We are very pleased to provide you with the Ministry of Health and Long-Term Care's (MOHLTC) Initial Report on Public Health in Ontario.

The Public Health Division, in partnership with the Ministry of Health Promotion (MHP) and the Ministry of Children and Youth Services (MCYS), has made significant strides to renew public health in Ontario and build a public health sector with a greater focus on performance, accountability and sustainability. Some of our recent achievements towards this goal include delivering the new Ontario Public Health Standards, producing the Ontario Health Plan for an Influenza Pandemic, and now, releasing a public report that reflects the state of public health in Ontario. This report demonstrates our commitment to a public health sector that is accountable to the people of Ontario.

The indicators provided in this report are intended to contribute to our understanding of public health in Ontario as a system, at both the provincial and local levels. As we move towards implementing a performance management system in public health, we have an increased need for information that can be used to ensure the public’s health is protected, to inform decisions on where improvements are required, to ensure that appropriate governance is in place and to help promote organizational excellence.

This initial report is intended to provide a snapshot of the current state of public health in Ontario. Over time, with the continued involvement of public health professionals in the sector, different indicators will need to be identified and developed. There is significant expertise related to performance management already available within our sector, and within the health care sector, and we will be relying on these resources to assist in developing the tools and processes required to operate a useful, efficient and effective performance management system at the provincial level.
The work of the Capacity Review Committee (2006) gave us an important conceptual framework for performance management. The work to implement this vision is now well underway, and this report is the first tangible product that begins to articulate that vision.

We hope you find the report informative and, most importantly, useful. We would like to take this opportunity to thank the members of the Performance Management Working Group who provided advice that shaped the development of this report. Their knowledge and wisdom have contributed substantially to the quality of this product.

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Health Protection
Producing this report involved the commitment of a diverse group of individuals, each of whom contributed their time and advice to ensure that the final product was representative of public health in Ontario at both the local and provincial levels. The ministry acknowledges and thanks the many individuals who contributed to this report including:

- The members of the Performance Management Working Group (PMWG) in 2007-2008\(^1\) who advised on the development of this report:
  - Dr. Kathleen Dooling, Community Medicine Resident, University of Toronto
  - Dr. Vera Etches, Medical Officer of Health (A), Sudbury & District Health Unit
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  - Dr. Robert Kyle, Commissioner & Medical Officer of Health, Durham Region Health Department
  - Dr. Jack Lee, Senior Strategic Advisor, Ministry of Health Promotion
  - Dr. Doug Manuel, Senior Scientist, Institute for Clinical Evaluative Sciences (co-chair December, 2007 – May, 2008)
  - Dr. Rosana Pellizzari, Associate Medical Officer of Health, Toronto Public Health (co-chair from May, 2008)
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  - Dr. Erica Weir, Associate Medical Officer of Health, York Regional Health Unit
  - Ms. Jackie Wood, Manager, Corporate Services, Ministry of Health Promotion

- Staff in public health units across the province, who contributed by completing the survey of boards of health on governance and management issues, providing case studies, and verifying the indicator methodology and data that appear in the report.

- Members of the Association of Public Health Business Administrators who assisted in developing the survey tool that was used to gather governance, organizational practices and financial data.

\(^1\) It should be noted that some members changed positions during the course of the production of the report. However this list accurately reflects the PMWG membership and roles during the period of the report’s development.
• The Institute for Clinical Evaluative Sciences (ICES) and Peel Public Health, which provided data analysis and advice.

• Members of the Association of Public Health Epidemiologists in Ontario (APHEO) who provided technical advice on indicator methodology and development:
  – Ms. Deborah Carr
  – Ms. Sherri Deamond
  – Mr. Foyez Haque
  – Ms. Joanna Oliver
  – Ms. Suzanne Sinclair

• Staff within the Ministry of Health Promotion and the Ministry of Children and Youth Services, who contributed to the indicator narratives and conducted data analysis.

• Staff within the Ministry of Health and Long-Term Care, who advised on the development of this report throughout 2008-09 within the following branches:
  – Communications and Information Branch
  – Controllership and Resources Management Branch
  – Emergency Management Branch
  – Environmental Health Branch
  – Health Analytics Branch
  – Infectious Diseases Branch
  – Legal Services Branch
  – Strategic Alignment Branch

• Staff of the Strategic Policy and Implementation Branch, who provided research and editorial support in the development of this report:
  – Ms. Allison McArthur
  – Ms. Beata Pach

• Staff of the Public Health Standards Branch, who acted as secretariat to the PMWG and guided this document through the development process, including:
  – Mr. David Moore
  – Mr. Hassan Parvin
  – Ms. Paulina Salamo
  – Ms. Sylvia Shedden
  – Ms. Joanne Thanos
  – Ms. Lisa Vankay
  – Ms. Tricia Willis

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Note that the Public Health Division underwent a restructuring that coincided with the publication of this report. The branch names shown here reflect the branches as they were known during the period of the report’s development.
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Section I:

Introduction

In A Dictionary of Public Health, John Last\(^1\) defines public health as:

“an organized activity of society to promote, protect, improve, and when necessary, restore the health of individuals, specified groups, or the entire population...The term “public health” can describe a concept, a social institution, a set of scientific and professional disciplines and technologies, and a form of practice...It is a way of thinking, a set of disciplines, an institution of society, and a manner of practice”.

On a daily basis, Ontario’s public health sector contributes to keeping Ontarians healthy and safe through health protection, disease prevention and management, and health promotion activities. The essential day-to-day work of the public health sector often goes unnoticed as many potential health threats or conditions are contained or averted by routine prevention, health protection, health promotion, as well as surveillance and management activities carried out by public health organizations across Ontario.

Some of the great accomplishments of public health in the twentieth century include the virtual elimination of polio in Canada, the pasteurization of milk, the disinfection and fluoridation of drinking water, and the identification and prevention of tobacco-related illness. These examples demonstrate the contribution that public health has made to protect the health of the population.

A strong public health sector is vital to a healthy and safe Ontario population and yet we tend not to think about it except in times of crisis. The anonymity of the public health sector disappeared quickly with the gastroenteritis outbreaks in Walkerton in 2000 and the Severe Acute Respiratory Syndrome (SARS) crisis in 2003. These two events revealed serious weaknesses in the province’s public health sector at the time.

Key reports that resulted from the Walkerton incident (the O’Connor Reports\(^2,3\)) and SARS (the Walker,\(^4,5\) Naylor,\(^6\) and Campbell\(^7,8,9\) reports) provided a range of recommendations for renewal of public health in Canada and specifically in Ontario. In response, the government of Ontario announced Operation Health Protection\(^10\) in 2004. The Operation Health Protection (OHP) action plan focused on revitalizing the public health sector, preventing future health threats, and promoting a healthy Ontario. The plan also included a commitment to produce an annual Ontario public health performance report.

Ontario has made significant progress delivering on the commitments made in the OHP. Ontario’s continued commitment to build a strong, flexible, and responsive public health sector has been demonstrated through initiatives such as:

- amending the Health Protection and Promotion Act (HPPA)\(^11\) to modernize the legislation
- creating the Ontario Agency for Health Protection and Promotion
- increasing provincial funding to public health units
- developing new standards for public health, which strengthen public health sector accountability

Another outcome of OHP was the establishment of the Capacity Review Committee (CRC). The committee was tasked with making recommendations to government on long-term strategies to revitalize public health in Ontario. The committee delivered its final report in 2006, which included a recommendation to adopt a comprehensive public health performance management system.\(^12\) Public reporting was seen as an important tool within this system to demonstrate accountability and measure performance.
Ontario has responded to the need to improve performance management in public health by initiating work on the development of a public health performance management system. This system is intended to enable the public health sector to demonstrate its achievements in terms of improvements in both outcomes and services over time.

The introduction of the new performance management system is intended to move Ontario away from focusing primarily on compliance with processes, towards an emphasis on tracking outcomes. As the performance management system continues to be developed, improved measures of outcomes will follow.

This initial report provides a snapshot of Ontario’s public health sector. It provides an overview of the scope of public health and profiles the local operational context of public health program and service delivery. It is a first step in understanding the current work of public health and will inform the discussion as Ontario moves towards a performance management system for public health.

This report also serves an important purpose in raising awareness of the vital role public health plays in protecting the health of Ontarians and in contributing to the provincial health system as a whole.

Towards Performance Management

Ontario’s efforts to introduce a performance management framework for public health are being informed by the Performance Management Working Group (PMWG).

Formed in 2007, PMWG members come from diverse backgrounds and include members of the Council of Ontario Medical Officers of Health (COMOH), the Association of Public Health Epidemiologists in Ontario (APHEO), Public Health Research, Education and Development (PHRED) Program, the Association of Local Public Health Agencies (alPHa), and local public health units.

The group also includes representatives from the Ministry of Health and Long-Term Care, the Ministry of Health Promotion and the Ministry of Children and Youth Services – the three ministries that share responsibility for providing funding and policy direction to public health units. The group’s advice has informed the development of this report as well as continuing to address the larger performance management framework for public health.
Scope of Public Health

The World Health Organization (WHO) defines public health as “a social and political concept aimed at improving health, prolonging life and improving the quality of life among whole populations through health promotion, disease prevention and other forms of health intervention.” The WHO notes a distinction between the traditional model of public health and an emerging concept of public health, which emphasizes:

- a significantly different understanding of how lifestyles and living conditions (social, economic and physical environments) determine health status
- the need to mobilize resources and make sound investments in policies, programs and services which create, maintain and protect health

The public health sector has contributed to improving the health of Ontarians through initiatives such as childhood immunizations, the control of infectious diseases, supporting parenting/early childhood development, addressing oral health, ensuring safe water, education and inspections related to safe food handling, the promotion of healthy sexuality, reproductive and child health, the prevention of injury, and the prevention of chronic diseases through initiatives such as tobacco control and promotion of healthy eating.

Public health also contributes to the health of Ontarians by complementing the work of other parts of the health care system. Through its work in addressing the determinants of health and reducing health risks to the population, public health contributes to reducing the need for other health care services and limiting the consequences of poor health including:

- the need for acute medical care
- long-term consequences of illness and injury, including the severity and incidence of diseases and disability
- reduced income or loss of employment
- premature mortality

The public health system consists of governmental, non-governmental, and community organizations operating at the local, provincial, and federal levels. However, the prime responsibility for program delivery in Ontario lies with local boards of health, which comprise the public health sector. Provincial and federal level organizations play an important role in setting policy, providing funding, issuing directives about specific programs, services and situations, as well as coordination across jurisdictions.

There are exceptions to this indirect support of the provincial and federal governments, such as the work of the Canadian Food Inspection Agency, which has the authority to take direct action at the community level when necessary to protect the food supply. In addition, First Nations Band Councils and the federal government have the responsibility for much of the delivery of public health programs on reserves.
In Ontario, the role of the provincial government is to:

- establish overall strategic direction and provincial priorities for public health
- develop legislation, regulations, standards, policies, and directives to support those strategic directions
- monitor and report on the performance of the public health sector and the health of Ontarians with regard to public health issues
- establish funding models and levels of funding for public health service delivery
- ensure that ministry, public health sector and health care system strategic directions and expectations are met

Ontarians are served by 36 local boards of health that collectively cover the entire province and are individually responsible for serving the population within their geographic borders. Approximately two-thirds of Ontario's boards of health are autonomous bodies created to provide public health services in their jurisdictions. For the remainder, municipal or regional councils act as the board of health.

All boards of health in Ontario and their staff:

- have the same statutory responsibilities under the HPPA for delivering public health programs and services within their communities
- must comply with over fifty acts and regulations
- must deliver the same core set of services according to the Ontario Public Health Standards (OPHS); local service delivery models vary based on community need, geography and other local factors
- deliver other optional programming, with funding from a variety of sources, to address local community needs and priorities

Within this document, the term “board of health” has the meaning assigned to it in Section 1 of the HPPA, and refers to either the legal entities that provide public health programs and services within a specific geographic region or to the governing body of the organization, depending on the context. The term “public health unit” is used to refer to the staff complement of the organization who deliver the programs and services, which is usually headed by a medical officer of health or by a shared leadership model of a medical officer of health and a chief executive officer.

**Legislative Framework for Public Health**

Ontario’s HPPA provides the legislative mandate for boards of health. The guiding purpose of the HPPA is to “provide for the organization and delivery of public health programs and services, the prevention of the spread of disease and the promotion and protection of the health of the people of Ontario.”

Part II, Section 5 of the HPPA specifies that boards of health must provide or ensure the provision of specific public health programs and services. The OPHS are published by the Minister of Health and Long-Term Care under his/her authority in Section 7 of the HPPA and specify the minimum mandatory programs and services with which all boards of health must comply.
Determinants of Health

The health of individuals and communities is significantly influenced by complex interactions between social and economic factors, the physical environment, and individual behaviours and living conditions. These factors are referred to as the determinants of health, and together they play a key role in determining the health status of the population as a whole. Determinants of health include the following:

- income and social status
- social support networks
- education and literacy
- employment/working conditions
- social and physical environments
- personal health practices and coping skills
- healthy child development
- biology and genetic endowment
- health services
- gender
- culture
- language

Public health works to address the determinants of health as the underlying causes of health inequities. This approach is reinforced in the OPHS, which require the following types of activities by public health units:

- identification of priority populations
- adapting programs and service delivery to meet locally identified priority needs
- assessment and sharing information of health inequities
- raising awareness with community decision makers and partners

These actions will foster more comprehensive solutions that will help improve the immediate and long-term health of Ontarians. The OPHS incorporate and address the determinants of health, and identify a broad range of population-based activities designed to promote health and reduce health inequities by working with community partners.
Public Health Programs and Services in Ontario

In addition to delivering programs and services to meet local contexts and situations, the scope of public health programs and services, as articulated in the OPHS, encompasses:

Chronic Diseases and Injuries: Chronic Disease Prevention
- Prevention of Injury and Substance Misuse
Family Health:
- Reproductive Health
- Child Health
Infectious Diseases:
- Infectious Diseases Prevention and Control
- Rabies Prevention and Control
- Tuberculosis Prevention and Control
- Sexual Health, Sexually Transmitted Infections, and Blood-borne infections (including HIV)
- Vaccine Preventable Diseases
Environmental Health:
- Food Safety
- Safe Water
- Health Hazard Prevention and Management
Emergency Preparedness:
- Public Health Emergency Preparedness

Health Unit Profiles

Each of Ontario’s 36 public health units must respond to unique demographics, social conditions and health needs within their community. The health unit profile information shown in Table 1: Health Unit Profiles describes the local service delivery environment for each public health unit in Ontario. The table provides context for the indicator data included in Section IV of the report. Each of the variables in the table underscores the fact that the delivery of public health programs and services in Ontario occurs in significantly different, multi-faceted and complex physical, cultural, social and economic environments.

For each variable, the provincial totals or averages, the minimum value, and the maximum value are shown. The Table is organized to show the public health units according to their peer groups. A peer group is a cluster of public health units, identified by Statistics Canada as having similar social, demographic and economic characteristics. Appendix 1 provides additional information on the definitions of peer groups. Appendix 2 provides information on the variable definitions and data sources.
### Table 1: Health Unit Profiles

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<td>1</td>
<td>Northwestern Health Unit</td>
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<td>57%</td>
<td>19.7%</td>
<td>10.8%</td>
<td>51.8%</td>
<td>1,063</td>
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<td>Mainly Rural</td>
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</tr>
<tr>
<td>3</td>
<td>The Eastern Ontario Health Unit</td>
<td>5,308</td>
<td>199,227</td>
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<td>37.5</td>
<td>6.0%</td>
<td>1</td>
<td>61%</td>
<td>23.7%</td>
<td>9.1%</td>
<td>51.1%</td>
<td>2,015</td>
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<td>13.2%</td>
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<td>64%</td>
<td>22.2%</td>
<td>7.4%</td>
<td>50.0%</td>
<td>1,091</td>
<td>1.1%</td>
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<td>Grey Bruce Health Unit</td>
<td>8,586</td>
<td>161,896</td>
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<td>8.4%</td>
<td>2</td>
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<td>62%</td>
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<td>Haliburton, Kawartha, Pine Ridge District Health Unit</td>
<td>8,988</td>
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<td>19.5</td>
<td>9.6%</td>
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<td>57%</td>
<td>22.9%</td>
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<td>53.1%</td>
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<td>Huron County Health Unit</td>
<td>3,397</td>
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<td>18.1</td>
<td>8.0%</td>
<td>0</td>
<td>65%</td>
<td>19.4%</td>
<td>5.8%</td>
<td>48.7%</td>
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<td>Leeds, Grenville and Lanark District Health Unit</td>
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<td>26.9</td>
<td>7.6%</td>
<td>0</td>
<td>60%</td>
<td>22.5%</td>
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<td>57.5%</td>
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<td>Oxford County Health Unit</td>
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<td>60%</td>
<td>20.4%</td>
<td>5.8%</td>
<td>49.5%</td>
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<td>Perth District Health Unit</td>
<td>2,218</td>
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<td>9.4%</td>
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<td>70%</td>
<td>20.2%</td>
<td>5.7%</td>
<td>49.4%</td>
<td>862</td>
<td>0.6%</td>
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<td>12</td>
<td>Renfrew County and District Health Unit</td>
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<td>100,468</td>
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<td>6.7</td>
<td>6.2%</td>
<td>1</td>
<td>58%</td>
<td>19.4%</td>
<td>7.6%</td>
<td>51.7%</td>
<td>1,020</td>
<td>5.6%</td>
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<td>13</td>
<td>Simcoe Muskoka District Health Unit</td>
<td>8,731</td>
<td>494,081</td>
<td>8.0%</td>
<td>56.6</td>
<td>11.8%</td>
<td>4</td>
<td>64%</td>
<td>26.1%</td>
<td>7.4%</td>
<td>55.9%</td>
<td>4,910</td>
<td>2.7%</td>
</tr>
<tr>
<td>Sparsely Populated Urban-Rural Mix</td>
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</tr>
<tr>
<td>14</td>
<td>The District of Algoma Health Unit</td>
<td>44,308</td>
<td>119,121</td>
<td>-1.8%</td>
<td>2.7</td>
<td>9.7%</td>
<td>8</td>
<td>52%</td>
<td>19.7%</td>
<td>13.1%</td>
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<td>2</td>
<td>54%</td>
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<td>52%</td>
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<td>70%</td>
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<td># Long-term Care Homes</td>
<td># Hospital Sites</td>
<td># Licenced Day Nurseries</td>
<td># Personal Service Settings (estimated)</td>
<td># Schools</td>
<td># School Boards</td>
<td># Small Drinking Water Systems (2008)</td>
<td># Municipalities</td>
<td>Board of Health Governance Model</td>
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<td>24</td>
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<td>11</td>
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<td>57</td>
<td>178</td>
<td>79</td>
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<td>129</td>
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<td>6</td>
<td>45</td>
<td>223</td>
<td>86</td>
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<td>21</td>
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<td>225</td>
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</tr>
<tr>
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<td>Ontario</td>
<td>2.2%</td>
<td>$141</td>
<td></td>
<td></td>
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<td>404</td>
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<td>12</td>
<td>54</td>
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<td>2</td>
<td>0</td>
<td>1</td>
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<td></td>
<td>Ontario Maximum</td>
<td>5.3%</td>
<td>$176</td>
<td>13,367</td>
<td>86</td>
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<td>924</td>
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<td>808</td>
<td>10</td>
<td>1,483</td>
<td>31</td>
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</tr>
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</table>

