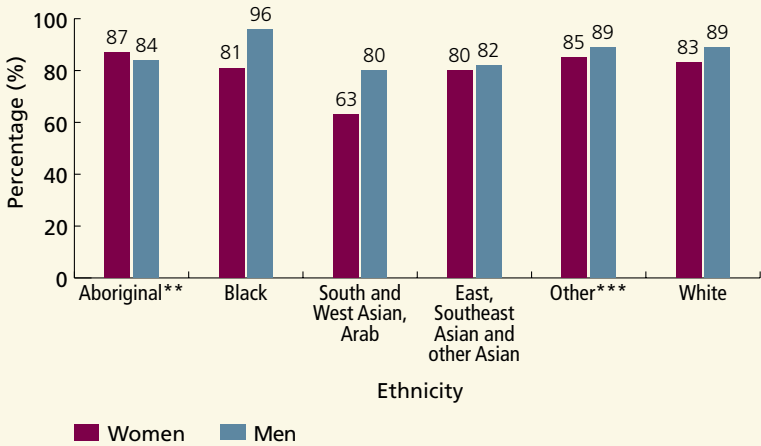
[^] The survey period was from October 2006–September 2008

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EXHIBIT 7A.15 | Percentage of adults aged 25 and older who reported no difficulties obtaining monitoring of health problems from a family doctor, by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- The percentage of women who reported no difficulties obtaining monitoring of health problems from a family doctor varied significantly by ethnicity, ranging from 63 percent among South and West Asian or Arab women to 83 percent among White women and 87 percent among Aboriginal women.
- The percentage of men who reported no difficulties obtaining monitoring of health problems from a family doctor ranged from 80 percent among South and West Asian or Arab men to 96 percent among Black men. This difference was not significant, possibly due to small sample sizes in some ethnic groups and thus limited power to detect differences.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

** Includes North American Indian, Métis, Inuit

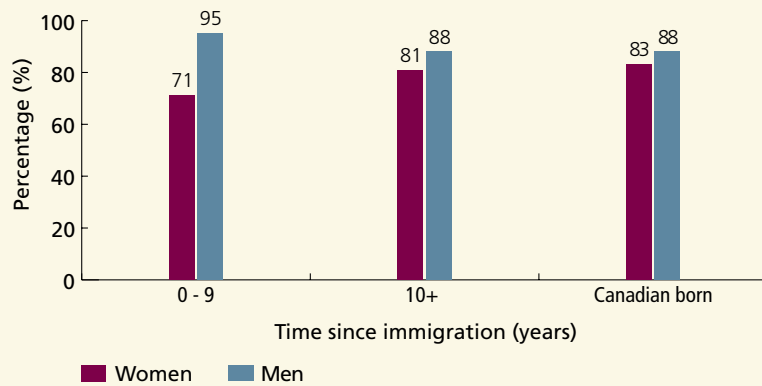
*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

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EXHIBIT 7A.16 | Percentage of adults aged 25 and older who reported no difficulties obtaining monitoring of health problems from a family doctor, by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- Among immigrants who had been in the country for less than 10 years, women were less likely than men to report no difficulties obtaining monitoring of health problems from a family doctor; 71 percent versus 95 percent, respectively.
- Women who had been in the country for less than 10 years were less likely to report no difficulties obtaining monitoring of health problems than women who have lived in the country for 10 or more years and women who were born in Canada. These differences were not significant, possibly due to small sample sizes in some groups and thus limited power to detect differences.
- Among men, the pattern was reversed; recently immigrated men were more likely to report no difficulties obtaining monitoring of health problems from a family doctor than those who had been in the country for 10 or more years and men who were born in Canada. These differences were not significant.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

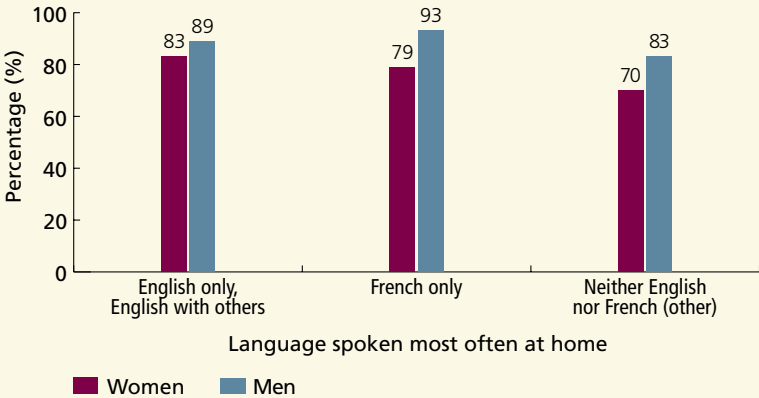
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.17 | Percentage of adults aged 25 and older who reported no difficulties obtaining monitoring of health problems from a family doctor, by sex and language spoken most often at home, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported no difficulties obtaining monitoring of health problems from a family doctor varied by language spoken most often at home; 70 percent of women and 83 percent of men who did not speak English or French most often at home reported no difficulties obtaining monitoring of health problems from a family doctor, compared with 79 percent of women and 93 percent of men who spoke French only and 83 percent of women and 89 percent of men who spoke English.
- These differences were significant for women but not for men, possibly due to small sample sizes among language groups and thus limited power to detect differences.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

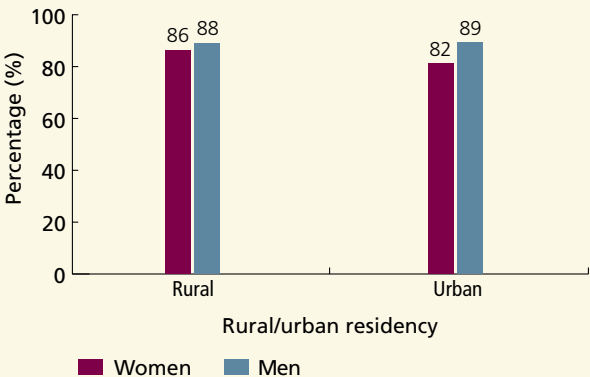
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.18 | Percentage of adults aged 25 and older who reported no difficulties obtaining monitoring of health problems from a family doctor, by sex and rural/urban residency, in Ontario, 2006–08[^]

FINDINGS

- Women living in urban areas were less likely than those from rural areas to report having no difficulties obtaining monitoring of health problems from a family doctor, 82 percent versus 86 percent, respectively.
- Among men there was no difference in the proportion who reported no difficulties obtaining monitoring of health problems from a family doctor by rural/urban residence.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

NOTE: See [Appendix 7.3](#) for definitions of rural/urban residency

[^] The survey period was from October 2006–September 2008

POWER Study

DIFFICULTIES WITH ACCESS TO PRIMARY CARE FOR AN URGENT, NON-EMERGENT HEALTH PROBLEM

Indicator: This indicator measures the percentage of the population aged 25 and older who reported no difficulties making an appointment for immediate care for an urgent, non-emergent health problem from their family doctor over the past 12 months. This sample was limited to adults who saw a family doctor due to an illness or a health problem in the past 12 months. For those who had difficulties accessing urgent, non-emergent care from a family doctor, we present the types of problems reported.

Background: Urgent, non-emergent health care include, but is not limited to, same-day service for fevers, headaches, sprained ankles, vomiting or an unexplained rash. Adults who report experiencing difficulties accessing immediate care from their primary care provider may seek care from an emergency department (ED) or walk-in clinic. For example in one Canadian study, approximately 30 percent of all ED visits were characterized as not urgent and treatable in a primary care setting.⁷⁰ This rate is similar to rates reported in Canada between 20 and 30 years ago.⁷¹ One Ontario study suggests that the presence of low acuity patients in EDs has a negligible impact on wait times for higher acuity patients.⁷² However, care in EDs or walk-in clinic can result in lack of care continuity, duplication of services, and increased health care costs.⁷³

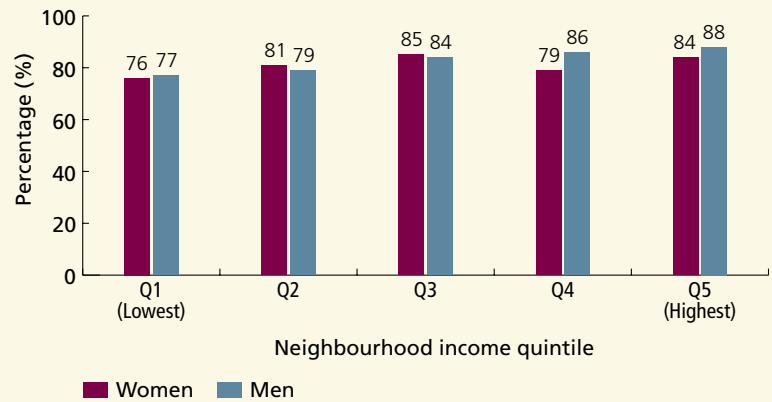
Data for this indicator were derived from the Primary Care Access Survey (PCAS), Waves 4-11, from the October 2006–September 2008 survey period. Adults who responded that they had seen a doctor for a sickness in the past 12 months were asked, “Did you have any problems making an appointment, getting to the doctor’s office, waiting for the doctor and so on?” We report the proportion that had no difficulties accessing urgent, non-emergent primary health care. This sample was restricted to participants who saw a family doctor because they were sick, had the flu or were concerned about a health issue other than an emergency situation or pregnancy.

Findings: Overall, among those who had seen a doctor for a health problem, 82 percent of Ontarians aged 25 and older reported no difficulties accessing urgent, non-emergent primary care from October 2006–September 2008. This did not vary by sex; 81 percent of women and 83 percent of men reported no difficulties accessing primary care for an urgent, non-emergent health problem.

EXHIBIT 7A.19 | Percentage of adults aged 25 and older who reported no difficulties making an appointment with their family doctor for an urgent, non-emergent health problem, by sex and neighbourhood income quintile, in Ontario, 2006–08[^]

FINDINGS

- Seventy-six percent of women living in the lowest-income neighbourhoods reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 84 percent of women living in the highest-income neighbourhoods.
- Among men, 77 percent living in the lowest-income neighbourhoods reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 88 percent of men living in the highest-income neighbourhoods.
- Women with higher educational attainment were less likely to report no difficulties making an appointment for an urgent, non-emergent health problem than those with less education, which may be due to differing expectations. Among men, the percentage who reported no difficulties making an appointment for urgent, non-emergent care did not differ by educational attainment (data not shown).
- As age increased, the proportion of respondents who reported no difficulties making an appointment for an urgent, non-emergent health problem increased from 78 percent among adults aged 25–44 to 94 percent among those aged 80 and older. This difference was significant for women and for men (data not shown).



DATA SOURCES: Primary Care Access Survey (PCAS), Waves 4–11; Statistics Canada 2001 Census

NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

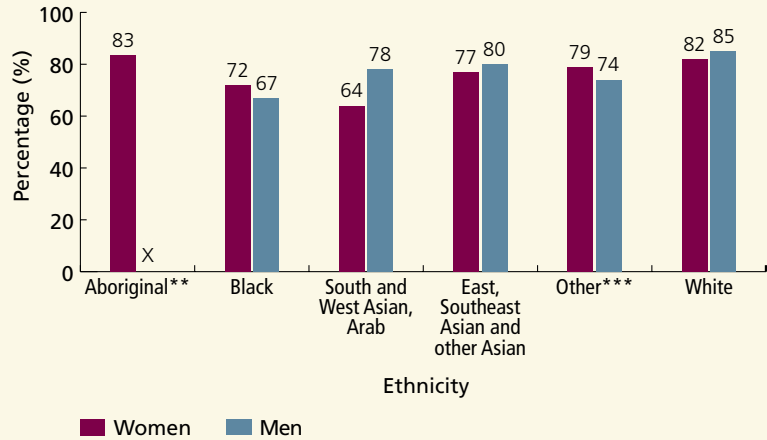
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.20 | Percentage of adults aged 25 and older who reported no difficulties making an appointment for an urgent, non-emergent health problem, by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported no difficulties making an appointment for an urgent, non-emergent health problem varied significantly by ethnicity from 70 percent among Black adults to 83 percent among White adults (data not shown).
- Sixty-four percent of South and West Asian or Arab women reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 83 percent of Aboriginal women and 82 percent of White women.
- Sixty-seven percent of Black men reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 85 percent of White men. This difference was not significant, possibly due to small sample sizes among some ethnic groups and thus limited power to detect differences.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

** Includes North American Indian, Métis, Inuit

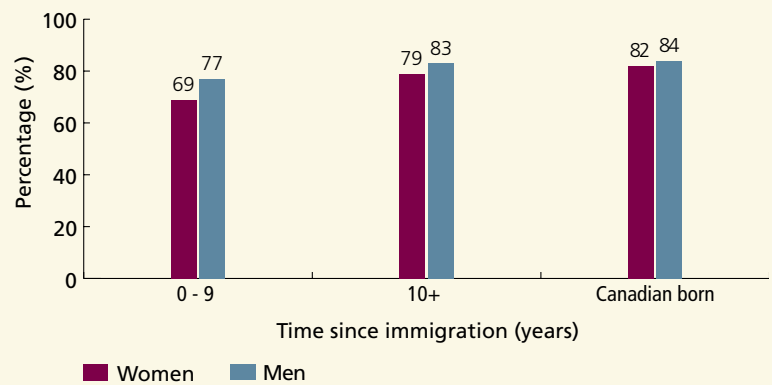
*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

POWER Study

EXHIBIT 7A.21 | Percentage of adults aged 25 and older who reported no difficulties making an appointment for an urgent, non-emergent health problem, by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- Adults who had been in Canada for less than 10 years were less likely to report no difficulties making an appointment for an urgent, non-emergent health problem than those born in Canada; 73 percent of recent immigrants reported no difficulties compared to 83 percent of Canadian born respondents (data not shown).
- Sixty-nine percent of women who had been in Canada for less than 10 years reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 82 percent of women who were Canadian born. This difference was not significant, possibly due to small sample sizes among some groups and thus limited power to detect differences.
- Seventy-seven percent of men who had been in Canada for less than 10 years reported no difficulties making an appointment for an urgent, non-emergent health problem compared to 84 percent of men who were Canadian born. This difference was not significant, possibly due to small sample sizes among some groups and thus limited power to detect differences.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.22 | Reasons for difficulties making an appointment for an urgent, non-emergent health problem, by sex, in Ontario, 2006–08[^]

Reasons for Difficulties	Overall (%)	Women (%)	Men (%)
Access Barrier: Difficulty contacting a physician, nurse or other health care provider	53	53	54
Difficulties getting an appointment in a timely fashion			
Do not have personal/family physician			
Specific type of care/service not available in the area			
Did not know where to go (i.e., information problems)			
Wait: Waited too long at the doctor's office/clinic	52	53	50
Transportation: Had to travel long distance to get care	4	5	X
Had difficulty getting to doctor/ office/ transportation problems			

DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

NOTE: Respondents could choose one or more categories. Because of this, numbers will not total to 100 percent

FINDINGS

- Among adults who reported having difficulties making an appointment for an urgent, non-emergent health problem, 53 percent of women and 54 percent of men reported a number of specific access barriers as their reasons including difficulty contacting a physician, nurse or other health care provider; not having a personal/family physician; difficulty getting or scheduling an appointment; lack of availability of the specific type of care or service required; or problems obtaining adequate information on where to go or how to seek care.
- Approximately half of respondents (53 percent of women and 50 percent of men) reported waiting too long at the doctor's office or clinic as their reason for reporting difficulties accessing care for an urgent, non-emergent health problem.
- A small number, four percent of respondents, reported difficulties with transportation (having to travel long distance to get care, or having difficulty getting to the doctor's office or clinic due to transportation problems) as their reason for reporting difficulties accessing care for an urgent, non-emergent health problem.

POWER Study

SATISFACTION WITH ACCESS TO PRIMARY CARE FOR AN URGENT, NON-EMERGENT HEALTH PROBLEM

Indicator: This indicator measures the percentage of the population aged 25 and older who reported being very satisfied with their experience getting to see a doctor for an urgent, non-emergent health problem. The sample was limited to adults who saw a family doctor due to an illness or a health problem in the past 12 months.

Background: Patient satisfaction reflects patients' experiences with care and is an important health care outcome. One determinant of patient satisfaction is accessibility and convenience of health care services, including ease or difficulty in scheduling appointments for medical care.⁶² Studies show that patients who have difficulties accessing primary care for urgent health care problems who seek care from a walk-in clinic or an emergency department (ED) are less satisfied with their care.^{74, 75}

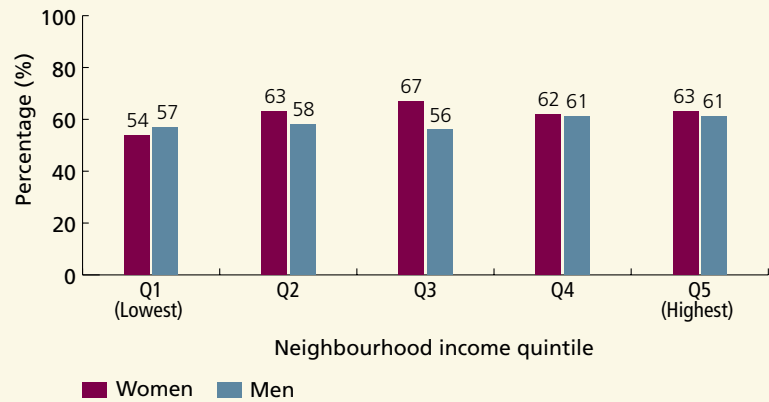
Data for this indicator were derived from the Primary Care Access Survey (PCAS), Waves 4-11, from the October 2006–September 2008 survey period. Adults who responded that they had seen a doctor because they were sick, had the flu or were concerned that they had a health problem in the past 12 months were asked, "How satisfied were you with your experience getting the doctor to see you?" We report the proportion that was very satisfied with their experience getting to see a doctor for an urgent, non-emergent health problem. This sample was restricted to participants who saw a family doctor because they were sick, had the flu or were concerned about a health issue other than an emergency situation or pregnancy.

Findings: Overall, among those who had seen a doctor for a health problem, 60 percent of Ontarians aged 25 and older reported being very satisfied with their experience getting to see a doctor for an urgent, non-emergent health problem from October 2006–September 2008. This did not vary by sex; 62 percent of women and 58 percent of men reported being very satisfied.

EXHIBIT 7A.23 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem, by sex and neighbourhood income quintile, in Ontario, 2006–08[^]

FINDINGS

- Women living in the lowest-income neighbourhoods were less likely than other women to report being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem. This did not vary by neighbourhood income among men.
- Adults with a Bachelor's degree or higher were less likely to report being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem than those with a secondary school education or less. Differences in expectations may contribute to these differences (data not shown).
- The proportion of respondents who were very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem increased with age from 53 percent among adults aged 25–44 to 81 percent among those aged 80 and older. This difference was significant for women and for men (data not shown).



DATA SOURCES: Primary Care Access Survey (PCAS), Waves 4–11; Statistics Canada 2001 Census

NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

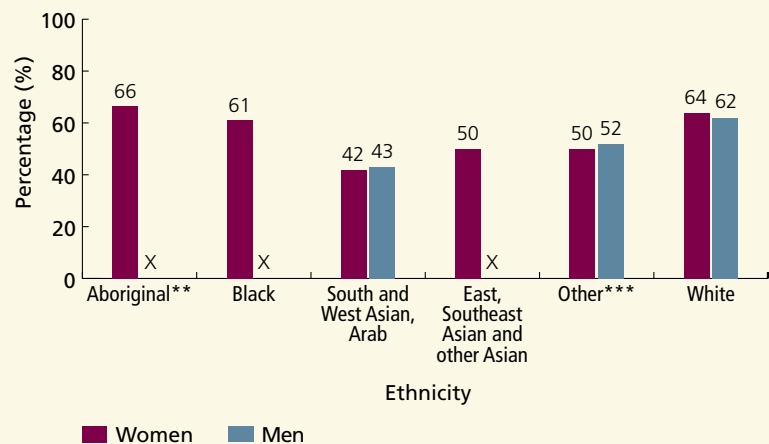
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.24 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem, by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem varied by ethnicity.
- Among women, the percentage who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem ranged from 42 percent among South and West Asian or Arab women to 64 percent among White women and 66 percent among Aboriginal women.
- Among men, the percentage who reported being very satisfied with their experience in getting to see their doctor for an urgent, non-emergent health problem ranged from 43 percent among South and West Asian or Arab men to 62 percent among White men. The rates among men from other ethnic groups could not be reported due to small sample size.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

** Includes North American Indian, Métis, Inuit

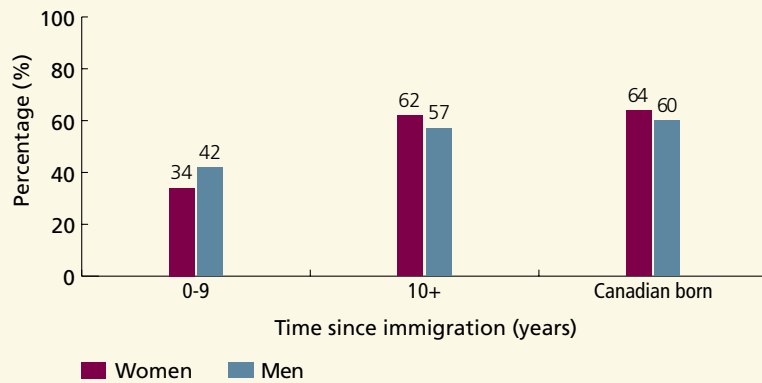
*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

POWER Study

EXHIBIT 7A.25 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem, by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem varied significantly by time since immigration.
- Thirty-four percent of women who had been in Canada for less than 10 years were very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem as compared to 62 percent of women who had been in the country for a longer period and 64 percent of women who were born in Canada.
- Among men, 42 percent of recent immigrants were very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem compared to 57 percent of men who had been in the country for 10 or more years and 60 percent of men who were born in Canada.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

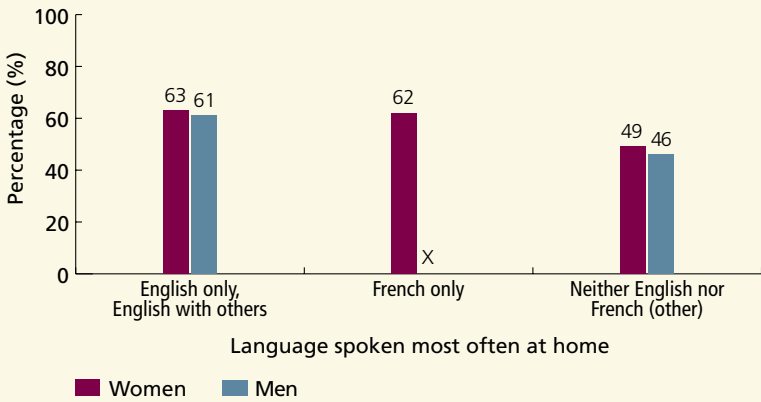
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.26 | Percentage of adults aged 25 and older who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem, by sex and language spoken most often at home, in Ontario, 2006–08[^]

FINDINGS

- The percentage of adults who reported being very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem varied significantly by language spoken most often at home.
- Forty-nine percent of women and 46 percent of men who did not speak English or French most often at home were very satisfied with their experience getting to see a doctor for an urgent, non-emergent health problem compared to 63 percent of women and 61 percent of men who spoke English and 62 percent of women who spoke French only.
- The percentage of women and men who were very satisfied with their experience getting to see their doctor for an urgent, non-emergent health problem varied by Local Health Integration Network (LHIN) and ranged from 52 percent in the North West LHIN to 70 percent in the South East LHIN (data not shown).



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

POWER Study

SATISFACTION WITH CARE PROVIDED FOR AN URGENT, NON-EMERGENT HEALTH PROBLEM

Indicator: This indicator measures the percentage of the population aged 25 and older who reported being very satisfied with the care they received when they sought care from a family doctor for an urgent, non-emergent health problem. The sample was limited to adults who saw their doctor for an illness or a health problem in the past 12 months.

Background: To provide all patients with the best possible care, providers must be able to understand patients' diverse health care needs and preferences and communicate clearly with patients about their care.⁷⁶ Patient satisfaction with care received is an important dimension of health care quality reflecting patient experiences with care. Improving the patient-centredness of care may increase patient satisfaction and higher patient satisfaction is associated with better adherence to treatment. Patient satisfaction is affected by personal expectations which are influenced by past experiences, demographics and socioeconomic status.^{62, 77}

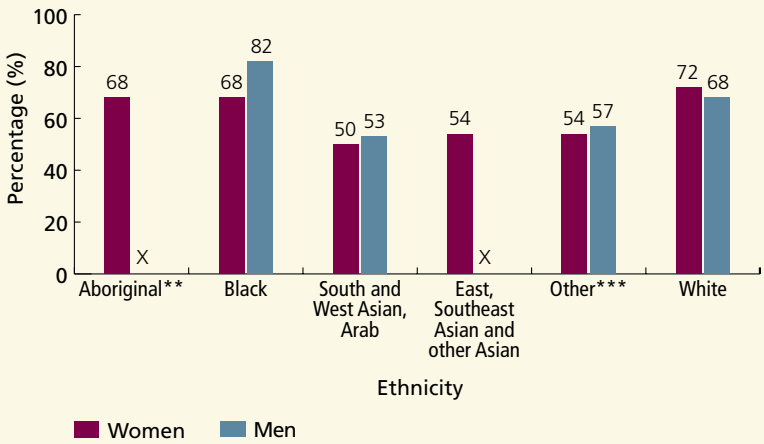
Data for this indicator were derived from the Primary Care Access Survey (PCAS), Waves 4-11, from the October 2006–September 2008 survey period. Adults who responded that they had seen a doctor for a sickness in the past 12 months were asked, “How satisfied were you with the care the doctor provided?” We report on the proportion who reported being very satisfied with the care they received from their doctor. This sample was restricted to respondents who saw their family doctor because they were sick, had the flu or were concerned about a health issue other than emergency situations or pregnancy.

Findings: Overall, among those who had seen a doctor for a health problem, 67 percent of Ontarians aged 25 and older reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem from October 2006–September 2008. This did not vary by sex; 69 percent of women and 65 percent of men reported being very satisfied with the care they received.

EXHIBIT 7A.27 | Percentage of adults aged 25 and older who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem, by sex and ethnicity, in Ontario, 2006–08[^]

FINDINGS

- Fifty percent of South and West Asian or Arab women reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 72 percent of White women.
- Fifty-three percent of South and West Asian or Arab men reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 68 percent of White men and 82 percent of Black men.
- Women living in lower-income neighbourhoods were less likely to be very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to women living in higher-income neighbourhoods; 66 percent versus 71 percent, respectively. Among men, the percentage who were very satisfied with their care did not vary by neighbourhood income (data not shown).
- Adults with less than a secondary education were more likely to be very satisfied with the care their doctor provided for an urgent, non-emergent health problem than adults with some post-secondary education, 74 percent versus 65 percent, respectively (data not shown). Differences in expectations may contribute to these differences.
- The proportion of women and men who were very satisfied with the care their doctor provided for an urgent, non-emergent health problem increased with age from 61 percent among adults aged 25-44 to 82 percent among those aged 80 and older. This difference was significant for women and for men (data not shown).



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

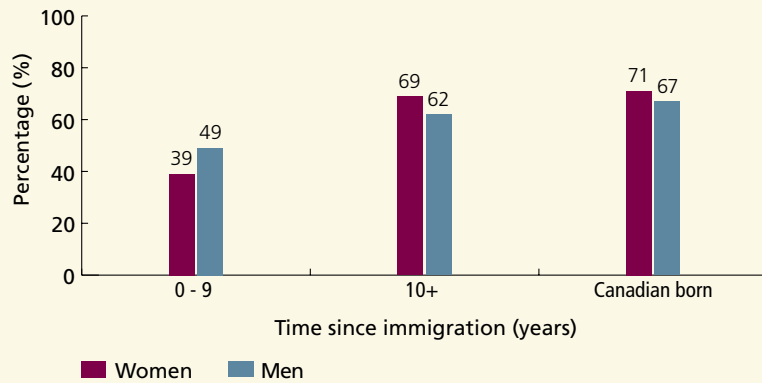
** Includes North American Indian, Métis, Inuit

*** Includes El Salvador, other European, other Central American, other South American, religion as an ethnicity

EXHIBIT 7A.28 | Percentage of adults aged 25 and older who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem, by sex and time since immigration, in Ontario, 2006–08[^]

FINDINGS

- Forty-four percent of adults who had lived in Canada for less than 10 years reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem as compared to 66 percent of adults who had been in the country for 10 or more years and 69 percent of respondents who were born in Canada (data not shown).
- Among women, 39 percent of those who had been in the country for less than 10 years were very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 69 percent of women who had been in the country for a longer period and 71 percent of women who were born in Canada.
- Among men, 49 percent of recent immigrants were very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 62 percent of men who had been in the country for 10 or more years and 67 percent of men who were born in Canada.



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

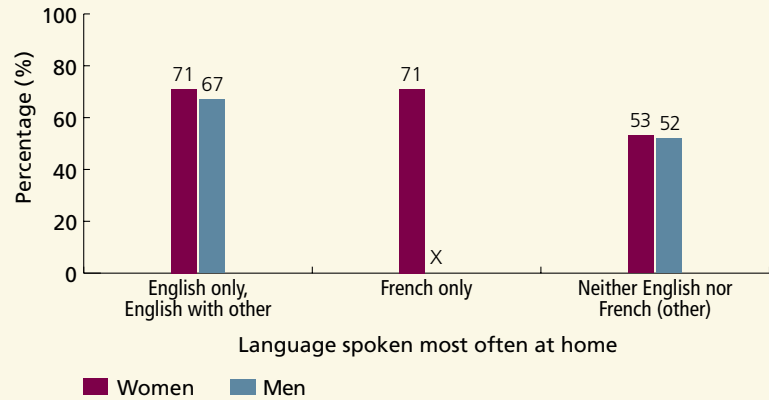
[^] The survey period was from October 2006–September 2008

POWER Study

EXHIBIT 7A.29 | Percentage of adults aged 25 years and older who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem, by sex and language spoken most often at home, in Ontario, 2006–08[^]

FINDINGS

- Satisfaction with urgent, non-emergent care varied by language spoken most often at home. Slightly more than half of adults who did not speak English or French most often at home reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to slightly less than seven out of ten adults who spoke English or French only.
- Three-quarters of men who lived in rural areas reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem, compared with two-thirds of men living in urban areas. The difference was not significant among women (data not shown).



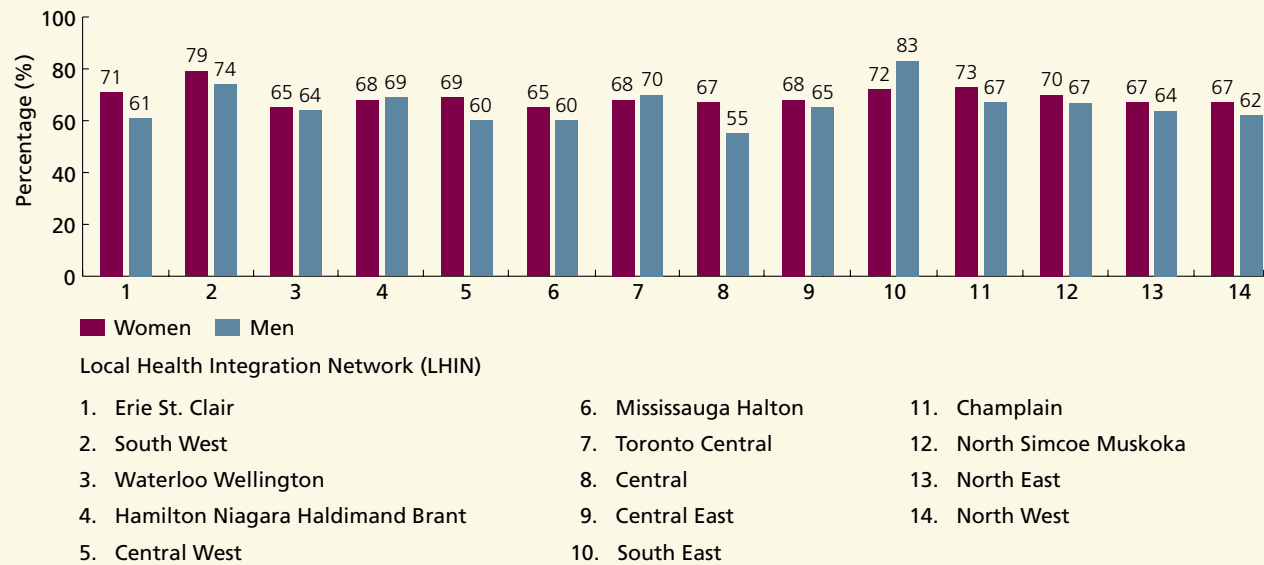
DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

X Suppressed due to small sample size

POWER Study

EXHIBIT 7A.30 | Percentage of adults aged 25 and older who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem, by sex and Local Health Integration Network (LHIN), in Ontario, 2006–08[^]



DATA SOURCE: Primary Care Access Survey (PCAS), Waves 4–11

[^] The survey period was from October 2006–September 2008

FINDINGS

- Satisfaction with the care their doctor provided for an urgent, non-emergent health problem varied across LHINs.
- Among women the percentage who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem ranged from 65 percent (Waterloo Wellington and Mississauga Halton LHINs) to 79 percent (South West LHIN).
- Among men the percentage who reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem ranged from 55 percent (Central LHIN) to 83 percent (South East LHIN).