* Health Unit did not have a Registered Dietitian in 2008 and therefore data is unavailable. The 2007 amount was $130.65.
### Table 1: Health Unit Profiles (cont’d)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Public Health Unit</td>
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</tr>
</tbody>
</table>
| 19 Brant County Health Unit | 1,129 | 136,865 | 4.6% | 121.3 | 12.9% | 2 | 64 | 23.4 | 12.1 | 52.1 | 1,444 | 1.2%
| 20 Chatham-Kent Health Unit | 2,471 | 109,612 | -3.3% | 44.4 | 11.0% | 2 | 61 | 22.2 | 10.1 | 49.0 | 1,165 | 3.0%
| 21 City of Hamilton Health Unit | 1,117 | 519,741 | 1.0% | 465.2 | 25.4% | 0 | 60 | 27.4 | 18.6 | 58.1 | 5,416 | 1.5%
| 22 Hastings and Prince Edward Counties Health Unit | 7,028 | 163,120 | 22.2% | 23.2 | 8.2% | 1 | 58 | 24.2 | 10.2 | 52.5 | 1,582 | 2.4%
| 23 Kingston, Frontenac and Lennox and Addington Health Unit | 6,449 | 187,843 | 0.4% | 29.1 | 11.4% | 0 | 60 | 26.3 | 9.5 | 61.8 | 1,763 | 2.9%
| 24 Lambton Health Unit | 3,002 | 132,228 | 0.6% | 44.1 | 11.6% | 3 | 60 | 19.1 | 7.8 | 58.1 | 1,191 | 2.5%
| 25 Middlesex-London Health Unit | 3,317 | 438,438 | 2.9% | 132.2 | 20.0% | 3 | 63 | 25.8 | 12.5 | 61.5 | 4,858 | 1.6%
| 26 Niagara Regional Area Health Unit | 1,854 | 433,946 | 1.2% | 234.0 | 18.0% | 0 | 61 | 25.4 | 10.5 | 56.1 | 3,906 | 3.6%
| 27 Peterborough County-City Health Unit | 3,806 | 133,583 | 1.4% | 35.1 | 9.5% | 2 | 58 | 26.8 | 9.7 | 58.3 | 1,188 | 1.3%
| 28 Durham Regional Health Unit | 2,523 | 595,354 | 10.7% | 236.0 | 20.3% | 1 | 67 | 25.9 | 8.9 | 60.1 | 6,352 | 2.0%
| 29 Halton Regional Health Unit | 967 | 468,980 | 16.5% | 484.9 | 24.8% | 0 | 69 | 23.3 | 7.8 | 69.3 | 5,645 | 2.1%
| 30 City of Ottawa Health Unit | 2,778 | 846,169 | 3.5% | 304.6 | 22.3% | 0 | 65 | 24.4 | 15.2 | 71.6 | 9,245 | 18.6%
| 31 Peel Regional Health Unit | 1,242 | 1,296,505 | 19.7% | 1,043.9 | 48.6% | 0 | 67 | 32.0 | 14.5 | 62.9 | 16,345 | 1.3%
| 32 Waterloo Health Unit | 1,369 | 496,370 | 7.0% | 362.7 | 22.3% | 0 | 68 | 23.1 | 9.1 | 58.1 | 6,077 | 1.5%
| 33 Wellington-Dufferin-Guelph Health Unit | 4,142 | 265,319 | 5.6% | 64.1 | 16.1% | 0 | 69 | 24.1 | 6.7 | 57.4 | 2,891 | 1.3%
| 34 Windsor-Essex County Health Unit | 1,851 | 403,797 | 1.8% | 218.1 | 22.4% | 0 | 60 | 23.7 | 12.2 | 55.4 | 4,370 | 3.6%
| 35 York Regional Health Unit | 1,762 | 975,906 | 20.8% | 553.9 | 42.9% | 1 | 67 | 29.7 | 11.5 | 67.1 | 10,837 | 1.1%
| 36 City of Toronto Health Unit | 630 | 2,651,717 | 1.3% | 4,207.9 | 50.0% | 0 | 60 | 36.5 | 25.4 | 66.4 | 31,581 | 1.5%

**Ontario**

| Ontario Total | 907,574 | 12,803,861 | 127 | 151,304
| Ontario Minimum | 650 | 34,564 | 3.2% | 297 | 0.6%
| Ontario Maximum | 266,291 | 2,651,717 | 20.8% | 4,209 | 25.4% | 71.6% | 31,581 | 48.2%
### Table 1: Health Unit Profiles (cont’d)

<table>
<thead>
<tr>
<th>Public Health Unit</th>
<th>% Speaking neither English nor French</th>
<th>Cost of Nutritious Food Basket for a Family of Four (2008)</th>
<th># Food Premises (2008)</th>
<th># Long-term Care Homes</th>
<th># Hospital Sites</th>
<th># Licenced Day Nurseries</th>
<th># Personal Service Settings (estimated)</th>
<th># Schools</th>
<th># School Boards</th>
<th># Small Drinking Water Systems (2008)</th>
<th># Municipalities</th>
<th>Board of Health Governance Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 Brant County Health Unit</td>
<td>0.4%</td>
<td>$149</td>
<td>786</td>
<td>7</td>
<td>2</td>
<td>30</td>
<td>200</td>
<td>64</td>
<td>3</td>
<td>114</td>
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<tr>
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<td>0.5%</td>
<td>$138</td>
<td>808</td>
<td>8</td>
<td>3</td>
<td>48</td>
<td>189</td>
<td>50</td>
<td>3</td>
<td>94</td>
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</tr>
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<td>2,988</td>
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<td>8</td>
<td>204</td>
<td>717</td>
<td>184</td>
<td>4</td>
<td>246</td>
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<td>Single-Tier</td>
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<td>1,265</td>
<td>26</td>
<td>5</td>
<td>65</td>
<td>204</td>
<td>78</td>
<td>5</td>
<td>580</td>
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</tr>
<tr>
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<td>1,100</td>
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<td>640</td>
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<td>51</td>
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<td>64</td>
<td>11</td>
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<td>646</td>
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<td>147</td>
<td>4</td>
<td>261</td>
<td>4</td>
<td>Regional</td>
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<td>10</td>
<td>326</td>
<td>1,100</td>
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<td>4</td>
<td>476</td>
<td>1</td>
<td>Single-Tier</td>
</tr>
<tr>
<td>31 Peel Regional Health Unit</td>
<td>3.7%</td>
<td>$130</td>
<td>5,013</td>
<td>36</td>
<td>3</td>
<td>433</td>
<td>1,200</td>
<td>386</td>
<td>4</td>
<td>130</td>
<td>3</td>
<td>Regional</td>
</tr>
<tr>
<td>32 Waterloo Health Unit</td>
<td>1.5%</td>
<td>$141</td>
<td>2,175</td>
<td>33</td>
<td>3</td>
<td>123</td>
<td>707</td>
<td>173</td>
<td>4</td>
<td>148</td>
<td>7</td>
<td>Regional</td>
</tr>
<tr>
<td>33 Wellington-Dufferin-Guelph Health Unit</td>
<td>0.8%</td>
<td>$149</td>
<td>1,460</td>
<td>30</td>
<td>8</td>
<td>77</td>
<td>327</td>
<td>97</td>
<td>5</td>
<td>393</td>
<td>16</td>
<td>Autonomous</td>
</tr>
<tr>
<td>34 Windsor-Essex County Health Unit</td>
<td>1.7%</td>
<td>$135</td>
<td>2,455</td>
<td>24</td>
<td>3</td>
<td>163</td>
<td>500</td>
<td>171</td>
<td>4</td>
<td>61</td>
<td>9</td>
<td>Autonomous</td>
</tr>
<tr>
<td>35 York Regional Health Unit</td>
<td>4.0%</td>
<td>$143</td>
<td>6,867</td>
<td>49</td>
<td>4</td>
<td>425</td>
<td>2,950</td>
<td>299</td>
<td>4</td>
<td>559</td>
<td>9</td>
<td>Regional</td>
</tr>
<tr>
<td>36 City of Toronto Health Unit</td>
<td>5.3%</td>
<td>$136</td>
<td>13,367</td>
<td>86</td>
<td>21</td>
<td>924</td>
<td>3,469</td>
<td>808</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>Semi-Autonomous</td>
</tr>
<tr>
<td>Ontario</td>
<td>2.2%</td>
<td>$141</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario Total</td>
<td></td>
<td></td>
<td>76,163</td>
<td>777</td>
<td>209</td>
<td>4,620</td>
<td>18,560</td>
<td>4,927</td>
<td>154</td>
<td>17,879</td>
<td>413</td>
<td></td>
</tr>
<tr>
<td>Ontario Minimum</td>
<td>0.0%</td>
<td>$130</td>
<td>404</td>
<td>7</td>
<td>1</td>
<td>12</td>
<td>54</td>
<td>29</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ontario Maximum</td>
<td>5.3%</td>
<td>$176</td>
<td>13,367</td>
<td>86</td>
<td>21</td>
<td>924</td>
<td>3,469</td>
<td>808</td>
<td>10</td>
<td>1,483</td>
<td>31</td>
<td></td>
</tr>
</tbody>
</table>
Report Development

The process of developing this report began with careful consideration of how public reporting contributes to performance management. Meeting the longer term objective of publishing provincial performance reports reflective of the public health mandate will require time and resources to develop new measures of program outcomes and to address data collection issues.

While this report is not intended as a performance report, it does provide a status update on a range of indicators related to public health practice. Over time, as new data sources and indicators are developed, these basic indicators may be replaced by more appropriate measures. The development of this report was informed by the decision to avoid trying to directly link the indicators to the standards in the OPHS, which were released during the report’s development. This decision was made because it was seen as inappropriate to begin to publicly report on local public health performance until public health units have had time to adapt to the new standards and begin measuring their impact at the outcome level. These outcome level measures will need to be identified and developed as this public health performance management work continues.

In presenting the scope of public health in Ontario at both the provincial and local levels, an important consideration was to use reliable data that could be presented at the health unit level. The selection of indicators, therefore, was contingent upon the availability of reliable and comprehensive data. During the indicator selection process a wide range of indicators, other than those presented, were considered for inclusion but were not selected for a variety of reasons, including unavailability of consistent and reliable data.

To guide the selection of indicators for the report, several different frameworks, or approaches to performance management indicator reporting were evaluated by the PMWG, including:

- balanced scorecard approach
- strategy mapping approach
- attributes of a high performing system

Through discussion and research on the use of these frameworks in other sectors and other jurisdictions, it was determined that each of these approaches has merits and limitations when applied to the public health sector in Ontario.

Balanced Scorecard Approach

The Balanced Scorecard, as developed by ICES for public health, identifies four quadrants: 1) Health Determinants and Status, 2) Community Engagement, 3) Resources and Services, 4) Integration and Responsiveness for the reporting of information on a system or organization.

Several public health units have used the Balanced Scorecard approach for local public reporting in the recent past. However, the lack of consistent and available data for all health units for two of the four quadrants (Community Engagement, and Integration and Responsiveness) would compromise the usefulness of this tool for provincial reporting at this time.
Strategy Mapping Approach

A strategy mapping approach was explored as a framework to guide measurement of performance in public health. This approach was helpful in understanding the strategic components of public health, but was found to be too high level for use as a framework for this report.

Attributes of a High Performing System

Determining the “attributes of a high performing system” that could be used in relation to the public health sector was approached by first researching the performance dimensions used in other jurisdictions and in other health care sector reports. Through discussion with the PMWG, the following five key dimensions were identified as appropriate for capturing the key aspects of Ontario’s public health sector.

1) Effectiveness
2) Capacity
3) Equitable
4) Community Partnership
5) Effectively Governed and Managed

Each of these approaches provides an organized way of presenting performance information. The PMWG determined that any one of these performance reporting approaches could be used as part of the process for selecting potential indicators. In fact, an exercise was completed which showed that the indicators that were available for use at this time could be mapped into all of the above frameworks. This shows that the different frameworks have significant conceptual overlap, and any one of them could be used to assess public health performance.

As the report development process continued, it was determined that focusing on performance reporting at this time was inappropriate, due mainly to the lack of performance related indicators and consistent data to support them, and because of the early stage of development of the new approach to performance management within the public health sector.

While the work of developing the report and the selection of indicators was informed by the earlier work on performance reporting frameworks, a decision was made to not use any specific reporting framework for this report.
Development of Indicators

Indicators used in existing reports on public health and population health were considered as part of the context for informing Ontario’s public health reporting. These existing reports included:

- *Q Monitor: 2008 Report on Ontario’s Health System* (Ontario Health Quality Council)\(^{17}\)
- *Ontario Health System Scorecard 2007/08* (Ministry of Health and Long-Term Care)\(^ {18}\)
- *Healthy Canadians: A Federal Report on Comparable Health Indicators 2006* (Health Canada)\(^ {19}\)
- *Developing a Balanced Scorecard for Public Health* (Institute for Clinical Evaluative Sciences)\(^ {16}\)
- *Towards Outcome Measurement* (Public Health Research Education and Development Program)\(^ {21}\)

Many public health units have also produced and will continue to produce, local health status reports or performance reports, which may contain similar or related indicators with more analysis and interpretation on the impact of these measures within their communities.

The indicators presented in this report are intended to complement and enhance our understanding of the scope and impact of public health across Ontario, whereas many other health reports focus on information about the impact of the health care system or the health of the general population.

A modified Delphi process was employed to select indicators for this report, using a number of rationales, including:

- strategic priority for public health
- provides sector-level information
- provides local-level information
- the ability of public health to influence outcomes in this area
- whether the indicator relates to multiple program areas

Selection criteria that were used to determine the final set of indicators required that each indicator be:

- relevant, feasible, and scientifically sound
- supported by currently available data that could be reported at the health unit level
- part of a set which reflects the scope of public health practice
- meaningful in describing the scope of public health at both the provincial and local levels

This report will allow local public health officials and other stakeholders to consider how a board of health is currently providing programs and services alongside of its peers. But this is only a starting point which also requires an understanding of local context and conditions, which must be taken into account. It is expected that public reporting will evolve as performance management in public health develops, consistent with the OPHS and Protocols, and that this will drive the development of better indicators and new data sources.
Case Studies

Throughout the report, examples of public health initiatives that are currently in place at the local level have been included as case studies. The case studies provide additional context to the work of the public health sector in Ontario.

Case study submissions were requested from public health units to showcase innovative or exciting local practices. The case studies included in the report are drawn from among the large number of submissions received from public health units. A full list of submissions can be found in the report’s webpage, at www.health.gov.on.ca/english/public/pub/pubhealth/init_report/index.html.

While examples of local practice are attributed to specific public health units, please note that this does not necessarily represent exclusive practice as other public health units may also deliver similar programs.

The case studies were selected to reflect a range of program areas, populations served, levels of interaction and types of local practice. While the case studies are intended to complement the information in the report, they do not relate directly to any specific indicators, particularly because they were selected as examples of the work of public health that is not currently well represented in the available data. There is no association between the indicators and the placement of the case studies.¹

¹The names of the public health units used in this section reflect locally used health unit names, and may differ from the legal names used by the ministry, as shown in the data tables.
This section contains narratives for each of the 34 selected indicators. The narratives provide background and contextual information on the importance of the indicator in public health practice and give specific examples of the role of public health in relation to that indicator. There is some duplication of text for those indicators which are closely related, particularly in terms of describing public health interventions. This structure was chosen so that each indicator narrative would provide the same level of information when read independently.

The corresponding data for each indicator can be found in Table 2: Indicators by Public Health Unit and information on indicator definitions, including sources and data limitations, can be found in Appendix 3. The data were compiled from existing data sources, such as Statistics Canada or the ministry’s Integrated Public Health Information System (iPHIS) system, with the exception of the governance and accountability data, which were collected directly from public health units via a survey.

For each indicator, the provincial totals or averages, the minimum value, and the maximum value are shown. The table is organized to show the public health units according to their peer groups, as described earlier in the health unit profile section.

**Group A – Population Health Indicators**

1. Teen Pregnancy
2. Low Birth Weight
3. Breastfeeding Duration
4. Postpartum Contact
5. Smoking Prevalence
6. Youth Lifetime Smoking Abstinence
7. Adult Heavy Drinking
8. Youth Heavy Drinking
9. Physical Activity Index
10. Healthy Body Mass Index
11. Fruit and Vegetable Consumption
12. Fall-Related Hospitalizations among Seniors
13. Enteric Illnesses Incidence
14. Respiratory Infection Outbreaks in Long-Term Care Homes
15. Chlamydia Incidence
16. Immunization Coverage for Hepatitis B
17. Immunization Coverage for Measles, Mumps and Rubella
18. Adverse Water Quality Incidents
Group B – Governance and Accountability Indicators

19. Total Board of Health Expenditures
20. Board of Health Expenditure Variance
21. Expenditures on Training and Professional Development
22. Number of FTEs by Job Category
23. Number of Vacant Positions by Job Category
24. Employment Status of Medical Officers of Health
25. Staff Length of Service
26. Familiarity with Public Health Unit Programs and Services
27. Issuance of a Health Status Report
28. Strategic Plan
29. Emergency Response Plan Tested
30. Accreditation Status
31. Medical Officer of Health Performance Evaluation
32. Medical Officer of Health Reporting Relationships
33. Board Member Orientation
34. Board Self-Evaluation
<table>
<thead>
<tr>
<th>Public Health Unit</th>
<th>Population Health Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teen pregnancy (rate)</td>
</tr>
<tr>
<td>Northwestern Health Unit</td>
<td>60.8</td>
</tr>
<tr>
<td>Porcupine Health Unit</td>
<td>53.1</td>
</tr>
<tr>
<td>The Eastern Ontario Health Unit</td>
<td>32.5</td>
</tr>
<tr>
<td>Elgin-St. Thomas Health Unit</td>
<td>28.2</td>
</tr>
<tr>
<td>Grey Bruce Health Unit</td>
<td>26.4</td>
</tr>
<tr>
<td>Haldimand-Norfolk Health Unit</td>
<td>22.8</td>
</tr>
<tr>
<td>Haliburton, Kawartha, Pine Ridge District Health Unit</td>
<td>30.6</td>
</tr>
<tr>
<td>Huron County Health Unit</td>
<td>22.1</td>
</tr>
<tr>
<td>Leeds, Grenville and Lanark District Health Unit</td>
<td>25.3</td>
</tr>
<tr>
<td>Oxford County Health Unit</td>
<td>33.5</td>
</tr>
<tr>
<td>Perth District Health Unit</td>
<td>23.8</td>
</tr>
<tr>
<td>Renfrew County and District Health Unit</td>
<td>29.0</td>
</tr>
<tr>
<td>Simcoe Muskoka District Health Unit</td>
<td>26.8</td>
</tr>
<tr>
<td>The District of Algoma Health Unit</td>
<td>42.5</td>
</tr>
<tr>
<td>North Bay Parry Sound District Health Unit</td>
<td>31.4</td>
</tr>
<tr>
<td>Sudbury and District Health Unit</td>
<td>32.6</td>
</tr>
<tr>
<td>Thunder Bay District Health Unit</td>
<td>44.6</td>
</tr>
<tr>
<td>Timiskaming Health Unit</td>
<td>42.6</td>
</tr>
<tr>
<td>Ontario</td>
<td>25.7</td>
</tr>
<tr>
<td>Ontario Total</td>
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</tr>
<tr>
<td>Ontario Minimum</td>
<td>9.5</td>
</tr>
<tr>
<td>Ontario Maximum</td>
<td>60.8</td>
</tr>
</tbody>
</table>

Notes:
* Ontario value is not provided
† Note that an amalgamation occurred in these health units during the period for which data is shown
‡ Warning of high variability associated with estimates
§ Estimates of unreliable quality and could not be reported
<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Population Health Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthy body mass index (percent)</td>
<td>Fruit and vegetable consumption (percent)</td>
</tr>
<tr>
<td></td>
<td>33%*</td>
<td>36%</td>
</tr>
<tr>
<td>Rural Northern Regions</td>
<td>1 Northwestern Health Unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>38%</td>
<td>44%</td>
</tr>
<tr>
<td></td>
<td>51%</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>47%</td>
</tr>
<tr>
<td></td>
<td>42%</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>38%</td>
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<td></td>
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<tr>
<td></td>
<td>48%</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>42%</td>
<td>39%</td>
</tr>
<tr>
<td>Mainly Rural</td>
<td>10 Oxford County Health Unit</td>
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</tr>
<tr>
<td></td>
<td>38%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>35%</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>42%</td>
<td>41%</td>
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<td></td>
<td>38%</td>
<td>34%</td>
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<tr>
<td></td>
<td>44%</td>
<td>45%</td>
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<td>43%</td>
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<td>45%</td>
</tr>
<tr>
<td></td>
<td>47%</td>
<td>42%</td>
</tr>
<tr>
<td>Sparserly Populated Urban-Rural Mix</td>
<td>14 The District of Algoma Health Unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>42%</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>44%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>43%</td>
<td>45%</td>
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<tr>
<td></td>
<td>45%</td>
<td>38%</td>
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<tr>
<td></td>
<td>36%</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>47%</td>
<td>42%</td>
</tr>
<tr>
<td>Ontario</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario Total</td>
<td>47%</td>
<td>42%</td>
</tr>
<tr>
<td>Ontario Minimum</td>
<td>33%*</td>
<td>29%</td>
</tr>
<tr>
<td>Ontario Maximum</td>
<td>55%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Notes:
* Ontario value is not provided
† Note that an amalgamation occurred in these health units during the period for which data is shown
§ Warning of high variability associated with estimates
* Estimates of unreliable quality and could not be reported
### Table 2: Indicators by Public Health Unit (cont’d)

<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Governance and Accountability Indicators</th>
<th>Number of FTEs by job category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total BOD expenditures ($M)</td>
<td>Total BOD expenditure variance (percent)</td>
</tr>
<tr>
<td>Rural Northern Regions</td>
<td>Northwestern Health Unit</td>
<td>13.0</td>
<td>4.0%</td>
</tr>
<tr>
<td></td>
<td>Porcupine Health Unit</td>
<td>10.7</td>
<td>-6.2%</td>
</tr>
<tr>
<td></td>
<td>The Eastern Ontario Health Unit</td>
<td>14.1</td>
<td>-1.7%</td>
</tr>
<tr>
<td></td>
<td>Elgin-St. Thomas Health Unit</td>
<td>6.4</td>
<td>-6.4%</td>
</tr>
<tr>
<td></td>
<td>Grey Bruce Health Unit</td>
<td>10.8</td>
<td>-1.2%</td>
</tr>
<tr>
<td></td>
<td>Haldimand-Norfolk Health Unit</td>
<td>7.0</td>
<td>-7.5%</td>
</tr>
<tr>
<td>Mainly Rural</td>
<td>Haliburton, Kawartha, Pine Ridge District Health Unit</td>
<td>15.1</td>
<td>-1.6%</td>
</tr>
<tr>
<td></td>
<td>Huron County Health Unit</td>
<td>6.2</td>
<td>-2.8%</td>
</tr>
<tr>
<td></td>
<td>Leeds, Grenville and Lanark District Health Unit</td>
<td>10.5</td>
<td>-2.0%</td>
</tr>
<tr>
<td></td>
<td>Oxford County Health Unit</td>
<td>6.8</td>
<td>-10.9%</td>
</tr>
<tr>
<td></td>
<td>Perth District Health Unit</td>
<td>6.6</td>
<td>-2.3%</td>
</tr>
<tr>
<td></td>
<td>Renfrew County and District Health Unit</td>
<td>6.2</td>
<td>-20.8%</td>
</tr>
<tr>
<td></td>
<td>Simcoe Muskoka District Health Unit</td>
<td>28.8</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Sparse, Populated Urban/Rural Mix</td>
<td>The District of Algoma Health Unit</td>
<td>16.6</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>North Bay Parry Sound District Health Unit</td>
<td>14.3</td>
<td>-4.5%</td>
</tr>
<tr>
<td></td>
<td>Sudbury and District Health Unit</td>
<td>15.8</td>
<td>-1.9%</td>
</tr>
<tr>
<td></td>
<td>Thunder Bay District Health Unit</td>
<td>15.7</td>
<td>-2.5%</td>
</tr>
<tr>
<td></td>
<td>Timiskaming Health Unit</td>
<td>5.7</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Ontario</td>
<td></td>
<td>-3.3%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Ontario Total</td>
<td></td>
<td>837.7</td>
<td>2,717.2</td>
</tr>
<tr>
<td>Ontario Minimum</td>
<td></td>
<td>5.7</td>
<td>-20.8%</td>
</tr>
<tr>
<td>Ontario Maximum</td>
<td></td>
<td>193.6</td>
<td>6.3%</td>
</tr>
</tbody>
</table>
Table 2: Indicators by Public Health Unit (cont’d)

<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Governance and Accountability Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Northern Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Northwestern Health Unit</td>
<td>Total number of vacant positions: 2.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 9%, 1-5 years: 41%, &gt;5 years: 21%, &gt;10 years: 18%, &gt;20 years: 10%, Familiarity with public health unit programs and services (year): 1998, Issuance of a health status report (year): 2007, EMERGENCY RESPONSE PLAN TESTED: Yes, Board self-evaluation (year): 2003</td>
</tr>
<tr>
<td>2</td>
<td>Porcupine Health Unit</td>
<td>Total number of vacant positions: 5.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 4%, 1-5 years: 43%, &gt;5 years: 27%, &gt;10 years: 10%, &gt;20 years: 16%, Familiarity with public health unit programs and services (year): 2005, Issuance of a health status report (year): 2006, Emergency response plan tested: No, Board self-evaluation (year): n/a</td>
</tr>
<tr>
<td>Mainly Rural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The Eastern Ontario Health Unit</td>
<td>Total number of vacant positions: 3.2, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 8%, 1-5 years: 39%, &gt;5 years: 25%, &gt;10 years: 16%, &gt;20 years: 12%, Familiarity with public health unit programs and services (year): 2007, Issuance of a health status report (year): 2007, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
</tr>
<tr>
<td>4</td>
<td>Elgin-St. Thomas Health Unit</td>
<td>Total number of vacant positions: 0.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 12%, 1-5 years: 35%, &gt;5 years: 20%, &gt;10 years: 24%, &gt;20 years: 9%, Familiarity with public health unit programs and services (year): 2003, Issuance of a health status report (year): 2006, Emergency response plan tested: No, Board self-evaluation (year): n/a</td>
</tr>
<tr>
<td>5</td>
<td>Grey Bruce Health Unit</td>
<td>Total number of vacant positions: 2.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 10%, 1-5 years: 43%, &gt;5 years: 22%, &gt;10 years: 14%, &gt;20 years: 11%, Familiarity with public health unit programs and services (year): 2005, Issuance of a health status report (year): 2008, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<tr>
<td>6</td>
<td>Haldimand-Norfolk Health Unit</td>
<td>Total number of vacant positions: 3.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 10%, 1-5 years: 37%, &gt;5 years: 23%, &gt;10 years: 11%, &gt;20 years: 19%, Familiarity with public health unit programs and services (year): 2008, Issuance of a health status report (year): 2008, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<td>7</td>
<td>Haliburton, Kawartha, Pine Ridge District Health Unit</td>
<td>Total number of vacant positions: 3.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 11%, 1-5 years: 26%, &gt;5 years: 22%, &gt;10 years: 28%, &gt;20 years: 12%, Familiarity with public health unit programs and services (year): 2007, Issuance of a health status report (year): 2006, Emergency response plan tested: No, Board self-evaluation (year): n/a</td>
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<td>8</td>
<td>Huron County Health Unit</td>
<td>Total number of vacant positions: 3.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 21%, 1-5 years: 43%, &gt;5 years: 25%, &gt;10 years: 7%, &gt;20 years: 5%, Familiarity with public health unit programs and services (year): 2008, Issuance of a health status report (year): 2007, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<td>10</td>
<td>Oxford County Health Unit</td>
<td>Total number of vacant positions: 1.5, Employment status of MOH: 0.5, Proportion of staff by length of service: Up to 1 year: 17%, 1-5 years: 19%, &gt;5 years: 36%, &gt;10 years: 9%, &gt;20 years: 19%, Familiarity with public health unit programs and services (year): 2008, Issuance of a health status report (year): 2008, Emergency response plan tested: No, Board self-evaluation (year): n/a</td>
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<td>11</td>
<td>Perth District Health Unit</td>
<td>Total number of vacant positions: 0.0, Employment status of MOH: 0.3, Proportion of staff by length of service: Up to 1 year: 12%, 1-5 years: 30%, &gt;5 years: 28%, &gt;10 years: 16%, &gt;20 years: 14%, Familiarity with public health unit programs and services (year): 2007, Issuance of a health status report (year): 2007, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<td>12</td>
<td>Renfrew County and District Health Unit</td>
<td>Total number of vacant positions: 4.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 15%, 1-5 years: 19%, &gt;5 years: 16%, &gt;10 years: 31%, &gt;20 years: 18%, Familiarity with public health unit programs and services (year): 2007, Issuance of a health status report (year): No, Emergency response plan tested: No, Board self-evaluation (year): 7/7</td>
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<tr>
<td>13</td>
<td>Simcoe Muskoka District Health Unit</td>
<td>Total number of vacant positions: 0.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 6%, 1-5 years: 29%, &gt;5 years: 31%, &gt;10 years: 18%, &gt;20 years: 16%, Familiarity with public health unit programs and services (year): 2007, Issuance of a health status report (year): Yes, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<tr>
<td>Sparsely Populated Urban-Rural Mix</td>
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<td></td>
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<tr>
<td>14</td>
<td>The District of Algoma Health Unit</td>
<td>Total number of vacant positions: 1.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 5%, 1-5 years: 29%, &gt;5 years: 28%, &gt;10 years: 22%, &gt;20 years: 16%, Familiarity with public health unit programs and services (year): 2008, Issuance of a health status report (year): 2006, Emergency response plan tested: Yes, Board self-evaluation (year): n/a</td>
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<tr>
<td>15</td>
<td>North Bay Parry Sound District Health Unit</td>
<td>Total number of vacant positions: 3.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 6%, 1-5 years: 40%, &gt;5 years: 29%, &gt;10 years: 15%, &gt;20 years: 10%, Familiarity with public health unit programs and services (year): No, Issuance of a health status report (year): 2008, Emergency response plan tested: No, Board self-evaluation (year): 8/8</td>
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<tr>
<td>16</td>
<td>Sudbury and District Health Unit</td>
<td>Total number of vacant positions: 3.4, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 13%, 1-5 years: 34%, &gt;5 years: 28%, &gt;10 years: 15%, &gt;20 years: 11%, Familiarity with public health unit programs and services (year): 2006, Issuance of a health status report (year): 2008, Emergency response plan tested: Yes, Board self-evaluation (year): 9/9</td>
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<td>17</td>
<td>Thunder Bay District Health Unit</td>
<td>Total number of vacant positions: 0.0, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 14%, 1-5 years: 20%, &gt;5 years: 35%, &gt;10 years: 16%, &gt;20 years: 15%, Familiarity with public health unit programs and services (year): 2003, Issuance of a health status report (year): 2007, Emergency response plan tested: Yes, Board self-evaluation (year): Yes</td>
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<td>18</td>
<td>Timiskaming Health Unit</td>
<td>Total number of vacant positions: 2.5, Employment status of MOH: 1.0, Proportion of staff by length of service: Up to 1 year: 2%, 1-5 years: 34%, &gt;5 years: 29%, &gt;10 years: 18%, &gt;20 years: 17%, Familiarity with public health unit programs and services (year): No, Issuance of a health status report (year): 2008, Emergency response plan tested: No, Board self-evaluation (year): n/a</td>
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<tr>
<td>Ontario</td>
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<tr>
<td></td>
<td>Total</td>
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<tr>
<td></td>
<td>Ontario Minimum</td>
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<tr>
<td></td>
<td>Ontario Maximum</td>
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</tr>
</tbody>
</table>

Initial Report on Public Health 2009
Table 2: Indicators by Public Health Unit (cont’d)

<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Population Health Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indicator</td>
<td>Teen pregnancy (rate)</td>
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<tr>
<td>Urban/Rural Mix</td>
<td>Brant County Health Unit</td>
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<tr>
<td></td>
<td>Chatham-Kent Health Unit</td>
<td>34.1</td>
</tr>
<tr>
<td></td>
<td>City of Hamilton Health Unit</td>
<td>34.4</td>
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<tr>
<td></td>
<td>Hastings and Prince Edward Counties Health Unit</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Kingston, Frontenac and Lennox and Addington Health Unit</td>
<td>33.0</td>
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<tr>
<td></td>
<td>Lambton Health Unit</td>
<td>32.9</td>
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<td>Middlesex-London Health Unit</td>
<td>34.5</td>
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<td>Niagara Regional Area Health Unit</td>
<td>32.4</td>
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<td></td>
<td>Peterborough County-City Health Unit</td>
<td>41.8</td>
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<tr>
<td>Urban Centres</td>
<td>Durham Regional Health Unit</td>
<td>24.9</td>
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<tr>
<td></td>
<td>Halton Regional Health Unit</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>City of Ottawa Health Unit</td>
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<tr>
<td></td>
<td>Peel Regional Health Unit</td>
<td>12.8</td>
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<td></td>
<td>Waterloo Health Unit</td>
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<td></td>
<td>Wellington-Dufferin-Guelph Health Unit</td>
<td>18.8</td>
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<tr>
<td></td>
<td>Windsor-Essex County Health Unit</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>York Regional Health Unit</td>
<td>12.1</td>
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<td>Metro Centre</td>
<td>City of Toronto Health Unit</td>
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<td>Ontario</td>
<td>25.7</td>
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<td>Ontario Total</td>
<td>9.5</td>
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<tr>
<td></td>
<td>Ontario Minimum</td>
<td>60.8</td>
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</table>

Notes:
* Ontario value is not provided
† Note that an amalgamation occurred in these health units during the period for which data is shown
<sup>e</sup> Warning of high variability associated with estimates
<sup>f</sup> Estimates of unreliable quality and could not be reported
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population Health Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy body mass index (percent)</td>
<td>50%</td>
</tr>
<tr>
<td>Fruit and vegetable consumption (percent)</td>
<td>43%</td>
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<tr>
<td>Falls-related hospitalizations among seniors (rate)</td>
<td>1,571.2</td>
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<tr>
<td>Enteric illnesses incidence (rate)</td>
<td>60.4</td>
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<tr>
<td>Respiratory infection outbreaks in LTC homes (number)</td>
<td>19</td>
</tr>
<tr>
<td>Chlamydia incidence (rate)</td>
<td>184.6</td>
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<tr>
<td>Immunization coverage for Hepatitis B (percent)</td>
<td>74.8%</td>
</tr>
<tr>
<td>Immunization coverage for Measles, Mumps and Rubella (percent)</td>
<td>95.9%</td>
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<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Ontario Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban/Rural Mix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Brant County Health Unit</td>
<td>602</td>
</tr>
<tr>
<td>20</td>
<td>Chatham-Kent Health Unit</td>
<td>4,458</td>
</tr>
<tr>
<td>21</td>
<td>City of Hamilton Health Unit</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Hastings and Prince Edward Counties Health Unit</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Kingston, Frontenac and Lennox and Addington Health Unit</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lambton Health Unit</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Middlesex-London Health Unit</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Niagara Regional Area Health Unit</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Peterborough County-City Health Unit</td>
<td></td>
</tr>
<tr>
<td>Urban Centres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Durham Regional Health Unit</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Halton Regional Health Unit</td>
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<tr>
<td>30</td>
<td>City of Ottawa Health Unit</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Peel Regional Health Unit</td>
<td></td>
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<tr>
<td>32</td>
<td>Waterloo Health Unit</td>
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<tr>
<td>33</td>
<td>Wellington-Dufferin-Guelph Health Unit</td>
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<td>34</td>
<td>Windsor-Essex County Health Unit</td>
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<td>35</td>
<td>York Regional Health Unit</td>
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<td>36</td>
<td>City of Toronto Health Unit</td>
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<tr>
<td>Metro Centre</td>
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<tr>
<td>Ontario</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario Total</td>
<td>602</td>
<td>4,458</td>
</tr>
<tr>
<td>Ontario Minimum</td>
<td>33%</td>
<td>29%</td>
</tr>
<tr>
<td>Ontario Maximum</td>
<td>55%</td>
<td>50%</td>
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</table>