POWER Study

DIFFICULTIES ACCESSING HEALTH INFORMATION OR ADVICE

Indicator: This indicator measures the percentage of adults aged 25 and older who reported no difficulties accessing health information or advice for themselves or for a family member in the past 12 months. The sample was limited to adults who required health information or advice for themselves or a family member. For those who had difficulties accessing health information or advice during regular office hours, we report the types of problems that were identified.

Background: A person's ability to obtain health information and advice when they need it has both indirect and direct affects on their health. Access to health information is important for informed decision making for treatment choice, lifestyle changes to improve health and for self-management support for chronic conditions. Patients may experience difficulties obtaining health information or advice because they are unable to contact their provider, they receive inadequate information or advice, they experience language problems or they lack the information on where to seek advice. Low levels of health literacy often present a barrier to accessing needed information.

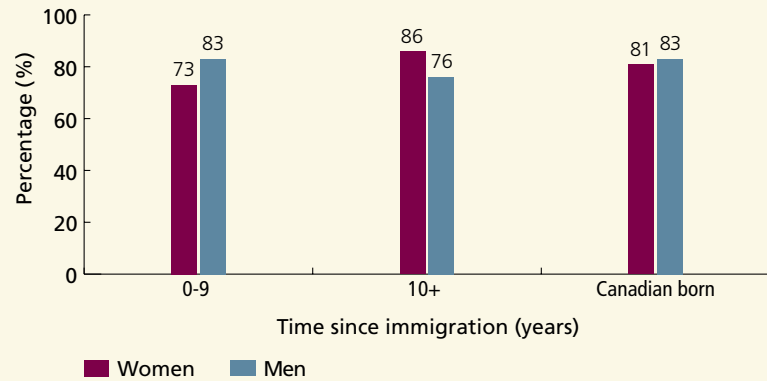
In the Canadian Community Health Survey (CCHS), 2007, adults who reported that they required health information or advice in the past 12 months were asked, "In the past 12 months, did you ever experience any difficulties getting the health information or advice you needed for yourself or a family member?" We report the percentage of respondents who had no difficulties accessing health information or advice for themselves or a family member. For those who indicated they had difficulties with access, we report the types of difficulties identified. For this follow up question, the CCHS restricts the sample to those who accessed health information during office hours; Monday to Friday, 9:00 a.m. to 5:00 p.m.

Findings: Overall among those who required health information or advice for themselves or for a family member, 81 percent of Ontarians aged 25 and older reported no difficulties accessing health information or advice in 2007. This did not vary by sex; 81 percent of women and 82 percent of men reported no difficulties accessing health information or advice.

EXHIBIT 7A.31 | Percentage of adults aged 25 and older who reported no difficulties accessing health information or advice, by sex and time since immigration, in Ontario, 2007

FINDINGS

- Women who were recent immigrants were less likely than women who had been in the country for 10 or more years and women who were born in Canada to report no difficulties accessing health information or advice. This did not vary by time since immigration among men.
- The percentage of women and men who reported no difficulties accessing health information or advice did not vary by annual household income or education (data not shown).
- The percentage of women and men who reported no difficulties accessing health information or advice did not vary by ethnicity, possibly due to small sample sizes in some ethnic groups and thus limited power to detect differences (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

POWER Study

EXHIBIT 7A.32 | Reasons for difficulties accessing health information or advice during regular office hours[^], by sex, in Ontario, 2007

Reasons for Difficulties	Women (%)	Men (%)
Contact: Difficulties contacting a physician or nurse; could not get through; waited too long to speak to someone	63	64
Inadequate information: Did not get adequate information or advice	33	35
Other: Did not have a phone number; language barriers; did not know where to go or call; could not leave the house due to a health problem; other	37	27

DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[^] Regular office hours (Monday to Friday, 9:00 a.m. to 5:00 p.m.)

NOTE: Respondents could choose one or more categories. Because of this, numbers will not total to 100 percent

FINDINGS

- Among adults who reported difficulties accessing health information or advice during regular office hours, almost two-thirds reported that they had difficulties contacting a physician or nurse, they could not get through or they waited too long to speak with someone. In addition, about one-third of respondents reported that they had difficulties obtaining adequate information or advice. The percentages of women and men who reported these types of difficulties were similar.
- Thirty-seven percent of women and 27 percent of men reported other problems, accessing health information or advice.

POWER Study

UNMET HEALTH CARE NEEDS

Indicator: This indicator measures the percentage of the population aged 25 and older who reported that there was a time during the past 12 months when they needed health care but did not receive it. We report this indicator in the general population and among those with two or more chronic conditions. As well, we present the reasons for those who reported having unmet health care needs.

Background: ‘Unmet need’ is a self-reported measure of an individual’s experiences in obtaining the care they believe they require.^{78, 79} While non-specific, it is commonly used as an indicator of access to care. Inability to access needed care may reflect financial and non-financial barriers within the health system or it may reflect unavailability of services. Unmet need is correlated with adverse health outcomes and worse health related quality of life.⁷⁹ Women, low-income and minority women and men are more likely to report unmet need as are those with greater health care needs.^{78, 79} Expectations may also influence perceptions of unmet need.

Data for this variable were derived from the Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1). Participants from the general population were asked, “During the past 12 months, was there ever a time when you felt that you needed health care but you didn’t receive it?” We report the proportion who report having unmet health care needs. Among adults in the general population who reported having unmet needs, we assessed the reasons why they did not receive the health care they needed. We also reported on the proportion of adults with two or more chronic conditions who reported unmet needs in the past 12 months. Chronic conditions were defined as ‘long-term conditions’ that have lasted or are expected to last 6 months or more and that have been diagnosed by a health professional (see [Appendix 7.3](#) for a list of conditions that were included).

Findings: Overall, 12 percent of Ontarians aged 25 and older reported unmet health care needs. Women were more likely to report unmet needs than men (14 percent versus 10 percent, respectively). Among Ontarians with two or more chronic conditions, 15 percent indicated that they had unmet health care needs and again, women were more likely than men to report unmet needs (17 percent versus 12 percent, respectively).

EXHIBIT 7A.33 | Percentage of adults aged 25 and older who reported having unmet health care needs, by sex and annual household income, in Ontario, 2005

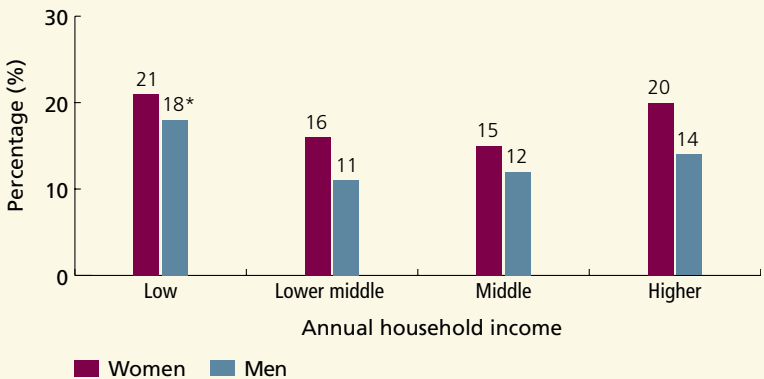
FINDINGS

- Low-income adults in the Ontario population were more likely to report unmet health care needs than higher-income adults.
- Irrespective of household income or the presence of chronic conditions, women were more likely to report having unmet health care needs than men.
- Eighteen percent of low-income women reported having unmet health care needs as compared to between 13 and 14 percent of women with higher annual household incomes.
- Fifteen percent of low-income men reported having unmet health care needs as compared to between nine and ten percent of men with higher annual household incomes.
- Low-income and higher-income women with two or more chronic conditions were more likely to report having unmet health care needs than women at the middle of the income spectrum.
- Among men with two or more chronic conditions, income was not associated with unmet health care needs, however the rate reported in low-income men should be interpreted with caution due to high sampling variability.

Ontario population



Population with two or more chronic conditions



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

NOTE: See [Appendix 7.3](#) for definitions of annual household income categories

* Interpret with caution due to high sampling variability

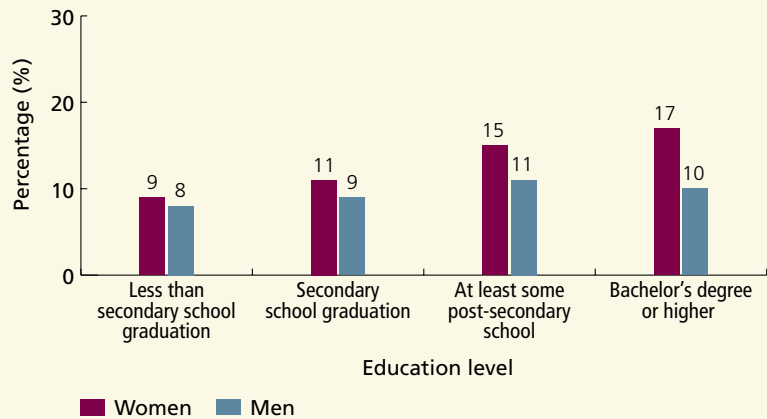
POWER Study

EXHIBIT 7A.34 | Percentage of adults aged 25 and older who reported having unmet health care needs, by sex and education level, in Ontario, 2005

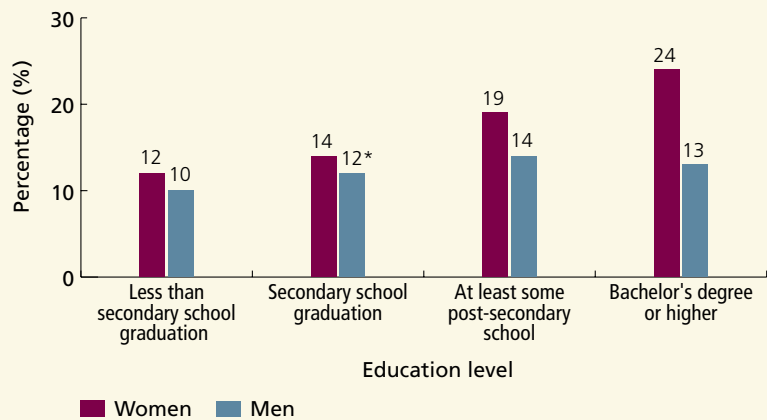
FINDINGS

- Women with a Bachelor's degree or higher were more likely to report having unmet health care needs than women with less than a secondary school education; 17 percent versus 9 percent, respectively. Differences in expectations may contribute to these differences.
- Among women with two or more chronic conditions, those with at least some post-secondary education were more likely to report having unmet health care needs than women with less education. Twenty-four percent of women with a Bachelor's degree or higher reported having unmet health care needs as compared to 12 percent of women with less than a secondary school education.
- Among men, education was not associated with unmet health care needs, irrespective of the presence of chronic conditions.
- As age increased, the percentage of adults who reported having unmet health care needs declined, irrespective of the presence of chronic conditions (data not shown).

Ontario population



Population with two or more chronic conditions



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

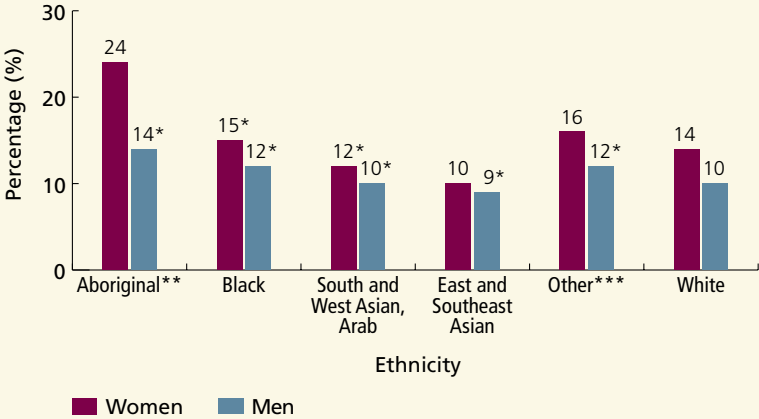
* Interpret with caution due to high sampling variability

POWER Study

EXHIBIT 7A.35 | Percentage of adults aged 25 and older who reported having unmet health care needs, by sex and ethnicity, in Ontario, 2005

FINDINGS

- Among women, the percentage who reported unmet health care needs varied by ethnicity. Twenty-four percent of Aboriginal women reported unmet health care needs, as compared to 14 percent of White women and 10 percent of East and Southeast Asian women.
- Ethnicity was not associated with unmet health care needs among men, possibly due to small sample sizes in some ethnic groups and thus limited power to detect differences.
- Immigrants who had been in the country for less than 10 years were more likely to report having unmet health care needs than those who had been in the country longer, 14 percent versus 10 percent, respectively (data not shown). This difference was significant for women but not for men.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

* Interpret with caution due to high sampling variability

** Includes off-reserve Aboriginal people (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

POWER Study

EXHIBIT 7A.36 | Reasons for reporting unmet health care needs, by sex and annual household income, in Ontario, 2005

Reasons for Reporting Unmet Needs	Women		Men	
	Lower income (%)	Higher income (%)	Lower income (%)	Higher income (%)
Availability: Not available in the area or at the time required; waiting time was too long	43	53	39	53
Accessibility: Cost; didn't know where to go; transportation problems; language problems	26	10	17*	11
Quality: Felt care would be inadequate; dislikes or afraid of doctors	4*	6*	7*	4*
Individual characteristics: Too busy; didn't get around to it/ didn't bother; personal or family responsibilities; decided not to seek care	13	17	17	18
Other: Doctor didn't think it was necessary; unable to leave the house because of a health problem; other	36	29	41	27

DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

* Interpret with caution due to high sampling variability

NOTE: Respondents could choose one or more categories. Because of this, numbers will not total to 100 percent

NOTE: See [Appendix 7.3](#) for definitions of annual household income categories

FINDINGS

- Almost half of all respondents reported availability as a reason for their unmet health care needs. This could include services not available in area; services not available at the time required or waiting time too long.
- Fifty-three percent of higher-income women and men reported availability as a reason for their unmet health care needs compared to 43 percent of lower-income women and 39 percent of lower-income men.
- More than one-quarter of lower-income women stated that accessibility was a reason for their unmet needs compared to 10 percent of higher-income women.
- Approximately one-third of all respondents reported other reasons for unmet health care needs, including the doctor did not think it was necessary; unable to leave the house because of a health problem or another reason.
- Lower-income men were significantly more likely to report other reasons for their unmet health care needs compared to higher-income men (41 percent versus 27 percent, respectively). The difference was not significant among women.

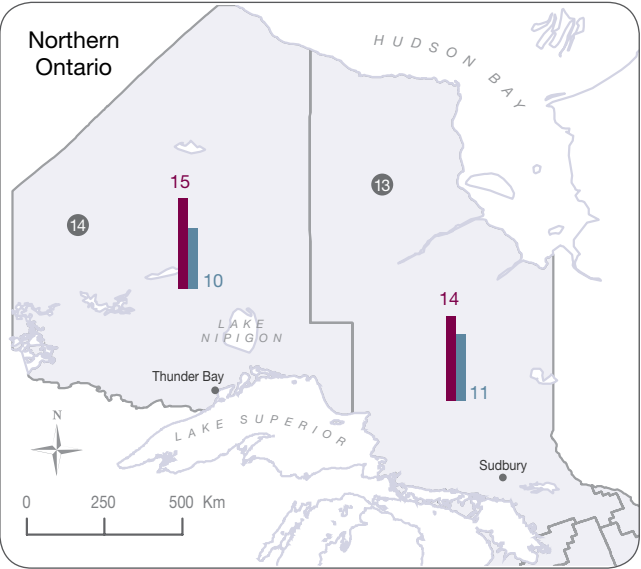
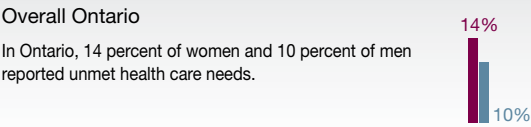
POWER Study

EXHIBIT 7A.37 | Percentage of adults aged 25 and older who reported having unmet health care needs, by sex and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

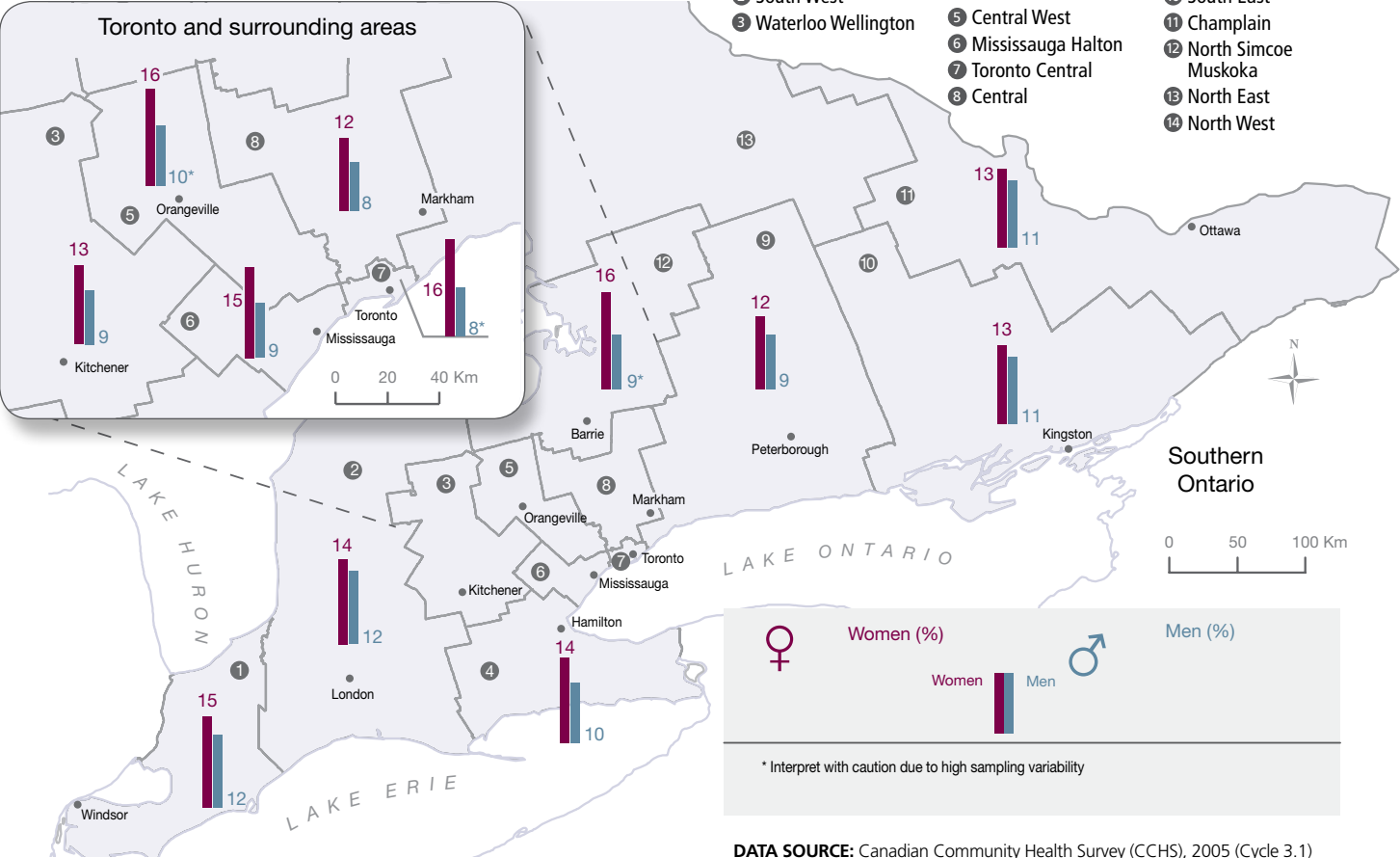
- The percentage of adults who reported unmet health care needs did not vary by LHIN.
- In all LHINs, women were more likely than men to report having unmet health care needs.
- The rates for women ranged from 12 percent (Central and Central East LHINs) to 16 percent (Central West, Toronto Central and North Simcoe Muskoka LHINs). Among men the rates ranged from 8 percent (Toronto Central and Central LHINs) to 12 percent (Erie St. Clair and South West LHINs).

POWER Study



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

DENTAL CARE

Indicator: This indicator measures the percentage of the Ontario population aged 25 and older who did not visit a dentist in the past 12 months.

Background: Oral health is an essential component of general health. Adults with poor oral health have a greater risk of developing poor general health, oral cancer and complications associated with cardiovascular disease and diabetes.^{18, 80-82} The literature shows that the burden of oral diseases and associated complications are more likely to affect low-income adults and children, the elderly and certain ethnic groups.^{82, 83} In Canada, dental care is not a universally insured benefit. Some Canadians receive dental insurance as an employment benefit, others must fund dental care using their own resources and government programs provide care to some. To improve access and reduce the oral disease burden, health policies should address issues of affordability, availability and patient acceptability of dental services.^{81, 83}

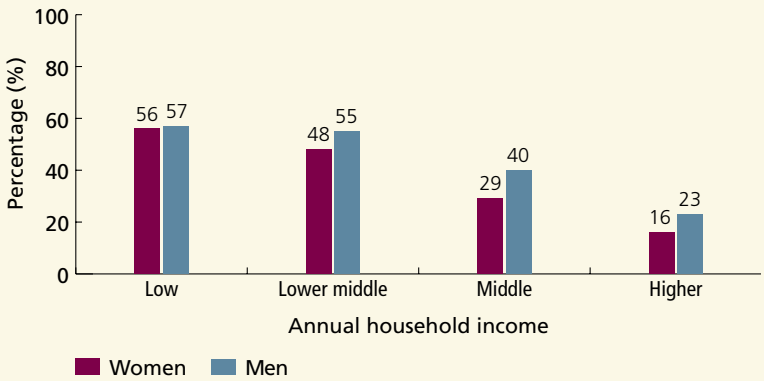
In the Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1), adults aged 25 and older were asked if they had visited a dentist in the past 12 months.

Findings: Overall in 2005, 32 percent of Ontarians aged 25 and older did not visit a dentist in the past 12 months. Men were more likely to have not seen a dentist than women (35 percent versus 30 percent, respectively).

EXHIBIT 7A.38 | Percentage of adults aged 25 and older who did not visit a dentist in the past 12 months, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was a strong income gradient in the percentage of adults who had not seen a dentist in the previous 12 months; more than half of lower-income adults had not seen a dentist as compared to one in five higher-income adults.
- Fifty-six percent of low-income women and 57 percent of low-income men had not seen a dentist compared to 16 percent of higher-income women and 23 percent of higher-income men.
- In all but the lowest-income group, men were significantly more likely than women to have not visited a dentist in the past 12 months.
- There was a strong education gradient in the percentage of adults who had seen a dentist in the previous 12 months; 55 percent of adults with less than a secondary education had not seen a dentist as compared to 22 percent of those with a Bachelor's degree or higher (data not shown).
- Older or younger adults were more likely to have not seen a dentist in the previous 12 months than women and men aged 45-64. Forty-three percent of adults aged 65-79 and over half of adults aged 80 and older had not seen a dentist in the previous 12 months (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

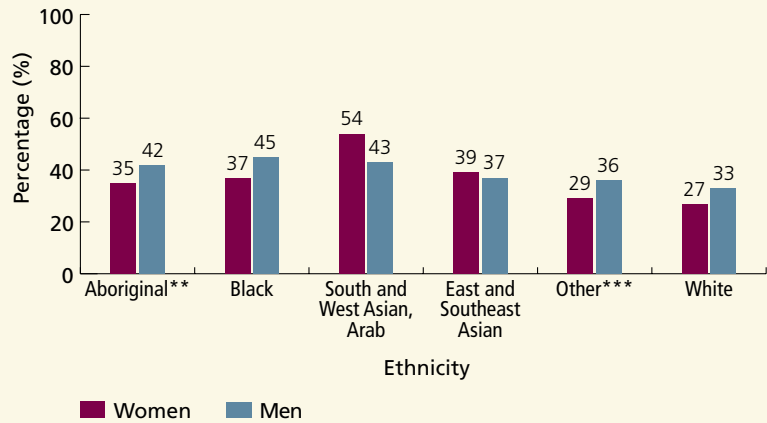
NOTE: See [Appendix 7.3](#) for definitions of annual household income categories

POWER Study

EXHIBIT 7A.39 | Percentage of adults aged 25 and older who did not visit a dentist in the past 12 months, by sex and ethnicity, in Ontario, 2005

FINDINGS

- The percentage of adults who had not seen a dentist in the previous 12 months varied significantly by ethnicity.
- Over half of South and West Asian or Arab women in Ontario (54 percent) had not seen a dentist in the previous 12 months compared to one-quarter (27 percent) of White women.
- Among men, 45 percent of Black men, 43 percent of South and West Asian or Arab men and 42 percent of Aboriginal men had not seen a dentist in the previous 12 months as compared to 33 percent of White men.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

** Includes off-reserve Aboriginal people (North American Indian, Métis, Inuit)

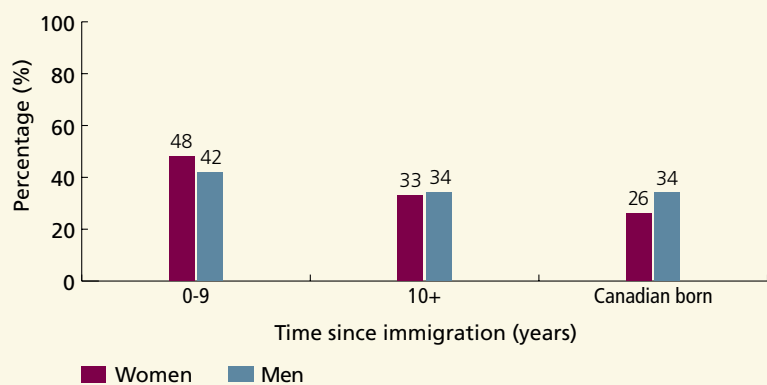
*** Includes Latin American, other racial and multiple racial origins

POWER Study

EXHIBIT 7A.40 | Percentage of adults aged 25 and older who did not visit a dentist in the past 12 months, by sex and time since immigration, in Ontario, 2005

FINDINGS

- The percentage of adults who had not seen a dentist in the previous 12 months varied significantly by time since immigration.
- Women who had been in the country for less than 10 years were significantly more likely to report not having seen a dentist in the previous 12 months than women who had been in the country for a longer period and women who were born in Canada.
- Among men, 42 percent of the most recent immigrants had not seen a dentist in the previous 12 months compared to 34 percent of men who had been in the country for 10 or more years who were born in Canada.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

POWER Study

EXHIBIT 7A.41 | Percentage of adults aged 25 and older who did not visit a dentist in the past 12 months, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

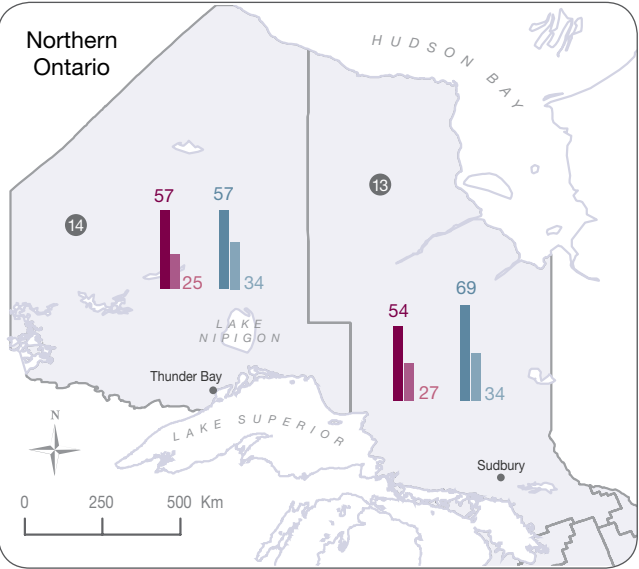
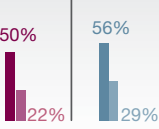
FINDINGS

- Across all LHINs, lower-income women and men were more likely to have not visited a dentist in the past 12 months than higher-income women and men.
- The percentage of lower-income women who had not visited a dentist in the past 12 months ranged from 40 percent (South West and Waterloo Wellington LHINs) to 61 percent (Toronto Central LHIN). Among higher-income women, the percentage ranged from 17 percent (Toronto Central LHIN) to 27 percent (North East LHIN).
- Among lower-income men, the percentage who had not visited a dentist in the past 12 months ranged from 45 percent (Central LHIN) to 70 percent (South East LHIN). Among higher-income men, the percentage ranged from 22 percent (Toronto Central LHIN) to 40 percent (North Simcoe Muskoka LHIN).
- Men living in rural areas were more likely to have not seen a dentist in the previous 12 months as compared to men from urban areas; 39 percent versus 34 percent, respectively. This difference was not significant among women (data not shown).

POWER Study

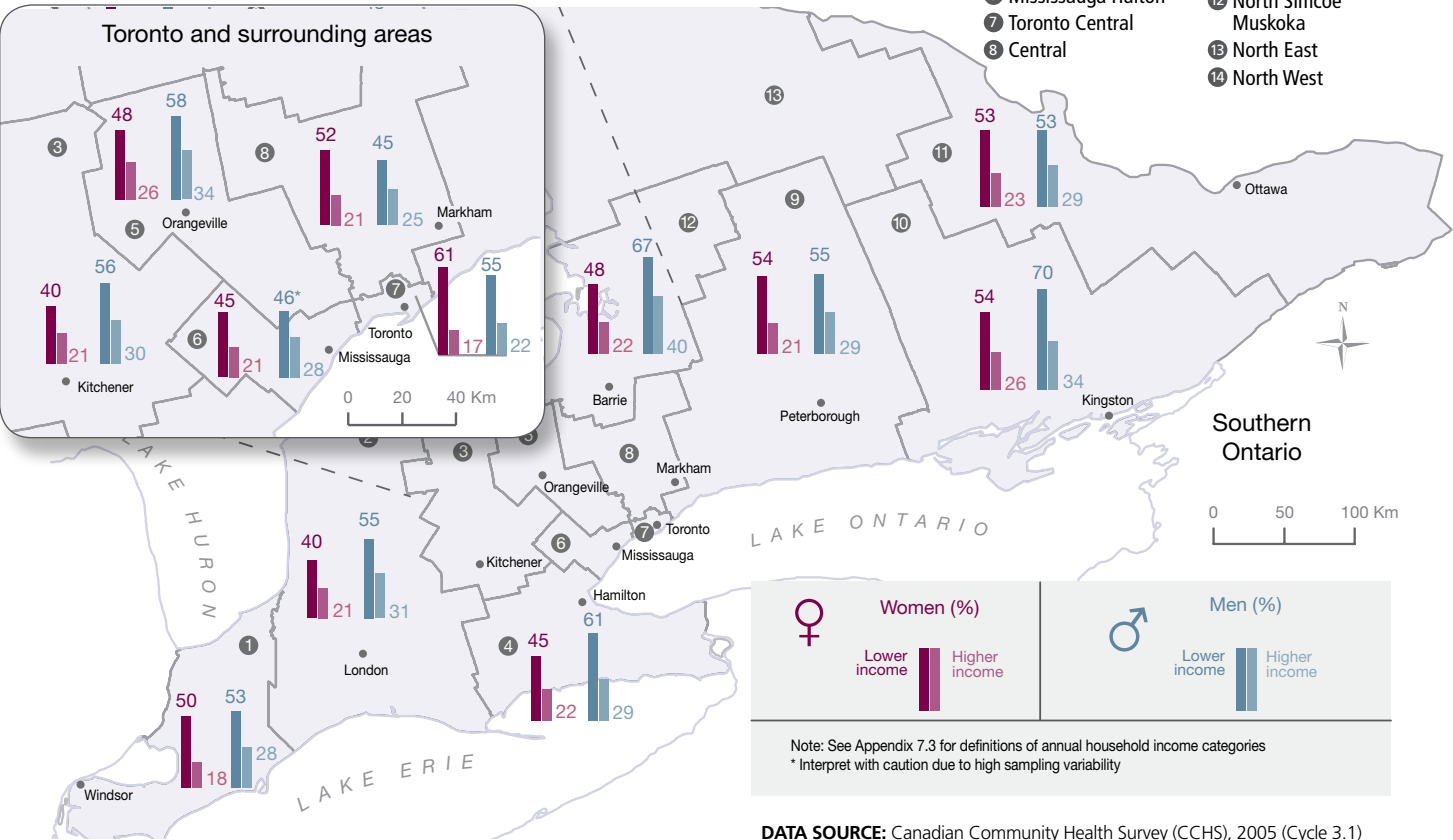
Overall Ontario

In Ontario, 50 percent of lower-income women, 22 percent of higher-income women, 56 percent of lower-income men and 29 percent of higher-income men did not visit a dentist in the past 12 months.



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



DATA SOURCE: Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

Section 7A

SUMMARY OF FINDINGS

In this section, we report on access to primary care including access to a primary care provider, satisfaction with getting an appointment for a regular check-up, difficulties accessing routine care, accessing care from a primary care doctor for monitoring of ongoing problems or for urgent, non-emergent care and satisfaction with access and the care provided. We also report on difficulties accessing health information, unmet health care needs and access to dental care in the previous year.

There were significant differences in access to health care services associated with sex, income, education, age and where one lives. Importantly, there were differences in access to primary care and satisfaction with that access by ethnicity, time since immigration and language.