Notes:
* Ontario value is not provided
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‡ Warning of high variability associated with estimates
§ Estimates of unreliable quality and could not be reported
## Table 2: Indicators by Public Health Unit (cont’d)

<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Public Health Unit</th>
<th>Indicators</th>
<th>Governance and Accountability Indicators</th>
<th>Number of FTEs by job category</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total BoH expenditures ($M)</td>
<td>Total BoH expenditure variance (percent)</td>
<td>Expenditures on training and professional development (percent)</td>
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<tr>
<td></td>
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<td>Ontario Maximum</td>
<td>Ontario Minimum</td>
<td>Ontario Total</td>
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* Ontario value is not provided
## Table 2: Indicators by Public Health Unit (cont’d)

<table>
<thead>
<tr>
<th>Peer Group</th>
<th>Indicator</th>
<th>Total number of vacant positions</th>
<th>Employment status of MOH (FTE)</th>
<th>Proportion of staff by length of service</th>
<th>Familiarity with public health unit programs and services (year)</th>
<th>Issuance of a health status report (year)</th>
<th>Strategic plan (2008)</th>
<th>Emergency response plan tested</th>
<th>Accreditation status</th>
<th>MOH performance evaluation</th>
<th>MOH reporting to the BOH (proportion)</th>
<th>MOH reporting to standing committee (proportion)</th>
<th>Board member orientation (year)</th>
<th>Board self-evaluation (year)</th>
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</thead>
<tbody>
<tr>
<td>Urban/Rural Mix</td>
<td>19 Brant County Health Unit</td>
<td>0.0 1.0</td>
<td>5%</td>
<td>38% 31% 16% 10%</td>
<td>2007 2008 Yes Yes Yes Yes Yes Yes Yes Yes 10/11 Yes n/a</td>
<td>Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
<td>20 Chatham-Kent Health Unit</td>
<td>1.0 1.0</td>
<td>6%</td>
<td>40% 27% 19% 9%</td>
<td>2008 2007 No Yes Yes Yes Yes Yes Yes Yes Yes 9/10 Yes 2007</td>
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<tr>
<td></td>
<td>21 City of Hamilton Health Unit</td>
<td>9.7 1.0</td>
<td>10%</td>
<td>21% 31% 20% 18%</td>
<td>2008 2007 Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
<td>22 Hastings and Prince Edward Counties Health Unit</td>
<td>1.4 1.0</td>
<td>10%</td>
<td>27% 28% 15% 19%</td>
<td>2008 2006 Yes No Yes Yes Yes Yes Yes Yes Yes Yes 9/10 Yes n/a</td>
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<td>23 Kingston, Frontenac and Lennox and Addington Health Unit</td>
<td>1.0 1.0</td>
<td>11%</td>
<td>27% 28% 20% 14%</td>
<td>2005 2008 Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td>Urban Centres</td>
<td>24 Lambton Health Unit</td>
<td>0.0 0.4</td>
<td>0%</td>
<td>36% 27% 21% 17%</td>
<td>2008 2008 No Yes No No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
<td>25 Middlesex-London Health Unit</td>
<td>0.0 1.0</td>
<td>14%</td>
<td>36% 22% 13% 16%</td>
<td>2002 2008 Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
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<td>5%</td>
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<tr>
<td></td>
<td>27 Peterborough County-City Health Unit</td>
<td>0.4 1.0</td>
<td>12%</td>
<td>25% 22% 27% 14%</td>
<td>2005 2008 Yes No No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td>Metro Centre</td>
<td>28 Durham Regional Health Unit</td>
<td>2.8 1.0</td>
<td>6%</td>
<td>30% 37% 17% 10%</td>
<td>2008 2008 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
<td>29 Halton Regional Health Unit</td>
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<td>14%</td>
<td>26% 30% 18% 11%</td>
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<tr>
<td></td>
<td>30 City of Ottawa Health Unit</td>
<td>11.0 1.0</td>
<td>4%</td>
<td>20% 33% 25% 17%</td>
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<tr>
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<td>31 Peel Regional Health Unit</td>
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<td>9%</td>
<td>36% 27% 19% 8%</td>
<td>2007 2007 Yes No Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
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<tr>
<td></td>
<td>32 Waterloo Health Unit</td>
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<td>6%</td>
<td>41% 26% 19% 9%</td>
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<td>28% 31% 16% 10%</td>
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<tr>
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*Shared MOH 1 FTE between two health units*
1. Teen Pregnancy

The teen pregnancy rate indicator estimates the number of pregnancies (resulting in live births, stillbirths, and therapeutic abortions) per 1,000 females age 15-19 years.

Teen pregnancy poses increased health risks to both the mother and the child, including the following:
• pregnant teens have a greater risk of developing health problems such as anaemia, hypertension, eclampsia and depressive disorders\textsuperscript{22,23}
• children of teen mothers are more likely to have low birth weights, preterm births and, as a result, are more likely to experience increased mortality and childhood morbidities including developmental problems, learning difficulties, hearing and visual impairments, and chronic respiratory problems\textsuperscript{24,25}

The rate of teen pregnancy is significant from a public health and determinants of health perspective because:
• teen pregnancy is more common among disadvantaged teens\textsuperscript{26,27}
• pregnancy in the teen years can be a significant predictor of other social, educational and employment barriers in later life\textsuperscript{26,27}
• children of teen mothers have higher rates of becoming teen parents themselves, thus perpetuating the cycle of teen pregnancy\textsuperscript{28,29}

Ontario’s public health units play a role in reducing the rate of teen pregnancy and promoting healthy pregnancies for those teens who do become pregnant. Public health units provide a comprehensive range of sexual health education and counselling services that aim to support young mothers to have positive health outcomes for themselves and their babies.

Specific public health initiatives include:
• healthy sexuality education and counselling
• the provision of low cost birth control supplies
• confidential and free sexual health clinic services
• building community partnerships with schools, hospitals, and community-based organizations to deliver healthy sexuality and reproductive health programs and services

Public health units may face specific challenges with community receptivity to sexual health education and clinic services – it is important to acknowledge that the acceptance of these services may vary across Ontario.

In 2007, the pregnancy rate in Ontario for women aged 15-19 was 25.7 per 1,000. Based on 36 public health units in Ontario, the highest rate was 60.8, and the lowest rate was 9.5 per 1,000 women aged 15-19.

Teen pregnancy rates have been on the decline in Canada in the last 25 years, with significant variation across provinces and territories. However, teen pregnancy has continued to be of significant concern in specific populations including socio-economically disadvantaged teens.
Having access to affordable healthy foods is an issue of public health concern, and the Peterborough County-City Health Unit has been working to address this issue with its Food Security Community Partnership Project.

For more than a decade, the annual Nutritious Food Basket survey has identified that low-income residents in Peterborough City and County cannot afford an adequate diet once they have paid for housing and other basic needs. In response, the Peterborough County-City Health Unit rallied community partners to provide the Food Security Community Partnership Project (FSCPP), with a focus on community-based food programs and food skill development.

The FSCPP involves 5,000 adults and children living on low incomes in Peterborough City and County. The program targets priority populations, including those from: rural and First Nation communities, youth living independently, parents of young children, homeless and under-housed community members, and seniors living in isolated situations. The new partnerships allowed the program to expand its reach within these priority populations.

The project components include:

- **Advocacy** for improved incomes for people receiving social assistance and low wages.
- **Come Cook with Us** – Cooking sessions in which participants cook, enjoy a meal together, share healthy eating and food safety tips, and take home meals and a food voucher. Graduates are invited to join a monthly collective kitchen.
- **Food Box Programs** – Monthly boxes of staples and/or produce with a subsidy for low income clients.
- **Cooking up Employment** – Two community members work with the “Open Table Chef” to provide a free, nourishing meal to community members five days a week.
- **Frozen Meal Program** – The provision of nutritious meals, delivered to isolated rural community members in Peterborough County.

Evaluations of this initiative indicate that participants are making healthier food choices. Community response to the program has been remarkable, in both the numbers reached and in the stories from individuals whose lives have been impacted.

Another local example of work on food security is occurring in the Huron County Health Unit, with their Farm to Table Project. This network of community organizations, concerned about access to local, healthy food and the overall decline in agriculture in Huron and Perth Counties, aims to educate consumers about food, nutrition, and agricultural issues, and create new markets for local farmers.

Farm to Table’s central initiative is the monthly Huron Good Food Box program, which provides Huron County residents with a regular, affordable supply of local fresh fruits and vegetables. The program relies on volunteers, and annual sales volumes have grown since its inception in 2001, to more than 2,500 Good Food Boxes in 2007, to a customer base that included 25% of buyers with annual household incomes of less than $20,000. More than 60% of users of the Huron Good Food Box program report they have increased their consumption of fruits and vegetables.
2. Low Birth Weight

The low birth weight rate indicator estimates the rate of singleton live births weighing 500-2499 grams immediately upon birth, based on the mother's usual place of residence per the total for singleton live births weighing at least 500 grams per 1,000 births.

Low birth weight is considered one of the most important indicators of a newborn’s chances of survival, with low birth weight being a major risk factor for perinatal and infant mortality. Low birth weight babies are more likely to have health and developmental problems including learning difficulties, hearing and visual impairments, chronic respiratory problems such as asthma and chronic diseases later in life.

Low birth weight is also an important population health indicator as it occurs with greater prevalence in disadvantaged populations. Risk factors associated with low birth weight include:

- socio-economic disadvantage
- poor health and nutrition of women during pregnancy
- smoking while pregnant
- consumption of drugs and alcohol while pregnant
- experiencing abuse while pregnant

It has been demonstrated that maternal smoking is one of the most modifiable risk factors to prevent low birth weight babies in developed countries. This underscores the importance of programs and policies to prevent women from becoming smokers and encouraging those who do smoke to quit.

Public health programs and services provide education and resources to women of child bearing age to promote healthy nutrition prior to conception and during pregnancy, provide prenatal education, encourage pregnant women to access prenatal support services, and provide assessments to at-risk pregnant women to help ensure they receive appropriate medical attention.

Public health interventions also address factors that influence health outcomes such as access to nutritious foods, smoking, substance misuse, and alcohol consumption during pregnancy.

In 2007, the rate of singleton live births in Ontario with a birth weight of less than 2500 grams was 47.9 per 1,000 births. Based on 36 public health units in Ontario, the highest rate of live births weighing under 2500 grams was 67.5 and the lowest rate was 20.9 per 1,000 births.
3. Breastfeeding Duration

The breastfeeding duration rate indicator estimates the proportion of mothers age 15-55 years who breastfed (not exclusively) their last baby (born within the past five years) for a duration of six months or more.

According to the WHO, “breastfeeding is the ideal way of providing young infants with the nutrients they need for healthy growth and development.” Breast milk contains the ideal nutritional elements for proper digestion, brain development, and growth. Breast milk transmits a mother’s antibodies to her baby, helping to protect the baby against infections and illnesses. Studies also suggest that breastfeeding may protect infants against allergies and respiratory infections, and may lower rates of type 2 diabetes later in the child’s life. Additionally, breastfeeding forms a bond between a mother and her child that is thought to contribute to the healthy psychological development of the child.

Breastfeeding is not only beneficial for infants. Research suggests that breastfeeding may lower rates of certain types of ovarian and breast cancer and reduce the risk of osteoporosis in women who have breastfed.

Most new mothers have the potential to breastfeed, giving their newborns breast milk which contains everything they need for a healthy start in life. The public health sector in Ontario helps to promote breastfeeding through:

- providing prenatal and parenting programs, services and supports
- distributing information regarding the benefits of breastfeeding through mass media
- offering breastfeeding support and counselling through phone lines, home visits, groups, and clinics
- providing referrals to professionals and community programming and services for breastfeeding support and information
- advocating and assisting in the development of policies to support breastfeeding in the workplace, restaurants, shopping malls and other public places

The data presented in Table 2: Indicators by Public Health Unit for the proportion of mothers in Ontario who breastfed their last baby for a duration of six months or more uses a combination of three sets of Canadian Community Health Survey data, collected over a span of 5 years. Because sample sizes of breastfeeding rates at the public health unit level can be quite small, it was necessary to combine these three sets of data in order to arrive at a stable figure for each public health unit.

Approximately 50% of mothers in Ontario breastfed their last baby for a duration of six months or more (over 3 cycles of the survey). Based on 36 public health units in Ontario, the highest estimated proportion of breastfeeding for six months or more was 65% and the lowest estimate was 31% for mothers who had given birth in the last five years at the time of the surveys.

In Ontario, the proportion of mothers breastfeeding for six months or more for each of the survey periods was as follows:

Canadian Community Health Survey Cycle 2.1 (2003) – 46.7%
Canadian Community Health Survey Cycle 3.1 (2005) – 50.8%
Canadian Community Health Survey 2007 – 53.1%

The indicator results demonstrate that improvements are being made in breastfeeding uptake and that there is more opportunity to encourage and support breastfeeding initiation and duration in Ontario, particularly at a time when hospital based supports for breastfeeding are limited.
4. Postpartum Contact

The postpartum contact indicator is defined as the percentage of families who consented to a post-partum phone call under the Healthy Babies Healthy Children (HBHC) program and who received a post-partum phone call or contact from the health unit within 48 hours of release from hospital after giving birth.

The postpartum contact by a public health nurse is a universal component of the HBHC program where new mothers who consent are contacted within 48 hours of discharge from hospital or after a home birth, and offered a home visit, counselling, support and information about community services on parenting and healthy child development.

The data in Table 2: Indicators by Public Health Unit show the percentage of mothers contacted within 48 hours of hospital discharge. This definition is consistent with the target used by the HBHC program, and the HBHC Protocol under the Child Health standard of the OPHS. It is important to note, however, that the method of contact under this definition includes all types of contact including person to person contact, phone messages, and letters; there is no way of ensuring that a message or letter was received by the new mother. This indicator therefore does not measure the effectiveness or success of the HBHC program. Rather, it gives an indication of the extent of work and resources expended by public health units attempting to make contact with every new mother in their community.

Addressing Poverty Case Study

Grey Bruce Health Unit’s Moving Forward program focuses on breaking the cycle of poverty by addressing systemic barriers that prevent marginalized individuals from obtaining adequate education and employment. Targeting high-risk young families, the program uses motivational interviewing to help clients recognize their readiness to change and to develop an action plan to achieve specific goals. Set-backs and relapses are common throughout the change process. Public health professionals support clients to evaluate their goals and reaffirm their action plans.

Grey Bruce Health Unit also provides tangible support through the provision of transportation, access to adequate childcare and by helping clients purchase affordable, appropriate interview clothing. All these elements increase the client’s opportunities for employment and education.

Moving Forward works on many levels to address and improve determinants of health associated with poverty and access to education and employment opportunities.
5. Smoking Prevalence

The smoking prevalence indicator estimates the *age-standardized proportion of people age 12 years and older who are current smokers (daily or occasional cigarette smokers)*.

Tobacco use is the number one preventable cause of premature death and illness in Ontario. Smoking accounts for approximately 13,000 deaths annually and results in a substantial burden on the health care system.46

Public health units are key partners in the implementation of the Smoke-Free Ontario Strategy (SFOS). The SFOS is focused on:

1. Prevention – preventing children and youth from starting to use tobacco products
2. Protection – eliminating involuntary exposure to second-hand smoke
3. Cessation – motivating and supporting people to quit tobacco use

Locally, public health units lead the delivery of several programs involving youth engagement, local tobacco control coordination and enforcement of the *Smoke-Free Ontario Act* (SFOA).47

The goal of these public health programs and services is to reduce the burden of preventable chronic diseases of public health importance. Public health units are responsible for:

- increasing public awareness of the importance of comprehensive tobacco control
- working with priority populations to adopt tobacco-free living
- ensuring tobacco vendors are in compliance with the SFOA
- reducing youth access to tobacco products

Based on 36 public health units in Ontario, in 2007 the highest proportion of current smokers among people age 12 years and older was 34% and the lowest was 16%.

6. Youth Lifetime Smoking Abstinence

The youth lifetime smoking abstinence indicator estimates the *proportion of young people age 12-19 years who have never smoked a whole cigarette*.

Tobacco use is the number one preventable cause of premature death and illness in Ontario. Smoking accounts for approximately 13,000 deaths annually and results in a substantial burden on the health care system.46

Preventing children and youth from starting to use tobacco products is a key pillar of the Smoke-Free Ontario Strategy (SFOS). Research has shown that more than 80% of current and former smokers in Canada started smoking before the age of 20.48 Thus, preventing adolescents from experimenting with tobacco products during adolescence is a key intervention to prevent them from smoking as adults – and to prevent morbidity and mortality from chronic disease.

Youth tobacco use is associated with a variety of personal, behavioural, environmental, and socio-demographic factors, including:

- lower self esteem49
- lower academic achievement50
- lower socio-economic status51
• peer and parental smoking
• use of alcohol, and marijuana

The goal of public health policies, programs and services is to reduce the burden of preventable chronic diseases of public health importance. Public health units are responsible for:
• increasing public awareness of the importance of comprehensive tobacco control
• working with youth to adopt tobacco-free living
• working with schools to educate students about the dangers of smoking
• ensuring tobacco vendors are in compliance with the SFOA
• reducing youth access to tobacco products

In 2007, 81% of youth age 12-19 years in Ontario had never smoked a whole cigarette. Based on 36 public health units in Ontario, the highest proportion was 92% and the lowest was 48% of youth age 12-19 years who have never smoked a whole cigarette.

The Low-Wage Worker Project Case Study

Public health programming that directly addresses the underlying social factors associated with poor health outcomes is an important practice area for public health units. As an example, in 2003, the Sudbury & District Health Unit (SDHU) staff and its university partners launched a major project to understand the health and wellness issues facing low-wage worker populations in the City of Greater Sudbury and to identify interventions that could be taken to improve their health, safety, and well-being.

A literature review revealed that research on public health interventions to improve the lives and working conditions of working poor people is limited. This made a series of needs assessment interviews fundamental to understanding the challenges faced by low-income workers and the possible interventions to address those challenges. As a result, nine focus groups were conducted with 23 key informants and 65 low-wage workers. Recommendations from the interviews included calls for:

• enhancement of existing health promotion, protection, and safety programs focused on the low-wage worker population
• development of community partnerships to advocate for and implement policy changes
• conducting more research on the needs of low-wage workers and the identification of interventions at the individual, workplace, community, and social policy levels.

These recommendations have implications for public health planners across Ontario. Full reports are available on the Sudbury & District Health Unit’s website at http://www.sdhu.com.
As new health concerns emerge in a community, public health units use their knowledge and skills to respond with creative community engagement strategies. For example, in 2005, The Toronto Star labelled Perth County the “Crystal Meth Capital” of Ontario. A series of methamphetamine lab discoveries and rising substance misuse rates had leaders scrambling to deal with this problem.

In response, the **Perth District Health Unit** became involved with the formation of the Perth County Task Force on Crystal Meth, which formed in 2005. By 2008, it had grown to a 40-member committee, including public health, police, politicians, fire, EMS, health-care providers, addiction counsellors, social services, pharmacies, and agriculture associations. The Director of Health Protection from the Perth District Health Unit and the Mayor of Stratford co-chair the committee.

The Task Force is tackling the crystal meth problem on four fronts:
- enforcement
- health protection
- prevention and education
- treatment

Through its leadership on the Task Force, the Perth District Health Unit is able to ensure that crystal meth use is addressed using a comprehensive, best-practices approach. In 2008, the Task Force implemented nine programs across the four areas of focus. Public health unit programs have focused on youth development and engagement to prevent substance misuse, and health protection measures related to drug labs.

To date, the program has experienced successes resulting in:
- a decrease in meth lab discoveries
- major enforcement successes
- improved addiction treatment services
- better informed youth through the impact of widespread, multifaceted education measures
7. Adult Heavy Drinking

The adult heavy drinking episode indicator estimates the age-standardized proportion of people age 20 years and older who reported consuming five or more drinks on at least one occasion during the previous 12 months.

Alcohol use is a significant risk factor for both injury and chronic disease. Heavy drinking puts a person at much higher risk of death or injuries from motor vehicle collisions; alcohol associated illness, falls, drowning and other hazards of poor judgement and reduced coordination.\textsuperscript{52,53} Longer term, heavy drinking can result in high blood pressure, stroke, liver disease, and neurological damage.\textsuperscript{54}

It is estimated that 10% of all deaths in Ontario directly or indirectly result from alcohol misuse.\textsuperscript{55} Alcohol misuse is involved in about 40% of all traffic collisions,\textsuperscript{56} which result in a large number of potential years of life lost because of the relatively young age of those killed in traffic collisions.\textsuperscript{57}

Alcohol misuse is associated with significant economic impacts including:
- lost productivity due to morbidity
- premature mortality
- social services costs
- law enforcement costs
- direct health care costs\textsuperscript{58}

Heavy drinking also increases the risk of violence,\textsuperscript{59} vandalism,\textsuperscript{60} sexual assault, and unprotected sexual encounters with the potential for unplanned pregnancy or infection from sexually transmitted diseases.\textsuperscript{61}

Public health programs and services aim to increase public awareness of the dangers of substance misuse and promote healthy public policy to reduce the risks. Programs and services include:
- promoting the Low-Risk Drinking Guidelines designed to minimize the health risks of alcohol use
- promoting responsible driving including not driving under the influence of alcohol
- advising women who know they are pregnant or are planning on becoming pregnant of the harmful effects of alcohol on their unborn child
- promoting adoption of municipal alcohol policies
- providing Server Intervention Training and Safe Bar Policy
- promoting responsible hosting

In addition, there are provincially funded initiatives such as the FOCUS Community Project which operates in 21 communities with the aim of reducing the abuse of alcohol and other drugs and preventing their associated problems, injuries, and chronic diseases.

In 2007, 37% of people in Ontario age 20 years and older reported consuming at least five or more drinks on at least one occasion in the last 12 months. Based on 36 public health units in Ontario, the highest proportion of heavy drinkers, that is those who reported consuming five or more drinks on at least one occasion in the last 12 months, was 54% and the lowest was 24% of adults age 20 years and older.
Many health units are addressing teens’ sexual health needs by providing services in ways that are relevant to this client group.

For example, Kingston, Frontenac and Lennox & Addington Public Health offers its comprehensive school-based teen sexual health clinic program in partnership with the Limestone District School Board. A public health nurse visits various local high schools to increase the access local teens have to free, confidential sexual health services. Public health nurses work closely with the adolescent care worker at each school and facilitate physician referrals as required.

The teen sexual health clinic program is designed to decrease the rate of teen pregnancy and prevent the spread of sexually transmitted infections. The program is currently available at five secondary schools within the public health unit’s catchment area. One Teen Clinic occurs at an alternate education centre where many of the students are homeless or involved in prostitution. A Teen Clinic database is currently being developed to capture all relevant demographic information and sexual health services provided in order to evaluate the program’s success.

Another approach is being used by the Middlesex-London Health Unit, which runs a one-day, interactive high school outreach program designed to enhance knowledge and engage youth. The Having a Baby Day program operates in conjunction with St. Joseph’s Health Care, London, the Regional Sexual Assault and Domestic Violence Treatment Centre (RSADVTC), and the Thames Valley and London District Catholic school boards.

The program is offered quarterly and brings high school students and their teachers into St. Joseph’s Health Care to learn about preparing for parenthood, achieving optimal pre-conception health, experiencing a healthy pregnancy, and having the healthiest newborn possible.

Students rotate through small-group discussion sessions on and site visits to:
- the Family Birthing Centre (FBC)
- the Neonatal Intensive Care Unit
- Healthy Relationships
- the Regional Sexual Assault and Domestic Violence Treatment Centre
- Post-Partum Issues

The sessions include discussions by health care staff on topics such as antenatal, intra-partum, and post-partum care, implications of having a pre-term or ill infant, decisions about safer sex, resources on preventing abuse, and changes facing families with newborns.
8. Youth Heavy Drinking

The youth heavy drinking episode indicator identifies the proportion of people age 12-19 years who reported consuming five or more drinks on at least one occasion during the previous 12 months.

Research shows that young people, whose brains are still developing, may be at greater risk than mature adults of lasting brain damage from heavy alcohol consumption. Alcohol is the most commonly used drug among Canada’s youth. Alcohol-related trauma is a significant and preventable cause of death among young Canadians.

Research indicates that youth view heavy drinking as a social norm and that the consequences of excessive alcohol consumption are a ‘rite of passage’. This view is highlighted by the fact that while illicit drug use has generally been declining, the prevalence of heavy drinking has been holding steady and even increasing, particularly among youth aged 15 to 25. Moreover, new studies show that some youth start drinking at age 13 or younger.

Heavy drinking is associated with risk taking behaviour. Risks and consequences associated with heavy drinking include death, injury, violence, alcohol poisoning, unplanned and unwanted sexual experiences including sexual assault and sexually transmitted infections. Prolonged heavy drinking may result in brain damage, liver disease, cancer or heart disease.

Although most health consequences of alcohol and drug use typically appear later in life, early initiation of heavy drinking can lead to earlier problems and the development of life-long habits.

Public health programs and services aim to increase public awareness of the dangers of substance misuse and promote healthy public policy to reduce these risks. Programs and services include:

- promoting the Low-Risk Drinking Guidelines designed to minimize the health risks of alcohol use
- promoting responsible driving including not driving under the influence of alcohol
- advising women who know they are pregnant or are planning on becoming pregnant of the harmful effects of alcohol on their unborn child
- promoting adoption of municipal alcohol policies
- providing Server Intervention Training and promoting Safe Bar Policy
- promoting responsible hosting

Interventions to address youth heavy drinking are given additional prominence before and during events such as high school proms where a single episode of binge drinking can have severe health effects. More broadly though, interventions with youth promote adoption of behaviours to minimize health risks and reduce underage drinking.

In 2007, 25% of people in Ontario age 12-19 years reported consuming at least five or more drinks on at least one occasion in the previous 12 months. Based on 36 public health units in Ontario, the highest proportion of heavy drinkers was 65% and the lowest was 12% for people age 12-19 years who reported consuming five or more drinks on at least one occasion.
9. Physical Activity Index

The physical activity index indicator estimates the age-standardized proportion of the population age 12 years and older by level of energy expenditure in the categories active and moderately active in their leisure time physical activity.

Physical activity directly benefits a person’s physical and mental health. People who exercise regularly are less susceptible to a number of chronic health conditions. Evidence also suggests that regular physical activity can contribute to improved mental health.\(^{72}\)

Physical inactivity is among the leading contributors to a wide range of illnesses and conditions including:

- coronary heart disease and stroke
- type 2 diabetes
- certain types of cancer
- osteoporosis\(^{73}\)

A physically active lifestyle among the population will substantially reduce the burden of disease, death, and disability in Ontario.\(^{74,75}\)

Childhood obesity is a serious concern in Canada and internationally. Over the past 25 years, obesity rates among children and youth have nearly tripled. Not only are children eating too much high-energy, high-fat food, but they also are more sedentary. Childhood obesity can result in serious medical problems, including type 2 diabetes, high blood pressure, and liver disease as well psychological difficulties. Most children do not outgrow their weight problem and many continue to gain weight as they age.\(^{76}\)

The increased prevalence of overweight/obese young people and adults, combined with only moderate levels of physical activity, is a public health issue. To address these issues, the Ministry of Health Promotion launched ACTIVE2010 Ontario’s Sport and Physical Activity Strategy in October 2004.\(^{77}\)

Public health programs and services use a population health approach to promote healthy behaviours that improve the quality of life and help reduce the number of Ontarians seeking diagnostic services and medical care. Public health initiatives promote a healthier Ontario by:

- Promoting health at each age and stage of life, focusing first on children and youth
- Influencing the social determinants of health – the social and economic factors that shape our health
- Engaging partners to share the responsibility for a healthier Ontario
- Improving the health of those most at risk
- Removing barriers to healthy, active living so Ontarians have more opportunities to enjoy good health (i.e., bicycle/walking trails)

In 2007, 50% of people in Ontario age 12 years and older reported participating in physical activities in which they were active or moderately active. Based on 36 public health units in Ontario, the highest proportion was 64% and the lowest was 43% of people age 12 years and older who reported participating in physical activities in which they were active or moderately active.
10. Healthy Body Mass Index

The healthy body mass index indicator estimates the age-standardized proportion of people age 18 years and older whose self reported height and weight denote a healthy body mass index (BMI). BMI is calculated using the person’s weight in kilograms divided by their height in squared metres. The World Health Organization considers a BMI in the range of 18.5-24.9 to be healthy for most adults.\textsuperscript{78}

A healthy body weight is associated with good health. Excess weight can lead to:

- coronary artery disease
- stroke
- hypertension
- colon cancer
- post menopausal breast cancer
- type 2 diabetes
- gall bladder disease
- osteoarthritis\textsuperscript{79}

Chronic diseases such as the above are the leading causes of death in Ontario.\textsuperscript{80}
Obesity is strongly linked with type 2 diabetes, which itself is associated with other health problems such as heart disease, stroke, blindness and kidney failure. Type 2 diabetes is a major cost driver of Ontario’s health care system. Diabetes is the single most significant contributor to renal disease and vision loss and a leading cause of heart disease, stroke, and non-traumatic limb amputations.

There are many contributing factors to obesity, including:
- over eating
- low activity levels
- genetics
- body metabolism
- socio-economic status
- psychological/emotional factors

Unhealthy weights – both overweight and obesity – are a global public health priority. Overweight and obesity now are such a serious public health concern that they are known as ‘the new tobacco’.

The increased prevalence of overweight and obese young people is of concern because overweight and obesity may persist into adulthood. To address these issues, and in response to the Chief Medical Officer of Health’s report, Healthy Weights, Healthy Lives, the Ministry of Health Promotion launched the Healthy Eating Active Living (HEAL) Action Plan in 2006.

Public health units play a significant role in chronic disease prevention and health promotion related to healthy weights, proper nutrition and physical activity.

Public health works with individuals to build food skills and promote healthy behaviours, and with communities to promote food security and awareness of healthy eating. Efforts also are made to influence policy makers and community partners to address issues related to the existing community infrastructure, environment, and community spaces so that people have options that support them to be active and to access healthy foods.

In 2007, 47% of individuals age 18 years and older had a healthy BMI. Based on 36 public health units in Ontario, the highest proportion of individuals age 18 years and older with a healthy BMI was 55% and the lowest was 33%.

11. Fruit and Vegetable Consumption

The fruit and vegetable consumption indicator estimates the age-standardized proportion of the population age 12 years and older that reported consuming fruits and vegetables five or more times per day.

Research has shown that diets containing substantial and varied amounts of vegetables and fruit:
- may prevent certain types of cancer
- are associated with reduced risk of cardiovascular disease
- are associated with healthy weights and decreased risk of obesity

Lack of adequate fruit and vegetable consumption has become an important public health issue. According to the Canadian Community Health Survey (2.2) 59% of Canadian children 2-17 years of age consume fruit and vegetables less than five times a day. These children are significantly more likely to be overweight or obese compared to those who consume fruit and vegetables more frequently.
Fruit and vegetable consumption is influenced by many factors, including:

- physical access within a community
- food affordability
- knowledge of healthy food choices
- food skills such as shopping, budgeting, preparation, and storage

Public health programs and services related to healthy eating and food security issues target both individuals, to build food skills and promote healthy behaviours, and communities to promote food security and awareness of healthy eating. Programs and services that support healthy eating and food security include:

- community gardens
- school nutrition programs
- awareness campaigns including comparisons of the cost of a nutritious food basket to the cost of living

The annual tracking of a cost of the Nutritious Food Basket for an Ontario family is used to monitor food affordability across Ontario and to advocate for food access and security for specific populations. Data for the 2008 cost of the Nutritious Food Basket across Ontario are shown within the Health Unit Profile table.

The Northern Fruit and Vegetable Program is a provincial initiative that aims to increase fruit and vegetable consumption and increase awareness of the importance of fruits and vegetables among elementary school children in select communities in Northern Ontario, and to educate elementary school-aged children and their families about the importance of eating fruit and vegetables, and the associated benefits of healthy eating and physical activity to overall health. The project provides fresh Ontario produce twice a week in conjunction with a curriculum-based resource that outlines the benefits of eating fruits and vegetables. Northern Ontario was selected for the project because of the higher proportion of overweight children, the higher cost of the Nutritious Food Basket in Northern Ontario, and because 62% of children in the region aged 12-19 do not eat five or more servings of fruits and vegetables daily.

In 2007, 42% of individuals age 12 years and older reported consuming fruits and vegetables five or more times per day. Based on 36 public health units in Ontario, the highest proportion of people age 12 years and older that consumed fruits and vegetables five or more times per day was 50% and the lowest was 29%.

12. Fall-Related Hospitalizations among Seniors

The fall-related hospitalization rate indicator estimates the age-standardized number of injury-related hospital separations that are due to falls in seniors age 65 years and older per 100,000 population.

Persons over age 65 have the highest mortality rate from injuries. In the elderly, injuries from falls cause about one-half of deaths due to injury – more than either pneumonia or diabetes. Injury prevention is a cost-effective strategy for reducing the indirect and direct health care costs associated with falls. Effective injury prevention interventions can reduce injury-associated demand for care, including reducing hospitalizations, the demand for rehabilitation and assistive devices, as well as for residential care and home care. Injury prevention can also help seniors preserve their independence and quality of life – avoiding clinical complications and increased dependency on support services.
Most falls are predictable and therefore, preventable. Public health injury prevention interventions focus on eliminating or reducing known risk factors associated with falling.

Public health programs and services focus on reducing the frequency, severity, and impact of preventable injury. Public health units and their community partners promote:

- the safe use of prescription and over-the-counter medication
- the importance of nutrition and calcium and Vitamin D rich foods combined with exercise to prevent falls and/or delay the onset of osteoporosis
- awareness of the built environment and the identification of hazards to reduce the risk of falling both in the home and in the community

The risk of being injured and the incidence of injury are not equal throughout Ontario; each age group is at risk for different types of injuries. Seniors are most at risk for serious injuries resulting from changes that occur during the aging process (e.g. decreased vision, diminished reflexes, reduced muscular strength and mass, and decreased bone density).

In 2007, the rate of injury-related hospital separations due to falls in seniors age 65 years and older was 1,309.5 per 100,000 seniors in Ontario. Based on 36 public health units in Ontario, the highest rate was 2,371.5 and the lowest rate was 942.6 injury-related hospital separations due to falls in seniors age 65 years and older, per 100,000 population.

### Guelph Inclusiveness Alliance Case Study

The Guelph Inclusiveness Alliance (GIA) is a multicultural coalition of more than 30 service provider organizations and persons focusing on making Guelph a more welcoming place for immigrants in need of support. The [Wellington-Dufferin-Guelph Public Health](#) (WDGPH) provides GIA with epidemiological expertise and brings a determinants-of-health perspective to the coalition’s work.

The 2006 Census found that immigrants represent 21% of Guelph’s population. In 2009, the Guelph Inclusiveness Alliance will buy customized, demographic information from Statistics Canada to provide more detailed immigrant profiles as a basis for identifying inequities and improving accuracy.

WDGPH uses census and postal code information to examine the spatial and temporal distribution of immigrants, mortality rates, emergency room visits, and hospitalizations, across 12 Guelph neighbourhoods. This work supports a powerful Geographic Information System (GIS) that includes advanced statistical analysis tools to help interpret health patterns within Guelph.

Through the GIA, Wellington-Dufferin-Guelph Public Health is attempting to identify and reduce health inequities among Guelph’s diverse populations, tailor its programs and services to better meet local needs, and share its knowledge and expertise with community partners.
Developing methods of promoting and supporting knowledge exchange is an important aspect of ensuring that new knowledge is translated into practice and that current thinking on best practices is continually updated.