Data on satisfaction and difficulties accessing care are based on survey data from the Canadian Community Health Survey (CCHS) and the Primary Care Access Survey (PCAS) and rely on respondent self-report. These indicators may be influenced by differences in expectations for care that may differ by sociodemographic factors.

For a number of the indicators reported in this section, the sample sizes available within strata limit the power to detect differences. While we have reported differences that were statistically significant, it is worthwhile to note that some differences across ethnic groups, by time since immigration, by language and across Local Health Integration Networks (LHIN) may not have reached statistical significance due to a lack of power.

Findings for the indicators reported in this section are summarized below.

Access to a Primary Care Doctor

Overall, 93 percent of Ontarians reported having a primary care doctor including a family doctor, a general practitioner/family physician or a medical doctor who

they considered to be their regular doctor. This varied by sex, neighbourhood income, age, time since immigration and LHIN but not by educational attainment or rural/urban residency. Women, older adults and those living in higher-income neighbourhoods were more likely to report having a primary care doctor.

Immigrants who had been in Canada for less than five years were less likely to have a primary care doctor than those who been in Canada for 10 or more years and Canadian born respondents (85 percent versus 94 percent and 93 percent, respectively). While the patterns were similar for women and men, the variation was significant only among men. Access to a primary care doctor did not vary significantly by ethnicity, however 87 percent of Black men reported having a family doctor compared to over 90 percent of men in all other ethnic groups. The lack of significance may be due to small numbers and limited power to detect differences.

Eighty-eight percent of Ontarians who did not have a primary care doctor at the time of the survey reported having had one in the past. The main reasons for not currently having a primary care doctor were that the respondent had moved or their doctor was no longer in practice.

Satisfaction with the Experience of Getting an Appointment for a Regular Check-up

Among respondents who had seen a doctor for a regular check-up, 61 percent were very satisfied with the experience getting an appointment; however women were slightly less likely than men to be very satisfied with their experience. This indicator also varied by age, education and LHIN, but not by neighbourhood income. Younger patients and those who had a higher level of educational attainment were less likely to be very satisfied with their experience

getting an appointment.

Women and men who identified as South and West Asian or Arab (47 percent of women and 50 percent of men) and East and Southeast Asian (49 percent of women and 40 percent of men) were significantly less likely to be very satisfied with their experience getting an appointment for a regular check-up. Recent immigrants were also less likely to report being very satisfied as compared to those who were born in Canada or those who had been in the country for 10 or more years (41 percent versus 62 percent and 61 percent, respectively). Additionally, respondents who did not speak English or French most often at home were less likely to report being very satisfied (50 percent) as compared to those who spoke English (62 percent) or those who spoke French only (70 percent).

Difficulties Accessing Routine or Ongoing Care

The majority of respondent—84 percent—reported no difficulties accessing routine or ongoing care for themselves or for a family member; however a significant proportion—16 percent—did report difficulties. This did not vary by sex, education, time since immigration, language (knowledge of English or French), rural/urban residence or by LHIN. However, this indicator did vary significantly by ethnicity among women.

Difficulties Obtaining Monitoring of Health Problems from a Family Doctor

For those people who reported that they had sought care from a family doctor to monitor health problems, 85 percent reported no difficulties accessing this type of care. This did not vary by neighbourhood income or by LHIN; however, women, younger adults and those with more education were more likely to report difficulties with access (i.e., they were less likely to report no difficulties). Women living in urban areas were less likely to report no difficulties obtaining monitoring of health problems than women from rural areas, however this was not the case for men.

As with many of the indicators in this section, women and men from certain ethnic minority groups, women who were more recent immigrants and women who spoke neither French nor English were less likely than their counterparts to report no difficulties obtaining monitoring of health problems from a family doctor. While 83 percent of White women did not have any difficulties obtaining monitoring of health problems, only 63 percent of South and West Asian or Arab women reported no difficulties accessing this care. Differences associated with ethnicity were similar for men; however the variation was not significant, possibly due to sample size. Women who had been in Canada for less than 10 years had more difficulties obtaining monitoring for health problems from a family doctor than women who had been in the country for a longer time, women who were born in Canada and men who had been in the country for less than 10 years. Finally, women who did not speak English or French most often at home were less likely to report no difficulties (70 percent) as compared to those who spoke French only (79 percent) or English (83 percent).

Difficulties with Access to Primary Care for an Urgent, Non-Emergent Health Problem

Urgent, non-emergent health care include but are not limited to, same-day services for fevers, headaches, injuries such as sprained ankles, vomiting or an unexplained rash. Among women and men who indicated that they had seen their doctor for an urgent, non-emergent reason in the previous 12 months, 82 percent indicated that they had no difficulties accessing this type of care. This did not vary by sex, language or geography, but did vary by income, education and age. Older adults, those from lower-income neighbourhoods and women and men with less education had more difficulties accessing urgent, non-emergent primary care.

Again, ethnicity and time since immigration were associated with reporting difficulties making an appointment for urgent, non-emergent primary care. Black adults were significantly less likely to report

having had no difficulties than White adults (70 percent versus 83 percent, respectively). As well, adults who had been in Canada for less than 10 years experienced more difficulties making an appointment for urgent, non-emergent primary health care than those who were born in Canada.

Among adults who reported having difficulties making an appointment for an urgent, non-emergent health problem, 53 percent of women and 54 percent of men reported specific access barriers including difficulty contacting a physician, nurse or other health care provider; not having a personal/family physician; difficulty getting or scheduling an appointment; lack of availability of the specific type of care required; or problems obtaining adequate information on where to go or how to seek care. Approximately half of respondents (53 percent of women and 50 percent of men) reported waiting too long at the doctor's office or clinic as their reason for reporting difficulties accessing care for an urgent, non-emergent health problem. This did not differ by sex.

Satisfaction with Access to Primary Care for an Urgent, Non-emergent Health Problem

Adults who had accessed urgent, non-emergent care from a family doctor were asked how satisfied they were with their access. Sixty-two percent of women and 58 percent of men were very satisfied with their experience seeing a doctor for this type of care. This did not vary by sex, but did vary by all other socioeconomic characteristics and by LHIN. Younger adults and women from lower-income neighbourhoods were less likely to be very satisfied with their experience of accessing care. Conversely, adults with lower educational attainment were more likely to be satisfied with their access to care; however, this variation may be influenced by their expectations.

Adults of South and West Asian or Arab ethnicity or East and Southeast Asian ethnicity were less likely to report being very satisfied with their access to urgent,

non-emergent primary care as compared to White and Aboriginal women and men. Thirty-four percent of women who had been in Canada for less than 10 years were very satisfied with their experience as compared to 62 percent of women who had been in the country for a longer period and 64 percent of Canadian born women. A similar pattern was seen among men. Less than half of women and men who did not speak either English or French most often at home reported being very satisfied as compared to almost two-thirds of adults who spoke either French or English.

Satisfaction with Care Provided for an Urgent, Non-emergent Health Problem

Overall, 67 percent of Ontarians reported being very satisfied with the care they received for an urgent, non-emergent health problem. This did not vary by sex, but did vary by neighbourhood income, educational attainment and age. Lower-income women, adults with less than a secondary school education and younger adults were less likely to be very satisfied with the care they received. Satisfaction with care received for an urgent, non-emergent health problem also varied across LHINs.

As with all measures of urgent, non-emergent care, satisfaction with the care received varied significantly by ethnicity, time since immigration and language spoken most often at home. Fifty percent of South and West Asian or Arab women reported being very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 72 percent of White women. Among women, 39 percent of those who had been in the country for less than 10 years were very satisfied with the care their doctor provided for an urgent, non-emergent health problem compared to 69 percent of women who had been in the country for a longer period and 71 percent of women who were born in Canada. Adults who did not speak English or French most often at home were also less satisfied with care received than those who spoke English or French.

Difficulties Accessing Health Information or Advice

Eighty-one percent of Ontarians reported no difficulties accessing primary health information or advice. This did not vary by sex, income, education, age, language, rural/urban residency or LHIN. Women who had been in the country for fewer than 10 years were less likely than those who had been in the country longer and women who were born in Canada to report no difficulties accessing health information or advice.

Unmet Health Care Needs

In the Ontario population, 14 percent of women and 10 percent of men reported unmet health care needs. The rates were higher among adults with two or more chronic conditions (17 percent of women versus 12 percent of men). Lower-income adults and women with higher levels of educational attainment were more likely to report unmet health care needs. Women were more likely to report unmet needs than men.

Among women, the proportion who reported unmet health care needs varied by ethnicity and time since immigration. Twenty-four percent of Aboriginal women reported unmet health care needs, as compared to 14 percent of White women and 10 percent of East and Southeast Asian women. Women who had been in the country for less than 10 years were more likely to report having unmet health care needs than those who had been in the country longer.

Almost half of all respondents who reported unmet health care needs indicated that availability including services not available in area; services not available at time required or waiting time too long was the reason for these unmet needs. However, more than one-quarter

of lower-income women stated that accessibility, including cost, was a reason for their unmet needs compared to one in ten higher-income women.

Dental Care

Among Ontario adults 32 percent had not visited a dentist in the last year. Men were more likely than women to have not seen a dentist, 35 percent versus 30 percent, respectively. There was a strong income and education gradient associated with this indicator; women and men with lower annual household income or with less educational attainment were more likely to have not seen a dentist. Over half of low-income women and men had not seen a dentist in the last year. The income pattern persisted across LHINs. Older or younger adults were more likely to have not seen a dentist in the previous 12 months than those aged 45-64; 43 percent of adults aged 65-79 and over half of adults aged 80 and older had not seen a dentist in the past year. As well, men from rural areas were less likely to have seen a dentist than those from urban areas.

As with almost all other indicators in this chapter, dental care varied by ethnicity and time since immigration. Over half of South and West Asian or Arab women in Ontario had not seen a dentist in the previous 12 months compared to one-quarter of White women. Among men, 45 percent of Black men, 43 percent of South and West Asian or Arab men and 42 percent of Aboriginal men had not seen a dentist in the previous 12 months as compared to 33 percent of White men. Women and men who had been in Canada for less than 10 years were significantly more likely to report not having seen a dentist in the previous 12 months compared to adults who had been in the country for a longer period or those who were Canadian born.



Section 7B

Access to Care for Chronic Disease

INTRODUCTION

This section provides an overview of access to care for chronic conditions in Ontario. Chronic conditions have a large impact on quality of life and the affected individual's ability to function and work, while placing enormous demands upon the health care system (see chapter 3, the Burden of Illness).

According to the Public Health Agency of Canada (PHAC), 16 million Canadians live with a chronic illness, and more than half of these are women.⁸⁴ Furthermore, chronic diseases are estimated to account for 87 percent of disability in Canada. In 2007, PHAC estimated that 67 percent of total health care costs were due to chronic diseases, with an additional \$52 billion in indirect costs due to loss of productivity and foregone income.⁸⁴ As the population of Ontario ages, the prevalence of chronic disease and its associated burden will continue to rise.

Much chronic disease is preventable through primary and secondary prevention in clinical and community settings. For individuals with chronic conditions, better primary care can help prevent hospitalizations and reduce health care utilization and costs. This will result in reduced burden on the health care system and contribute to health system sustainability.^{50, 85, 86} Access to effective care for chronic disease is therefore critical.

Because many of the risk factors for different chronic conditions are the same, people with chronic illnesses often have more than one condition. For example smoking increases the risk of lung disease, heart disease, stroke and cancer; obesity increases the risk of arthritis, diabetes, heart disease, hypertension and

cancer. Patterns of chronic disease and their consequences differ for women and men. For example, women are more likely than men to have arthritis, which leads to higher rates of disability. Women usually develop heart disease about ten years later than men, but women who have diabetes lose this advantage. Women are more likely to experience depression or have multiple chronic conditions than men.

The prevalence of chronic diseases also varies by ethnicity. Aboriginal people have a higher prevalence of diabetes than Canadians of European origin. South Asians are at increased risk for heart disease. Furthermore, socioeconomic position is strongly associated with an increased burden of common chronic conditions and comorbidity. Individuals with low income and/or less education are more likely to have chronic illnesses and comorbidity than those with higher income or more education.⁸⁷⁻⁸⁹

Numerous studies have identified gaps in the quality of care for chronic diseases. One study reported that fewer than half (47 percent) of Ontarians with diabetes have their blood pressure or blood sugar under control.⁹⁰ The mismatch between the way we deliver care and the needs of patients with chronic illnesses disproportionately affects those with the highest burden of

disease; women, people with low income or low levels of education and some ethnic minorities (including Aboriginal people). Furthermore, these groups are at greater risk for receiving care of suboptimal quality; gender, socioeconomic and ethnic disparities in quality of care have all been well-documented. Therefore, Ontarians with the greatest needs are also at the greatest risk for worse health outcomes.

In this section, we report on the types of physicians providing care to adults with prevalent diabetes (either type 1 or type 2) and the rates of hospitalizations for selected ambulatory care sensitive conditions (ACSC) including congestive heart failure, chronic obstructive pulmonary disease, asthma and diabetes. These conditions are among the most prevalent in Canada and cause substantial burden to individuals, their families, the health care system and society as a whole. Acute care hospitalizations for ACSCs can be prevented or reduced through effective primary and specialty care in outpatient settings. Lower-income Canadians have higher rates of hospitalizations for these conditions than those with higher incomes.⁹¹ In Ontario, one study found that patients living in low-income neighbourhoods were admitted to the hospital for diabetes 43 percent more often than those living in higher-income neighbourhoods after controlling for confounding factors.⁹²

In this section, we report on indicators of access to care for chronic disease, and examine differences associated

with sex, age, neighbourhood income and Local Health Integration Network (LHIN). The indicators include:

- Regular provider of care for adults with diabetes
- Hospital admission rates for specific ACSCs:
 - Congestive heart failure
 - Chronic obstructive pulmonary disease
 - Asthma
 - Diabetes

For the indicator of regular provider of diabetes care, the Ontario Diabetes Database (ODD) was used to identify adults aged 25 and older who had prevalent diabetes as of April 1, 2006. The sample was linked to the Ontario Health Insurance Plan (OHIP), physician claims data and was followed for two years to determine the types of physicians who provided care to adults with diabetes. The physician types were classified based on data from the Institute for Clinical Evaluative Sciences (ICES) Physician Database (IPDB) as: an endocrinologist or a general internist (specialist) only; a general practitioner/family physician (GP/FP) only; a specialist and a GP/FP; or neither type (but patients may have visited another type of specialist). The Canadian Institute for Health Information Discharge Abstracts Database (CIHI-DAD) was used to identify hospital admissions during the 2006/07 fiscal year for specific ACSCs, based on ICD10 diagnosis codes (see [Appendix 7.3](#) for details).

EXHIBITS AND FINDINGS

REGULAR PROVIDER OF CARE FOR ADULTS WITH DIABETES

Indicator: This indicator measures the types of physicians providing care to Ontarians aged 25 and older with prevalent diabetes as of April 1, 2006. We report the percentage of adults who received care from a general practitioner/family physician (GP/FP) only, an endocrinologist or general internist only (specialist), both a GP/FP and a specialist, or neither which was defined as patients with no visits to a GP/FP, endocrinologist or general internist within the two-year follow up period from April 1, 2006-March 31, 2008. Patients classified as having no diabetes-related physician care may have had visits to other specialists during the follow up period.

Background: Diabetes is one of the leading chronic diseases in Canada, and the prevalence among Canadians has risen from 5.2 percent in 1995 to 8.8 percent in 2005.⁹³ Diabetes is one of the most common causes of blindness, end-stage renal disease and cardiovascular complications among adults in developed countries.⁹³ In addition, direct health care costs of diabetes range from 2.5 percent to 15 percent of health care budgets.⁹³ Short-term and long-term complications of diabetes are preventable with guideline adherent diabetes care. Therefore, it is important for people with diabetes to have a regular source of medical care to ensure adequate monitoring and appropriate long-term follow up. The Canadian Diabetes Association recommends that regular care for adults with diabetes should be delivered by an interdisciplinary team of medical care providers. Most diabetes care is provided by family doctors⁹⁴ and due to an increase in the prevalence of diabetes and a decrease in the number of physician providing diabetes specialty care, the proportion of diabetes care provided by family doctors is likely to increase.⁹⁴ Individuals with insulin dependent diabetes, who tend to be younger or with more severe or complex disease, are most likely to benefit from specialty care.

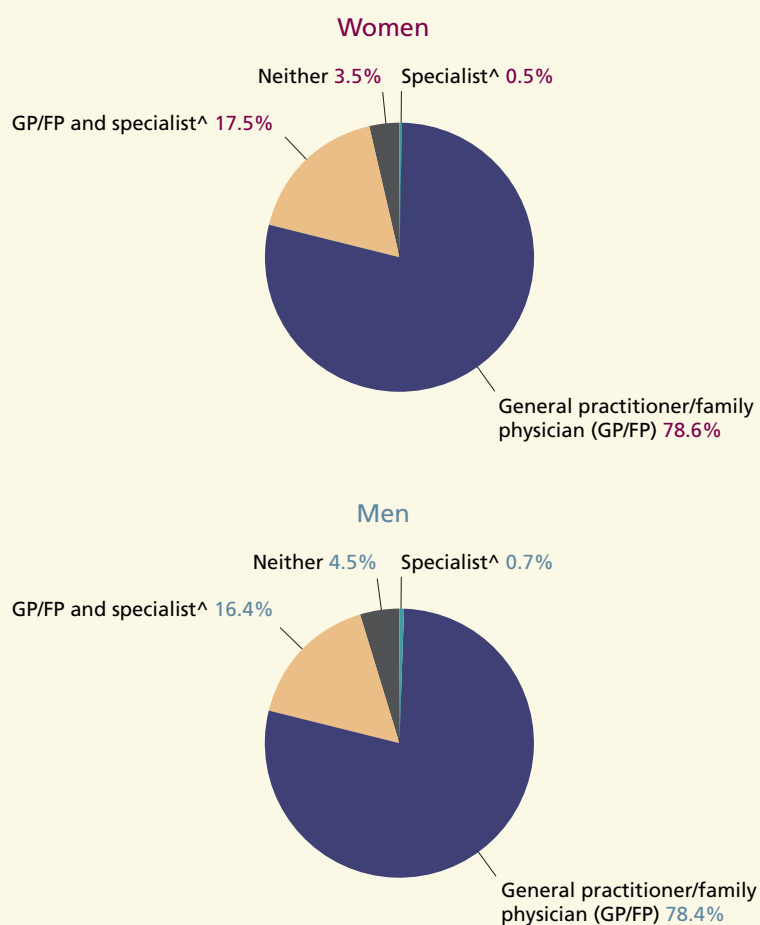
The data that were used for this indicator are from the Ontario Diabetes Database (ODD). The ODD is a cumulative dataset that uses an administrative data algorithm to identify adults with diabetes, not including gestational diabetes (see [Appendix 7.3](#) for details). The ODD contains incident and prevalent cases from 1991 to current. We included adults who were identified as having prevalent diabetes as of April 1, 2006. The types of physicians providing care to people with diabetes were captured during the two-year period from April 1, 2006-March 31, 2008. Diabetes specialty care was defined as care by an endocrinologist or a general internist. General internists may vary in their capacity to provide diabetes specialty care.

Findings: During the two-year follow up period, 79 percent of Ontarians with prevalent diabetes saw a GP/FP only, 17 percent saw a GP/FP as well as a specialist (endocrinologist or general internist), less than one percent saw a specialist only, and 4 percent had no visits to any of these types of providers.

EXHIBIT 7B.1 | Types of physicians providing care for adults aged 25 and older with diabetes, by sex and provider type, in Ontario, 2006/07–07/08

FINDINGS

- The types of physicians providing care to adults with diabetes were similar for women and men.
- The vast majority of Ontarians with diabetes received care from a GP/FP only (78.6 percent of women and 78.4 percent of men), while a smaller percentage received care from an endocrinologist and/or internist as well as a GP/FP (17.5 percent of women and 16.4 percent of men).
- There is a small but clinically important percentage of adults with diabetes who did not receive care from any of these types of physicians during the two-year follow up period (3.5 percent of women and 4.5 percent of men).

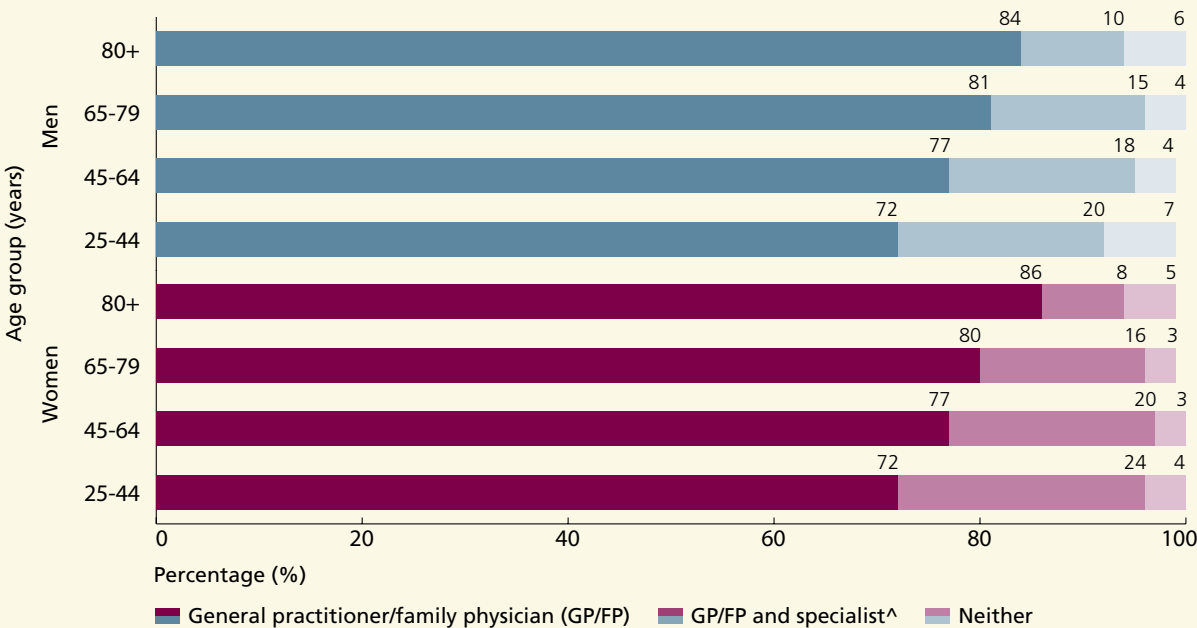


DATA SOURCES: Ontario Diabetes Database (ODD); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)

^ Specialists include endocrinologists or general internists

POWER Study

EXHIBIT 7B.2 | Types of physicians providing care for adults aged 25 and older with diabetes, by sex, age group and provider type, in Ontario, 2006/07-07/08



DATA SOURCES: Ontario Diabetes Database (ODD); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)

^ Specialists include endocrinologists or general internists

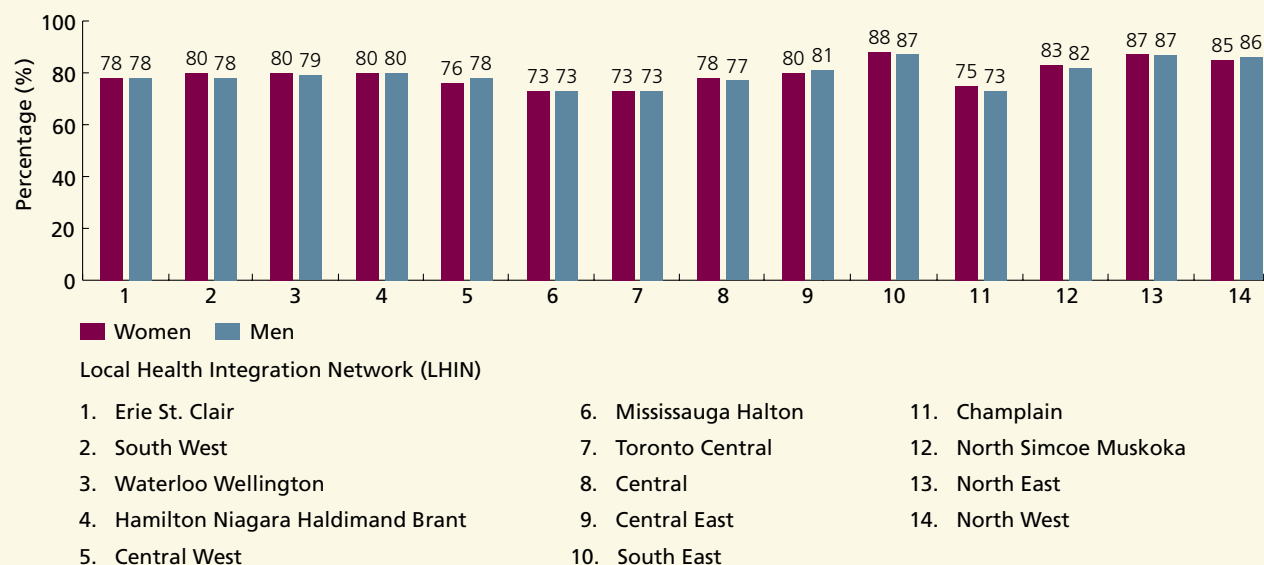
¥ Physician care by a specialist only could not be reported due to small numbers. Because of this and due to rounding, bars will not add to 100 percent

FINDINGS

- The types of physicians providing care to adults with diabetes varied by age for women and men. Older patients were more likely to receive care from a GP/FP only and less likely to receive care from a specialist (endocrinologist or general internist) in addition to their GP/FP.
- Among adults aged 25-44 with diabetes, 24 percent of women and 20 percent of men received care from a specialist in addition to care from a GP/FP, while less than 10 percent of adults aged 80 and older (8 percent of women and 10 percent of men) received care from both types of providers.
- Young men, aged 25-44, were more likely than older men to have had no visits to either a GP/FP or a specialist during the follow up period.
- Adults with diabetes who lived in lower-income neighbourhoods were more likely to have received no care from either provider type in the previous two years than those living in the highest-income neighbourhoods, however the differences were small (five percent versus four percent, respectively) (data not shown).

POWER Study

EXHIBIT 7B.3 | Percentage of adults aged 25 and older with diabetes who received care from a general practitioner/family physician (GP/FP) only, by sex and Local Health Integration Network (LHIN), in Ontario, 2006/07-07/08



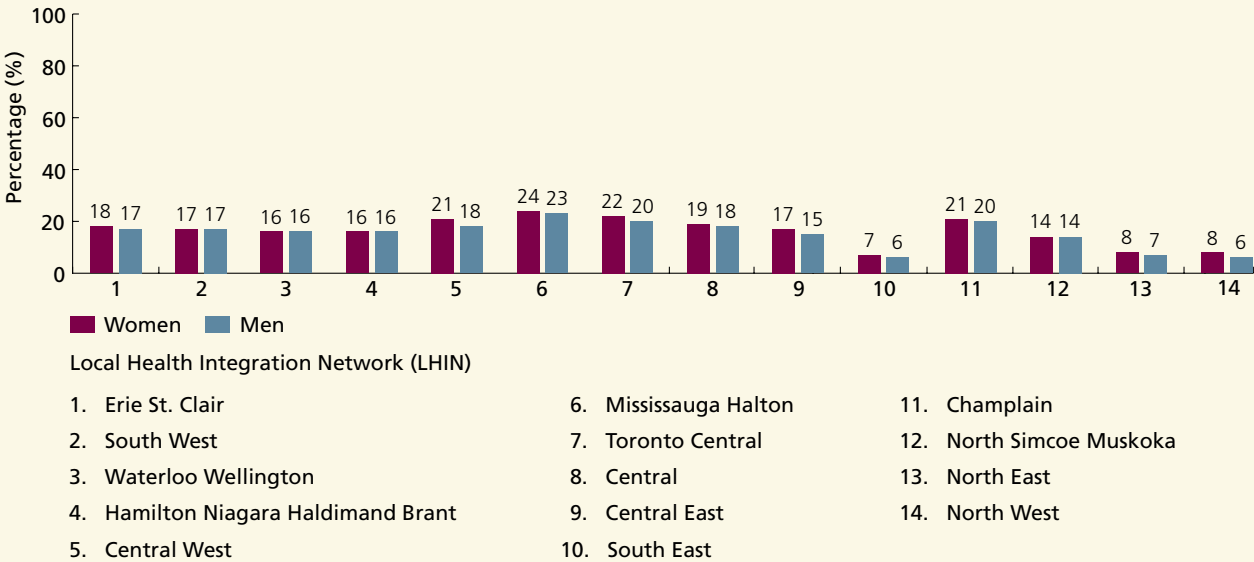
DATA SOURCES: Ontario Diabetes Database (ODD); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)

FINDINGS

- The percentage of adults with diabetes who received care from a GP/FP alone varied significantly across LHINs.
- Among women with diabetes, the percentage who received care from a GP/FP alone ranged from 73 percent (Mississauga Halton and Toronto Central LHINs) to 88 percent (South East LHIN).
- The percentage of men with diabetes who received care from a GP/FP alone ranged from 73 percent (Mississauga Halton, Toronto Central and Champlain LHINs) to 87 percent (South East and North East LHINs).

POWER Study

EXHIBIT 7B.4 | Percentage of adults aged 25 and older with diabetes who received care from a general practitioner/family physician (GP/FP) and a specialist,[^] by sex and Local Health Integration Network (LHIN), in Ontario, 2006/07-07/08



DATA SOURCES: Ontario Diabetes Database (ODD); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)

[^] Specialists include endocrinologists or general internists

FINDINGS

- The percentage of adults with diabetes who received care from a GP/FP and from a specialist (endocrinologist and/or general internist) varied significantly across LHINs.
- Among women with diabetes, the percentage who received care from a GP/FP and from a specialist ranged from 7 percent (South East LHIN) to 24 percent (Mississauga Halton LHIN).
- The percentage of men with diabetes who received care from a GP/FP and a specialist ranged from 6 percent (South East and North West LHINs) to 23 percent (Mississauga Halton LHIN).

POWER Study

HOSPITAL ADMISSION RATES FOR AMBULATORY CARE SENSITIVE CONDITIONS (ACSC)

Indicator: This indicator measures the rates of acute care hospitalizations per 100,000 adults aged 25 and older for conditions (congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD) asthma, and diabetes) where effective ambulatory care can prevent or reduce the need for admission to hospital.

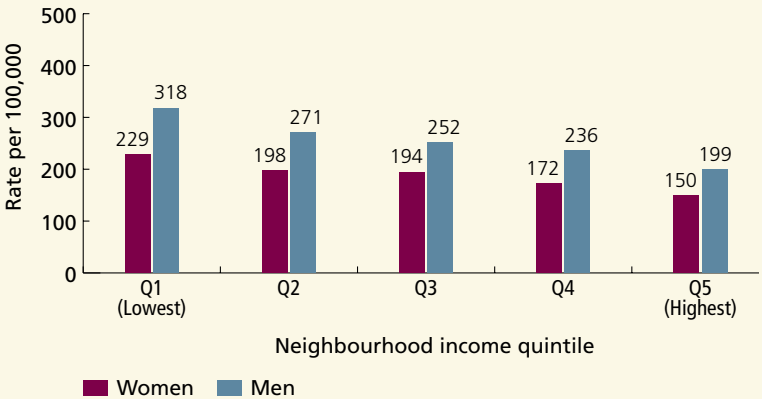
Background: Hospitalization rates for ambulatory care sensitive conditions (ACSC) are used as an indicator of impaired access to or suboptimal quality of ambulatory care.⁹⁵ While it is not possible to eliminate all hospitalizations for these conditions, many of these hospitalizations could potentially be avoided. Each condition that is examined is responsive to primary prevention, early diagnosis and chronic disease management including patient self-management and care coordination.^{95, 96} Better management and monitoring of these conditions reduces the occurrence of acute complications (e.g., decompensated CHF, uncontrolled blood sugar in patients with diabetes).^{50, 95, 97} Thus, optimal, timely and effective primary health care should reduce the rates of potentially avoidable hospitalizations. There are well-documented differences in hospital admission rates for ACSCs associated with sex and socioeconomic status.⁸⁶ Hospital admission rates for ACSCs were based on most responsible diagnosis and excluded patients with ACSCs who were admitted for elective procedures or surgery.

Findings: Among adults aged 25 and older, the age-standardized hospitalization rates for ACSCs in 2006/07 were 217 per 100,000 adults for CHF (190 per 100,000 women and 255 per 100,000 men); 273 per 100,000 adults for COPD (239 per 100,000 women and 317 per 100,000 men); 27 per 100,000 adults for asthma (38 per 100,000 women and 16 per 100,000 men); and 79 per 100,000 adults for diabetes (63 per 100,000 women and 97 per 100,000 men). The hospitalization rates for all four ACSCs examined varied significantly by sex.