**Peel Public Health** has embarked on a ten year strategic direction setting process to enhance evidence informed decision making throughout the health unit. This multi-faceted strategy currently includes a review of library services, staff skill development, particularly in critical appraisal of the literature, a department wide communication plan, a project by one of the Associate Medical Officers of Health who has a fellowship through the CHSRF Executive Training for Research Application (EXTRA) program, and a post doctoral study on the change management process by a researcher at McMaster University. Additional activities include piloting the use of a knowledge broker role, contracting academics for selected literature reviews, a 12 month pilot of RefWorks (an online research management tool that manages on line information and generates citations and bibliographies) and formation of a critical appraisal club where staff can develop new skills and learn from each other.

**Region of Waterloo Public Health** approached this task by organizing a Research Pathways to Healthy Public Policy forum as a way to advance population health assessment, research, and evaluation activities. The forum is part of a program through which the health unit developed specific goals and objectives to guide its work with key stakeholder groups, including community organizations, the community at large and in particular vulnerable populations, professional partners and colleagues, decision makers and members of academia.

The Research Pathways to Healthy Public Policy one day forum attracted more than 80 participants from local academic institutions and key community groups. The event focused on three themes:
- health and the built environment (community design)
- environmental conditions affecting health (drinking water, air quality)
- local healthy food system development

The day was organized into three sections:
1. a general overview of the public health context, which outlined the Region of Waterloo Public Health’s mandate and what Research Pathways had to offer researchers
2. a large-group plenary section, which addressed expectations and concerns in partnering with Public Health and brainstormed how to overcome barriers to working together
3. small-group break-out sessions covering the three themes

Each small-group session identified key issues for both academia and public health by theme area, discussed ways to continue communications on the issues, and identified the key contact people for each theme area. Since the session, public health staff have followed up on at least 10 potential research ideas, proposals, or discussions for projects with the academic attendees.
13. Enteric Illnesses Incidence

The enteric illnesses age-standardized incidence rate estimates the total number of reported cases of selected enteric illnesses per 100,000 population.

Enteric illnesses are frequently characterized by diarrhea, nausea, vomiting, abdominal cramps, fever, and other symptoms. They can be transmitted via ingestion of contaminated food or water, exposure to infected vomit or feces, direct or indirect contact with infected persons or animals, or contaminated objects. Enteric illnesses are typically caused by pathogens such as *Campylobacter*, *Salmonella*, and *E. coli*. Young children, the elderly, and those with weakened immune systems, are at greater risk for complications from these pathogens, which can result in significant morbidity and mortality.

Enteric diseases are generally under-reported. Many individuals who acquire an enteric disease do not seek medical attention, or do not submit a laboratory specimen to confirm the existence of the disease. Studies estimate that for each reported case of enteric illness, there are at least several hundred undiagnosed or unreported cases in the community.

An important role of public health is to increase public awareness of the importance of hand hygiene, food safety and safe food handling practices, and the safe use of drinking and recreational water to reduce the spread of enteric diseases in the community. Public health programs and services aimed at reducing enteric illnesses include:

- inspecting regulated establishments, such as food premises and recreational waters, for compliance with the HPPA
- conducting local and provincial surveillance of enteric diseases
- investigating enteric illnesses and outbreaks
- educating the public regarding enteric disease prevention
- providing food-safety training programs for food-handlers
- educating drinking water system operators

In 2007, the reported incidence rate of cases of selected enteric illnesses in Ontario was 88.7 per 100,000 population. Based on 36 public health units in Ontario, the highest incidence rate was 164.1 and the lowest was 40.0 cases of selected enteric illnesses, per 100,000 population.

14. Respiratory Infection Outbreaks in Long-Term Care Homes

The respiratory infection outbreak indicator estimates the number of confirmed respiratory infection outbreaks in long-term care homes between September 1, 2006 and August 31, 2007.

Respiratory tract infections such as the common cold (*Rhinovirus*), adenovirus, and influenza, along with other respiratory pathogens, are spread through contact with an infected person via droplets from coughs, sneezes, and tissues or surfaces contaminated with the virus. Although symptoms vary depending on the

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**Selected enteric illnesses reporting fields include:** Amebiasis; Botulism; Campylobacter Enteritis; Cholera; Cryptosporidiosis; Cyclosporiasis; Food Poisoning, All Causes; Gastroenteritis, Institutional Outbreaks; Giardiasis; Hepatitis A; Listeriosis; Paratyphoid fever; Typhoid Fever; Salmonellosis; Shigellosis; Trichinosis; Verotoxin producing E.coli including Hemolytic Uremic syndrome (HUS); Yersiniosis
causative agent, they generally include nasal congestion, cough, running nose, sore throat, fever, sneezing, and fatigue.

A confirmed respiratory infection outbreak in a long-term care home is defined as:

- Two cases of acute respiratory tract illness, at least one of which must be laboratory confirmed; or
- Three cases of acute respiratory tract illness occurring within 48 hours in a geographic area (e.g. unit, floor); or
- More than two units having a case of acute respiratory tract illness within 48 hours.  

Respiratory tract infections are one of the most commonly diagnosed infections of long-term care home residents. Long term care residents are predisposed to such infections in part because they may:

- be elderly
- have chronic illnesses which weaken their immune system
- have chronic lung or neurological disease which impairs their ability to clear secretions from their lungs and airways

Residents are also at risk because they are often already medically compromised and many viral and bacterial respiratory pathogens are easily transmitted in an institutional environment. Thus, respiratory infections can result in substantial morbidity and mortality in residents of long-term care homes.

Public health units provide support to long-term care homes to prevent and reduce the spread of infectious diseases. This includes:

- promoting influenza immunization to staff and residents
- providing education to staff on infectious disease prevention
- working in partnership with staff to:
  - develop infection prevention and control policies and procedures
  - develop an outbreak contingency plan surveillance system
  - assist in the prevention, investigation, confirmation and management of cases and outbreaks

The number of outbreaks provides an indication of the workload and resources required of public health units to carry out appropriate response and investigations, to prevent the further spread of illness, and to prevent death. A high number of outbreaks should not be considered a sign of poor performance by a health unit, but may indicate an effective surveillance strategy and strong working relationships between long term care homes and a local public health unit staff. The data presented reflect the number of outbreaks and not closures due to outbreaks.

Through long-term care home reporting of respiratory infection outbreaks to public health units, early detection and investigation of outbreaks and implementation of appropriate infection control measures can be put in place to limit further transmission, illness and death.

Between September 1, 2006 and August 31, 2007 there were a total of 602 respiratory infection outbreaks in Ontario long-term care homes. Based on 36 public health units, the highest number of respiratory infection outbreaks in long-term care homes was 113 and the lowest number was zero.
15. Chlamydia Incidence

The age-standardized chlamydia incidence rate indicator estimates the total number of reported chlamydia cases per 100,000 population.

Chlamydia is the most common bacterial sexually transmitted bacterial infection (STI) in Canada. If left untreated in women, it can cause complications such as pelvic inflammatory disease which can lead to ectopic pregnancies, infertility, and septicaemia. In men, untreated infections can cause inflammation of the testicles and prostate which can also lead to infertility.

Public health units play a significant role in the prevention and management of STIs through the programs and services they provide. These programs and services include:

- promoting healthy sexuality
- providing sexual health clinical services
- providing testing and counselling for STIs
- providing case and contact management of STI cases
- providing treatment for Chlamydia at no cost to the client

Individuals infected with one STI are at a higher risk of contracting another STI, including HIV. By improving counselling, screening, diagnosis and treatment of chlamydia, public health units can help decrease new cases of other STIs.

The highest incidence rate of chlamydia infections is found in young adults aged 15-24. In recent years, the number of reported cases has been increasing. While this reflects a real increase in infection rates, it is also believed to reflect an increase in partner notification, expanded screening efforts and improved diagnostic testing.

In 2007, the incidence rate of reported chlamydia cases in Ontario was 219.8 per 100,000 population. Based on 36 public health units in Ontario, the highest incidence rate of reported chlamydia cases was 678.9 and the lowest incidence rate of reported chlamydia cases was 78.9, per 100,000 population.

16. Immunization Coverage for Hepatitis B

The immunization coverage for hepatitis B indicator estimates the proportion of grade 7 students who have completed the immunization series against hepatitis B by the end of grade 7.

Hepatitis B is caused by a virus that attacks, and can permanently damage, the liver. It is the leading cause of liver cancer worldwide. The highly contagious virus is spread through close contact with infected bodily fluids including blood. Unprotected sexual contact is the most common risk factor for hepatitis B infection in Ontario. Sharing needles with an infected person is another risk factor for infection.

In Ontario, publicly funded hepatitis B vaccines are provided for specific populations including those at higher risk due to lifestyle, or due to being a contact, being a carrier, or having been diagnosed with an acute liver
disease. In addition, a universal vaccination program is administered by public health units through a school-based program to students in grade 7. There is also a catch-up program for students in grade 8 who may have missed some or all of the vaccine series in grade 7.

Hepatitis B coverage among students is a unique indicator in that it speaks to the efficacy of a program over which public health units have direct control at the local level.

Public health units plan and deliver school-based hepatitis B immunization clinics. This indicator reflects the appropriate planning and delivery of school-based hepatitis B immunization clinics, public health unit efforts to educate parents and children and promote uptake of hepatitis B immunization, and public health unit data gathering with respect to hepatitis B immunization.

At the end of the 2007-2008 school year 79.8% of grade 7 students in Ontario completed the immunization series against hepatitis B. Based on 36 public health units in Ontario, the highest coverage was 95.2% and the lowest coverage was 65.2% of grade 7 students who completed the two-dose series against hepatitis B.

Toronto Cancer Prevention Coalition Case Study

The Toronto Cancer Prevention Coalition was created in 1998 by Toronto Public Health and community partners and is North America’s largest municipal cancer prevention coalition. In November 2002, City Council endorsed the Coalition Action Plan as the cornerstone of cancer prevention in the City of Toronto.

The strength of the coalition lies in its dedicated membership. For the first time in history, governments, universities, unions, health and environmental agencies, school boards, grassroots groups, activists and survivors have brought their individual expertise to the coalition and its comprehensive agenda for cancer prevention. The coalition’s work has accomplished or influenced prevention work being done throughout Canada today.

In 2007, the Toronto Board of Health endorsed a policy statement for shade for the City of Toronto which was forwarded to City Managers for implementation and has since been a catalyst for additional pilot projects, activities and advocacy work in effectively reducing overexposure to ultraviolet radiation within the city’s facilities.
17. Immunization Coverage for Measles, Mumps and Rubella

The immunization coverage for measles, mumps and rubella indicator estimates the proportion of school children age 7 years who are known to be complete for age for vaccination against measles, mumps and rubella.

Several vaccines are currently provided through the publicly funded immunization program to reduce the incidence of vaccine preventable diseases.\textsuperscript{113} Publicly funded vaccines are provided for routine immunization, the immunization of high-risk persons, and the control of disease outbreaks. The measles virus is highly contagious and can result in respiratory complications and death in extreme cases;\textsuperscript{114} mumps can cause sterility and subfertility in adult males;\textsuperscript{115} and the rubella virus is a respiratory disease that causes rash and fever. If contracted by a pregnant woman, the rubella virus can have devastating consequences on the developing fetus.\textsuperscript{116}

The combined measles, mumps and rubella (MMR) vaccine became available in 1975. It is administered to Ontario children on or after their first birthday and again at age 18 months as part of the Publicly Funded Immunization Schedules. Under the \textit{Immunization of School Pupils Act} (ISPA), all school pupils must have documented receipt of two doses of measles and one dose each of mumps and rubella by 7 years of age for school attendance, unless a valid exemption is provided.\textsuperscript{117} Children receive this immunization primarily through primary care physicians or through public health unit clinics.

Public health units are required to assess the immunization status of all school pupils and attendees of licensed day nurseries on a yearly basis to determine their immunization status and in the case of school pupils, the medical officer of health may issue suspension orders to school principals, where required, to remove non-immunized children from school. The process also provides important information to public health units regarding vulnerable children and populations in order to target these groups for immunization and to plan for potential outbreaks of disease. Public health units also provide recommendations to parents to immunize infants and children whose immunization is not up to date to ensure that both day nursery attendees and school pupils are appropriately immunized.

Having up to date MMR immunization at age 7 contributes to the timely and effective detection and identification of children and priority populations facing barriers to immunization who may be susceptible to vaccine preventable diseases, and their associated risk factors, as well as to any emerging immunization trends. It relates to the public's awareness of the importance of immunization across the lifespan and the achievement of target coverage rates for provincially-funded immunizations.

At the end of the 2007-2008 school year 84.9\% of school children in Ontario age 7 years were known to be complete for age for vaccination against measles, mumps and rubella. Based on 36 public health units in Ontario, the highest coverage was 97.8\% and the lowest coverage was 20.7\% of school children age 7 years known to be complete for age for vaccination against measles, mumps and rubella.
18. Adverse Water Quality Incidents

The adverse water quality incidents indicator identifies the number of adverse water quality incidents from drinking water systems subject to O.Reg 170/03/O.Reg 252/05 and unregistered drinking water systems. An adverse drinking water incident occurs when a water sample test result exceeds the Ontario Drinking Water Quality Standards or an operator observes that the system may not be providing safe water.

Contaminated drinking water can lead to serious health concerns. Most water-related health problems are caused by microbial or chemical contamination and can result in illnesses ranging from mild gastroenteritis, to disease outbreaks including *E. coli* infections, giardiasis and cryptosporidiosis.

Public health programs and services, together with programs through the Ministry of the Environment, aim to prevent or reduce the occurrence of water-borne illness:

- through timely and effective detection and identification of water contaminants and illnesses, their associated risk factors and emerging trends
- mitigating water-borne illness
- using evidence to influence the development of healthy public policy to reduce the burden of water-borne illnesses of public health importance
- ensuring public awareness of drinking water safety and the importance of source protection

Boards of health must ensure that the medical officer of health, or designate, is available 24 hours a day, 7 days a week to receive and respond to reports of adverse water quality incidents. Public health units are also involved in providing input into the development of legislation and regulations in order to ensure that the minimum standards for public water systems reflect evidence informed best practices.

The safety of drinking water is a major concern throughout Ontario, especially since the Walkerton contaminated drinking water incident in 2000.

There are about 2,855 drinking water systems in Ontario as of February 2008 governed under the *Safe Drinking Water Act* Regulation 170/03. These include year-round residential systems as well as those that supply water to designated facilities such as schools, daycares and nursing homes. An additional 18,000 small drinking water systems fall under Ontario Regulation 318/08 (Transitional- Small Drinking Water Systems) and Ontario Regulation 319/08, (Small Drinking Water Systems).

There are wide variations in the size and complexity of the drinking water systems that fall under the various regulations. These variations have a direct bearing on the water sampling and testing frequency and, ultimately, the number of adverse water quality incidents which may occur.

In 2007 there were a total of 4,458 adverse drinking water incidents in Ontario for all system types. Based on 36 public health units in Ontario the highest number of adverse drinking water incidents was 446 and the lowest number was 13 for the calendar year of 2007. The wide variation of reported adverse water quality incidents among public health units reflects the number of regulated drinking water systems within each health unit as well as the size of the population served by the systems. Systems serving larger populations have greater sampling frequency requirements.
Substance misuse prevention initiatives need to match both the community characteristics and the needs of the population being served. Huron County Health Unit, which is located in a rural region, has developed a web based intervention that is designed to reduce barriers that rural youth face in accessing health information such as distance, transportation, lack of anonymity, and a general lack of youth health and social services.

Since local rates of youth alcohol abuse are significantly higher than the provincial average, the website content focuses on alcohol and drug abuse, but also contains information on a variety of health topics, including healthy sexuality, relationships, and mental health. There is a strong evaluation component to this project to ensure this interactive, youth-led site is continually evolving to meet the needs of local youth.

By providing employment for 6 youth in the initial stages of the design and maintenance of the website itself and currently employing 1 SPARK youth ambassador, the SPARK youth website is designed to give at-risk youth in Huron County the opportunity to develop the skills to:

- design and maintain a health-promotion website and
- build the website into a reliable source of public health information for Huron County youth

The website, found at www.youthspark.ca includes personal stories, local information and announcements of events. It also has open forums for youth to find answers together, and to connect with health professionals who can answer questions anonymously.
Governance and Accountability Indicators

Governing bodies are responsible for the general oversight and direction of an organization. Effective governance is required for efficient program management, fiscal accountability, and the achievement of organizational objectives. Good governance is achieved through the implementation of guidelines and mechanisms which ensure that appropriate actions are taken when needed, and that the public is protected.

Governance is a multi-faceted subject. A well governed organization will feature:

- an ability to focus on strategic matters
- a clear understanding of the purpose of the organization
- clear delineation between board and administrative roles, responsibilities, and accountabilities
- an ability for the board to manage itself effectively
- board time used to focus on the most important issues
- administrative staff have the freedom to operate within the confines of stated policies
- alignment of resources with goals of the organization

Being able to demonstrate effective governance is a key component of any performance management system. Strengthened and consistent governance is the foundation for all other reforms to revitalize public health in Ontario.

In this report, three key aspects of organizational effectiveness are presented. They are 1) board of health finances, 2) human resource issues and 3) board operations.

The data for this section of the report were collected via a survey of boards of health in November 2008. The survey tool is available on the report website at: www.health.gov.on.ca/english/public/pub/pubhealth/init_report/index.html. A summary of the survey data can be found in Table 2: Indicators by Public Health Unit.

This information builds on the previous work of the CRC, which also conducted a survey of boards of health in June 2005. To support the CRC, MOHLTC sent all health units in Ontario an extensive, online survey about issues such as governance, funding, accountability, human resources and their research and knowledge transfer capacity. Health units were asked to describe their management and reporting structures, as well as the strategies they use to recruit and support their boards, and to assess performance. These results were presented in the CRC Interim Report.

19. Total Board of Health Expenditures

The indicator for total board of health expenditures is defined as the total board of health expenditures for “core and related public health programs and services”, from all sources, including all government funding, user fees, one time funding, fee for service contracts, and donations.

Expenditure data are one of the most basic pieces of baseline information used to describe an organization. They provide context to other information that describes the size, scope, diversity and complexity of an organization’s operations.
Boards of health were asked to report on revenues from all sources, and to categorize their funding by whether it was for a core public health program, a program related to public health, or for a program that is outside the traditional public health functions. Note that these categories do not align with those used by the ministry in its Program Based Grant funding package, where “related” programs has a specific meaning; further details are available within the data definition for this indicator.

This report marks the first time that this level of information has been presented on board of health budgets in a way that allows for comparisons across the province. It is important to note that because this was the first time that this information was collected, the completeness and consistency of reporting within the funding categories limits the validity of comparisons between boards using this data.