EXHIBIT 7B.5 | Age-standardized rates of hospitalization for congestive heart failure (CHF) per 100,000 adults aged 25 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- There was an income gradient in the age-standardized hospitalization rate for CHF. As neighbourhood income decreased, the rates increased.
- Women living in the lowest-income neighbourhoods were 53 percent more likely to be hospitalized for CHF than women living in the highest-income neighbourhoods (229 per 100,000 versus 150 per 100,000, respectively).
- Men living in the lowest-income neighbourhoods were 60 percent more likely to be hospitalized for CHF than men living in the highest-income neighbourhoods (318 per 100,000 versus 199 per 100,000, respectively).
- Men had higher CHF hospitalization rates than women across all neighbourhood income quintiles.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

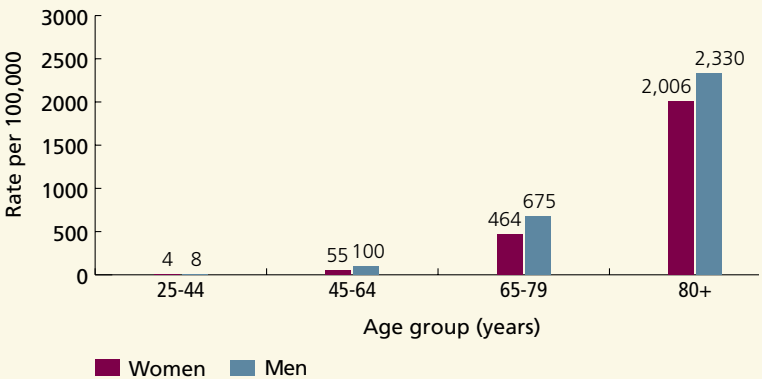
NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 7B.6 | Age-specific rates of hospitalization for congestive heart failure (CHF) per 100,000 adults aged 25 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- The hospitalization rate for CHF increased with age for both women and men. Most CHF hospitalizations occurred among adults aged 65 and older, with the highest rates occurring among those aged 80 and older.
- Among adults aged 80 and older, CHF hospitalization rates were 2,006 per 100,000 women and 2,330 per 100,000 men.
- CHF hospitalization rates were much lower for those aged 45-64 and negligible for those aged 25-44.



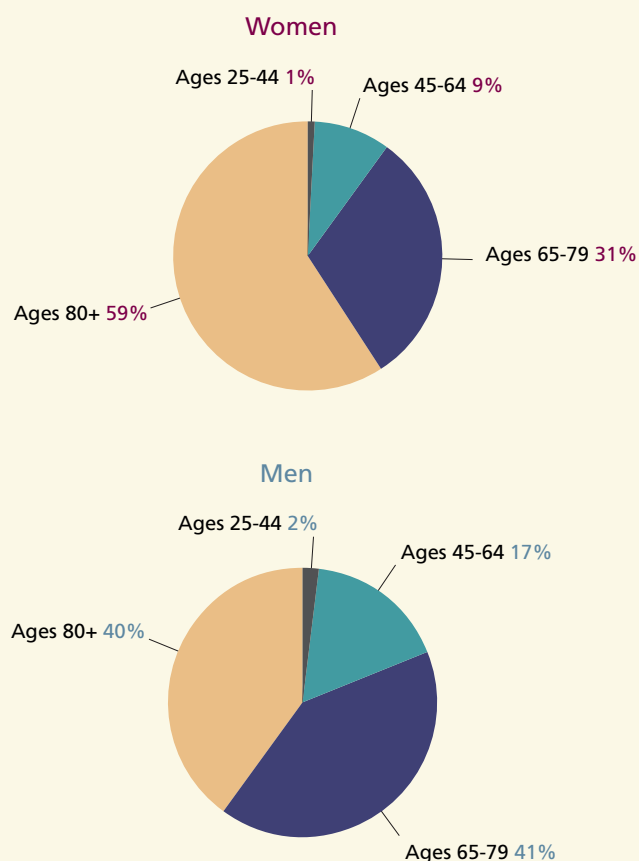
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.7 | Age distribution of congestive heart failure (CHF) hospitalizations (percentage) for adults aged 25 and older, by sex, in Ontario, 2006/07

FINDINGS

- The overwhelming majority of CHF hospitalizations for CHF were among adults aged 65 and older (90 percent of women and 81 percent of men).
- The age distribution of CHF hospitalizations differed between women and men. Women hospitalized with CHF were more likely to be aged 80 and older and less likely to be under age 65 than men hospitalized for this condition.
- Fifty-nine percent of CHF hospitalizations in women and 40 percent of those in men were among patients aged 80 and older.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.8 | Age-standardized rates of hospitalization for congestive heart failure (CHF) per 100,000 adults aged 25 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2006/07

FINDINGS

- Age-standardized CHF hospitalization rates varied significantly across LHINs among both women and men.
- Across all LHINs with one exception, women and men from lower-income neighbourhoods had significantly higher CHF hospitalization rates than those from higher-income neighbourhoods.
- CHF hospitalization rates ranged from 178 per 100,000 (Central West LHIN) to 319 per 100,000 (North West LHIN) among women living in lower-income neighbourhoods and from 137 per 100,000 (Toronto Central LHIN) to 249 per 100,000 (North East LHIN) among women living in higher-income neighbourhoods.
- CHF hospitalization rates ranged from 225 per 100,000 (Central East LHIN) to 420 per 100,000 (Erie St. Clair LHIN) among men living in lower-income neighbourhoods and from 181 per 100,000 (Toronto Central LHIN) to 341 per 100,000 (North East LHIN) among men living in higher-income neighbourhoods.

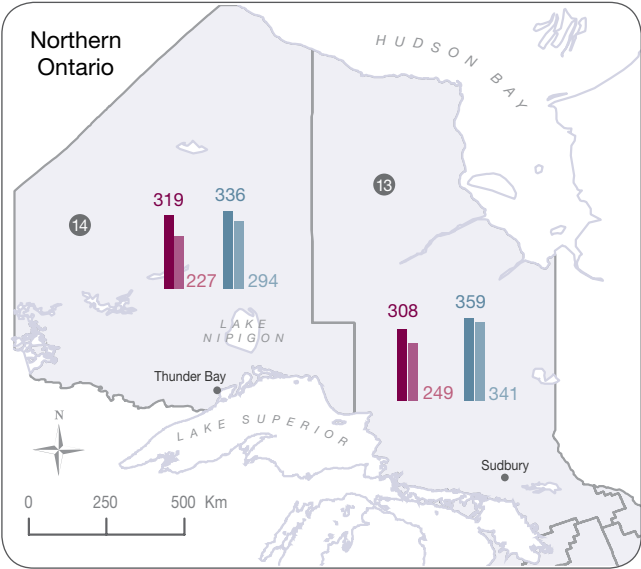
POWER Study

Overall Ontario

In Ontario, 213 per 100,000 lower-income women, 172 per 100,000 higher-income women, 294 per 100,000 lower-income men and 228 per 100,000 higher-income men were hospitalized for congestive heart failure.

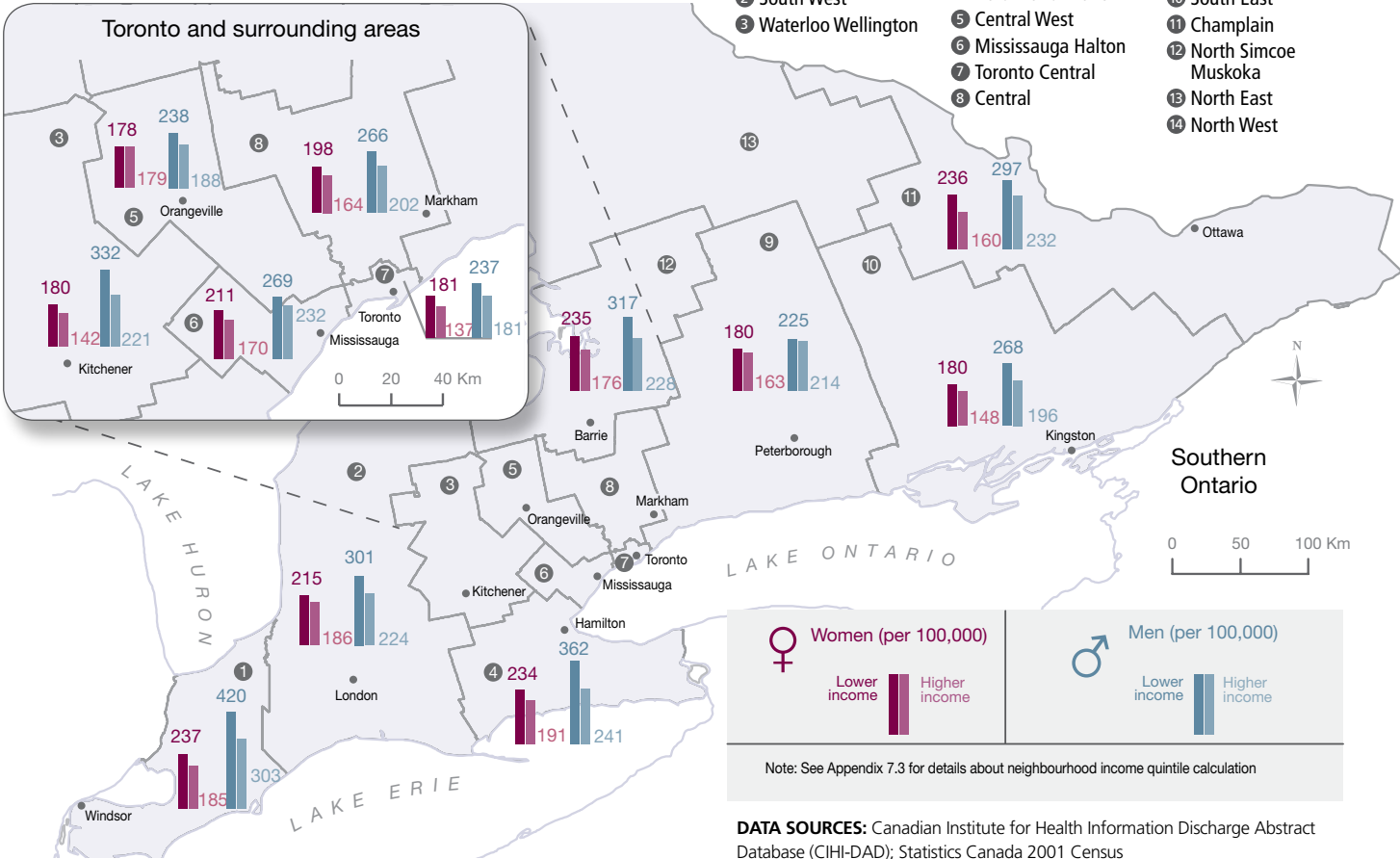
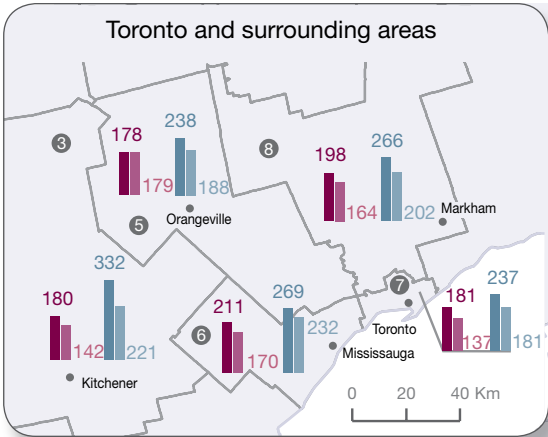


Northern Ontario



Local Health Integration Networks (LHINs)

- 1 Erie St. Clair
- 2 South West
- 3 Waterloo Wellington
- 4 Hamilton Niagara Haldimand Brant
- 5 Central West
- 6 Mississauga Halton
- 7 Toronto Central
- 8 Central
- 9 Central East
- 10 South East
- 11 Champlain
- 12 North Simcoe Muskoka
- 13 North East
- 14 North West



♀ Women (per 100,000)

Lower income Higher income

♂ Men (per 100,000)

Lower income Higher income

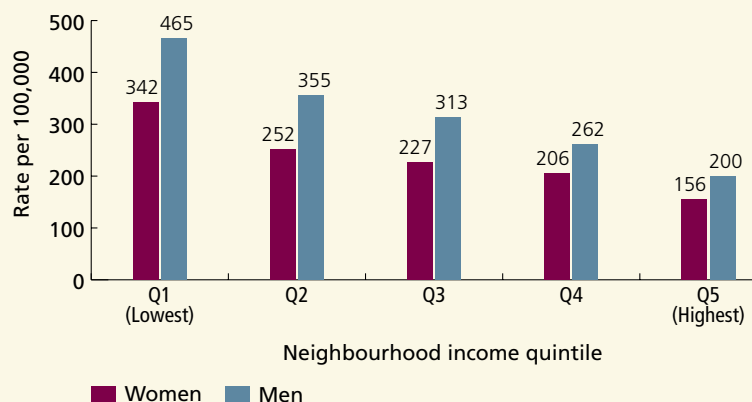
Note: See Appendix 7.3 for details about neighbourhood income quintile calculation

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

EXHIBIT 7B.9 | Age-standardized rates of hospitalization for chronic obstructive pulmonary disease (COPD) per 100,000 adults aged 25 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- There was an income gradient in the age-standardized hospitalization rates for COPD. As neighbourhood income decreased, rates increased.
- Women living in the lowest-income neighbourhoods were more than twice as likely to have a hospital admission for COPD as those living in the highest-income neighbourhoods (342 per 100,000 versus 156 per 100,000, respectively).
- Men living in the lowest-income neighbourhoods were also more than twice as likely to have a hospital admission for COPD as those living in the highest-income neighbourhoods (465 per 100,000 versus 200 per 100,000, respectively).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

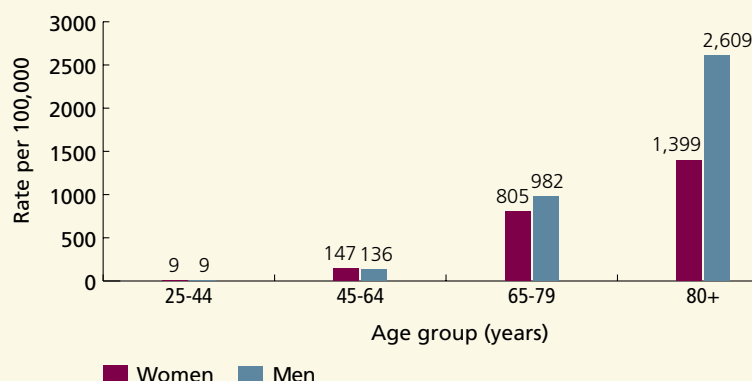
NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 7B.10 | Age-specific rates of hospitalization for chronic obstructive pulmonary disease (COPD) per 100,000 adults aged 25 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- COPD hospitalization rates increased with age, from 9 per 100,000 adults aged 25-44 to 1835 per 100,000 adults aged 80 and older (data not shown).
- Among both women and men, most COPD hospitalization rate for those aged 65 and older.
- Among adults aged 80 and older, the COPD hospitalization rate for men was nearly twice the rate for women (2,609 per 100,000 versus 1,399 per 100,000, respectively).



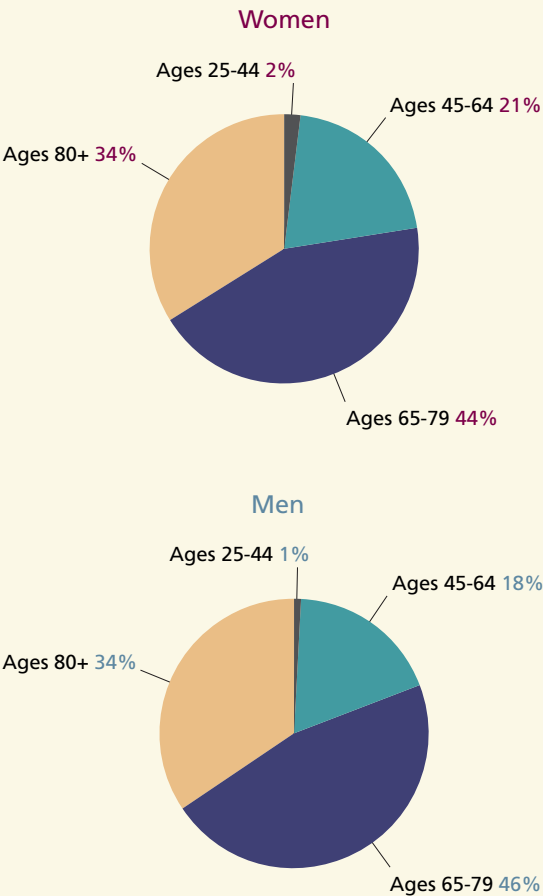
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.11 | Age distribution of chronic obstructive pulmonary disease (COPD) hospitalizations (percentage) for adults aged 25 and older, by sex, in Ontario, 2006/07

FINDINGS

- Among adults who were hospitalized for COPD, the overwhelming majority of hospitalizations were among those aged 65 and older (78 percent of women and 80 percent of men).
- Thirty-four percent of COPD hospitalizations for both women and men were among those aged 80 and older.
- The age distributions of COPD hospitalizations were similar for women and men.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.12 | Age-standardized rates of hospitalization for chronic obstructive pulmonary disease (COPD) per 100,000 adults aged 25 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2006/07

FINDINGS

- Age-standardized COPD hospitalization rates varied significantly across LHINS for women and for men.
- Across all LHINS, women and men living in lower-income neighbourhoods had higher COPD hospitalization rates than those living in higher-income neighbourhoods.
- COPD hospitalization rates ranged from 146 per 100,000 (Central LHIN) to 541 per 100,000 (North West LHIN) among women living in lower-income neighbourhoods and from 122 per 100,000 (Toronto Central and Central LHINs) to 385 per 100,000 (North East LHIN) among women living in higher-income neighbourhoods.
- COPD hospitalization rates ranged from 242 per 100,000 (Central LHIN) to 740 per 100,000 (North West LHIN) among men living in lower-income neighbourhoods and from 159 per 100,000 (Central LHIN) to 476 per 100,000 (North East LHIN) among men living in higher-income neighbourhoods.

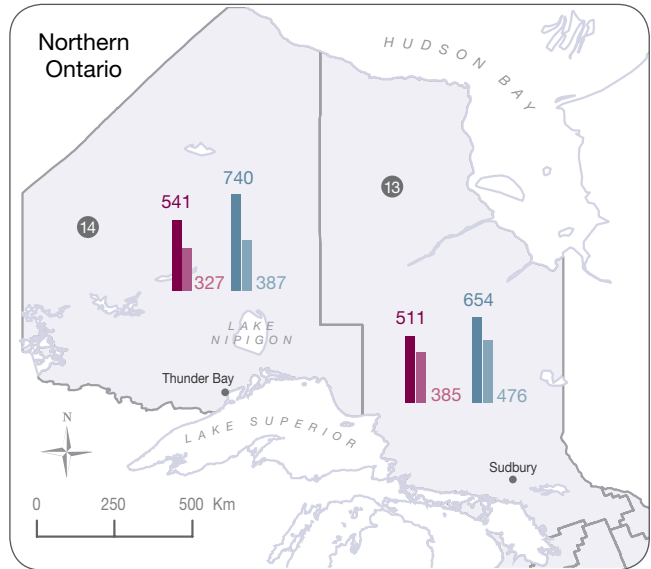
POWER Study

Overall Ontario

In Ontario, 297 per 100,000 lower-income women, 196 per 100,000 higher-income women, 408 per 100,000 lower-income men and 257 per 100,000 higher-income men were hospitalized for COPD.

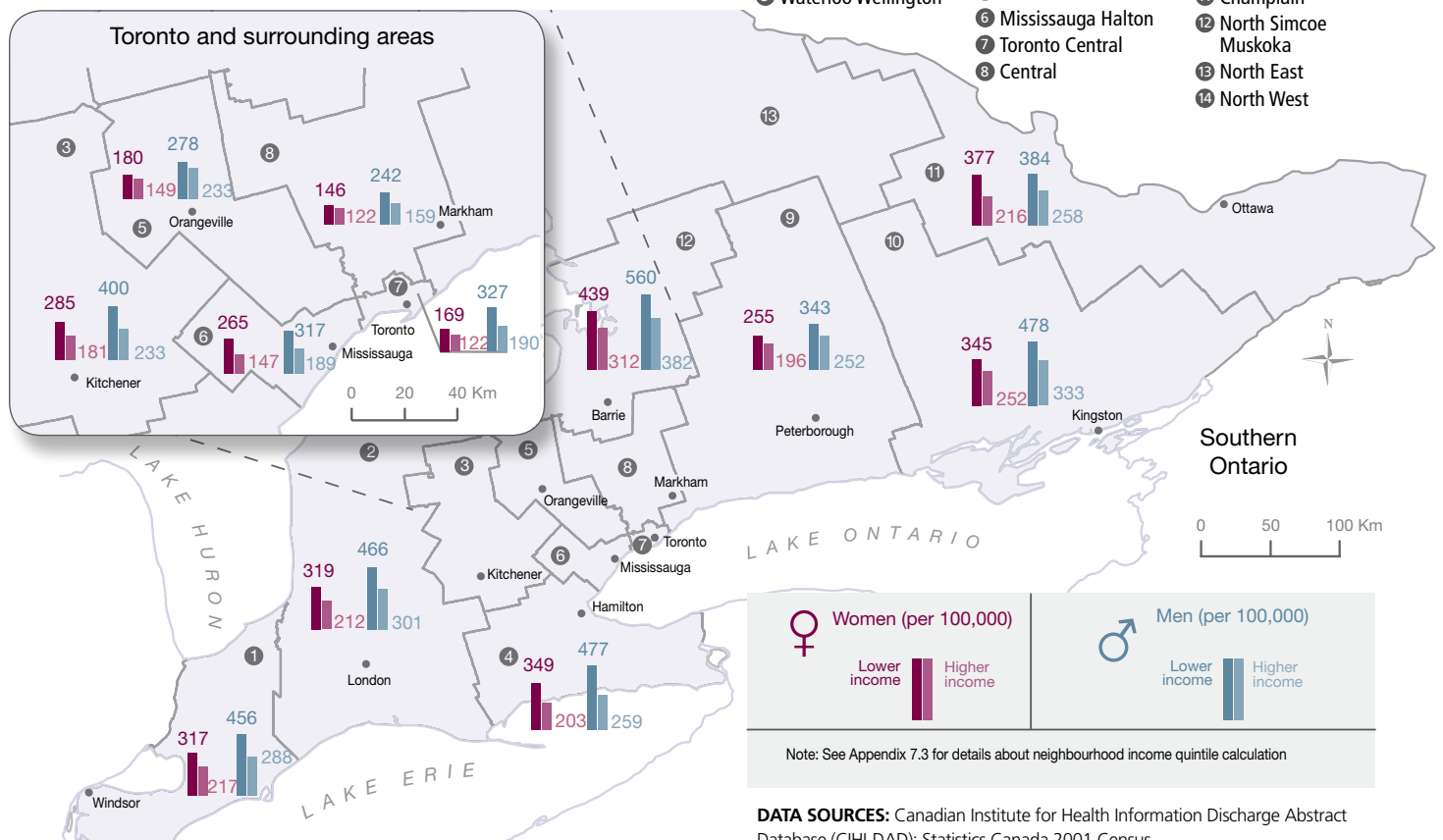


Northern Ontario

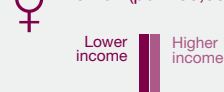


Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |



♀ Women (per 100,000)



♂ Men (per 100,000)



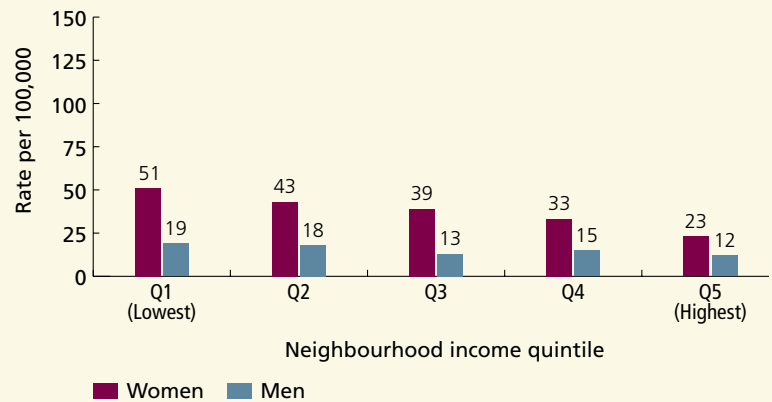
Note: See Appendix 7.3 for details about neighbourhood income quintile calculation

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

EXHIBIT 7B.13 | Age-standardized rates of hospitalization for asthma per 100,000 adults aged 25 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- There was an income gradient in the age-standardized hospitalization rates for asthma. As neighbourhood income decreased, hospitalization rates increased. The income gradient was more pronounced among women than among men.
- Across all neighbourhood income quintiles, women had higher hospitalization rates for asthma than men.
- Among women, asthma hospitalization rates ranged from 23 per 100,000 among women living in the highest-income neighbourhoods to 51 per 100,000 among women living in the lowest-income neighbourhoods.
- Among men, asthma hospitalization rates ranged from 12 per 100,000 among men living in the highest-income neighbourhoods to 19 per 100,000 among men living in the lowest-income neighbourhoods.



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

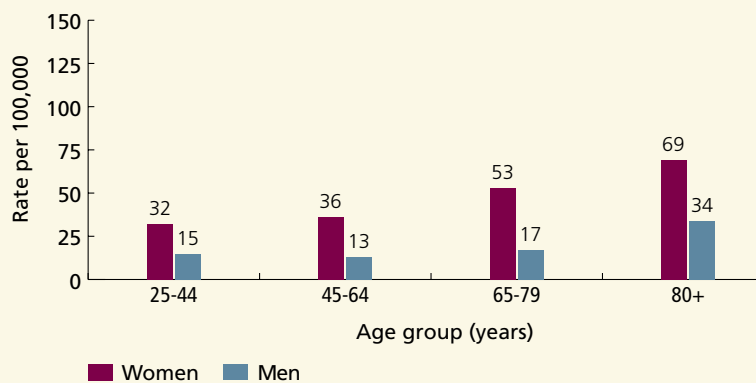
NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 7B.14 | Age-specific rates of hospitalization for asthma per 100,000 adults aged 25 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- Hospitalization rates for asthma increased with age, with the highest rates observed among those aged 80 and older.
- Among women, asthma hospitalization rates increased with age, from 32 per 100,000 women aged 25-44 to 69 per 100,000 women aged 80 and older.
- Among men, asthma hospitalization rates were similar across most age groups, but doubled for men aged 80 and older.



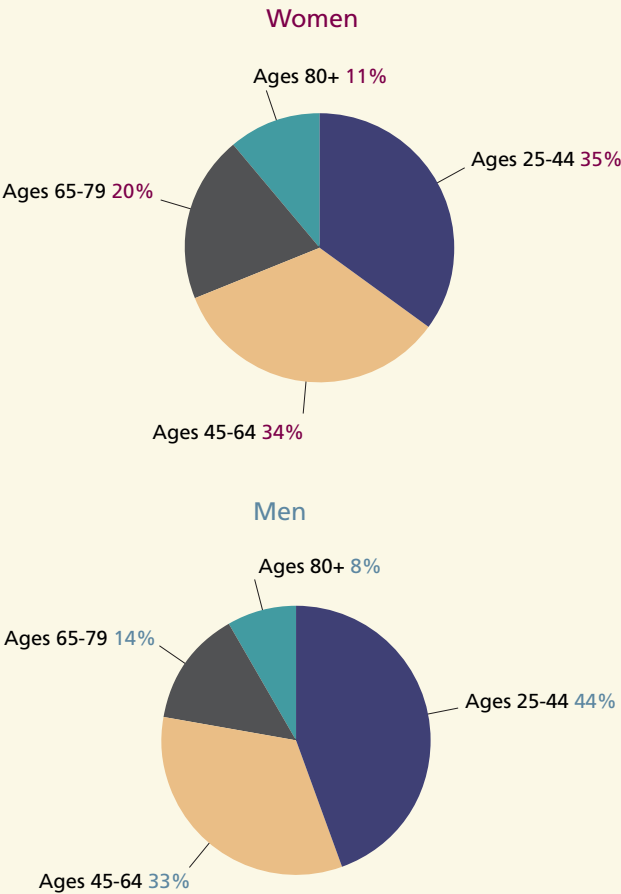
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.15 | Age distribution of asthma hospitalizations (percentage) for adults aged 25 and older, by sex, in Ontario, 2006/07

FINDINGS

- Among adults who were hospitalized for asthma, seven out of ten hospitalizations were among those aged 25-64 (69 percent of women and 77 percent of men).
- Among women who were hospitalized for asthma, 35 percent of admissions occurred among those aged 25-44.
- Among men who were hospitalized for asthma, 44 percent of admissions occurred among those aged 25-44.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.16 | Age-standardized rates of hospitalization for asthma per 100,000 adults aged 25 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2006/07

FINDINGS

- Age-standardized asthma hospitalization rates varied significantly across LHINs among women and men.
- Across most LHINs, with few exceptions, women and men living in lower-income neighbourhoods had higher asthma hospitalization rates than those living in higher-income neighbourhoods.
- Asthma hospitalization rates ranged from 37 per 100,000 (South West and Champlain LHINs) to 93 per 100,000 (North West LHIN) among women living in lower-income neighbourhoods and from 21 per 100,000 (South West LHIN) to 63 per 100,000 (Central West LHIN) among women living in higher-income neighbourhoods.
- Asthma hospitalization rates ranged from 12 per 100,000 (Central LHIN) to 31 per 100,000 (North West LHIN) among men living in lower-income neighbourhoods and from 6 per 100,000 (South West LHIN) to 25 per 100,000 (North East and North West LHINs) among men living in higher-income neighbourhoods.

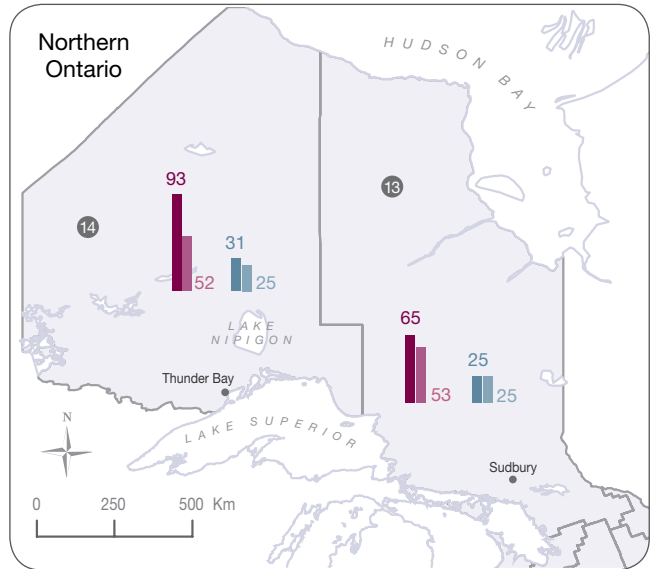
POWER Study

Overall Ontario

In Ontario, 47 per 100,000 lower-income women, 32 per 100,000 higher-income women, 19 per 100,000 lower-income men and 14 per 100,000 higher-income men were hospitalized for asthma.



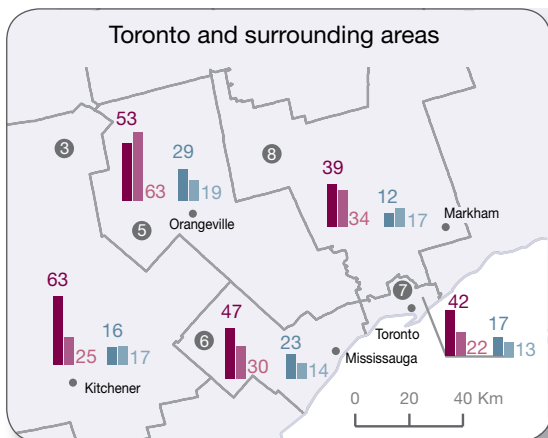
Northern Ontario



Local Health Integration Networks (LHINs)

- | | | |
|-----------------------|------------------------------------|-------------------------|
| 1 Erie St. Clair | 4 Hamilton Niagara Haldimand Brant | 9 Central East |
| 2 South West | 5 Central West | 10 South East |
| 3 Waterloo Wellington | 6 Mississauga Halton | 11 Champlain |
| | 7 Toronto Central | 12 North Simcoe Muskoka |
| | 8 Central | 13 North East |
| | | 14 North West |

Toronto and surrounding areas



Southern Ontario



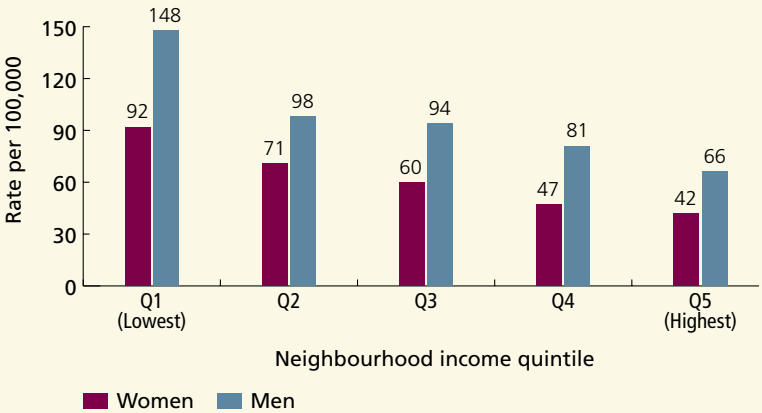
Note: See Appendix 7.3 for details about neighbourhood income quintile calculation

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

EXHIBIT 7B.17 | Age-standardized rates of hospitalization for diabetes per 100,000 adults aged 25 and older, by sex and neighbourhood income quintile, in Ontario, 2006/07

FINDINGS

- There was an income gradient in the age-standardized hospitalization rates for diabetes. As neighbourhood income decreased, hospitalization rates increased.
- Men had higher hospitalization rates for diabetes than women across all neighbourhood income quintiles.
- Women living in the lowest-income neighbourhoods were more than twice as likely to be hospitalized for diabetes as women living in the highest-income neighbourhoods (92 per 100,000 women versus 42 per 100,000 women, respectively).
- Men living in the lowest-income neighbourhoods were more than twice as likely to be hospitalized for diabetes as men living in the highest-income neighbourhoods (148 per 100,000 men versus 66 per 100,000 men, respectively).



DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

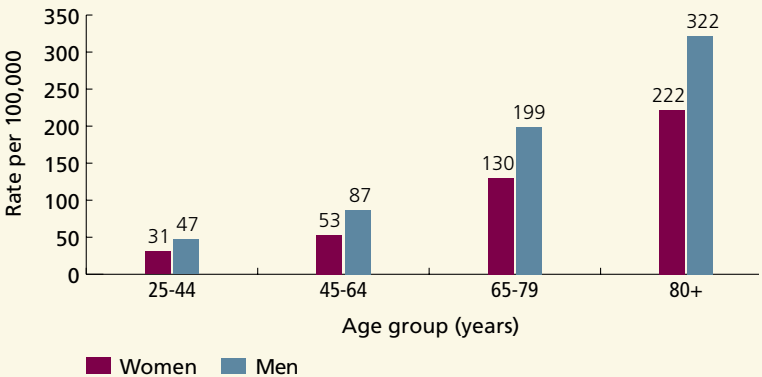
NOTE: See [Appendix 7.3](#) for details about neighbourhood income quintile calculation

POWER Study

EXHIBIT 7B.18 | Age-specific rates of hospitalization for diabetes per 100,000 adults aged 25 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- The hospitalization rates for diabetes increased with age for both women and men, with the highest rates observed among those aged 80 and older.
- For women, the diabetes hospitalization rates ranged from 31 per 100,000 women aged 25-44 to 222 per 100,000 women aged 80 and older.
- The diabetes hospitalization rates for men ranged from 47 per 100,000 men aged 25-44 to 322 per 100,000 men aged 80 and older.



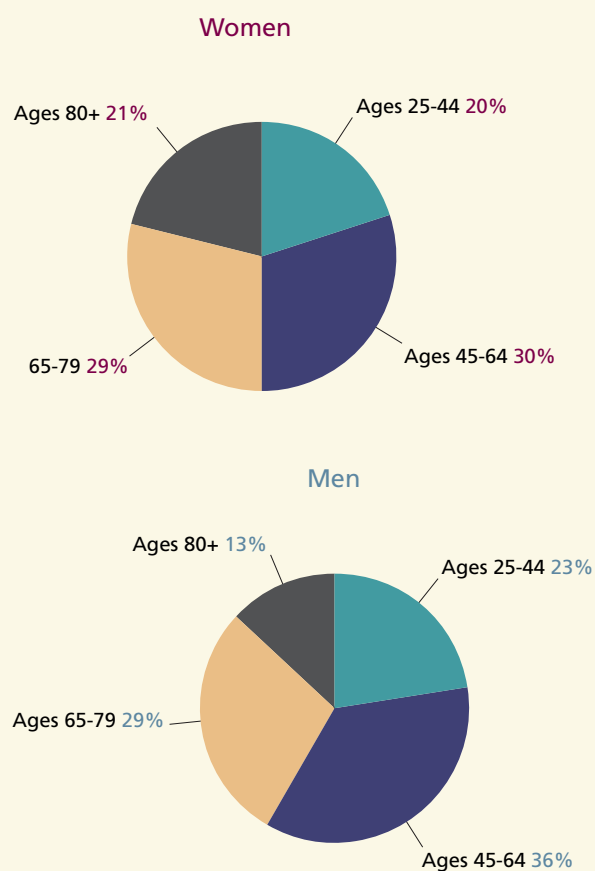
DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

POWER Study

EXHIBIT 7B.19 | Age distribution of diabetes hospitalizations (percentage) for adults aged 25 and older, by sex, in Ontario, 2006/07

FINDINGS

- Among adults who were hospitalized for diabetes, at least half of all hospitalizations were among those aged 25-64 (50 percent of women and 59 percent of men).
- The age distribution of diabetes hospitalizations was somewhat younger for men than for women.



DATA SOURCE: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)

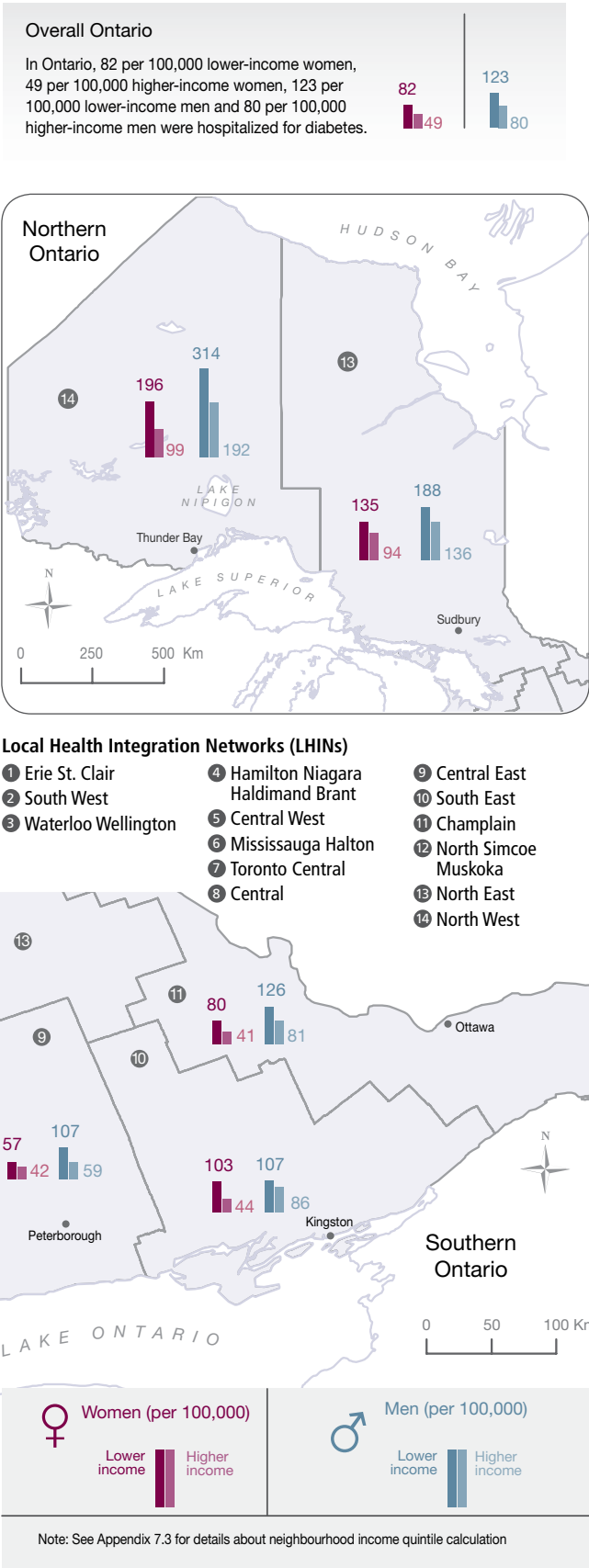
POWER Study

EXHIBIT 7B.20 | Age-standardized rates of hospitalization for diabetes per 100,000 adults aged 25 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2006/07

FINDINGS

- Age-standardized hospitalization rates varied significantly across LHINs among women and men.
- Across most LHINs, with one exception, women and men living in lower-income neighbourhoods had significantly higher diabetes hospitalization rates than those living in higher-income neighbourhoods.
- Diabetes hospitalization rates for diabetes ranged from 46 per 100,000 (Central West LHIN) to 196 per 100,000 (North West LHIN) among women living in lower-income neighbourhoods and from 38 per 100,000 (Central LHIN) to 99 per 100,000 (North West LHIN) among women living in higher-income neighbourhoods.
- Diabetes hospitalization rates ranged from 76 per 100,000 (Central West LHIN) to 314 per 100,000 (North West LHIN) among men living in lower-income neighbourhoods and from 58 per 100,000 (Mississauga Halton LHIN) to 192 per 100,000 (North West LHIN) among men living in higher-income neighbourhoods.

POWER Study



Section 7B

SUMMARY OF FINDINGS

This section reports on physician care for adults with diabetes and the rates of hospitalizations for ambulatory care sensitive conditions (ACSC) (i.e., conditions for which hospitalization could potentially be avoided through primary prevention, early diagnosis and chronic disease management). These indicators were evaluated using administrative data and as such could be compared by sex, age group, neighbourhood income and Local Health Integration Network (LHIN) but not by ethnicity, length of time in Canada or language.

Findings for the indicators reported in this section are summarized below.

Regular Provider of Care for Adults with Diabetes

In Ontario, the majority of adults with diabetes (almost eight out of ten) received care from a general practitioner/family physician (GP/FP) only during the two-year follow up period. An additional 17 percent received care from an endocrinologist and/or general internist (specialist) as well as a GP/FP. However, 4 percent of adults with prevalent diabetes did not see either a GP/FP or a specialist during the two-year follow up period. The type of physician providing care to adults with diabetes did not vary by sex or by neighbourhood income.

Older adults (who are more likely to have type 2 diabetes) were more likely than younger adults (who are more likely to have type 1 diabetes, requiring specialty care) to have received care from a GP/FP and less likely to have received care from an endocrinologist and/or general internist (specialist). There was considerable LHIN variation in the proportion of adults with diabetes who received care only from a GP/FP and those who

received specialist care in addition to receiving care from a GP/FP.

Hospital Admission Rates for Ambulatory Care Sensitive Conditions

In Ontario, the age-standardized hospitalization rates for ACSCs were 217 per 100,000 adults for congestive heart failure (CHF), 273 per 100,000 adults for chronic obstructive pulmonary disease (COPD), 27 per 100,000 adults for asthma and 79 per 100,000 adults for diabetes. Women had higher hospitalization rates for asthma while men had higher hospitalization rates for CHF, COPD and diabetes. For all four conditions, women and men living in the lowest-income neighbourhoods were significantly more likely to be hospitalized than those living in the highest-income neighbourhoods. The age-standardized ACSC hospitalization rates varied significantly across LHINs; and sex and income patterns noted at the provincial levels persisted almost uniformly at the LHIN level.

Hospitalization rates for ACSCs also increased significantly with age, however the age variation was most pronounced among women and men hospitalized for CHF or COPD. Among women, 90 percent of CHF admissions, 78 percent of COPD admissions and 50 percent of diabetes admissions occurred in women aged 65 and older. Among men, 81 percent of CHF admissions, 80 percent of COPD admissions and 41 percent of diabetes admissions occurred in those aged 65 and older. Most asthma admissions occurred among those under age 65; 69 percent of women and 77 percent of men who were hospitalized with asthma were aged 25-64.

Section 7C

Access to Specialized Services and Home Care

INTRODUCTION

In this section we provide an overview of access and wait times for specialized services and home care in Ontario.

Timely access to specialized services is an essential component of health care access. Difficulty accessing these services can lead to diagnostic or treatment delays that could ultimately result in worse health outcomes. Home care services allow individuals to receive chronic and rehabilitative care in their homes rather than in a hospital or long-term care setting. Delays in receiving these services can result in avoidable use of emergency departments, hospitals and long term care facilities.

In Canada, socioeconomic inequities in access to specialist care have been found to be greater than socioeconomic differences in access to primary care.^{3, 4} In Ontario, higher rates of magnetic resonance (MR) imaging, hip and knee total joint replacements and radical prostatectomy have been observed for those living in higher- compared to lower-income neighbourhoods.⁹⁸ Recent increases in access to MR imaging in the province appear to have disproportionately benefited those of higher socioeconomic status.^{99, 100} There is evidence that some diagnostic tests and surgical procedures may be over utilized by some patients while others have difficulty accessing this care.¹⁰¹⁻¹⁰³ Improving access to these services for all who need them can therefore not be accomplished by increasing capacity alone and will require increased efficiency by assuring appropriateness of use. Along with socioeconomic differences in access, prior studies have shown a gender bias in receipt of

specific speciality services.¹⁰⁴⁻¹⁰⁶ Little is known about differences in access to these services associated with ethnicity or immigration status.

While socioeconomic differences in use of specialty services have been found in multiple studies, wait times for those receiving services have been found to be similar across socioeconomic groups in Ontario.^{98, 107-109} This suggests that once patients are put on a waiting list, they are treated similarly, regardless of socioeconomic status.⁹⁸ Wait times were also similar for women and men and for patients of different ages in Ontario.⁹⁸

In this section, we provide an analysis of indicators for access to and wait times for specialized services and home care, and examine the differences associated with sex, age, income, education, ethnicity, time since immigration, language and Local Health Integration Networks (LHINs) as data allows. The indicators include:

- Difficulties accessing specialized services in the past 12 months
 - Specialist care for a diagnosis or consultation (including visits to medical specialists but excluding optometrists)
 - Non-emergent diagnostic tests, including non-emergency MR imaging, computed tomography (CT) scanning, and angiography
 - Elective surgery (excluding laser eye surgery)

- Wait times for specialized services (specialist care, non-emergent diagnostic tests, elective surgery)
 - Median wait times
 - The percentage of adults who waited less than two months for a specialized service
- Mean number of days between the date a home care client's case is opened and the date of first administration of the Resident Assessment Intake Instrument – Home Care (RAI-HC) for new long-term care patients. The RAI-HC provides clinical, functional and utilization information for quality improvement and planning of services.

Data on access and wait times for specialized services were obtained from the Canadian Community Health Survey (CCHS) 2007. We report the proportion of adults who reported no difficulties accessing specialized services (specialist care for a diagnosis or consultation; non-emergent diagnostic tests including MR imaging, CT scanning and angiography; elective surgery). Wait times were measured as the time from when a specialized service was identified as necessary and when it was received. We report the median wait times and the percentage of people who waited less than two

months for care. Gender, socioeconomic status and ethnicity may all influence perception both of need for these services as well as perception of difficulty in accessing them. The wait times measures are based on self-report and as such, may be subject to reporting and recall biases. In addition, the sample only includes participants who completed the waiting period and received care. The wait times indicators do not capture referral biases and delays in referrals for specialized procedures.

For the analysis of the mean number of days between intake and first assessment for long-term home care patients, we used the Home Care Reporting System (HCRS) database to measure the number of days between the date a new long-term home care client's case is opened and the date of the first Resident Assessment Instrument – Home Care (RAI-HC). This included all assessments for new home care clients where the first RAI-HC was done up to 90 days from the date the case was opened during the time period from 2006 to 2007. The sample does not include clients who were assessed beyond 90 days or where assessments were not completed.



EXHIBITS AND FINDINGS

ACCESS TO SPECIALIZED SERVICES

Indicators: These indicators assess the percentage of the population aged 25 and older who reported no difficulties in the past 12 months accessing:

- Specialist care for a diagnosis or consultation for a new or existing illness or condition;
- Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography);
- Elective (non-emergent) surgery.

Background: When patients require specialized services, these need to be accessed in a timely manner whether it is for a consultation with a specialist, a specialized diagnostic test or elective surgery. When accessing specialized services, patients may be faced with difficulties at multiple points of care along their care path.¹⁷ For example patients may be unable to access or have to wait for a primary health care professional, a diagnostic test, a specialist, surgery, rehabilitation, discharge to the community and home care.¹⁷ Analysis of the Canadian Community Health Survey (CCHS) by Statistics Canada found that among Canadians aged 15 and older who accessed specialized services, approximately 19 percent reported difficulties accessing specialist care; 13 percent reported difficulties accessing specialized diagnostic tests and between one and three percent reported difficulties accessing non-emergency surgery.¹¹⁰ Canadians reported that the most common reason for having difficulty accessing specialized care was feeling that they waited too long (about two-thirds of respondents) or they had difficulties getting an appointment (about one-third of respondents). Depending on the service needed and the reason for needing the service, waiting may not always be a problem. However, lack of timely access can sometimes adversely affect a patient's health and well-being.¹¹⁰⁻¹¹² Health system redesign to improve patient flow and efficiency can reduce wait times. However, overuse of specialized services when not indicated can contribute to longer wait times for those who require the services.¹¹³ Therefore, another way to reduce wait times is to identify and use evidence-based indications for these services.

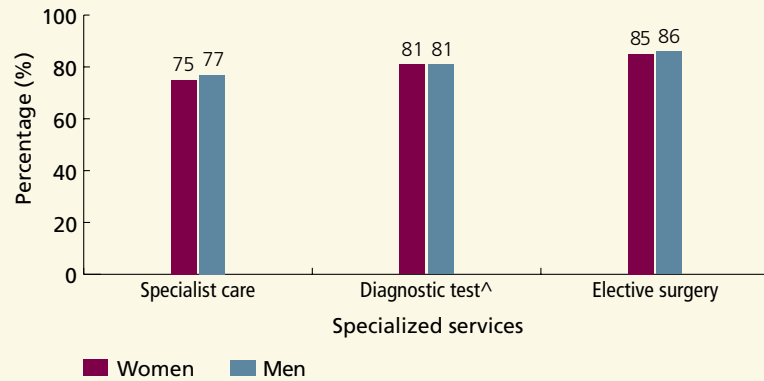
Data from the CCHS, 2007 were used to assess these indicators. To assess access to specialist services, adults who felt they needed these services (i.e., specialist care, specialized diagnostic testing or elective surgery) were asked if they had difficulties getting access to these services in the last 12 months. For all three indicators, we report on the proportion that had no difficulties accessing the care they needed (for details, see [Appendix 7.3](#)). Perception of need and expectations for timeliness of service may differ by education and other sociodemographic characteristics. Thus, differences in perception of need and expectations in addition to differences in need due to clinical factors may contribute to variation in findings across population subgroups.

Findings: In Ontario in 2007, 31 percent of adults indicated they needed to see a specialist for a new or existing condition of whom 76 percent reported no difficulties accessing specialist care; 12 percent of adults indicated they needed MR imaging, CT scanning or angiography of whom 81 percent reported having no difficulties accessing these specialized diagnostic tests and eight percent of adults needed elective surgery of whom 85 percent reported no difficulties with their access. These findings did not differ by sex (see [Exhibit 7C.1](#)).

EXHIBIT 7C.1 | Percentage of adults aged 25 and older who reported no difficulties accessing specialized services, by sex and type of service, in Ontario, 2007[¥]

FINDINGS

- Among adults who required these services, a similar percentage of women and men reported no difficulties accessing specialist care, specialized diagnostic tests or elective surgery.
- One in four women and men reported difficulty accessing specialist care (76 percent reported no difficulty), one in five reported difficulty accessing specialized diagnostic tests (81 percent reported no difficulty), and about one in seven reported difficulty accessing elective surgery (85 percent reported no difficulty).
- The percentage of adults reporting difficulties accessing specialized services did not vary by annual household income (data not shown).
- Older adults, aged 65 and older, were more likely to report no difficulties accessing specialist care and diagnostic testing than younger adults (data not shown).
- Access to elective surgery did not vary by age (data not shown).



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[¥] Among those who reported needing the service

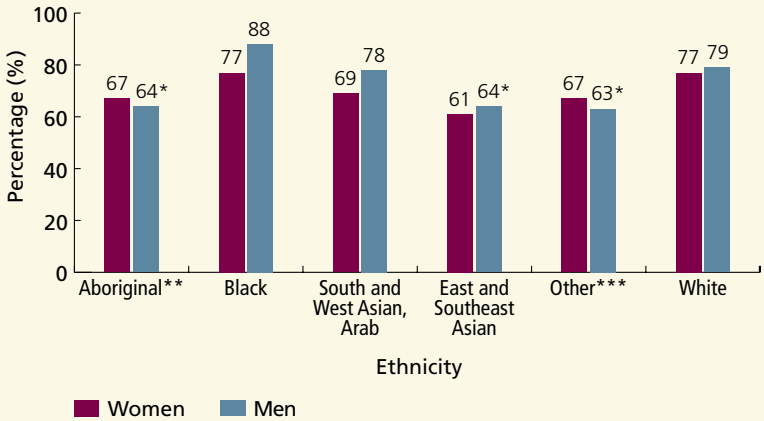
[^] Includes non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning and angiography

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EXHIBIT 7C.2 | Percentage of adults aged 25 and older who reported no difficulties accessing specialist care for diagnosis or consultation, by sex and ethnicity, in Ontario, 2007*

FINDINGS

- Among those who reported needing specialist care, 62 percent of East and Southeast Asian and 66 percent of Aboriginal adults reported no difficulties accessing specialist care compared to 78 percent of White adults and 79 percent of Black adults. These differences were significant (data not shown).
- While the overall pattern was consistent for women and men, these differences were not significant, possibly due to small sample sizes in some groups and limited power to detect differences.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

¥ Among those who reported needing the service

* Interpret with caution due to high sampling variability

** Includes off-reserve Aboriginal people (North American Indian, Metis, Inuit)

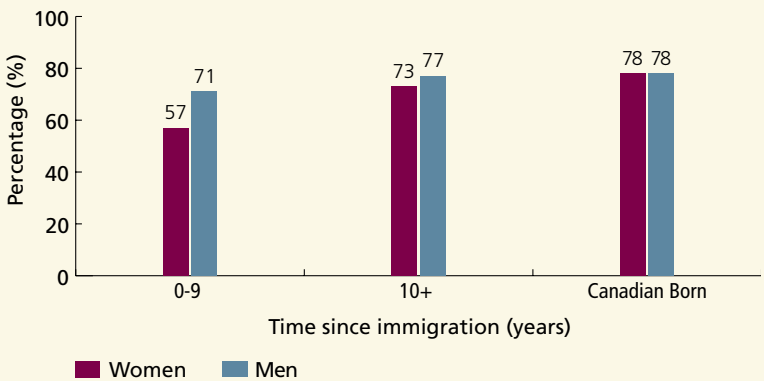
*** Includes Latin American, other racial and multiple racial origins

POWER Study

EXHIBIT 7C.3 | Percentage of adults aged 25 and older who reported no difficulties accessing specialist care for diagnosis or consultation, by sex and time since immigration, in Ontario, 2007*

FINDINGS

- Among those who reported needing specialist care, 57 percent of women who had been in Canada for less than 10 years reported no difficulties with access, compared to 73 percent of women who had been in the country for at least 10 years and 78 percent of women who were born in Canada.
- Though the pattern was similar for men, the difference was not significant, possibly due to small sample sizes and limited power to detect differences.
- Men living in rural areas were more likely to report no difficulties accessing specialist care than those living in urban areas (83 percent versus 76 percent, respectively). This indicator did not vary by rural/urban residence among women (data not shown).

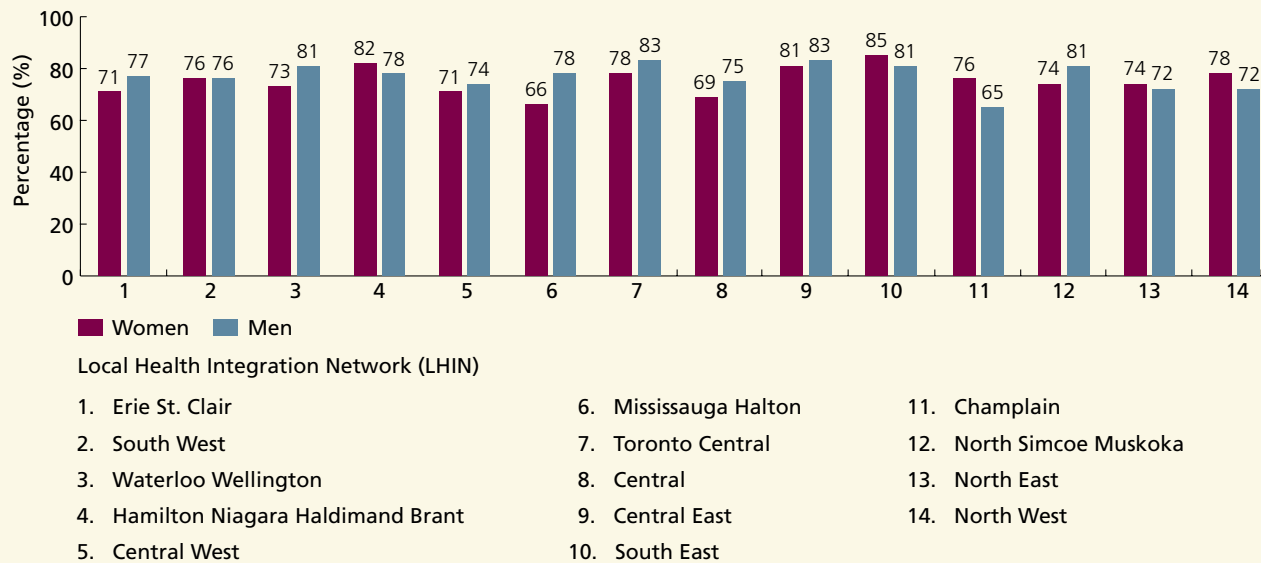


DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

¥ Among those who reported needing the service

POWER Study

EXHIBIT 7C.4 | Percentage of adults aged 25 and older who reported no difficulties accessing specialist care for diagnosis or consultation, by sex and Local Health Integration Network (LHIN), in Ontario, 2007[¥]



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[¥] Among those who reported needing the service

FINDINGS

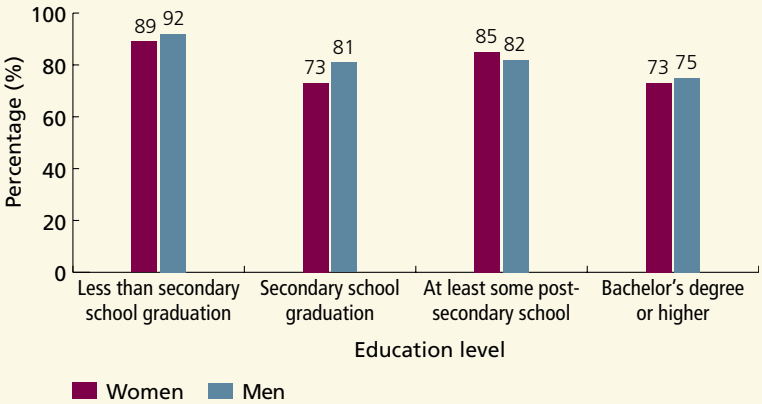
- Among adults who reported needing specialist care, the percentage who reported no difficulties with access varied across LHINs.
- The percentage of women who reported no difficulties accessing specialist care ranged from 66 percent (Mississauga Halton LHIN) to 85 percent (South East LHIN).
- The percentage of men who reported no difficulties accessing specialist care ranged from 65 percent (Champlain LHIN) to 83 percent (Toronto Central and Central East LHINs). The variation among men was not significant, possibly due to small sample sizes and limited power to detect differences.

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EXHIBIT 7C.5 | Percentage of adults aged 25 and older who reported no difficulties getting a specialized diagnostic test,[^] by sex and education level, in Ontario, 2007[¥]

FINDINGS

- Among those who reported needing a specialized diagnostic test (MR imaging, CT scanning or angiography), adults with less than a secondary school education were more likely to report no difficulties getting their test than those with a Bachelor's degree or higher. This may be due to different expectations with respect to both need and timeliness of services.
- Seventy-three percent of women with a Bachelor's degree or higher reported having no difficulties getting a specialized diagnostic test as compared to 89 percent of women with less than a secondary school education.
- Seventy-five percent of men with a Bachelor's degree or higher reported having no difficulties getting a specialized diagnostic test as compared to 92 percent of men with less than a secondary school education.
- The percentage of women and men who reported having no difficulties getting a specialized diagnostic test did not vary by annual household income (data not shown).
- Adults aged 65 and older were more likely to report having no difficulties getting a specialized diagnostic test than younger adults (87 percent versus 79 percent, respectively) (data not shown).



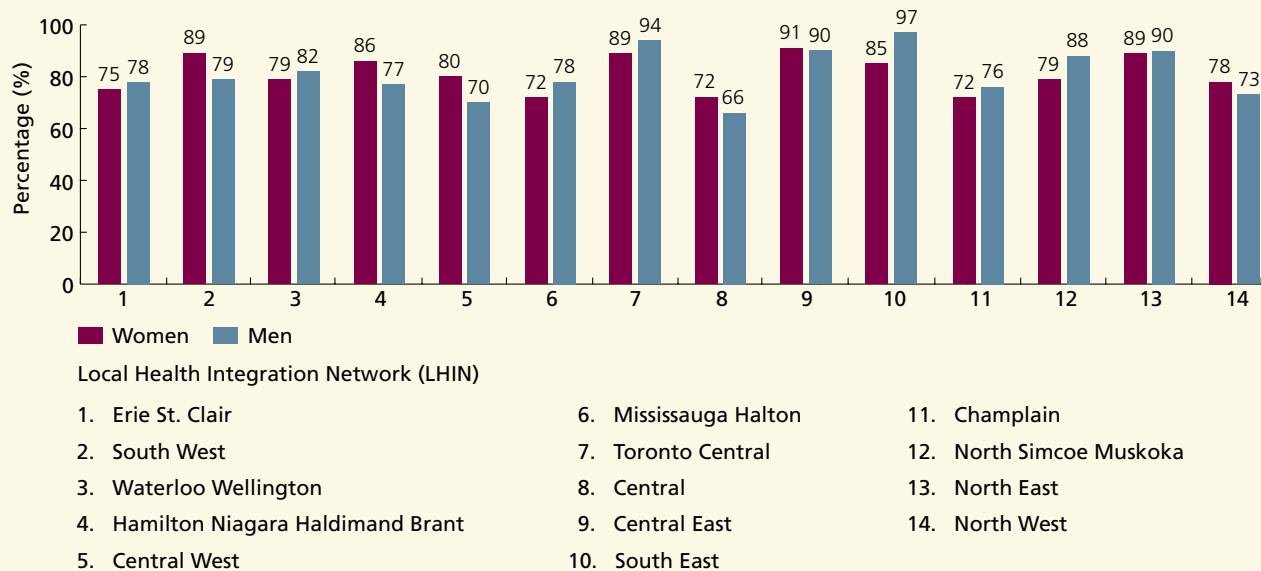
DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[¥] Among those who reported needing the service

[^] Includes non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning and angiography

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EXHIBIT 7C.6 | Percentage of adults aged 25 and older who reported no difficulties getting a specialized diagnostic test,[^] by sex and Local Health Integration Network (LHIN), in Ontario, 2007*



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

* Among those who reported needing the service

[^] Includes non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning and angiography

FINDINGS

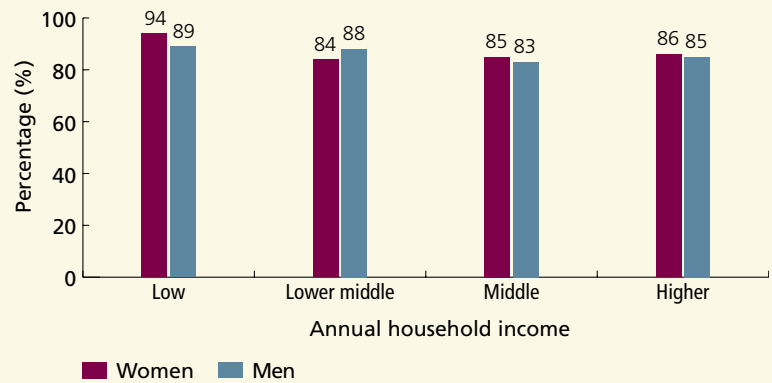
- Among those who reported needing a specialized diagnostic test (MR imaging, CT scanning or angiography), the percentage of adults who reported no difficulties with access varied across LHINs.
- The percentage of women who reported having no difficulties accessing a specialized diagnostic test ranged from 72 percent (Mississauga Halton, Central and Champlain LHINs) to 91 percent (Central East LHIN).
- The percentage of men who reported having no difficulties accessing a specialized diagnostic test ranged from 66 percent (Central LHIN) to 97 percent (South East LHIN).
- Men living in rural areas were more likely to report no difficulties accessing diagnostic tests than those from urban areas (91 percent versus 79 percent, respectively). This indicator did not vary by rural/urban residence among women (data not shown).

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EXHIBIT 7C.7 | Percentage of adults aged 25 and older who reported no difficulties getting elective surgery, by sex and annual household income, in Ontario, 2007[¥]

FINDINGS

- Among those who reported needing elective surgery, the percentage of adults who reported no difficulties with access did not vary by annual household income for women or for men.
- The percentage of adults who reported no difficulties getting elective surgery did not vary by education (data not shown).
- Due to small sample size we could not assess access to elective surgery by time since immigration, ethnicity or language.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

NOTE: See [Appendix 7.3](#) for definitions of annual household income categories

[¥] Among those who reported needing the service

POWER Study

WAIT TIMES FOR SPECIALIZED SERVICES

Indicators: These indicators measure the percentage of adults aged 25 and older who needed specialized services and who were seen within two months and the median wait times for:

- Specialist care for diagnosis or consultation for a new illness or condition;
- Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography);
- Elective (non-emergent) surgery.