Because boards self defined which of their programs fit within each of the expenditure categories, there was some inconsistency in the reporting. Based on the information gathered from this first effort to collect board of health expenditure data, future iterations of this question will be able to support more consistent data collection and reporting. Despite this limitation, the reported expenditure data give an overall sense of the relative range and scope of program spending across Ontario.

The expenditure data also begin to provide a picture of the complexity of managing the delivery of public health in Ontario, as evidenced by the variation in the number of separate programs that boards of health are administering. While some boards of health focus primarily on delivering core public health programs, others are providing a large number of different programs, most with separate funding streams.

Expenditures for public health programs and services from all revenue sources for all boards of health were reported to be $837.7M in 2007. Program funding is provided primarily by the three ministries with responsibility for public health: Ministry of Health and Long-Term Care, Ministry of Health Promotion and Ministry of Children and Youth Services. In addition, some boards of health receive funding from the federal government (e.g., for the Canada Prenatal Nutrition Program) and collect fee for service revenues related to septic inspections.

### 20. Board of Health Expenditure Variance

The indicator board of health expenditure variance is defined as the percentage variance between a board of health’s projected annual budget for “core and related public health programs and services” and year-end actual expenditures with revenue from all sources.

Expenditure variance measures the effectiveness of internal fiscal management. A small amount of variance is expected, unless there are unforeseen events that result in one time financial anomalies.

Of the 36 boards of health, a total of 30 reported overall underspending totaling $34.6M in 2007, which represents approximately 4.0% of board of health budgets for core and related programs.

The most commonly cited reasons for underspending were staff vacancies due to difficulty in recruiting (cited by 21 boards of health), delays in recruiting due to delay in budget approvals (cited by 18 boards of health) and cost containment initiatives or planned gapping to actively manage expenditures.

The presence of surpluses is partly due to the timing of provincial government decisions on funding levels. While some municipalities will provide cash flow early in the calendar year in anticipation of government
announcements of funding increases, others wait until the approval letters are received before allowing boards of health to spend at the new level.

Because of the lack of alignment between the fiscal years used by boards of health (January to December) and the provincial government (April to March), provincial funding approvals are not provided until well into the operational year for public health programs and services. Some municipalities delay their approvals to avoid financial risks, but this leaves little time for public health units to adjust their spending or program service levels either up or down to accommodate the provincial funding adjustment.

Overspending totaled $1.6M in 2007, which accounts for less than one percent of reported planned expenditures of $870.7M. Out of the total of six boards of health that reported overspending, three accounted for 88% of the total.

The commonly cited reasons for overspending were unexpected demand for programs (cited by 5 boards of health), funding shortfalls (cited by 4 boards of health) and unanticipated in-year costs (e.g., training, one time purchases of office equipment).

**First Nations Children’s Oral Health Initiative Case Study**

Many health units are working in innovative ways with First Nations communities to address local health needs and build collaborative partnerships that will support improved communication and planning.

For example, in September 2004 the Northwestern Health Unit (NWHU) partnered with Health Canada to enrol five new First Nations communities in the Children’s Oral Health Initiative (COHI), pilot program, and to date 19 communities are involved. The initiative addresses the high rates of preventable dental disease in First Nations and Inuit communities in Canada.

Under the program the NWHU provides diversified oral health promotion activities, such as: education, oral health assessments, screenings, fluoride varnish, sealants, scaling, and oral hygiene instruction. Yearly baseline epidemiological data are collected and used to implement and evaluate the program and determine trends in oral disease.

This strategy has broken down the federal/provincial/First Nations jurisdictional barriers and ties in nicely with other tripartite initiatives across Canada, enabling health unit staff to provide desperately needed services to children under federal jurisdiction.

The ultimate goal is to empower communities to provide these services themselves.
21. Expenditures on Training and Professional Development

The indicator for expenditures on training and professional development is defined as the percentage of board of health total actual expenditures for “core and related public health programs and services” used to support staff training and professional development costs.

Spending on training and professional development is a measure of a board of health’s investment to support staff in their ongoing skill enhancement and maintenance for effective public health practice. Given the emphasis on the need to use evidence informed approaches, it is essential that staff have opportunities to enhance their knowledge. Access to current information on new methods of practice contributes to improvements in the delivery of public health programs and services.

Boards of health report that their expenditures on training and development in 2007 ranged from 0.15% to 1.65% of their total budgets, with most under 1% (32 out of 36).

The CRC recognized that professional development is a key to increasing staff satisfaction, improving staff retention and improving the quality of public health service delivery. Their report comments that public health units need deliberate strategies to provide professional development to address both program and discipline needs, and that innovative strategies need to be considered, such as subsidized refresher courses, scholarship programs, training networks and activities related to developing core competencies. The CRC recommended that public health units support training and staff development with expenditures in the range of 1% - 2% of their overall budgets.124

22. Numbers of FTEs by Job Category

The indicator number of FTEs by job category is defined as the number of FTE positions in 2007 in each of the following professional job categories: public health nurse, registered nurse, registered practical nurse, nurse practitioner, public health inspector, dentist, dental hygienist/dental assistant, health promoter, dietitian/public health nutritionist, speech-language pathologist, epidemiologist, heart health coordinator and librarian.

Information on the number of staff positions in specific job categories provides context for understanding current human resource capacities in terms of the range and size of staff complements of boards of health. Information was collected on the number of FTE positions in these selected job categories because of the persistent concerns within the sector regarding the potential for gaps in human resource capacity in these professional job categories, and the need to establish context for consideration of this issue.

The table below indicates that the single most common job category in public health units is public health nurse. All 36 public health units also have public health inspectors, dental hygienists/dental assistants and dietitians/public health nutritionists, and almost all have health promoters (33 public health units) and epidemiologists (35 public health units).

Less than half of public health units employ librarians (17 public health units) and speech-language pathologists (12 public health units). Information on the remaining job categories that were included in the board of health survey but not shown in the table below is available in Table 2: Indicators by Public Health Unit.
## Numbers of FTEs by Specific Job Categories

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Number of public health units reporting FTEs</th>
<th>Total FTEs across all health units</th>
<th>Median across all health units</th>
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</tr>
<tr>
<td>Speech-language pathologists</td>
<td>12</td>
<td>64.3</td>
<td>4.4</td>
</tr>
</tbody>
</table>

## First Nations, Métis and Inuit Diabetes Network Case Study

An example of current work taking place with First Nations is Ottawa Public Health’s work with the First Nations, Métis and Inuit Diabetes Network. With diabetes among Ontario Aboriginals three times higher than that in non-Aboriginal populations, the Ottawa Aboriginal community recognized the need for a more coordinated approach to diabetes education. Ottawa Public Health, working with Ottawa Aboriginal organizations, initiated the formation of a network that includes the Canadian Diabetes Association, Heart and Stroke Foundation, and the Diabetes Education Program of Ottawa.

The strength of the First Nations, Métis and Inuit Diabetes Network is its Aboriginal membership and its commitment to collectively engage, discuss, and arrive at a shared understanding on planning diabetes education while ensuring the efforts reflect the three distinct populations. As a result, the network has been able to move toward developing and sharing culturally relevant resources, training, and service approaches to diabetes prevention, as well as bring a focus to the prevention of other chronic diseases.

The First Nations, Métis and Inuit Diabetes Network is building on its interdisciplinary and intersectoral membership to attract new service, research, and academic partners to work together to reduce the burden of this preventable chronic disease among Ottawa’s approximately 60,000 Aboriginals.

**Case Study 12**
23. Number of Vacant Positions by Job Category

The number of vacant positions by job category is defined as the number of job vacancies for staff positions in the following job categories for which there had been a job posting and that had remained vacant between May 1, 2008 and date of survey in November, 2008. The job categories are: associate medical officer of health, public health nurse, registered nurse, registered practical nurse, nurse practitioner, public health inspector, dentist, dental hygienist/dental assistant, health promoter, dietitian/public health nutritionist, speech-language pathologist, epidemiologist, heart health coordinator and librarian.

Information on the number of vacancies in specific job categories is important because it identifies areas of potential gaps in public health unit human resource capacity that may have both local and system wide implications.

Boards of health were asked to report the number of positions that had been advertised and had remained vacant over the last six months in specific job categories. This indicator measures persistent vacancies that boards of health are trying to fill but where they have been unable to attract suitable candidates.

Boards of health reported minimal persistent vacancies in positions for registered nurses, registered practical nurses, dentists, and librarians. In each of these categories, the number of job vacancies that had remained unfilled after a six month posting was less than 1 FTE across all public health units.

The largest proportion of ongoing vacancies in public health units are for associate medical officer of health positions, with almost 25% of the total reported FTE positions sitting vacant for the last six months, and for nurse practitioners with approximately 15% of the total reported FTE positions vacant over the last six months. The other job categories where concern about the inability to fill positions has been noted (epidemiologist, registered practical nurse, speech-language pathologist) show province wide vacancy rates of between 4.7% and 9.1%.

<table>
<thead>
<tr>
<th>Numbers of Vacant Positions by Job Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Associate MOH</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Total number of vacant positions (for the last 6 months)</td>
</tr>
<tr>
<td>Total FTE staff positions</td>
</tr>
<tr>
<td>Total number of vacant positions as a % of Total FTE staff positions</td>
</tr>
</tbody>
</table>

Boards of health also reported that these numbers may underrepresent the impact of persistent vacancies because of the lateral movement of staff into vacant positions to backfill for a maternity leave, or as part of a vacancy management plan that delays recruitment for a part of a year. These types of situations were specifically excluded from this measure, in order to get a picture of long term vacancies in certain job categories.
24. Employment Status of Medical Officers of Health

The indicator employment status of medical officers of health is defined as a _situation where the medical officer of health is employed on a permanent full time basis with the board of health._

Strong medical officer of health (MOH) leadership is essential in public health to protect the community's health, and assume overall responsibility for management of the delivery of public health programs and services.

Under the HPPA, each board of health is responsible for recruiting a qualified MOH to fill the position on a permanent, full time basis. In the event that the MOH office becomes vacant, the Act requires that the board of health appoint an Acting MOH while it works expeditiously to fill the position. Boards may also appoint one or more Associate MOHs.

The appointment of both MOHs and AMOHs requires approval by the Minister of Health and Long-Term Care and the qualifications for these positions are specified in regulation.

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Healthy Menus for Arenas Case Study

In developing strategies to encourage healthy eating, health units are exploring ways to get beyond the use of broadcast messages to a whole population and are looking at strategies that address the specific locations where people eat meals away from home.

An innovative local approach led by the **Durham Region Health Department** is occurring whereby a Healthy Menus for Arenas program is currently operating in five Durham arenas. This program was based on the positive results of a 2007 pilot study, which found that arena users will make healthy food choices if options are available at arena concession stands.

Healthy menu options were developed by Public Health Nurses and Nutritionists in collaboration with the Heart and Stroke Foundation of Ontario, Canadian Cancer Society, Canadian Diabetes Association, Canadian Liver Foundation, FoodSense Vending Services, and local Municipal Recreation Facilities.

Further initiatives have also been introduced in support of healthy eating in other recreational facilities, including a communication campaign and a coaches' incentive program. Along with Health Department funding, financial support has also been received from the local Heart Health Coalition (Durham Lives!), the Public Health Agency of Canada's Diabetes Strategy, and the Canadian Cancer Society, Ontario Division.
Public health units with acting MOHs (as of December 31st, 2008)

<table>
<thead>
<tr>
<th>Type of Public Health Unit</th>
<th>Public Health Unit</th>
<th>Length of time MOH position has been filled on an acting basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Northern Regions</td>
<td>Northwestern</td>
<td>&gt; 2 years</td>
</tr>
<tr>
<td></td>
<td>Porcupine</td>
<td>&gt; 7 years</td>
</tr>
<tr>
<td>Mainly Rural</td>
<td>Eastern Ontario</td>
<td>&gt; 2 years</td>
</tr>
<tr>
<td></td>
<td>Elgin-St. Thomas</td>
<td>&gt; 12 years</td>
</tr>
<tr>
<td></td>
<td>Haldimand-Norfolk</td>
<td>&gt; 12 years</td>
</tr>
<tr>
<td></td>
<td>Oxford County</td>
<td>&gt; 11 years</td>
</tr>
<tr>
<td></td>
<td>Perth District</td>
<td>&gt; 2 years</td>
</tr>
<tr>
<td>Urban/Rural Mix</td>
<td>Chatham-Kent</td>
<td>&gt; 6 years</td>
</tr>
<tr>
<td></td>
<td>Lambton</td>
<td>&gt; 10 years</td>
</tr>
<tr>
<td>Sparsely Populated Urban-Rural Mix</td>
<td>Timiskaming</td>
<td>&gt; 12 years</td>
</tr>
<tr>
<td>Urban Centres</td>
<td>Wellington-Dufferin-Guelph</td>
<td>&gt; 3 years</td>
</tr>
</tbody>
</table>

In terms of full time status, three public health units reported that they have MOHs who are working less than a full time equivalent, and two public health units share one FTE.

Building Internal Evaluation Capacity Case Study

The Leeds, Grenville and Lanark District Health Unit has developed a plan to build organizational capacity for program evaluation and evidence-based public health practice. The goal is to integrate the planning and evaluation function into all public health professional job functions within the health unit and thus build an organizational culture of continuous quality improvement.

The plan involves implementing a comprehensive strategy of policies, supportive environments, infrastructure development, and staff education and training. The goal of the plan is to enhance the skills of public health professionals in the foundations of effective, evidence-based public health practice. The strategy includes the launch of a learning series to enhance knowledge and skills, and the creation of an Evaluation Community of Practice, which is an informal network supporting the exchange of ideas and experiences in program evaluation.

Ultimately, building organizational capacity for program evaluation will enhance accountability to stakeholders and the quality of public health programs delivered to the community.
25. Staff Length of Service

The indicator staff length of service is defined as the percent of current full and part time public health unit staff who have been employed continuously by the public health unit, by length of service.

Length of staff service is a commonly used measure of staff retention and turnover. High staff turnover rates affect organizational stability and capacity, since it is recognized that an organization needs to retain staff in order to maintain stability in operations, transfer corporate knowledge, and support the orientation of new staff. On the other hand, an organization where the majority of staff have over 20 years of service may have less change in their organizational culture.

Board of health reporting on the length of service of their staff is summarized in the table below. The figures represent the percentage of the staff in a board of health that were reported to have been with the board of health for the designated period of time.

Across the province, about 9% of staff have been with their board of health for less than one year. In this category, the majority of boards (27) reported rates between 5% and 15%, with one board having double the average, with just over 20% of their staff in this category.

Data collected through the survey of public health units found that:
- in the “more than 1 year but less than 5 years” category, 20 boards reported this as their peak in staff length of service, with ranges from 19.2% to 43.0% of all staff.
- in the category “more than 5 but less than 10 years”, 13 boards reported that the majority of their staff had a length of service that fit within this category, with rates ranging from 16.4% to 38.0%.

For the majority of public health units, the highest proportion of staff were in these two specific categories. This suggests that staff may be near the beginning of their careers or are moving between public health units every few years.

Staff Length of Service

<table>
<thead>
<tr>
<th>Rates across all public health units</th>
<th>Up to 1 year</th>
<th>More than 1 year, but less than 5 years</th>
<th>More than 5, but less than 10 years</th>
<th>More than 10, but less than 20 years</th>
<th>More than 20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest %</td>
<td>0.0%</td>
<td>19.2%</td>
<td>16.4%</td>
<td>6.6%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Highest %</td>
<td>20.5%</td>
<td>43.0%</td>
<td>38.0%</td>
<td>31.3%</td>
<td>21.0%</td>
</tr>
<tr>
<td>Average length of service – all health units</td>
<td>9.3%</td>
<td>31.3%</td>
<td>27.8%</td>
<td>18.0%</td>
<td>13.6%</td>
</tr>
</tbody>
</table>
In a few cases, boards of health were unable to confirm whether all their staff had worked continuously for the public health unit or had spent some time working in other departments within the municipal or regional government. This will primarily impact the reporting on administrative and corporate support staff (such as IT, communications, HR), who have transferable skills. Given that these staff positions are a minority of all public health positions, the effect will be minor but it may have skewed the length of service upward for boards of health that are part of municipal or regional governments, since the reporting was on staff length of service with the same employer.

**26. Familiarity with Public Health Unit Programs and Services**

The indicator familiarity with public health unit programs and services is defined as *whether a board of health has assessed local community members’ familiarity with any of the public health unit’s programs and services.*

Although it is an important component of public health practice, indicators that measure community engagement and awareness of public health are not yet well developed or validated. For this report, data were collected from boards of health on whether they had assessed local community members’ familiarity with their programs and services. Of the 36 boards of health, 26 reported that they had most recently conducted an assessment on this issue between 2005 and 2008, and a further 6 had last conducted an assessment between 1998 and 2004.

In other jurisdictions, the leading edge practice is to collect information on community partners’ awareness of a public health organization directly from the partner organizations and stakeholders. Survey tools are used to question staff in settings such as other health care services, schools, housing organizations and outreach programs about their knowledge and opinions of the availability and delivery of public health services in their community.

Building community awareness is a necessary first step towards building community engagement. But this is a challenge for public health because interventions are often invisible to the community. Public health does not usually receive credit for news stories that do not happen, such as preventing disease outbreaks or long term health outcomes that are improved for a whole population over a generation.

Because of this paradox, members of the general public are often unaware of the role and mandate of public health. Community organizations that public health works with every day may also under estimate the role that public health plays in influencing public policy and contributing to new knowledge about what works to create and sustain change in communities.

The foundational principles guiding public health service delivery in Ontario speak directly to the issue of partnership and collaboration. The OPHS describe partnership and collaboration as involving partnerships within the health sector (e.g., Local Health Integration Networks and primary health care) and other sectors (e.g., education, social services, housing, workplace health and safety system, and environment).

Community collaborations and citizen engagement can occur in the areas of assessment, planning, delivery, management, and evaluation of programs and services. Boards of health need to use their influence to achieve and maintain the leadership role required to create the conditions necessary for effective program outcomes.
The Health Bus Case Study

The Health Bus began as a vision of the Niagara-based Wise Guys charity, which provided funding to allow Niagara Region Public Health to purchase a bus and convert it into a mobile health care facility for the homeless. The Health Bus is permanently staffed by a team leader and a public health nurse. In addition, staff from the sexual health program, the dental program and the mental health program provide services on a rotating or occasional basis.