Background: Waiting for care may be problematic, as some patients may experience worsening health while waiting.¹¹⁰ Based on the Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1), Canadians who required specialist care waited an average of 4.3 weeks for a visit and 13 percent waited longer than three months. The median wait time for a specialized diagnostic test in Canada was three weeks and 11.5 percent waited longer than three months. The median wait time for an elective surgery in Canada was 4.3 weeks and 17.4 percent of Canadians waited longer than three months.¹¹⁰

For diagnostic tests and elective surgeries, more than one in ten Canadians reported difficulties accessing care however almost one in five Canadians reported difficulties accessing specialist care. The most commonly reported reason for difficulties accessing services was waiting too long.¹¹⁰

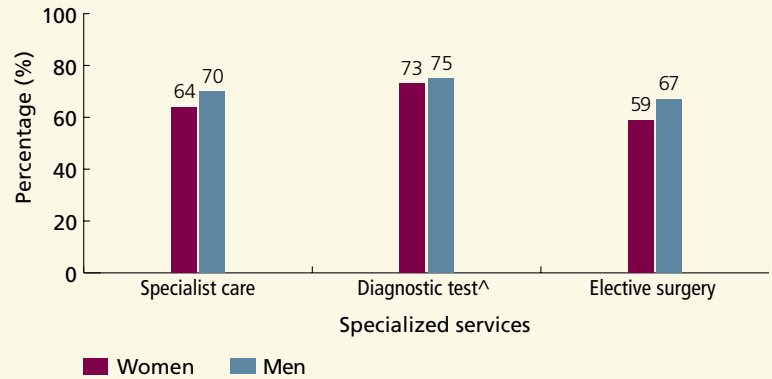
Data from the CCHS, 2007 were used to assess these indicators. To assess wait times for these specialist services, adults who felt they needed these services (i.e., specialist care, specialized diagnostic testing or elective surgery) were asked how long they had to wait between when they and their doctor/health care provider decided that they needed the service and the actual date when the service was received (see [Appendix 7.3](#) for details). For all three, we report the proportion of patients who waited less than two months for the service and the median length of time patients waited for the service. The results are based on self-report and depend upon respondent recall and thus may be subject to recall bias. Due to small sample size we could not report these indicators by time since immigration, ethnicity or language.

Findings: Overall, in Ontario in 2007, the percentages of adults who waited less than two months to receive specialized services were: 66 percent for a specialist visit, 74 percent for a diagnostic test and 63 percent for an elective surgery. The median wait times were: 30 days for a specialist visit, 21 days for a diagnostic test, and 30 days for elective surgery. The percentage seen within two months (see [Exhibit 7C.8](#)) and the median wait times (see [Exhibit 7C.10](#)) were similar for women and men for each type of specialized service. A small, but significant proportion of individuals who indicated they needed a specialized service did not receive the service; 9 percent of adults who reported that they needed to see a specialist, 5 percent who reported that they needed a specialized diagnostic test and 5 percent of those who needed elective surgery.

EXHIBIT 7C.8 | Percentage of adults aged 25 and older who reported waiting less than two months[¥] for specialized services, by sex and type of service, in Ontario, 2007

FINDINGS

- Among those who reported needing to see a specialist for a new illness or condition, 64 percent of women and 70 percent of men reported waiting less than two months for the service.
- Among those who reported needing a specialized diagnostic test such as MR imaging, CT scanning or angiography, 73 percent of women and 75 percent of men reported waiting less than two months for the service.
- Among those who reported needing elective surgery, 59 percent of women and 67 percent of men reported waiting less than two months for the service.
- The percentages who accessed specialized services within two months did not differ by sex.
- The percentage of adults who reported waiting less than two months for a specialized services did not vary by education or by annual household income (data not shown).
- As age increased, the percentage of adults who underwent diagnostic testing within two months also increased, from 72 percent among adults aged 25-44 to 96 percent among adults aged 80 and older (data not shown).



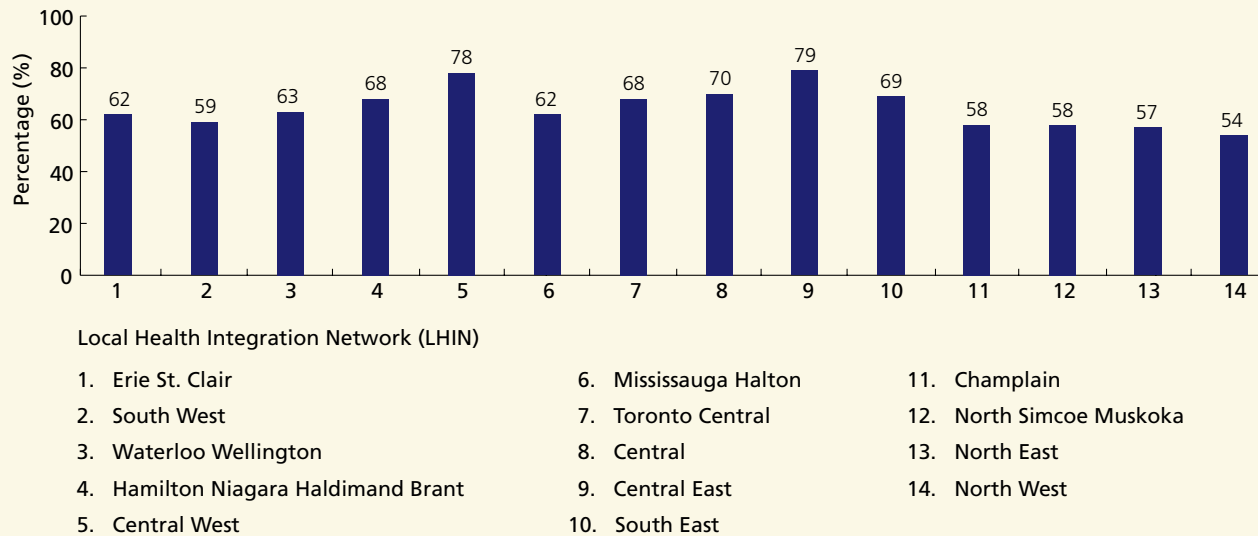
DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[¥] Wait times were measured from the time a health care professional determined the service to be needed to the service date (physician visit, test date or surgery date) among those who reported needing the service

[^] Includes non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning and angiography

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EXHIBIT 7C.9 | Percentage of adults aged 25 and older who reported waiting less than two months* for specialist care, by Local Health Integration Network (LHIN), in Ontario, 2007



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

* Wait times were measured from the time a health care professional determined the specialist visit to be needed to the service date among those who reported needing the service

FINDINGS

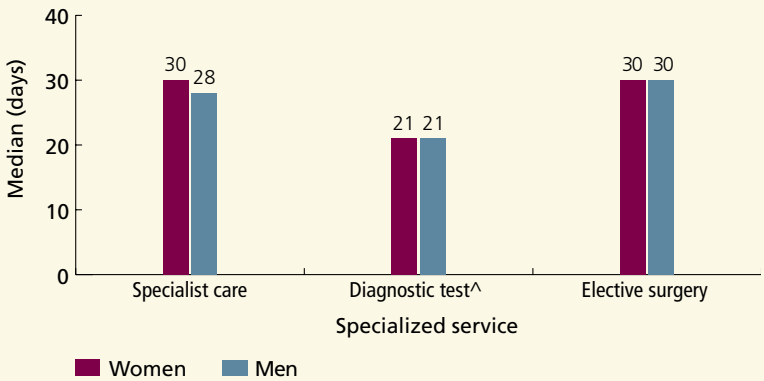
- Among those who reported needing to see a specialist for a new illness or condition, the percentage of adults who saw a specialist within two months varied significantly across LHINs.
- The percentage of adults who saw a specialist within two months ranged from 54 percent in the North West LHIN to 79 percent in the Central East LHIN. The rates for women and men within LHINs could not be compared due to small sample sizes and limited power to detect differences.

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EXHIBIT 7C.10 | Median wait times in days[¥] for adults aged 25 and older who accessed specialized services, by sex and type of service, in Ontario, 2007

FINDINGS

- The median wait time to see a specialist for a new illness or condition in Ontario was 30 days for women and 28 days for men. This did not vary by sex.
- The median wait time between the decision being made to have a specialized diagnostic test and the test date was 21 days for both women and men.
- The median wait time between the decision being made that surgery was needed and the date of elective surgery was 30 days for both women and men.



DATA SOURCE: Canadian Community Health Survey (CCHS), 2007

[¥] Wait times were measured from the time a health care professional determined the service to be needed to the service date (physician visit, test date or surgery date) among those who reported needing the service

[^] Includes non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography

POWER Study

WAIT TIME FOR FIRST ASSESSMENT FOR LONG-TERM HOME CARE PATIENTS

Indicator: This indicator measures the mean number of days between the date the home care client's case is opened and the date of first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older for clients who had an assessment completed within 90 days.

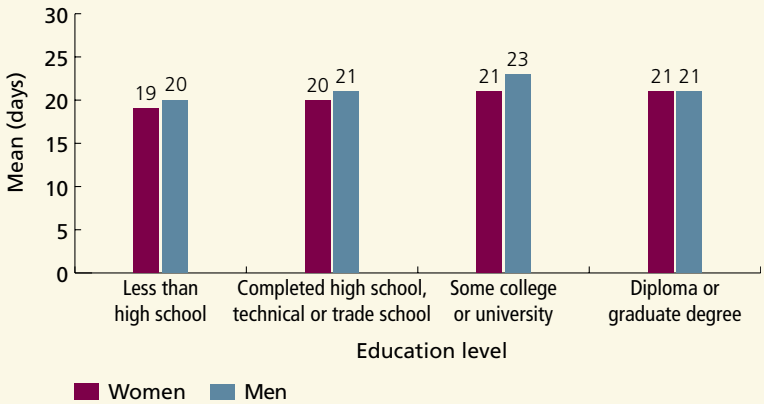
Background: Home care programs allow people to live independently by allowing them to receive care at home rather than in a hospital or long-term care facility.¹¹⁴ These programs provide cost-effective service delivery and sustainable care.¹¹⁵ The data that were used for this indicator are from the Home Care Reporting System (HCRS) (see [Appendix 7.3](#) for details). The HCRS collects information on publicly funded home care to enable policy makers and health planners to manage, evaluate and improve the quality of home care services in Canada. The HCRS classifies clients based on the type of home care they receive: short-term or long-term care. Short-term care is provided to clients who are expected to receive home care for a limited period of time to achieve specific goals. Long-term care is provided to clients who will require the service for periods that can range from 60 days to several years. Long-term care clients are assessed with the RAI-HC, which provides clinical, functional and utilization data for quality improvement and planning.¹¹⁴ It is an important tool for assessing the needs of home care clients and to provide information for planning of their services. For newly opened cases, it is important that RAI-HC be completed soon after care begins so that it can inform the client's care plan in a timely fashion. The provincial guideline is for the RAI-HC to be completed within 14 days, although there may be reasons why this is not possible (e.g., logistical challenges in arranging to meet clients when their informal caregiver is also available or a visit is scheduled and then the client is readmitted to hospital for a few days). We report on the time to administration of the RAI-HC for long-term home care clients who were assessed within 90 days. Analyses are completed by sex, age, education and Local Health Integration Network (LHIN), but not by income as these data are not available. We also report on this indicator by MAPLe (Method of Assigning Priority Levels) score. The MAPLe score classifies clients based on their relative need for care and risk of adverse outcome.¹¹⁵ The MAPLe score assists case managers in determining the relative priority of care that a client may require based on urgency and need, regardless of care setting.¹¹⁵ The MAPLe score is based on five risk profiles ranging from low risk to very high risk. Our objective was to determine whether wait times differed by sex, education, health status, LHIN or MAPLe score. More recent data are now available that assesses current wait times for home care assessment.

Findings: Among Ontario long-term home care clients aged 18 and older, the mean number of days between the date the case was opened and administration of the RAI-HC was 20 days in 2006/07. This exceeded the provincial guideline of 14 days. The mean number of days waited did not vary by sex (20 days for women and 21 days for men).

EXHIBIT 7C.11 | Mean number of days to first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older, by sex and education level, in Ontario, 2006/07

FINDINGS

- The mean number of days to the first administration of the RAI-HC for home care clients was 19 days (19 for women and 20 for men) for those with less than a high school education and 21 days for women and men with a post-secondary diploma, undergraduate or graduate degree.



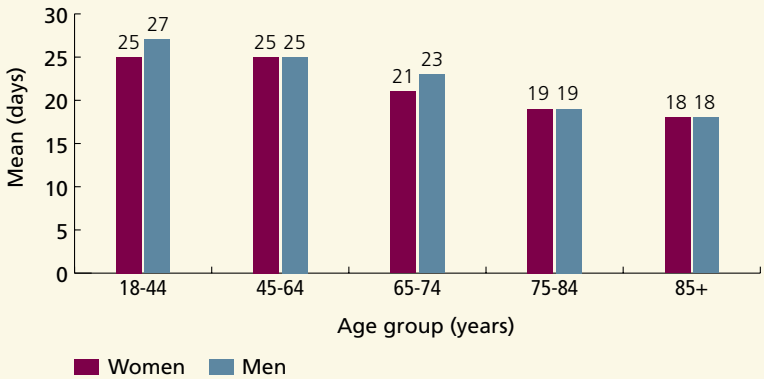
DATA SOURCE: Home Care Reporting System (HCRS)

POWER Study

EXHIBIT 7C.12 | Mean number of days to first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older, by sex and age group, in Ontario, 2006/07

FINDINGS

- The mean number of days to first administration of the RAI-HC among long-term home care clients decreased with age. Adults aged 18-44 waited an average of 26 days (25 days for women and 27 days for men) for an RAI-HC assessment as compared to an average of 18 days waited by women and men aged 85 and older.
- The pattern of mean number of days to assessment was similar for women and men across age groups.



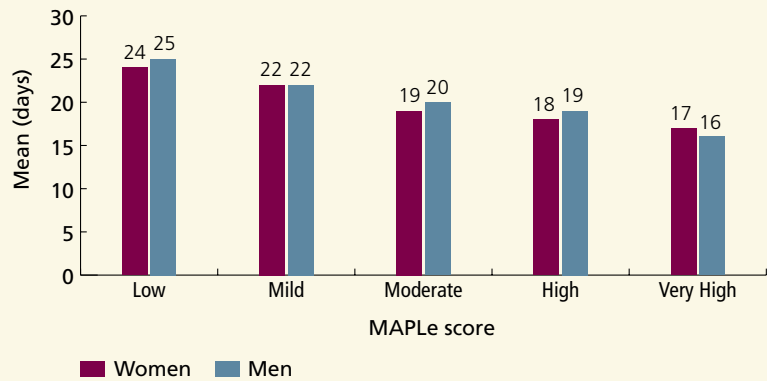
DATA SOURCE: Home Care Reporting System (HCRS)

POWER Study

EXHIBIT 7C.13 | Mean number of days to first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older, by sex and MAPLe score,[^] in Ontario, 2006/07

FINDINGS

- As MAPLe score increased, the mean number of days to first administration of the RAI-HC among long-term home care clients decreased, indicating that case managers were more likely to conduct the assessment earlier for clients who had a greater need for care.
- For women, the mean number of days to first administration of the RAI-HC ranged from 17 days for those with very high MAPLe scores to 24 days for women with low scores.
- For men, the mean number of days to first administration of the RAI-HC ranged from 16 days for those with very high MAPLe scores to 25 days for men with low scores.
- The mean number of days waited was similar for women and men for all MAPLe score categories.

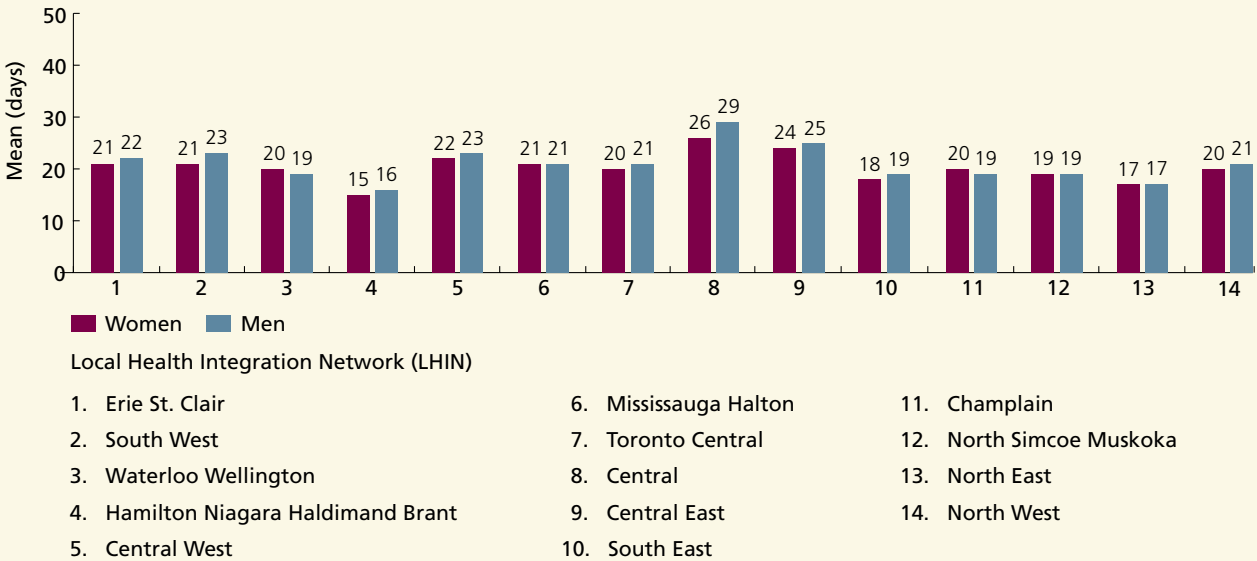


DATA SOURCE: Home Care Reporting System (HCERS)

[^] MAPLe (Method of Assigning Priority Levels) score is assigned to home care clients based on their relative need for care and risk of adverse outcome

POWER Study

EXHIBIT 7C.14 | Mean number of days to first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older, by sex and Local Health Integration Network (LHIN), in Ontario, 2006/07



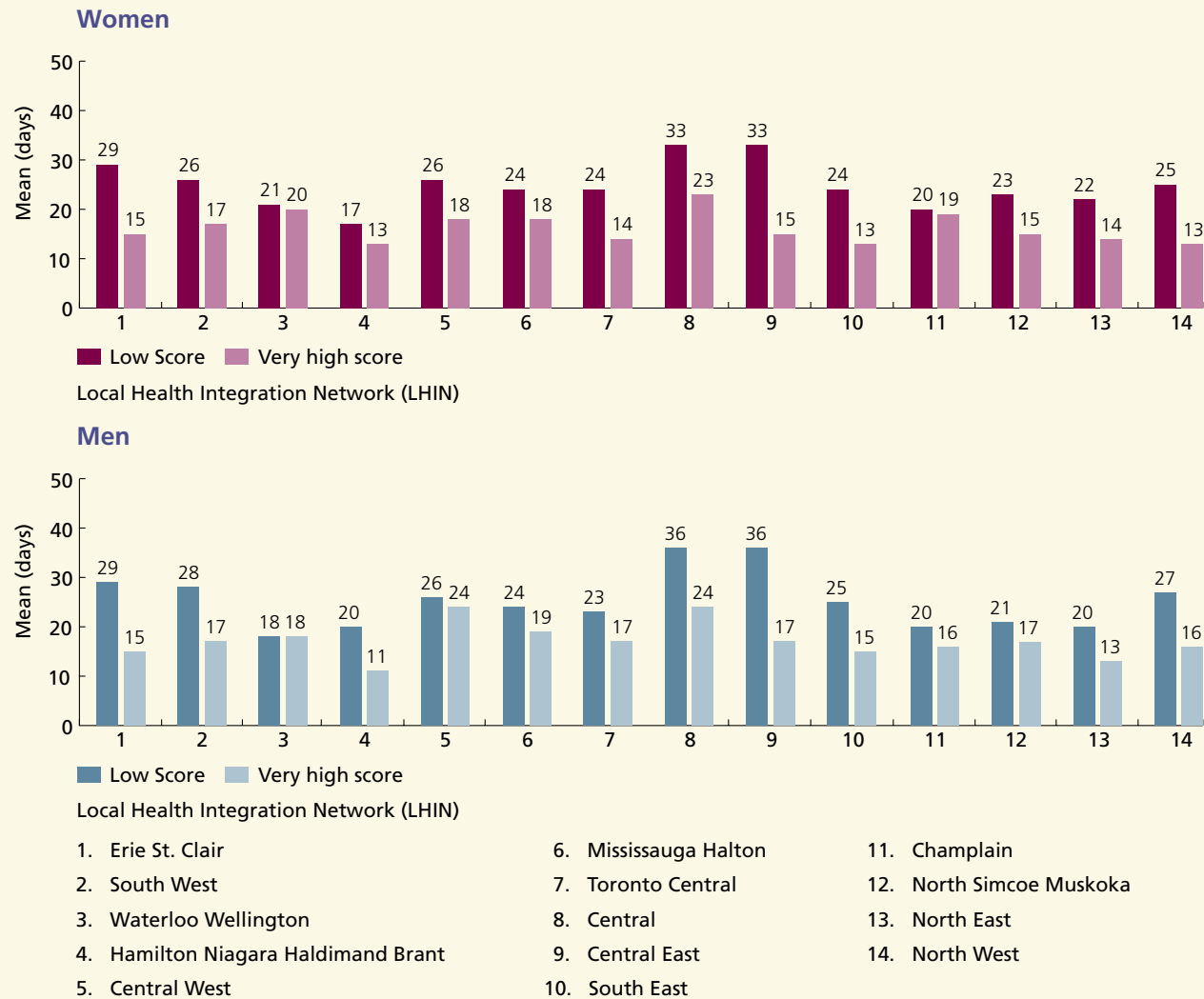
DATA SOURCE: Home Care Reporting System (HCRS)

FINDINGS

- The mean number of days between intake and RAI-HC assessment varied across LHINs.
- The mean number of days between intake and assessment for women ranged from 15 days (Hamilton Niagara Haldimand Brant LHIN) to 26 days (Central LHIN).
- The mean number of days between intake and assessment for men ranged from 16 days (Hamilton Niagara Haldimand Brant LHIN) to 29 days (Central LHIN).

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EXHIBIT 7C.15 | Mean number of days to first administration of the Resident Assessment Instrument-Home Care (RAI-HC) for long-term home care clients aged 18 and older, by sex, MAPLe score[^] and Local Health Integration Network (LHIN), in Ontario, 2006/07



DATA SOURCE: Home Care Reporting System (HCRS)

[^] MAPLe (Method of Assigning Priority Levels) score is assigned to home care clients based on their relative need for care and risk of adverse outcome

FINDINGS

- Across most LHINs, the mean number of days between intake and RAI-HC assessment was less for home care clients with very high MAPLe scores than for clients with low MAPLe scores.
- Among women with low MAPLe scores, the mean number of days waited ranged from 17 days (Hamilton Niagara Haldimand Brant LHIN) to 33 days (Central and Central East LHINs). For women with very high scores, the mean number of days from intake to assessment ranged from 13 days (Hamilton Niagara Haldimand Brant, South East and North West LHINs) to 23 days (Central LHIN).
- For men with low MAPLe scores, the mean number of days from intake to assessment ranged from 18 days (Waterloo Wellington LHIN) to 36 days (Central and Central East LHINs). For men with very high scores, the mean number of days ranged from 11 days (Hamilton Niagara Haldimand Brant LHIN) to 24 days (Central West and Central LHINs).

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Section 7C

SUMMARY OF FINDINGS

This section reports on access to specialized services including specialist visits for diagnosis or consultation, specialized diagnostic testing (i.e., magnetic resonance (MR) imaging, computed tomography (CT) scanning and angiography) and elective (non-emergent) surgery. Among adults who required these services, we report the percentage who had no difficulties accessing care; the percentage who waited less than two months for the service and the median wait times. Finally, we report the mean number of days that new long-term home care clients waited for an assessment of home care needs. While there was some variation in the percentage of adults who reported difficulties accessing specialized services by income, education and age, these indicators did not, for the most part, vary by sex. East and Southeast Asian and Aboriginal adults and immigrants who had been in Canada for less than ten years were more likely to report difficulty accessing specialist care. However, due to small numbers and a lack of data (home care indicator), we were not able to assess differences for most indicators by ethnicity or time since immigration.

Findings for the indicators reported in this section are summarized below.

Access to Specialized Services

In Ontario, 31 percent of adults indicated that they needed to see a specialist for a new or existing condition of which 76 percent reported no difficulties accessing care. Twelve percent of adults needed MR imaging, CT scanning or angiography of which 81 percent reported no difficulties accessing care. Eight percent needed elective surgery of which 85 percent indicated no difficulties with access.

Specialist Care

Access to a specialist for diagnosis or consultation did not vary by sex or by household income, but did vary by education, age and rural/urban residency. Older adults, those with lower educational attainment and men who were residents of rural areas were more likely to report no difficulties accessing specialist care for diagnosis or consultation than their counterparts. East and Southeast Asian and Aboriginal adults reported more difficulty getting access to a specialist than White adults. Recent immigrants were also more likely to report difficulties accessing specialist care for diagnosis or consultation than those who had been in Canada for 10 or more years and those who were born in Canada. Access to specialist care also varied significantly by Local Health Integration Network (LHIN).

Diagnostic Testing

Access to specialized diagnostic testing including MR imaging, CT scanning and angiography did not vary by sex or by household income, but did vary by education, age and rural/urban residence and followed the same pattern as noted above. The percentage of adults who reported no difficulties accessing diagnostic testing varied significantly across LHINs. We were not able to assess variation by ethnicity, language or time since immigration on this indicator due to small numbers and limited power to detect differences.

Elective Surgery

The percentage of adults who reported difficulties accessing elective surgery did not vary by sex, income, education, age, rural/urban residence or LHIN. However, due to small numbers, LHIN estimates lacked precision. We were not able to assess variation by ethnicity,

language or time since immigration for this indicator due to small numbers and limited power to detect differences.

Wait Times for Specialized Services

Overall, in Ontario the percentages of adults who had been referred for a specialized service who waited less than two months was 66 percent for a specialist visit, 74 percent for a non-emergent diagnostic test and 63 percent for elective surgery. The median wait times were 30 days, 21 days and 30 days, respectively. The percentage of adults who waited less than two months for specialized services did not vary by sex, income or education. Older adults were more likely to report waiting less than two months for a specialized diagnostic test than younger adults. The percentage of adults who waited less than two months to visit a specialist varied significantly by LHIN.

Wait Times for First Assessment for Long-term Home Care Patients

For patients who required long-term home care, a Resident Assessment Instrument-Home Care (RAI-HC) should be completed soon after care begins to assess need and inform the client's care plan. The provincial guidelines state that patients should have an RAI-HC completed within 14 days. Irrespective of sex, education, age, need (as assessed by Method of Assigning Priority Levels (MAPLe) score) or LHIN, in 2006/07 this guideline was not met for new home care clients who were assessed within 90 days. Older patients and those with greatest need underwent an assessment sooner than their counterparts.



Chapter Summary of Findings

In this chapter, we reported on Ontarians' access to health care services and how it differs by sex, age, income, education, time since immigration, language and where one lives. In doing so, we identify opportunities for improvement and provide a baseline from which to measure progress.

The chapter includes the following three sections:

- A. Access to Primary Care
- B. Access to Care for Chronic Disease
- C. Access to Specialized Services and Home Care

Table 1 provides a summary of where differences were observed by sex, age, income, education, ethnicity, time since immigration, language, rural/urban residence or Local Health Integration Network (LHIN). The chapter findings are summarized below.

Access to Primary Care

Access to a Primary Care Doctor

- Ninety-three percent of Ontarians reported having a primary care doctor. This varied by sex, neighbourhood income, age, time since immigration and LHIN but not by education or rural/urban residence. Women and older adults were more likely to report having a regular doctor.
- Neighbourhood income was associated with having a primary care doctor. Ninety percent of adults living in the lowest-income neighbourhoods reported having a primary care doctor compared to 95 percent of those living in the highest-income neighbourhoods (Exhibit 7A.1).
- Recent immigrants, those who had been in Canada for less than five years, were less likely to have a primary care doctor than those who been in Canada for 10 or more years and those who were Canadian

born (85 percent versus 94 percent and 93 percent, respectively) (Exhibit 7A.4).

- Eighty-eight percent of Ontarians who did not have a primary care doctor at the time of the survey reported having had one in the past. The most common reasons for not currently having a primary care doctor were that they had moved or their doctor was no longer in practice (Exhibit 7A.6).

Access to Primary Care Services

- Among respondents who had seen a doctor for a regular check-up in the previous year, 59 percent of women and 63 percent of men were very satisfied with the experience getting an appointment.
- Women and men who identified as South and West Asian or Arab (47 percent of women and 50 percent of men) or East and Southeast Asian (49 percent of women and 40 percent of men) were significantly less likely to be very satisfied with their experience getting an appointment for a regular check-up (Exhibit 7A.8).
- Recent immigrants were significantly less likely to report being very satisfied with their experience getting an appointment for a regular check-up as compared to those who had been in the country for 10 or more years or those who were born in Canada (41 percent versus 61 percent and 62 percent, respectively) (Exhibit 7A.9). Also respondents who did not speak English or French most often at home were less likely to report being very satisfied (50 percent) as compared to those who spoke English (62 percent) or those who spoke French only (70 percent) (Exhibit 7A.10).
- The majority of respondents, 84 percent, reported no difficulties accessing routine or ongoing care for themselves or for a family member. However a significant proportion—16 percent—did report difficulties. This did

not vary by sex, income ([Exhibit 7A.12](#)), education, time since immigration, language, rural/urban residence or by LHIN. However, this indicator did vary by ethnicity among women ([Exhibit 7A.13](#)).

- Among people who reported that they had sought care from their family doctor to monitor a health problem, 82 percent of women and 88 percent of men reported no difficulties accessing care. This did not vary by neighbourhood income or by LHIN but younger adults and those with more education ([Exhibit 7A.14](#)) were more likely to report difficulties with access (i.e., they were less likely to report no difficulties). Sixty-three percent of South and West Asian or Arab women reported no difficulties accessing care to monitor a health problem as compared to 83 percent of White women ([Exhibit 7A.15](#)). Women who had been in Canada for less than 10 years had more difficulties accessing care ([Exhibit 7A.16](#)) as did women who did not speak English or French most often at home ([Exhibit 7A.17](#)).
- Urgent, non-emergent health care includes, but is not limited to, same-day services for fevers, headaches, injuries such as sprained ankles, vomiting or an unexplained rash; 82 percent of respondents who needed this type of care reported no difficulties accessing it. This did not vary by sex, language or geography. Older adults, those from lower-income neighbourhoods ([Exhibit 7A.19](#)), women and men with less education, adults from certain ethnic groups ([Exhibit 7A.20](#)) and recent immigrants ([Exhibit 7A.21](#)) had more difficulties accessing this type of care.
- Among adults who reported having difficulties making an appointment for an urgent, non-emergent health problem, 53 percent of women and 54 percent of men reported a number of specific access barriers as their reasons including difficulty contacting a physician, nurse

or other health care provider; not having a personal/family physician; difficulty getting or scheduling an appointment; lack of availability of the specific type of care or service required or problems obtaining adequate information on where to go or how to seek care. Approximately half of respondents (53 percent of women and 50 percent of men) reported waiting too long at the doctor's office or clinic as their reason for reporting difficulties accessing care for an urgent, non-emergent health problem ([Exhibit 7A.22](#)).

- Among adults who had accessed urgent, non-emergent care from a family doctor, 62 percent of women and 58 percent of men were very satisfied with their access to care. Younger adults and women from lower-income neighbourhoods ([Exhibit 7A.23](#)) were less likely to be very satisfied with their experience; however, adults with less education were more likely to be satisfied with their access to care than more educated individuals. This variation may be influenced by differing expectations. Among women, the percentage who reported being very satisfied with their experience getting to see a doctor for an urgent, non-emergent health problem ranged from 42 percent among South and West Asian or Arab women to 64 percent among White women ([Exhibit 7A.24](#)).
- Thirty-four percent of women who had been in Canada for less than 10 years were very satisfied with their experience accessing urgent, non-emergent care from a family doctor as compared to 62 percent of women who had been in the country for a longer period and 64 percent of Canadian born women ([Exhibit 7A.25](#)). A similar pattern was seen among men. Less than half of adults who did not speak English or French most often at home reported being very satisfied as compared to almost two-thirds of adults who spoke English or French ([Exhibit 7A.26](#)).

- Among those who had seen a doctor for an urgent, non-emergent health problem, 67 percent of Ontarians reported being very satisfied with the care they received. This did not vary by sex, but did vary by neighbourhood income, education and age. Lower-income women, adults with less than a secondary school education and younger adults were less likely to be very satisfied with the care they received.
- As with all measures of urgent, non-emergent care, satisfaction with the care received varied significantly by ethnicity ([Exhibit 7A.27](#)), time since immigration ([Exhibit 7A.28](#)) and language spoken most often at home ([Exhibit 7A.29](#)) and with similar patterns to previous indicators. Satisfaction with the care their doctor provided for an urgent, non-emergent problem varied across LHINs ([Exhibit 7A.30](#)) and by rural/urban residence. Three-quarters of men living in rural areas reported they were very satisfied with the care their doctor provided, compared with 64 percent of men in urban areas. This difference was not significant among women.
- For those who indicated that they required health information or advice, 81 percent of women and 82 percent of men reported no difficulties accessing health information or advice. This did not vary by sex, income, education, age, knowledge of English or French, rural/urban residency or LHIN. Women who had been in the country for less than 10 years were less likely than those who had been here longer or who were born in Canada to report no difficulties accessing health information or advice (73 percent versus 86 percent and 81 percent, respectively) ([Exhibit 7A.31](#)).

Unmet Need

- In Ontario, 14 percent of women and 10 percent of men reported unmet health care needs. The rates were higher among adults with two or more chronic conditions (17 percent of women versus 12 percent of men). Lower-income adults were more likely to report unmet health care needs than higher-income adults ([Exhibit 7A.33](#)). Almost half of all respondents who reported unmet health care needs indicated that availability (including service not available in the area or at the time required or waiting too long) was the reason. However, more than one-quarter of lower-income women stated that accessibility, including cost, was one of the reasons for their unmet needs compared to 10 percent of higher-income women ([Exhibit 7A.36](#)).
- Nearly one in four Aboriginal women (24 percent) reported unmet health care needs, as compared to 14 percent of White women and 10 percent of East and Southeast Asian women ([Exhibit 7A.35](#)). Immigrants who had been in the country for less than 10 years were more likely to report having unmet health care needs than those who had been in the country longer.

Dental Care

- Among adults, 30 percent of women and 35 percent of men had not seen a dentist in the previous 12 months. Forty-three percent of adults aged 65-79 and over half of adults aged 80 and older had not seen a dentist in the last year. Women and men with lower annual household income ([Exhibit 7A.38](#)) or with less education were less likely to have seen a dentist. The income pattern persisted across LHINs ([Exhibit 7A.41](#)).
- Dental visits varied by ethnicity and time since immigration. Women and men who had been in Canada for less than 10 years were less likely to have seen a dentist in the previous 12 months than those who had been in the country for a longer period or women and men who were born in Canada ([Exhibit 7A.40](#)). Over half of South and West Asian or Arab women in Ontario had not visited a dentist in the previous 12 months compared to one-quarter of White women. Among men, 45 percent of Black men, 43 percent of South and West Asian or Arab men and 42 percent of Aboriginal men had not seen a dentist in the previous 12 months as compared to 33 percent of White men ([Exhibit 7A.39](#)).

Access to Care for Chronic Disease

- Adults identified as having diabetes as of April 1, 2006 (see [Appendix 7.3](#) for details) were followed for a two-year period to determine the types of health care providers they had seen. Seventy-nine percent of adults with diabetes received care from a general practitioner/family physician (GP/FP) alone and an additional 17 percent of patients received care from a specialist (an endocrinologist or a general internist) as well as a GP/FP. However, four percent of adults with diabetes did not see a GP/FP, an endocrinologist or a general internist during the two-year period ([Exhibit 7B.1](#)). This did not vary by sex but did vary by LHIN ([Exhibits 7B.3, 7B.4](#)). There was little variation by income.
- Older adults, those aged 80 and older, were more likely than adults aged 25-44 to receive care from a GP/FP only (85 percent versus 72 percent, respectively) and less likely to receive care from an endocrinologist or general internist ([Exhibit 7B.2](#)). This may be appropriate as younger patients are more likely to have insulin-dependent diabetes, and as such, may require specialist care.
- The age-standardized hospitalization rates for ambulatory care sensitive conditions (ACSC) were 217 per 100,000 adults for congestive heart failure (CHF), 273 per 100,000 adults for chronic obstructive pulmonary disease (COPD), 27 per 100,000 adults for asthma and 79 per 100,000 adults for diabetes. Women had higher rates of hospitalizations for asthma while men had higher rates of hospitalizations for CHF, COPD and diabetes. Irrespective of the type of ACSC condition, women and men living in the lowest-income neighbourhoods were significantly more likely to be hospitalized than those living in the highest-income neighbourhoods ([Exhibits 7B.5, 7B.9, 7B.13, 7B.17](#)) and hospitalization rates for all conditions varied by LHIN ([Exhibits 7B.8, 7B.12, 7B.16, 7B.20](#)).
- Rates of hospitalizations for ACSCs increased significantly with age, and the variation was especially

pronounced among those hospitalized for CHF or COPD. Ninety percent of CHF admissions ([Exhibit 7B.7](#)), 78 percent of COPD admissions ([Exhibit 7B.11](#)) and 50 percent of diabetes admissions ([Exhibit 7B.19](#)) occurred in women aged 65 and older. Among men, 81 percent of CHF admissions, 80 percent of COPD admissions and 41 percent of diabetes admissions occurred in those aged 65 and older. The age distribution of asthma admissions was younger; four in ten asthma hospitalizations were in adults aged 25-44 ([Exhibit 7B.15](#)).

Access to Specialized Services and Home Care

- In Ontario, 31 percent of adults reported that they needed to see a specialist for a new or existing condition, of which 76 percent reported no difficulties accessing care. Twelve percent of adults reported needing magnetic resonance (MR) imaging, computed tomography (CT) scanning or angiography, of which 81 percent reported no difficulties accessing care. Eight percent of adults needed elective surgery, of which 85 percent reported no difficulties with access. Access to specialist visits or diagnostic testing did not vary by sex ([Exhibit 7C.1](#)) or annual household income. Access to elective surgery did not vary by sex ([Exhibit 7C.1](#)), income, education, age, rural/urban residence or LHIN. We were not able to assess variation by ethnicity, language or time since immigration for access to diagnostic testing or elective surgery because of sample size limitations.
- For adults who needed to see a specialist for a diagnosis or a consultation or who were referred for a non-emergent diagnostic test, older adults, those with less education ([Exhibit 7C.5](#)) and men who were residents of rural areas were more likely to report no difficulties with access.
- Ethnicity and time since immigration were associated with access to specialist care for diagnosis or consultation. East and Southeast Asian adults and Aboriginal

adults were less likely to report no difficulties accessing a specialist than White adults (62 percent, 66 percent and 78 percent, respectively) ([Exhibit 7C.2](#)). Sixty-one percent of recent immigrants reported no difficulties accessing specialist care for diagnosis or consultation as compared to 75 percent of immigrants who had been in Canada for 10 or more years and 78 percent of adults who were born in Canada ([Exhibit 7C.3](#)).

- The percentage of adults who reported no difficulties accessing specialist care ([Exhibit 7C.4](#)) or diagnostic testing ([Exhibit 7C.6](#)) varied significantly across LHINs.
- The percentages of Ontarians who waited less than two months for a specialized service were 66 percent for a specialist visit, 74 percent for a non-emergent diagnostic test and 63 percent for elective surgery. The median wait times were 30 days, 21 days and 30 days, respectively ([Exhibit 7C.10](#)). The percentage of adults who waited less than two months for specialized

services did not vary by sex ([Exhibit 7C.8](#)), income or education. Timely access to diagnostic testing varied significantly by age with older adults reporting better access. The percentage of adults who waited less than two months to visit a specialist varied significantly by LHIN ([Exhibit 7C.9](#)).

- The provincial guidelines state that long-term home care patients should have a Resident Assessment Instrument-Home Care (RAI-HC) completed within 14 days of their case being opened. Irrespective of sex, education ([Exhibit 7C.11](#)), age, need (as assessed by Method of Assigning Priority Levels (MAPLe) score) or LHIN, this guideline was not met in 2006/07. Older patients ([Exhibit 7C.12](#)) and those with greatest need ([Exhibit 7C.13](#)) did undergo an assessment sooner, however the mean number of days to assessment for the oldest patients or those with very high MAPLe scores were still longer than recommended.



Table 1 | Factors associated with differences in access to health care services

Indicators	Overall Result	Stratification Factor								
		Sex	Age	Income	Education	Ethnicity	Immigration	Language	Rural/Urban Residency	LHIN
Access to primary care (10 indicators)										
Percentage with a primary care doctor (family doctor, family physician, general practitioner or medical doctor)	93%	Y	Y	Y	N	N	Y	N	N	Y
Percentage who were very satisfied with their experience getting an appointment for a regular check-up	61%	Y	Y	N	Y	Y	Y	Y	Y	Y
Percentage who reported no difficulties obtaining routine or ongoing care for themselves or a family member	84%	N	Y	N	N	Y	N	N	N	N
Percentage who reported no difficulties obtaining monitoring for a health problem from a family doctor	85%	Y	Y	N	Y	Y	N	Y	Y	N
Percentage who reported no difficulties making an appointment for care for an urgent, non-emergent health problem with their family doctor	82%	N	Y	Y	Y	Y	Y	N	N	N

Indicators	Overall Result	Stratification Factor								
		Sex	Age	Income	Education	Ethnicity	Immigration	Language	Rural/Urban Residency	LHIN
Percentage who were very satisfied with their experience getting an appointment for care for an urgent, non-emergent health problem with their family doctor	60%	N	Y	Y	Y	Y	Y	Y	N	Y
Percentage who were very satisfied with the care they received for an urgent, non-emergent health problem from their family doctor	67%	N	Y	Y	Y	Y	Y	Y	Y	Y
Percentage who reported no difficulties accessing health information or advice for themselves or for a family member	81%	N	N	N	N	N	Y	N	N	N
Percentage who reported that there was a time when they needed health care but did not receive it (unmet health care needs)										
General population	12%	Y	Y	Y	Y	Y	Y	N	N	N
Population with two or more chronic conditions	15%	Y	Y	Y	Y	•	•	•	•	•
Percentage who did not visit a dentist in the past 12 months	32%	Y	Y	Y	Y	Y	Y	Y	Y	Y

Indicators	Overall Result	Stratification Factor							
		Sex	Age	Income	Education	Ethnicity	Immigration	Language	Rural/Urban Residency

Access to care for chronic disease (5 indicators)

Providers of care for adults with diabetes during a two-year follow up period

General practitioner/ family physician (GP/FP) only	79%	N	Y	Y	•	•	•	•	•	Y
GP/FP with either an endocrinologist or a general internist (specialist)	17%	Y	Y	Y	•	•	•	•	•	Y
No visits to GP/ FPs or specialists	4%	Y	Y	Y	•	•	•	•	•	Y

Hospital Admission Rates for Specific Ambulatory Care Sensitive Conditions (ACSC)

Congestive heart failure (CHF)	217 [#]	Y	Y	Y	•	•	•	•	•	Y
Chronic obstructive pulmonary disease (COPD)	273 [#]	Y	Y	Y	•	•	•	•	•	Y
Asthma	27 [#]	Y	Y	Y	•	•	•	•	•	Y
Diabetes	79 [#]	Y	Y	Y	•	•	•	•	•	Y

Access to specialized services and home care (7 indicators)

Percentage who required specialist services who reported no difficulties accessing this type of care

Specialist care for a diagnosis or consultation	76%	N	Y	N	Y	Y	Y	–	Y	Y
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Indicators	Overall Result	Stratification Factor								
		Sex	Age	Income	Education	Ethnicity	Immigration	Language	Rural/Urban Residency	LHIN
Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography)	81%	N	Y	N	Y	–	–	–	Y	Y
Elective (non-emergent) surgery	85%	N	N	N	N	–	–	–	N	–
Percentage who required specialist services who reported being seen within two months and the median wait times										
Specialist care for a diagnosis or consultation										
Percentage who reported waiting less than 2 months	66%	N	N	N	N	–	–	–	N	Y
Median wait time	30 days [^]	N	–	–	N	–	–	–	N	–
Specialized diagnostic tests (non-emergency MR imaging, CT scanning, and angiography)										
Percentage who reported waiting less than 2 months	74%	N	Y	N	N	–	–	–	Y	N
Median wait time	21 days [^]	N	Y	–	N	–	–	–	N	–
Elective (non-emergent) surgery										
Percentage who reported waiting less than 2 months	63%	N	N	N	N	–	–	–	N	–
Median wait time	30 days [^]	N	–	–	N	–	–	–	N	–

Incidence per 100,000 population

[^] Median wait time for specialized services

• Data not available

– Limited power to detect differences due to small sample sizes in some subgroups

POWER Study

Discussion

We found inequities in access to health care in Ontario associated with gender, income, immigration, ethnicity, language and geography.

Recent immigrants, certain ethnic groups, and those who spoke a language other than English or French were most likely to report difficulty accessing care and were less satisfied with their experiences. Women and men living in lower-income neighbourhoods were much more likely to have potentially avoidable hospitalizations for common chronic conditions: congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), asthma and diabetes. For nearly all indicators there were significant differences in performance across Local Health Integration Networks (LHINs). We identify many opportunities for improvement, present objective evidence to inform priority setting and provide a baseline from which to measure progress.

While the overwhelming majority of Ontarians have a primary care physician, many do not. Recent immigrants and those living in low-income neighbourhoods were less likely to have a regular primary care provider.

Immigrants who have been in Ontario less than five years were the least likely to have a primary care physician; nearly one in six did not have one. In addition, there were significant variations across LHINs in the proportion of the population who did not have a primary care physician. Most Ontarians who reported not having a primary care physician, had one in the past. The most common reasons for currently not having one were that either they had moved or their physician had moved or retired.

Women and men who have a regular primary care provider report difficulty getting care when they need it.

Assuring access to a primary care physician is only the first step in assuring access to effective primary care, highlighting the need for quality improvement and practice redesign in primary care to facilitate timely access. Many who had a primary care physician reported difficulties getting appointments for check-ups, monitoring of health problems and urgent, non-emergent care. One in five Ontarians reported difficulties accessing care for urgent, non-emergent health problems. Immigrants, certain ethnic groups and Ontarians who did not speak either English or French most often at home were most likely to report difficulties. South and West Asian or Arab women reported difficulties accessing care more often than other population groups.

There are also inequities in access to specialty care.

When specialty care is required, primary care providers refer patients to specialists. One in four Ontarians who required this type of care reported difficulty seeing a specialist. Recent immigrants and certain ethnic groups were more likely to report difficulties with access to specialists.

Low-income Ontarians are at significantly increased risk of having potentially avoidable hospitalizations for common chronic conditions.

Effective primary care can reduce rates of hospitalization for common chronic conditions including CHF,

COPD, asthma and diabetes. Ontarians living in lower-income neighbourhoods were much more likely than those living in higher-income neighbourhoods to be admitted to the hospital for these problems and there was a gradient in admission rates for these conditions across all neighbourhood income quintiles, even after adjusting for age. There was also variation across LHINs in the age-adjusted hospitalization rates for these conditions. We estimate that 9000 hospitalizations a year could potentially be avoided if all neighbourhoods achieved the same admission rates as the highest-income neighbourhoods. If all LHINs achieved admission rates of the LHINs with the lowest rates for each condition, we estimate that 8500 hospitalizations a year could potentially be avoided. Reducing hospitalization rates for these conditions can contribute to health system sustainability by reducing demand on hospitals.

Access to dental care, a service not covered by OHIP, is a problem for many Ontarians, particularly for low-income women and men, older adults, immigrants, certain ethnic groups and Aboriginal women and men.

Oral health is an important component of general health and well-being. Poor oral health can lead to systemic infections, and has been associated with chronic diseases (e.g., heart disease) and poor pregnancy outcomes. In addition, lack of access to dental care may result in use of emergency departments for oral health problems that could have been prevented or treated in a dentist's office.¹⁸

BARRIERS TO CARE FOR DISADVANTAGED WOMEN IN ONTARIO

Much is known about barriers to care encountered by socioeconomically disadvantaged communities in Ontario. Our review of qualitative studies on access to care found a large body of literature that examined access barriers encountered by women with a diverse range of life circumstances including; lesbian, low-income, disabled, rural and/or homeless women. This review highlighted the interplay between structure

and delivery of health care services and women's complex, differing life circumstances. It is important to recognize the importance of intersectionality in addressing the access barriers encountered by disadvantaged populations. A woman may be poor, a recent immigrant with limited knowledge of English and have a disability. These "multiple jeopardies" interact to influence access and use of health care services.¹¹⁶

Our analysis indicated that access to health care is shaped by four major forces. An understanding of these forces can be used to develop interventions that address the inequities in access observed in our quantitative analyses. **Contextual conditions** such as inadequate housing, limited employment opportunities or food insecurity may predispose affected individuals to illness and influence health care access.^{19, 20}

Constraints to accessing health care are linked with women's social, economic and environmental contexts. For example, recent immigrants from India, China or Vietnam found transportation difficulties constrained access to health information and primary or prenatal care. The inability to communicate in English created additional challenges to accessing needed care.^{21, 22}

Barriers posed by the social and institutional organization of health care make it difficult for women to benefit from available services. Long waiting periods for specialist appointments or test results and even time spent in clinic waiting rooms with restless or sick children are barriers to access, contribute to worry or anxiety and may discourage further use of needed health care.^{21, 23-30} **Deterrents** to access are created when at risk individuals have negative experiences with the health care system. Homeless women's negative experiences with public services may prompt them to avoid health care until a problem is unbearable; the emergency department is their most common point of access.¹⁹ Similar vulnerabilities and past instances of social surveillance, cultural insensitivity, silencing and negative stereotyping were deterrents to health care access described by aboriginal mothers,³⁰ women of colour,³² lesbian women,^{33, 34} mothers with low

incomes or mental illness³⁵⁻³⁷ and women experiencing partner violence.³⁸ These issues may deter women from seeking health care even when it is available. Organizing health care services in a way that is sensitive to these issues can foster access.

ACCESS, QUALITY AND HEALTH OUTCOMES

Health care is an important determinant of health, serving as a mediator of health outcomes. Barriers to health care access contribute to inequities in health and health care. Socioeconomically disadvantaged populations encounter multiple financial and non-financial barriers to accessing effective care which in turn contribute to health inequities. Health inequalities resulting from social conditions are manifested through preventable or treatable clinical conditions, (e.g., heart disease, diabetes or asthma) which are thus more prevalent among disadvantaged and marginalized groups. When socioeconomically disadvantaged populations experience barriers to accessing care or receive health care of lower quality, they often experience suboptimal health outcomes. Access to quality health care can potentially improve the health of population groups of lower socioeconomic position, whereas poor access and worse quality of care can compound these inequalities.¹⁴ Improving access to and quality of care is dependent upon understanding access barriers as experienced by at risk populations and developing effective interventions to address them.

The conceptual framework presented by Bierman and colleagues¹³ illustrates how access to and quality of care mediate health outcomes. This framework, which describes access barriers, can serve as a tool for identifying opportunities for intervention.⁵³ Primary, secondary, and tertiary barriers to access work at different levels to impede the receipt of effective care. The strategies needed to overcome these barriers often differ by gender, as women and men have different health care needs, financial and social resources and contexts and interactions with health care providers.

Primary access barriers represent the first obstacle in getting care and include such factors as health coverage, proximity of providers, competing demands such as caregiving and lack of transportation. Even under Canada's system of universal health insurance, essential services such as drugs or physical therapy may not be covered for everyone. Women who are more likely to have lower incomes and more chronic illnesses may be disproportionately affected by these barriers. Secondary barriers are structural barriers within the care delivery system such as difficulty getting appointments, specialty referrals or advice after hours. Tertiary access is the link between access and quality and reflects the ability of providers and the health care system to understand and address the patient's needs and the provider's communication skills, cultural competence, knowledge and clinical skills.^{13, 117} Improved access and quality of care for women is dependent upon understanding all of these barriers for diverse groups and developing effective interventions to address them.

IMPROVING ACCESS TO CARE IN ONTARIO: DIFFERENT APPROACHES

There is much that can be done to improve access to care overall in the province and to reduce observed inequities in health care access. We have reported the results of these analyses so that the findings can be used to inform and guide efforts to improve access to care across the province and specifically for disadvantaged populations. Many examples of interventions that can improve access to care can be found in prior chapters. In the [Burden of Illness Chapter \(chapter 3\)](#) we discuss implementation of the chronic care model, approaches to improving cultural and linguistic access and the role of CHCs. In the [Cancer Chapter \(chapter 4\)](#) we discuss the role of quality improvement collaboratives in primary care settings, strategies to engage and activate patients and tailored interventions including the use of patient navigators for those who are most vulnerable. In the [Depression Chapter \(chapter 5\)](#) we discuss the role of collaborative care

models, integration and coordination of services and the potential of web-based intervention and e-health. In the [Cardiovascular Chapter \(chapter 6\)](#) we discuss the role of quality improvement in primary care and improving care transitions. All chapters have identified the role of performance measurement and quality improvement in improving access, quality and outcomes of care. They have also identified opportunities for research to build the evidence base for effective interventions to reduce inequities in health and health care.

In this chapter we provide additional examples of interventions which can improve access. A variety of different approaches being used provincially and internationally can help. Health Care Connect is a program of the Ontario Ministry of Health and Long-Term Care (MOHLTC) to help people who do not have a regular primary care provider to find one.¹¹⁸ Making sure that this program reaches low-income individuals, recent immigrants and those living in communities where access to a primary care provider is more challenging could help reduce inequities in access. Innovations in primary care such as advanced access and practice redesign to improve efficiency have been shown to facilitate timely access.¹¹⁹⁻¹²⁷ Telemedicine can facilitate access to specialty care and help to improve chronic disease management.^{128, 129} Regulatory approaches combined with guidelines have also been used to facilitate access for disadvantaged populations in the US. The National Standards on Culturally and Linguistically Appropriate Services (CLAS) standards are primarily directed at health care organizations, however individual providers are also encouraged to use the standards to make their practices more culturally and linguistically accessible. It is recommended that the principles and activities of culturally and linguistically appropriate services be integrated throughout an organization and undertaken in partnership with the communities being served. The 14 standards are organized by themes: Culturally Competent Care,

Language Access Services, and Organizational Supports for Cultural Competence.⁵⁸ Policy interventions and interventions aimed at the health system, provider or patient levels can all help to improve access and to reduce inequities in health care access. See [Improving Access to Care: Different Approaches](#).

LIMITATIONS

A number of limitations of our work should be noted. Our biggest challenges were related to data. Indicators were assessed using large, secondary datasets and we were limited to items asked in surveys or calculable with administrative data. Thus, there were dimensions of access that could not be assessed, particularly specific barriers encountered by diverse communities. Our review of the qualitative literature helped provide more information and context about access barriers encountered by Ontario's diverse communities.

Many of the indicators are measured using the Primary Care Access Survey (PCAS) or the Canadian Community Health Survey (CCHS) and are based upon self-report. The way a question is asked can influence the accuracy of response and can increase the risk of reporting or recall biases. Furthermore, culture may influence responses to questions. Expectations can differ by age, education or culture and thus influence responses about difficulties obtaining care or satisfaction with care. In other circumstances, important questions may not be asked. For example, caregiving responsibilities commonly create a barrier to care for many women and this was something we were unable to assess.

While we provide new information on access to care in the province for immigrants, ethnic minority groups and those whose primary language is not English or French, there were a number of indicators where sample sizes in these population groups were not large enough to produce reliable estimates. The CCHS is administered in multiple languages. The PCAS is administered in English and French. It asks about language spoken most often at home which may be a

marker for recency of immigration, culture, preference or facility with English or French. Thus, on indicators derived from the PCAS we may underestimate differences in access associated with language spoken.

When sampling Aboriginal populations, the CCHS only includes self-identified, off-reserve, Aboriginal adults (North American Indian, Métis, Inuit). Thus, our measures of access to care for Aboriginal women and men excluded those living on reserves and are not representative of the overall Aboriginal population in Ontario. Aboriginal people living on reserves are likely to have different experiences accessing care than those living off-reserves.

For indicators using administrative data, income level was assessed using neighbourhood income quintiles. This measure captures the impact on health of living in a low-income neighbourhood. This measure has been well-validated as a proxy for individual income, but it is subject to measurement error in neighbourhoods where households with a mix of income levels reside. Data on wait times for specialty care are based on self-report and subject to reporting bias.

Importantly, income, education, ethnicity, language and geography do not operate alone to influence health and well-being. Rather they operate together and interact to shape the health of women and men. We were only able to examine these factors separately, thus, we do not capture the impact of their intersectionality.

Most of the indicators we report are from 2006-2008. We have provided a baseline from which to monitor progress that can be updated as newer data become available.

WHAT WE CAN'T MEASURE

Due to data limitations, there are a number of important aspects of access to care that we were unable to measure. Above we discuss the complex dimensions of access to care for diverse groups that can result in access barriers. We have no data on contextual factors in women's lives such as caregiving, inability to get time off work and domestic violence that often create barriers to care. We also do not capture important factors related to experiences with the health care system and interpersonal quality of care that may create barriers to care for women such as perceptions of disrespect, discrimination or lack of trust. Our review of the qualitative literature provides insights into some of these factors. There are validated survey items to assess these issues that if added to current surveys would improve our ability to better understand barriers to care encountered by women in Ontario.

Limited data are available in the province on ethnicity. The data that are available come from the PCAS and the CCHS, and sample sizes are not large enough to report on all indicators for the diverse ethnic groups that comprise the Ontario population. It was not possible to assess whether access to care for ethnic minorities differed across the LHINs. Likewise, similar limitations apply to assessing the health of Franco-phones in the province or those who did not speak English. We were also unable to provide a full picture of Aboriginal health across the province. Nevertheless we were able to examine access to care for these populations much more broadly than has been done previously in Ontario. Better data on ethnicity and language can be obtained through oversampling specific populations in surveys to increase sample size, targeting surveys to specifically assess the health of populations of interest, collecting data on ethnicity and language in administrative data or linking datasets containing this information to health data.

KEY MESSAGES

There are enormous opportunities to improve access to health services while at the same time reducing inequities in access to health care in Ontario. Improved access to effective, comprehensive, coordinated and culturally sensitive primary care can make an important contribution to health system sustainability. Improving access to care and primary care reform have been priorities of the Ontario Ministry of Health and Long-Term Care (MOHLTC) and a number of important initiatives are underway to improve access and quality of primary care services in the province.

The following seven actions can accelerate progress in improving access to care for all Ontarians and reducing inequities in access to care among Ontario's diverse population.

Facilitate Access to a Primary Care Provider for all Ontarians

- Efforts are underway in Ontario to increase the proportion of the population who have a regular primary care provider. It will be important to specifically target low-income individuals and recent immigrants as a component of these efforts as well as those living in communities where access to a primary care provider is more challenging. This action aligns with the mandates of Community Health Centres (CHCs) which explicitly include reducing health inequities and serving disadvantaged populations. Increased access to CHCs is one way to improve access to primary care.
- Regular monitoring of this indicator by income and time in Canada is needed to assess the effectiveness of these efforts.

Design Innovations in Primary Care Practice to Help Ensure Timely Access to Effective Care

- Practice innovations such as “Advanced Access” can help assure appointments are available in a timely

manner for those who need them. Patient self-management education, as part of chronic disease management strategies, together with quality improvement interventions can improve patient quality of life and reduce the need for urgent services. Thus, primary care innovation is key to assuring timely access to effective care.

- Improving timely access to effective primary care can contribute to health system sustainability by leading to reduced demand on emergency departments and hospitals for care that can be provided and managed in primary care settings.

Address Cultural and Linguistic Barriers to Care

- Our findings highlight the need to address cultural and linguistic barriers to care among Ontario's diverse population. There are models to draw upon internationally and locally that, with wider implementation and adaptation to the needs of specific communities, can help meet this objective. Because barriers encountered by women and men in cultural and linguistic minority communities differ, these interventions need to be gender sensitive.
- Community engagement and partnership along with increased diversity in the health care workforce, with the explicit goal of addressing these barriers, can help to ensure access to effective care among Ontario's diverse communities.

Focus on Patient-Centred Care to Improve Satisfaction with Health Care Access

- Patient-centred care is care that is respectful of and responsive to individual patient preferences, needs, and values and ensures that patient values guide all clinical decisions. It is care that addresses an individual's constellation of problems rather than being disease specific. Patient-centred models of care that address the multiple

health care needs of individuals and are sensitive to gender and cultural differences can improve patients' experiences with care and increase satisfaction with access to care and the care received.

- Patient-centred models of care that integrate and coordinate care across care settings are central to improving satisfaction with health care access.

Reduce Avoidable Hospital Admissions for Common Chronic Conditions through Quality Improvement in Primary Care

- Quality improvement interventions aimed at chronic disease prevention and management in primary care can reduce rates of potentially avoidable hospitalizations for common chronic conditions, contributing to health system sustainability and improving the quality of life of patients. These interventions need to be gender and culturally sensitive and address barriers encountered by low-income women and men. Care coordination between primary and speciality care and across settings of care can also help reduce avoidable hospitalizations.
- The majority of potentially avoidable hospitalizations for common chronic conditions occur in older adults. Patient-centred, integrated models of care that meet the specific needs of older adults are needed to reduce rates of potentially avoidable hospitalizations.

Develop Strategies to Improve Access to Dental Care

- Oral health affects both physical and mental health. While access to dental care has been expanded for

children in the province, many Ontarians are not receiving routine dental care and there are sizable inequities in access to these services. There is a great need to improve access to dental care for low-income Ontarians, recent immigrants, ethnic minorities and older adults.

Increase the Capacity to Assess and Monitor Access to Care in Diverse Communities

- Our findings highlight the importance of routinely assessing gender, ethnic, language and socioeconomic differences in health care access as well as barriers in accessing care encountered by recent immigrants. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities. However, there is limited data capacity to measure access, quality and outcomes of care by ethnicity, language or time in Canada. Adding this information to administrative data and oversampling minority communities in population-based surveys would provide this needed capacity. Improvements in data quality, availability and timeliness are all needed to support monitoring and reporting strategies.
- Providers can collect these data in their practices and institutions and use them to assure that their efforts to improve quality and access are effective and meet the needs of all of their patients. Standardized tools and methods for data collection can assure data quality and allow benchmarking and comparisons.



Appendix 7.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

APPENDIX 7.1 | Indicators and their links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) strategic objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 7A – Access to Primary Care		
Access to primary care doctor	<ul style="list-style-type: none"> • Accessible • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve clinical and population health outcomes • Improve health status of Ontarians • Increase sustainability of the health system • Increase equity of the health system
Satisfaction with the experience of getting an appointment for a regular check-up	<ul style="list-style-type: none"> • Accessible • Patient-centred • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness
Difficulties accessing routine or ongoing care	<ul style="list-style-type: none"> • Accessible • Patient-centred • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness • Improve chronic disease management • Improve clinical and population health outcomes
Difficulties obtaining monitoring of health problems from a family doctor	<ul style="list-style-type: none"> • Accessible • Effective • Patient-centred • Equitable 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness • Improve chronic disease management • Improve clinical and population health outcomes
Difficulties with access to primary care for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • Accessible • Patient-centred • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness • Improve safety and effectiveness of health services • Improve clinical and population health outcomes
Satisfaction with access to primary care for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • Accessible • Patient-centred • Equitable • Efficient 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness • Improve clinical and population health outcomes

APPENDIX 7.1 | Indicators and their links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) strategic objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 7A – Access to Primary Care (Continued)		
Satisfaction with care provided for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • Patient-centred • Equitable 	<ul style="list-style-type: none"> • Improve patient-centredness • Improve safety and effectiveness of health services
Difficulties accessing health information or advice	<ul style="list-style-type: none"> • Accessible • Effective • Safe • Patient-centred • Equitable • Efficient • Appropriately resourced • Integrated • Focused on population health 	<ul style="list-style-type: none"> • Improve patient-centredness • Improve health behaviours, health promotion and disease prevention
Unmet health care needs	<ul style="list-style-type: none"> • Accessible • Patient-centred • Equitable 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve patient-centredness • Improve clinical and population health outcomes
Dental care	<ul style="list-style-type: none"> • Accessible • Equitable • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve health behaviours, health promotion and disease prevention • Improve clinical and population health outcomes • Increase equity of the health system
Section 7B – Access to Care for Chronic Disease		
Regular provider of care for adults with diabetes	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Efficient • Appropriately resourced 	<ul style="list-style-type: none"> • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services • Improve chronic disease management

APPENDIX 7.1 | Indicators and their links to the Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System and the Ministry of Health and Long-Term Care (MOHLTC) strategic objectives

Indicator	Link(s) to OHQC Attributes of a High-Performing Health System	Link(s) to MOHLTC Strategic Objectives
Section 7B – Access to Care for Chronic Disease (Continued)		
Hospital admission rates for specific ambulatory care sensitive conditions: <ul style="list-style-type: none"> • Congestive heart failure (CHF) • Chronic obstructive pulmonary disease (COPD) • Asthma • Diabetes 	<ul style="list-style-type: none"> • Accessible • Effective • Equitable • Efficient • Integrated • Focused on population health 	<ul style="list-style-type: none"> • Improve integration of health services providers, processes and systems • Increase productive use and appropriate distribution of resources across the system • Improve access to appropriate health services • Improve chronic disease management • Improve health behaviours, health promotion and disease prevention • Increase equity of the health system
Section 7C – Access to Specialized Services and Home Care		
Access to specialized services <ul style="list-style-type: none"> • Specialist care for a diagnosis or consultation for a new or existing illness or condition • Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography) • Elective (non-emergent) surgery 	<ul style="list-style-type: none"> • Accessible • Equitable • Efficient • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve safety and effectiveness of health services
Wait times for specialized services <ul style="list-style-type: none"> • Specialist care for a diagnosis or consultation for a new or existing illness or condition • Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography) • Elective (non-emergent) surgery 	<ul style="list-style-type: none"> • Accessible • Safe • Equitable • Efficient • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve safety and effectiveness of health services
Wait time for first assessment for long-term home care patients	<ul style="list-style-type: none"> • Accessible • Safe • Equitable • Efficient • Appropriately resourced 	<ul style="list-style-type: none"> • Improve access to appropriate health services • Improve safety and effectiveness of health services

Appendix 7.2

INDICATORS AND THEIR SOURCES

APPENDIX 7.2 | Access to health care services indicators—indicator sources and data sources[^]

Indicator	Indicator Source(s)	Data Source(s)
Section 7A – Access to Primary Care		
Access to primary care doctor	<ul style="list-style-type: none"> • APHEO - Association for Public Health Epidemiologists of Ontario¹³⁰ • CIHI: Pan-Canadian primary health care indicators. Vol. 1 & 2^{63, 64} • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ • A profile of women's health indicators in Canada¹³² 	Primary Care Access Survey (PCAS), Waves 4-11
Satisfaction with the experience of getting an appointment for a regular check-up	<ul style="list-style-type: none"> • CIHI: Pan-Canadian primary health care indicators Vol. 1⁶⁴ 	Primary Care Access Survey (PCAS), Waves 4-11
Difficulties accessing routine or ongoing care	<ul style="list-style-type: none"> • CIHI: Pan-Canadian primary health care indicators Vol. 1 & 2^{63, 64} • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ • A profile of women's health indicators in Canada¹³² 	Canadian Community Health Survey (CCHS), 2007
Difficulties obtaining monitoring of health problems from a family doctor	<ul style="list-style-type: none"> • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Primary Care Access Survey (PCAS), Waves 4-11
Difficulties with access to primary care for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • CIHI: Pan-Canadian primary health care indicators. Vol. 1 & 2^{63, 64} • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Primary Care Access Survey (PCAS), Waves 4-11

APPENDIX 7.2 | Access to health care services indicators—indicator sources and data sources[^]

Indicator	Indicator Source(s)	Data Source(s)
Section 7A – Access to Primary Care (Continued)		
Satisfaction with access to primary care for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • CIHI: Pan-Canadian primary health care indicators. Vol. 1⁶⁴ • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Primary Care Access Survey (PCAS), Waves 4-11
Satisfaction with care provided for an urgent, non-emergent health problem	<ul style="list-style-type: none"> • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Primary Care Access Survey (PCAS), Waves 4-11
Difficulties accessing health information or advice	<ul style="list-style-type: none"> • CIHI: Pan-Canadian primary health care indicators. Vol. 1 & 2^{63, 64} • Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Canadian Community Health Survey (CCHS), 2007
Unmet health care needs	<ul style="list-style-type: none"> • Ontario District Health Council's Local Health System Monitoring Technical Working Group: Access, equity and integration indicators for local health system monitoring in Ontario¹³³ • A profile of women's health indicators in Canada¹³² 	Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)
Dental care	<ul style="list-style-type: none"> • APHEO – Association for Public Health Epidemiologists of Ontario¹³⁴ • Statistics Canada/CIHI's Health Indicators Framework¹³⁵ 	Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1)

APPENDIX 7.2 | Access to health care services indicators—indicator sources and data sources[^]

Indicator	Indicator Source(s)	Data Source(s)
Section 7B – Access to Care for Chronic Disease		
Regular provider of care for adults with diabetes	<ul style="list-style-type: none"> ICES Atlas: Diabetes in Ontario, 2003¹³⁶ 	Ontario Diabetes Database (ODD); Ontario Health Insurance Plan (OHIP); ICES Physician Database (IPDB)
Hospital admission rates for specific ambulatory care sensitive conditions: <ul style="list-style-type: none"> Congestive heart failure (CHF) Chronic obstructive pulmonary disease (COPD) Asthma Diabetes 	<ul style="list-style-type: none"> Healthy People 2010¹³⁷ Statistics Canada/CIHI's Health indicators Framework¹³⁵ Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Registered Persons Database (RPDB)
Section 7C – Access to Specialized Services and Home Care		
Access to specialized services <ul style="list-style-type: none"> Specialist care for a diagnosis or consultation for a new or existing illness or condition Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography) Elective (non-emergent) surgery 	<ul style="list-style-type: none"> Health Statistics Division, Statistics Canada: Access to health care services in Canada, January to December 2005¹¹⁰ 	Canadian Community Health Survey (CCHS), 2007
Wait times for specialized services <ul style="list-style-type: none"> Specialist care for a diagnosis or consultation for a new or existing illness or condition Specialized diagnostic tests (non-emergency magnetic resonance (MR) imaging, computed tomography (CT) scanning, and angiography) Elective (non-emergent) surgery 	<ul style="list-style-type: none"> Health Statistics Division, Statistics Canada: Access to health care services in Canada, January to December 2005 2005.¹¹⁰ Conference Board of Canada: Healthy provinces, healthy Canadians: a provincial benchmarking report¹³¹ 	Canadian Community Health Survey (CCHS), 2007
Wait time for first assessment for long-term home care patients	<ul style="list-style-type: none"> Ontario Health System Scorecard¹³⁸ 	Home Care Reporting System (HCRS)

[^] There may be small differences in the indicator reported compared to the indicator source(s) listed here.

Appendix 7.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators we report are the result of a rigorous selection process which included an extensive review of peer-reviewed and grey literature (see [Introduction to the POWER Study, chapter 1](#) for a more detailed description of the indicator selection process). The review of literature identified approximately 209 indicators. The working groups reviewed the indicators using the defined indicator selection criteria and identified a set of potential indicators for inclusion for review by a Technical Expert Panel (TEP). Indicators were then selected through a modified Delphi process by the TEP using a two-step process—first through an online questionnaire and then at a face-to-face meeting on December 12, 2006. The final list included 10 indicators that apply to access to primary care, five indicators for access to care for chronic disease, six indicators for access to specialized services and wait times and one indicator for access to home care (See [Appendix 7.1](#) for a complete indicator list).

All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators were first stratified by sex, and then further stratified by age, income level, education level, ethnicity, time since immigration, language and rural/urban residence as allowed by sample size and data availability. At the LHIN level, indicators were stratified by sex and then by income level, education and age group as allowed by sample size and data availability. Age adjustment was done using indirect standardization.

2A. Datasets—Survey Data

Canadian Community Health Survey (CCHS)

The CCHS is a nationally representative cross-sectional survey of the Canadian community-dwelling population conducted every two years by Statistics Canada. The CCHS is offered in English and in French. To remove language as a barrier to conducting interviews, each of the Statistics Canada Regional Offices recruited interviewers with a wide range of language competencies. When necessary, cases were transferred to an interviewer with the language competency needed to complete an interview. In addition, the survey questions were translated into the following languages: Chinese, Punjabi and Inuktitut. Chinese and Punjabi were the most common language barriers identified by the regional offices. The Inuktitut translation was used to facilitate collection in Nunavut. The survey is conducted via face-to-face interviews. Until 2007 the survey material alternated between a general overview of the health of Canadians (the x.1 cycle surveys) and more in-depth issues (the x.2 cycle surveys) and was released every two years. In 2007, major changes were made to the CCHS design. Data are now collected on an ongoing basis with annual releases. As such, as of 2007, the naming convention has also changed to reflect the year of the survey rather than the cycle. Residents living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded from the survey. The Ontario share files for the survey were

used for all analyses. The analyses for several indicators were based on data from the Canadian Community Health Survey (CCHS), 2005 (Cycle 3.1) and 2007.

For all the CCHS-based indicators, we included all respondents aged 25 and older. For the overall population and for women and men we assessed the relationship between these indicators and income, education, age, ethnicity, immigrant status, language skills and rural/urban residence. The variable measuring language in the CCHS refers to knowledge of Canada's official languages, i.e., English or French. The variable measuring rural/urban residency is a derived variable by Statistics Canada based on population density and size. In analyses that use the CCHS, income levels were based on information collected about annual household income, a variable derived by Statistics Canada that accounts for total household income and household size (see [Table 2](#) for more detail regarding variable categories). Income data were missing for 13 percent of the sample from CCHS, 2005 (Cycle 3.1) and 14 percent of the sample from CCHS, 2007. Data from CCHS, 2005 (Cycle 3.1) were used to assess those who accessed a dentist in the past 12 months and the percentage of the population

who reported unmet health care needs. Data from CCHS 2007 were used to assess those who accessed routine primary health care, health information and specialized services, and wait times for specialized services. The studentized range test was used to assess the significance of differences among the rates. The standard errors of the rates and 95 percent confidence intervals were calculated using 500 bootstrap weights provided by Statistics Canada. In addition, relative rates were calculated for women-to-men, lowest-to-highest neighbourhood income quintile and rural-to-urban residence.

Statistics Canada rules were followed in the reporting of estimates using the Ontario share file as follows:

- Estimates should not be reported if the unweighted sample is less than 10
- Estimates are adequate and can be reported if the coefficient of variation is 16.5 or less
- Estimates should be reported with caution if the coefficient of variation is between 16.6 and 33.3
- Estimates should be suppressed if the coefficient of variation is greater than 33.3.

Table 2 | Stratifying variables for CCHS indicators
Sex

Female
Male

Age (years)

25–44
45–64
65–79
80+

Household income – Provincial level analyses

Lowest income	< \$15,000 if 1 or 2 people < \$20,000 if 3 or 4 people < \$30,000 if 5+ people
Lower middle income	\$15,000 to \$29,999 if 1 or 2 people \$20,000 to \$39,999 if 3 or 4 people \$30,000 to \$59,999 if 5+ people
Upper middle income	\$30,000 to \$59,999 if 1 or 2 people \$40,000 to \$79,999 if 3 or 4 people \$60,000 to \$79,999 if 5+ people
Highest income	>= \$60,000 if 1 or 2 people >= \$80,000 if 3+ people

Household income – LHIN level analyses

Lower income (Lowest / Lower Middle)	< \$30,000 if 1 or 2 people < \$40,000 if 3 or 4 people < \$60,000 if 5+ people
Higher income (Upper Middle / Highest)	>= \$30,000 if 1 or 2 people >= \$40,000 if 3 or 4 people >= \$60,000 if 5+ people

Education – Provincial level analyses

Less than secondary school graduation
Secondary school graduation
At least some post-secondary school
Bachelor's degree or higher

Education – Provincial level analyses

Lower education	Secondary school graduation or less
Higher education	At least some post-secondary school

Immigration

0-9 years of residency in Canada
10+ years of residency in Canada
Born in Canada

Ethnicity

White	
Black	
East and Southeast Asian	Filipino, Japanese, Korean, Chinese, Southeast Asian
Arab, West and South Asian	South Asian, Arab, and West Asian
Other	Latin American, other racial or cultural origins, multiple racial origins
Aboriginal people	North American Indian, Métis or Inuit

Rural/urban

Urban	Urban core; Urban fringe; Urban area outside CMAs and CAs Secondary urban core
Rural	Missing; Rural fringe inside CMAs and CAs; Rural fringe outside CMAs and CAs

Knowledge of official languages

English only
French only
English and French only
English or French with other languages
Neither English nor French

Primary Care Access Survey (PCAS)

The Primary Care Access Survey (PCAS) is a cross-sectional telephone survey of the Ontario population conducted every three months by the Institute for Social Research (ISR) at York University. The PCAS is offered in English and in French. The survey includes questions on health status, perceptions of the health care system in Ontario, family doctor status, practice setting for family doctors, utilization of primary health care services, access to primary health care services, use of emergency departments and walk-in clinics, awareness and use of Telehealth Ontario services, sociodemographic status and provincial health care coverage. The sample is targeted to individuals aged 16 and older who live in private dwellings in Ontario. The sample is allocated equally across the 14 Local Health Integration Network (LHIN) areas. A sampling frame of telephone numbers is generated using a modified random digit dialling method and based on telephone numbers available through published sources. Sampled households are removed from the sampling frame for two years. Households without telephones, households that utilize only cell phones and people living in institutions are excluded.

For all the PCAS-based indicators, we included all respondents aged 25 and older. For the overall population and for women and men we assessed the relationship between these indicators and education, income, age, ethnicity, immigration status, language skills, rural/urban residence and LHIN and self-reported access to care. The variable measuring language in the PCAS refers to language spoken most often at home. In analyses that use the PCAS, postal codes were used to assign people to enumeration areas or dissemination areas (using the Statistics Canada Postal Code

Conversion File) and then to one of the income quintiles (see [Table 3](#) for more detail regarding variable categories).

The PCAS results were based on the two year data (eight survey waves), from October 2006 (Wave 4) to September 2008 (Wave 11). The responses were weighted by the provincial weight and were post-stratified to the 2007 Ontario population estimates (by LHIN, gender and five-year age groups). The following were assessed using PCAS, Waves 4-11: access to regular family doctor; access to routine primary health care; access to urgent, non-emergent primary health care; monitoring of ongoing problems; satisfaction with access to care provided by doctor for regular check-up; satisfaction with experience in access to care provided by doctor for urgent, non-emergent primary health care; satisfaction with the care the doctor provided for urgent non-emergent primary health care. The studentized range test was used to assess the significance of differences among the rates. In addition, relative rates were calculated for women-to-men, lowest-to-highest neighbourhood income quintile and rural-to-urban residence.

We followed the following rules in the reporting of estimates based on recommendations from the Health Analytics Branch of the Ministry of Health and Long-Term Care:¹³⁹

- Estimates should not be reported if the unweighted sample is less than 30

All estimates, with the exception of numbers less than ten, were rounded to the nearest integer for presentation of exhibits. As such, proportional distributions may not add up to 100 percent.

Table 3 | Stratifying variables for PCAS indicators

Sex	
Female	
Male	
Age – Provincial level analyses	
25–44	
45–64	
65–79	
80+	
Age – LHIN level analyses	
25–64	
65+	
Neighbourhood household income – Provincial level analyses	
Quintile 1 (Lowest)	
Quintile 2	
Quintile 3	
Quintile 4	
Quintile 5 (Highest)	
Neighbourhood household income – LHIN level analyses	
Lower income	Q1 (Lowest)
	Q2
Higher income	Q3
	Q4
	Q5 (Highest)
Education – Provincial level analyses	
Less than secondary school graduation	Less than high school
Secondary school graduation	Completed high school
At least some post-secondary school	Some community college or technical school; Completed community college or technical school; Some university
Bachelor's degree or higher	Completed Bachelor's Degree (arts, Science, Eng, etc.); Post graduate training: Ma, MSc, MLS, MSW, MBA, etc.; Post graduate training: PhD, "doctorate" and professional degrees

Education – LHIN level analyses/Regrouped

Lower education	Secondary school graduation or less
Higher education	At least some post-secondary school

Ethnicity

White	
Black	Bahamian, Black/African, Ethiopian, Guyanese, Haitian, Jamaican, Nigerian, Somali, Trinidadian, Other African, Other Caribbean
Aboriginal	Inuit, Métis, North American Indian
South and West Asian, Arab	Bangladeshi, Indian, Israeli, Lebanese, Pakistani, Sikh, Sri Lankan, Tamil, Other Middle Eastern
East, Southeast Asian and other Asian	Chinese, Japanese, Korean, Filipino, Vietnamese, Other Asian
Other	El Salvador, Other European, Other C. American, Other S. American, Ethnicity as religion

Immigration

0-4 years of residency in Canada
5-9 years of residency in Canada
10+ years of residency in Canada
Born in Canada

Language spoken most often at home

English only, English with other
French only
Neither English nor French (other)

Rural/urban residency

Rural	Communities of 10,000 or fewer residents
Urban	Communities of greater than 10,000 residents

2B. Datasets—Administrative data

Ontario Diabetes Database (ODD)

The ODD employs a validated algorithm to identify people with diabetes using data on hospitalizations and physician visits. Hospital discharge abstracts, collected by the Canadian Institute for Health Information (CIHI) from April 1988 onwards were used to identify Ontarians with a valid health card number who had been hospitalized with a new or pre-existing diagnosis of diabetes, based on a specific code (ICD-9 code: 250.x; ICD-10 code: any of E10, E11, E13, E14) in any diagnostic field. Physician claim records held by the Ontario Health Insurance Plan (OHIP) from July 1991 onwards were also used to identify individuals with visits to a physician for diabetes (diagnostic code 250). When there was a hospital record with a diagnosis of pregnancy care or delivery (ICD-9 code: 641-676, V27; ICD-10 code: O10-O16; O21-O95, O98, O99, Z37) close to a diabetic record (i.e., diabetic record date between 120 days before and 180 days after a gestational admission date), the diabetic record was considered to be for gestational diabetes and was excluded. Individuals were considered to have diabetes if they had at least one hospitalization or two physician service claims over a two-year period. Persons enter the ODD as incident cases when they are defined as having diabetes (i.e., the first of CIHI admission date or OHIP service date over the two-year period as incident date). The database contains an encrypted patient identifier that can be linked to hospital discharge abstracts from CIHI, physician claims from OHIP and sociodemographic information from the Registered Persons Database (RPDB) and the Statistics Canada Census files. For our analysis, we restricted the sample to adults aged 25 and older with prevalent diabetes as of April 1, 2006.

Ontario Health Insurance Plan (OHIP)

The OHIP claims database covers all reimbursement claims to the Ontario Ministry of Health and Long-Term

Care made by fee-for-service physicians, community-based laboratories and radiology facilities. The OHIP database at ICES contains encrypted patient and physician identifiers, code for service provided, date of service and the associated diagnosis and fee paid. Services which are missing from the OHIP claims data include some lab services, services received in provincial psychiatric hospitals, services provided by health service organizations and other alternate funding plans, diagnostic procedures performed on an inpatient basis and lab services performed at hospitals (both inpatient and same day). Also excluded is remuneration to physicians through Alternate Fee Plans (AFPs). Their concentration in certain specialties or geographic areas could distort an analysis.

ICES Physician Database (IPDB)

The IPDB contains information on physician demographics and specialty training. The IPDB incorporates information from the Corporate Provider Database (CPDB), the Ontario Physician Human Resource Data Centre (OPHRDC) database and the OHIP database of physician billings. The CPDB contains information about physician demographics, specialty training and certification and practice location. This information is validated against the OPHRDC database, which verifies this information through periodic telephone interviews with all physicians practicing in Ontario.

Canadian Institute of Health Information Discharge Abstracts Database (CIHI-DAD)

The CIHI-DAD is a database of information abstracted from hospital records. It includes patient-level data for acute and chronic care hospitals, rehabilitation hospitals and day surgery clinics in Ontario. The CIHI-DAD database at ICES contains encrypted patient identifiers, patient demographics (age, sex, geographic location), diagnoses, procedures, and administrative information (institution number, admission category, length of stay).

Home Care Reporting System (HCRS)

The HCRS is a database that captures data from various types of organizations that are responsible for providing publicly funded home care services, such as the Regional Health Authorities (RHAs), Community Care Access Centres (CCAC) or Centre Local de Services Communautaires (CLSCs). The HCRS captures standardized client-specific clinical, demographic, administrative and resource utilization information based on the Resident Assessment Instrument-Home Care (RAI-HC). The RAI-HC is a standardized clinical instrument for the assessment of home care clients and was developed by the international research consortium (interRAI). The RAI-HC was developed to provide “real-time feedback on client risks and needs for care planning; clinical benchmarking using indicators and outcome scales at regional, national and international levels; and a better understanding of the resource needs of diverse home care populations.”¹¹⁴ Data were supplied by the Ontario Association of Community Care Access Centres through data sharing agreements with interRAI. Data were held within the research group led by Dr. John Hirdes at the University of Waterloo and analyses conducted by Dr. Jeff Poss.

3. Analyses and Regional and Socioeconomic Variables

Analysis

For survey data (CCHS and PCAS), analyses were conducted at the provincial level, first by sex and then by annual household income (CCHS) or neighbourhood income quintile (PCAS), educational attainment, age group, ethnicity, time since immigration, language, rural/urban residence and Local Health Integration Network (LHIN). Where possible, relative rates were calculated for women-to-men, lowest-to-highest income groups and rural-to-urban residence. Ninety-five percent confidence intervals were calculated for all rates and rate comparisons. At the LHIN level, due to small cell sizes, the analysis was done by sex, age group, income level and education.

For administrative data from the ODD, OHIP and the CIHI-DAD, analyses were conducted at the provincial level, first by sex and then by income quintile, age group and LHIN. Analyses at the LHIN level were stratified first by sex and then by neighbourhood income. Where possible, relative rates were calculated for women-to-men and lowest-to-highest income groups. Ninety-five percent confidence intervals were calculated for all rates and rate comparisons. For administrative data from the HCRS, analyses were conducted at the provincial level, first by sex and then by age group, educational attainment, MAPLe (Method of Assigning Priority Levels) score and LHIN. Analyses at the LHIN level were stratified first by sex and then by age group, educational attainment and MAPLe score.

Standardization

Depending on the indicator and its purpose, we reported crude rates or age-adjusted. When age-adjusted rates were reported, we used indirect standardization which compares the age specific rates to the provincial average for that age group. The observed over the expected rate tells us how a particular stratum compares to the overall population and the relative rate tells us how a specific stratum compares to another (i.e., women versus men or low versus high income).

Income Quintile

Average neighbourhood income is calculated by Statistics Canada and is updated every five years when new Census data become available. Income was calculated using the neighbourhood income per person equivalent (IPPE), which is a household size adjusted measure of household income based on 2001 census summary data at the dissemination area and using person-equivalents implied by the 2006 low income cut-offs. In 2001, average income estimates were calculated by dissemination area. Ontario neighbourhoods are classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are used as

proxy for overall socioeconomic status, which has been shown to be related to population health status and levels of health care utilizations. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to enumeration areas or dissemination areas (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. Enumeration areas and dissemination areas are small adjacent geographic areas, designated for collection of census data. Dissemination areas replaced enumeration areas in 2001 and have a population of 400–700 persons.

Annual Household Income

Annual household income was collected in the CCHS. Taking the number of household members into consideration, annual household income was classified into four categories: low income, lower middle, middle or higher income. Low income was defined as <\$15,000 for 1 or 2 household members, <\$20,000 for 3 or 4 household members or <\$30,000 for 5 or more household members. Lower middle income was defined as \$15,000 to \$29,999 for 1 or 2 household members, \$20,000 to \$39,999 for 3 or 4 household members or \$30,000 to \$59,999 for 5 or more household members. Upper middle income was defined as \$30,000 to \$59,999 for 1 or 2 household members, \$40,000 to \$79,999 for 3 or 4 household members or \$60,000 to \$79,999 for 5 or more household members. Higher income was defined as ≥\$60,000 for 1 or 2 household members or ≥\$80,000 for 3 or more household members.

Location of Residence (Urban Versus Rural)

For the PCAS, rural/urban residency was assigned based on postal code and using the Statistics Canada Postal Code Conversion File (2006) macro to assign locations. Community size was derived from the Statistics Canada 2001 Census data and communities of 10,000 or fewer

residents were defined as rural. All other communities were classified as urban.

For the CCHS, rural/urban residency was assigned based on a Statistics Canada derived variable. Urban areas are those continuously built-up areas having a population concentration of 1,000 or more and a population density of 400 or more per square kilometre based on current census population counts. Areas are designated as rural, urban core, urban fringe, urban area outside CMAs and CAs, secondary urban code and mix or urban/rural areas. This variable is further dichotomized into rural and urban location by Statistics Canada.

Patients' Residence

For all analyses presented in the report, the definition of "Local Health Integration Network (LHIN) of patient residence" is based on where each person lived.

4. Indicators

Access to a Primary Care Doctor

The percentage of adults who reported having a primary care doctor was measured using PCAS, Waves 4-11 and was based on a derived variable "famdoc". Respondents identified whether they had a doctor (family doctor, general practitioner/ family physician, medical doctor) and if they thought of this doctor as their regular doctor. This did not include dentists, eye doctors, gynecologists, obstetricians or specialists, but could include a nurse practitioner. For those who reported that they had a doctor in the past, but no longer had one, the reasons for not currently having a regular doctor were analysed. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Satisfaction With The Experience Of Getting An Appointment For A Regular Check-Up

The percentage of adults who were satisfied with their experience of getting an appointment for a regular

check-up was measured using PCAS, Waves 4-11. The sample was limited to adults who had seen a doctor for a regular check-up during the previous 12 months. A regular check-up was defined as a routine physical check-up as opposed to seeing a doctor for a specific reason such as being sick or concerned about a problem. Women were asked to exclude regular visits for prenatal or postnatal care. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Difficulties Accessing Routine Or Ongoing Care

The percentage of adults who reported having no difficulties in accessing routine or ongoing care for themselves or for a family member was measured using CCHS, 2007. The sample was limited to adults who reported that they required routine or ongoing care for themselves or a family member in the past 12 months. We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Difficulties Obtaining Monitoring of Health Problems from a Family Doctor

The percentage of adults who reported no difficulties obtaining monitoring for health problems from a family doctor was measured using PCAS, Waves 4-11. The sample was limited to adults who had seen a doctor to monitor a health problem during the previous 12 months. Examples of the types of difficulties that were mentioned in the survey included difficulties making an appointment, getting to the doctor's office or waiting for the doctor. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Difficulties with Access to Primary Care for an Urgent, Non-Emergent Health Problem

The percentage of adults who reported no difficulties making an appointment for an urgent, non-emergent

problem during the previous 12 months was measured using PCAS, Waves 4-11. The sample was limited to adults who had seen a doctor in the past 12 months because they were sick, had the flu or were concerned that they had a health problem. Examples of the types of difficulties that were mentioned in the survey included difficulties making an appointment, getting to the doctor's office or waiting for the doctor. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals. We also measured, for people who indicated they did have difficulties accessing care, the types of barriers that they faced, including access barriers, wait times, transportation barriers and services being unavailable when needed.

Satisfaction with Access to Primary Care for an Urgent, Non-Emergent Health Problem

The percentage of adults who were very satisfied with their experience of getting to see a doctor for an urgent, non-emergent problem during the previous 12 months was measured using PCAS, Waves 4-11. The sample was limited to adults who had seen a doctor because they were sick, had the flu or were concerned that they had a health problem in the past 12 months. Response options included very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied or very dissatisfied. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Satisfaction with Care Provided for an Urgent, Non-Emergent Health Problem

The percentage of adults who were very satisfied with the care they received when they sought urgent, non-emergent primary health care during the previous 12 months was measured using PCAS, Waves 4-11. The sample was limited to adults who had seen a doctor in the past 12 months because they were sick, had the

flu or were concerned that they had a health problem. Response options included very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied or very dissatisfied. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Difficulties Accessing Health Information or Advice

The percentage of adults who reported no difficulties accessing health information or advice in the past 12 months for themselves or for a family member was measured using CCHS, 2007. The sample was limited to adults who reported that they required health information or advice in the past 12 months. The percentage who reported having no difficulties was reported.

In the CCHS, 2007, respondents who reported difficulties accessing health information or advice were asked to report the types of difficulties that they encountered. This included difficulties contacting a care provider, receiving inadequate information and other reasons. CCHS restricts the sample of respondents to those who sought care during regular office hours, defined as Monday to Friday, 9:00am to 5:00pm.

Unmet Health Care Needs

The percentage of adults who reported that there was a time during the past 12 months when they needed health care and did not receive it was measured using the CCHS, 2005 (Cycle 3.1). We also report, for people who had unmet health care needs, the reason for the lack of care including availability, accessibility, quality, respondent characteristics as well as other reasons. We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Unmet health care needs were measured in the general population and among respondents who indicated that

they had two or more chronic conditions. We included the following conditions diagnosed by a health professional: Alzheimer's disease; bowel disorder, Crohn's disease or colitis; cancer (excluding skin cancer); diabetes; epilepsy; heart disease; high blood pressure; stroke; thyroid condition; urinary incontinence; arthritis and/or rheumatism (excluding fibromyalgia or back problems); asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease (COPD); and Chronic Fatigue Syndrome or fibromyalgia.

In the CCHS, 2005 (Cycle 3.1), respondents who reported having unmet health care needs were asked to report the reasons they believed there needs remained unmet. This included lack of availability, poor accessibility, poor quality information or care and other reasons. CCHS restricts the sample of respondents to those who sought care during regular office hours, defined as Monday to Friday, 9:00am to 5:00pm.

Dental Care

The percentage of adults who reported that they had not visited a dentist in the past 12 months was measured using the CCHS, 2005 (Cycle 3.1). We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Regular Provider of Care for Adults with Diabetes

Using data from the ODD 2007, Ontarians with prevalent diabetes as of April 1, 2006 were followed for two years to determine the percentage that were seen by a physician during the period and the types of physicians providing care. Physician visits were identified by linking the ODD to OHIP physician claims and the type of physician providing care was confirmed by linking physician visits to the IPDB to determine specialization. Given that patients may see more than one physician during the period, care was classified as being provided by a general practitioner/family physician (GP/FP) only, an endocrinologist or general internist (specialist care), GP/FP and specialty care, or neither.

Individuals classified as having seen neither a GP/FP nor a specialist may have seen another type of physician, however this was not included. Statistics Canada, 2001 Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Hospital Admissions for Ambulatory Care Sensitive Conditions

Data from the CIHI-DAD for the 2006/07 fiscal year were used to identify hospital admissions among Ontarians aged 25 and older for the following conditions:

- Congestive heart failure (CHF) (ICD-10 code: I50.0, J81);
- Chronic obstructive pulmonary disease (COPD) (ICD-10 code: J41, J42, J43, J44, J47)
- Asthma (ICD-10 code: J45)
- Diabetes (ICD-10 code: E10.1, E10.6, E10.7, E10.9, E11.0, E11.1, E11.6, E11.7, E11.9, E13.0, E13.1, E13.6, E13.7, E13.9, E14.0, E14.1, E14.6, E14.7, E14.9)

Admissions were included if the diagnosis was classified as the most responsible diagnosis for the admissions (DXTYPE M). Admissions were excluded if the diagnosis was coded as an in-hospital complication (DXTYPE M and 2). CHF admissions were excluded if patients were admitted for the following specific procedures or elective surgery:

- Canadian Classification of Procedures (CCP) codes: 48.1, 49.5, 48.02, 48.03, 49.71, 49.72, 49.73, 49.82, 49.86
- Canadian Classification of Health Interventions (CCI) codes 1.IJ.50, 1.HZ.85, 1.IJ.76, 1.HB.53, 1.HD.53, 1.HZ.53, 1.HB.55, 1.HD.55, 1.HZ.55, 1.HB.54, 1.HD.54

Admissions were reported as number of admissions per 100,000 population. The Statistics Canada, 2001

Census was used to allocate the neighbourhood income quintile of the patient. We calculated the crude rates and the 95 percent confidence intervals.

Access to Specialized Services

The percentage of adults who reported no difficulties in accessing specialized services was measured using the CCHS, 2007. The types of services included were:

- Specialist care for diagnosis or consultation of a new or existing condition;
- Non-emergent diagnostic testing, specifically magnetic resonance (MR) imaging, computed tomography (CT) scanning or angiography;
- Elective (non-emergent) surgery.

To assess access to specialist care, adults who reported needing to visit to a medical specialist (e.g., cardiologist, allergist, gynecologist or psychiatrist, excluding optometrists) for a diagnosis or a consultation in the past 12 months were asked: "In the past 12 months, did you ever experience any difficulties getting the specialist care you needed for a diagnosis or consultation?"

To assess access to specialized diagnostic tests, adults who reported requiring MR imaging, CT scanning or angiography in the past 12 months were asked: "In the past 12 months, did you ever experience any difficulties getting the tests you needed?"

To assess access to elective surgery, adults who reported requiring surgery (e.g., cardiac surgery, joint surgery, caesarean sections and cataract surgery, excluding laser eye surgery) in the past 12 months were asked: "In the past 12 months, did you ever experience any difficulties getting the surgery you needed?"

The samples for each type of service were restricted to respondents who indicated that they required the service. We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Wait Times for Specialized Services

This set of indicators measures the percentage of adults who required specialized services who received care within two months and the median wait times for each type of service. Data from the CCHS, 2007 were used to assess these indicators. The types of services included were:

- Specialist care for diagnosis or consultation of a new condition;
- Non-emergent diagnostic testing, specifically magnetic resonance (MR) imaging, computed tomography (CT) scanning or angiography;
- Elective (non-emergent) surgery.

To assess wait times for specialist care, adults who reported seeing a medical specialist (e.g., a cardiologist, allergist, gynecologist or psychiatrist, excluding optometrists) for a diagnosis or a consultation for a new illness or condition were asked: "How long did you have to wait between when you and your doctor/health care provider decided that you should see a specialist and when you actually visited the specialist?"

To assess wait times for a specialized diagnostic test, adults who reported having MR imaging, CT scanning or angiography in the past 12 months were asked: "How long did you have to wait between when you and your doctor decided to go ahead with the test and the day of the test?"

To assess wait times for elective surgery, adults who reported having elective surgery (e.g., cardiac surgery, joint surgery, caesarean sections and cataract surgery, excluding laser eye surgery) in the past 12 months were asked: "How long did you have to wait between when you and the surgeon decided to go ahead with surgery and the day of surgery?"

The samples for each type of service were restricted to respondents who indicated that they required the service. Wait times were self-reported and measured as the time from when a health care professional determined that the service was needed to the service date (specialist visit, diagnostic test or elective surgery). We calculated crude and age-adjusted rates and the associated 95 percent confidence intervals.

Access to Home Care

The HCRS was used to measure the mean number of days between the date the long-term home care client's case was opened and the date of first administration of the Resident Assessment Instrument-Home Care (RAI-HC). All assessments where the first RAI-HC was done within 90 days of the date the case was opened were included. RAI-HC assessments that exceeded 90 days from the date when the case was first opened were excluded because they may represent dates that have been incorrectly entered or cases for which an assessment would be expected but was never done.

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