The initial homeless target population has been expanded to include vulnerable, marginalized, and isolated populations. Niagara Region Public Health undertook extensive collaboration and consultation with community partners to determine the services required and the best locations at which to reach the target population, and works to keep community agencies abreast of Health Bus services and service locations.

The Health Bus provides a wide range of health services, including:

- treatment for minor medical conditions
- general, mental, and sexual health counselling
- foot care
- immunizations
- sexually transmitted disease testing and treatment
- needle exchange
- dental assessments and
- referrals to appropriate medical and dental service providers

Despite demands to expand the coverage area, the Health Bus has been able to maintain its focus on providing access to the target population. One of the Health Bus’s strengths is its visibility and the trust it has developed with the target population. The Health Bus has been successful in increasing client, community, and staff satisfaction in providing health care to a traditionally poorly served population.

Case Study 15

27. Issuance of a Health Status Report

The indicator issuance of a health status report is defined as situations where a board of health has issued a health status report or other health intelligence or information product that considered inequities in health outcomes and health determinants.

A health status report or other health intelligence or information product includes any publication designed for distribution to the public and partners that used health status statistics and provided analysis of these statistics to describe the inequity of health outcomes or health determinants among various populations in the public health unit’s catchment area.
Issuing a health status report provides information about the community which the public health unit serves that can be used to guide programming and resource decisions. It also works to educate the community about the role of public health programs in keeping a community healthy.

Health status reports are usually customized to highlight local issues. They can be about a single issue or a specific population or age group, or they can provide an overview of the general health of a community, often in comparison to provincial or national averages.

All boards of health issued a local health status report between 2006 and 2008, with one exception, which issued a report in 2000.

**Collaboration with First Nations Case Study**

As an example of inclusion at the governance level, the Peterborough County-City Board of Health (PCCHU) has signed an agreement with Curve Lake First Nation and Hiawatha First Nation for comprehensive public health services.

Both communities contribute their share of the 25% local funding, and the council of each band appoints one of its members to the board of health for one, two, or three years. Curve Lake First Nation and Hiawatha First Nation also may jointly appoint a representative. In Peterborough, Curve Lake First Nation Chief Keith Knott has served as a Board Member since 2002, including a term as Chair in 2004. The relationship with these two communities continues to evolve and PCCHU continues to act as a resource, a facilitator, an educator, a trainer, and an advocate as needs arise.

PCCHU has partnered with staff at the Curve Lake First Nation Health Centre on a youth tobacco-prevention strategy. Curve Lake First Nation and Hiawatha First Nation are partners in the Health Canada funded smoking cessation project and also have partnered with PCCHU on a proposal to the Canadian Tobacco Control Research Initiative.

Services offered by the health unit, such as HBHC home-visiting, food handler training and certification, parenting groups (such as Nobody’s Perfect), and food security initiatives, such as “Come Cook with Me” enhance the programs that already exist within the First Nation. Child care is provided, so parents can have some time for themselves, forge new friendships, and learn new skills.
28. Strategic Plan

The indicator for strategic plan is defined as whether a board of health reports having a strategic plan in place that covers the current period (2008).

A strategic plan is an organizational document that generally covers a period of three to five years, presents the organization’s mission and vision, describes the relationship of programs to community needs and establishes priorities for action within a specific timeframe and with specific resources.

The existence of a strategic plan is an indicator of good governance because it signals a purposeful approach to planning and priority setting for the organization. Such plans are also a key element in capacity building because they provide an opportunity for an organization to consider its strengths and weaknesses, and to make plans to address these.

Strategic plans are commonly used among boards of health, with 24 of the 36 boards of health reporting having a strategic plan current as of 2008. Three boards of health had strategic plans that expired prior to 2008, two boards of health have a strategic plan that began in 2009, and seven reported that they do not have a strategic plan in place.

29. Emergency Response Plan Tested

The indicator emergency response plan tested is defined as whether a board of health has an internal emergency response plan and whether it was tested between January 1, 2007 and the date of the survey in November, 2008. Testing an emergency response plan would include activities such as running a table top exercise, testing a telephone contact list of all staff, and staging a mock emergency scenario.

All boards of health reported that they had an internal emergency response plan in place, and the majority (29) had tested their plans since January 1, 2007. Seven boards of health reported they had not tested their plans since this date.

Of the 29 boards of health that reported they had tested their plans, most used more than one method to assess the strengths and weaknesses of their plans. The most common methods were table top exercises (18 boards of health) and scenarios or simulations (17 boards of health). The third most common method, used by 15 boards of health, was to conduct a call out or fan out exercise, which tests the ability to contact all staff or designated people by telephone and other electronic means.

More than seventy percent of boards of health that had tested their plans (21 of 29 boards of health) used at least two of these methods and 10 boards of health had completed multiple versions of a testing exercise over this time period.

In addition, eight of the boards of health that had tested their plans have also faced real emergency situations during this period, and reported that they have been able to identify ways to improve their emergency response plans based on these experiences.
30. Accreditation Status

The accreditation status indicator is defined as whether the board of health participates in an accreditation process, and if so, indicates the accrediting organization and current accreditation status.

Accreditation sets benchmarks of consistent standards for public health services that should be met by boards of health. It also provides a process for quality improvement by identifying areas for improvement in efficiency and performance. In doing so, accreditation acts as a continuous quality improvement mechanism and embeds this as a feature of the public health culture.

Fourteen boards of health were accredited at the time of the survey. A further seven boards of health are preparing to undertake, or are currently undertaking the accreditation process.

Of the 21 boards of health involved in accreditation, 19 are accredited with or working towards accreditation with the Ontario Council on Community Health Accreditation (OCCHA), one is accredited with Accreditation Canada, and one is accredited with the National Quality Institute.

Operation Hairspray Case Study

Ottawa Public Health has developed a health protection initiative that works with community members to provide health information to populations at risk. Operation Hairspray trains African and Caribbean hairdressers and barbers to deliver culturally appropriate information about HIV/AIDS prevention strategies to their customers and to members of local African and Caribbean communities.

Volunteers in Operation Hairspray are trained as peer educators and acquire the knowledge and skills needed to impart STI and HIV/AIDS prevention information while they are interacting with their clients. Over the course of 12 months, 19 peer volunteers were recruited and trained across Ottawa. In total, they made more than 14,000 contacts with clients and community members, sharing information and a variety of different written publications on basic HIV/AIDS prevention, and distributing more than 24,000 condoms. South East Ottawa Centre Healthy Communities created a database to house information collected by the peer volunteers.

In 2008, Ottawa Public Health developed a successful partnership with Somerset West Community Health Centre to expand the reach of the project by recruiting and training an additional 20 peer volunteers. The AIDS Community Action Programme (ACAP) provided time-limited funding for Operation Hairspray, Phase 2: Spray the Word. To date, an additional seven peer volunteers have been recruited and trained.
31. Medical Officer of Health Performance Evaluation

The indicator medical officer of health performance evaluation is defined as the completion of a regularly scheduled performance evaluation of the medical officer of health, by type of evaluator and by year of the most recent evaluation.

The majority of boards of health (32) report that their medical officer of health receives a regularly scheduled performance evaluation, and three report that MOH performance evaluation does not occur within their boards of health. One board of health did not respond to this question.

In terms of frequency, about two thirds of those that have regular performance evaluations (21 of 32) report that reviews are done annually. An additional four boards of health conduct MOH performance evaluations every 2 years and the remaining boards of health use varying schedules.

In terms of who conducts the performance evaluations, 23 boards of health use a committee of board members, and two use a self evaluation method. Among the remaining boards of health that conduct performance evaluations, the performance evaluation was conducted by the Chief Administrative Officer (3), the City Manager or Deputy City Manager (2) or the Commissioner of Health (2). In two of these cases, the senior manager also received input from members of the board of health. Two boards of health did not report on their method of evaluation.

32. Medical Officer of Health Reporting Relationships

The indicator medical officer of health (MOH) reporting relationships is defined as situations where the Medical Officer of Health attends board of health meetings and/or standing committee meetings, and whether he or she participated in the meetings. Participation includes attending meetings and providing reports, advice or presentations to the board.

The MOH is entrusted with statutory responsibilities to guard and protect the community's health. In order to fulfill these responsibilities, the HPPA specifies that the MOH “report directly to the board of health on issues related to public health concerns and to public health programs and services”.125

Boards of health were asked to describe how their MOHs reported to their boards of health in 2007, with participation including activities such as providing written or verbal reports, presenting items, or participating in the meeting to address issues under discussion.

In the majority of cases (23), MOHs reported directly to the board of health while 10 others have the MOH report to both a standing committee of the board and to the board of health itself. In two cases, the MOH reports only to a standing committee of the board.
33. Board Member Orientation

The indicator board member orientation is defined as *situations where new board of health members are provided with an orientation to the roles and responsibilities of the board of health, the duties of members and public health functions and issues.*

In order to effectively carry out their responsibilities, new members of any board of directors require a thorough understanding of their service sector. An orientation program for new members to a board of health should include information on public health in Ontario; the board’s roles and responsibilities, as well as the individual’s role and responsibilities; the board’s vision and objectives; existing provincial legislation related to boards of health; the roles and responsibilities of the board of health in relation to the medical officer of health; the Ontario Public Health Standards; and information about relevant organizations.

Orientation of board members is supported by the Association of Local Public Health Agencies through training programs and resources.

Of the 36 boards of health, 35 reported that they routinely orient new board members and that this orientation includes training or information on the core functions of public health and the board of health’s governance responsibilities.

34. Board Self-Evaluation

The indicator board self-evaluation is defined as *situations where a board of health has engaged in a process to evaluate its governance processes and organizational effectiveness.*

Board self-evaluation is usually a requirement for the accreditation of an organization.

Of the 36 boards of health, 13 reported that they regularly evaluate their performance to improve systems and processes, including an assessment of the governing body’s own structures, processes and team functioning. The most recent review time frames ranged from 2003 to 2008, with 9 occurring in 2007 or 2008.

The remaining 23 boards of health reported that their boards do not undertake a self evaluation process.
The **Halton Region Health Department’s** Communicable Disease Control team has launched a program to assist and support health in the two “Super Jails” (Maplehurst and the Vanier Centre) within its jurisdiction. Maplehurst Correctional Complex, with a population of 1,182 and a turnover rate of 30 inmates per day, is the largest male correctional facility in Canada. The Vanier Centre for Women is a 333-bed medium- and maximum-security facility with an almost 100% turnover rate every 18 to 21 days and an 80% recidivism rate.

The Communicable Disease Control team provides program support to both facilities and works closely with the jail’s health services and administration to ensure routine admission testing, including testing for tuberculosis, and prompt reporting of communicable disease issues for appropriate follow-up and treatment. At both facilities, 95% of the workload is TB related, including latent TB infections (LTBIs), active disease follow-up, treatment and contact management.

In addition, the Food Safety team conducts regular compliance inspections of the kitchen facilities at both locations. One is a commercial-grade food-production facility that provides more than 9,000 meals daily to five other provincial institutions. The other provides the meals for inmates at both Maplehurst and Vanier. In both kitchens, inmates assist in the production and assembly of meals.

In this role, Halton Region Public Health has been involved in both investigating food-safety-related complaints and outbreaks, including those resulting from contaminated food products and intentional adulteration. As well, staff respond to environmental health issues, including mould and indoor air quality issues.

The health unit also runs a Sexual Health and Needle Exchange Program that provides Maplehurst and Vanier inmates with education and case management for those diagnosed with a sexually transmitted infection (STI), and general education on STIs, including HIV/AIDS and hepatitis A, B, and C.

**Case Study 18**
Context for Performance Management in Public Health

Public health interventions contribute to the effectiveness and outcomes of the health care system in a number of ways, including:

- reducing the need for emergency room and acute services through prevention efforts, so that fewer people develop conditions that require hospitalization
- providing information on population health status and needs through surveillance, to assist with health care planning and demand analysis
- improving health outcomes for broad populations through community based partnerships and collaboration with other health care providers.

Around the world, governments and communities are implementing performance measurement and management strategies in order to better address increasingly complex health issues and growing demand for services. The need to demonstrate program effectiveness and cost efficiency is driving the development of performance measures in all parts of the health care system.

Ontario’s work in implementing performance management within public health is congruent with this global trend within the health sector. It is also consistent with the performance reporting that is emerging on Ontario’s health care system, such as the MOHLTC Health System Scorecard and from the Ontario Health Quality Council.

The development of this report has benefited from some of the lessons learned in other jurisdictions. Every jurisdiction faces the lack of reliable, meaningful performance indicators and corresponding data. As with other jurisdictions, data on process measures or need for services tend to be more readily available than data on the outcomes of population based interventions or how these outcomes are achieved.

All parts of the system, including acute care, primary care, public health, and long-term care, as well as Local Health Integrated Networks (LHIINs), government, provincial associations, and provincial and regional service networks need to champion the changes required to shift from reactive, episodic acute care to proactive health protection, health promotion and chronic disease prevention and management. Leadership, skills development, incentives, and quality improvement across the health system and within individual organizations are prerequisite to successful implementation of sustainable change.

This report represents the ministry’s first steps towards developing a product to inform the development of the public health performance management system based on the conceptual approach presented in the Capacity Review Committee’s (CRC) 2006 final report.12
As the CRC's diagram illustrates, a performance management system requires the development of tools and business processes focused on:

- setting clear performance goals and expectations that span multiple dimensions of the organization
- measuring progress
- reporting on performance and assessing the risks to achieving goals and expectations
- evaluating how effective the system is in achieving goals and building knowledge
- ongoing adjustments to incorporate new knowledge and circumstances

Some framework components, such as the release of the Ontario Public Health Standards and amendments to the HPPA to permit the use of accountability agreements, have been developed. Others, however, still are in early stages of development or redesign. Creating the tools and processes to properly support this framework is a long-term project that will align with, and build on, existing systems and processes.
Developing a Performance Management Culture

As a first product of the new approach to performance management in public health, it is hoped that this report will serve as a catalyst for a cultural shift within the sector. Such a shift involves moving away from an exclusive focus on measuring compliance and reporting on processes, and moving towards measuring outcomes and looking for ways to improve practices.

This shift in focus does not diminish the importance of tracking processes or delivering on program requirements. Performance management is far more than simply meeting minimum standards. Under the new performance management system, organizations within the public health system will need to work together to:

- identify current achievement levels
- explore ways to achieve more with the same resources
- use a continuous quality improvement approach to support change

As the performance management system matures, it is assumed that provincial level public reporting on all requirements and outcomes would be inappropriate and unmanageable. However, boards of health are responsible for ensuring that they are fulfilling and managing all requirements as a necessary part of their responsibilities for effective governance and management.

Moving forward, it will be necessary to balance provincial reporting on key high-level outcomes of primary importance to protecting and improving the public’s health and the need to have enough information available to identify sectoral pressure points in order to be able to intervene when it is in the public’s interest to do so.

Future Indicators

Through the process of developing this initial report it became clear that the kinds of indicators that directly measure performance of public health programs and services are not currently available. While Ontario’s work in this area is building on the work of other jurisdictions, a review of the literature shows that it takes time; there are no ready made answers or systems that can be adopted quickly or without customization.

Developing these future indicators will be an iterative process as information needs are clarified and defined over time. The consensus-building phase of indicator selection and the more technical phases of indicator definition and development will require a significant investment of time and effort to properly consider the issues, the implications, and possible alternatives. It will also require engagement with public health professionals to develop a consensus that the right things are being measured, in the right ways, for the right purpose.

Once appropriate measures are identified as priorities for development, it will also be necessary to develop or modify data collection mechanisms and procedures for ensuring consistency in data collection.

Over time, it is anticipated that the indicators included in this report may be amended, or replaced in order to include a focus on sector-level risk assessment measures. Currently, measures that assess the strengths and weaknesses of public health have not been agreed upon, have not been clearly developed and defined and therefore are not likely to be supported by existing data sources.
Requirements for a Performance Management System

Developing an effective public health performance management system will require substantial infrastructure which will take time to design and implement. It is anticipated that much of this change will happen within the context of existing local and provincial resources.

The infrastructure required to support a performance management approach features:
- valid and reliable indicators
- accurate and reliable baseline data for each indicator
- a robust data-collection system
- policy on the use of targets
- knowledge about how program activities change outcomes
- consideration of local conditions, constraints, and program/organizational capacity to change outcomes
- organizational capacity to manage data, interpret results, and undertake actions to support operational changes

Some of the tasks required to support implementation of this vision include:
- reaching consensus on which indicators to develop that will report on program outcomes and allow the assessment of risks to the public
- designing and validating the identified indicators
- developing and implementing corresponding data-collection tools
- developing and implementing new accountability mechanisms that clarify roles, responsibilities, and reporting requirements
- developing and implementing supports and incentives for improving practices

The ministry, with its sister ministries (MHP and MCYS) and the advice of the Performance Management Working Group, is currently planning how best to accomplish these important tasks.

Implementation Challenges

Experience with performance management in other systems and jurisdictions has highlighted certain common implementation challenges. In Ontario, these challenges include the following:
- The individuals and organizations within the sector already have an existing set of relationships, areas of expertise, and ownership for data systems, processes, and tools, all of which are likely to be impacted by the implementation process.
- Success ultimately requires changes in attitudes and behaviours. This will require the use of change-management strategies at all levels of the sector.
- Current participants have different levels of experience and expertise in understanding and using performance management approaches. Some public health units are farther ahead than the ministry; others are newer to the ideas and process changes required for performance management. To fully engage staff at all levels, implementation will have to be concrete and practical. If the individuals within the sector do not share an understanding of accountability or performance management, the system will face strategy dilution which will undermine the implementation’s effectiveness.
• This new approach to performance management is occurring at the same time as the Ontario Agency for Health Protection and Promotion is becoming active and all parties are in the process of establishing new relationships and determining appropriate linkages and roles.

• The significance of the issues faced in developing the day-to-day processes for working with data and ensuring data quality and integrity cannot be underestimated. The importance of using data to drive program delivery is emphasized in the Foundational Standard of the OPHS, and public health units are already working on ways to integrate these requirements into their processes.

Implementation Opportunities

Along with the challenges, there are opportunities to be leveraged, including:

• The substantial capacity and performance management expertise already at work within the Ontario public health sector. This can be marshalled to support the implementation of performance management at the sector level.

• The fact that many public health units and other stakeholders already are implementing compatible performance management practices at the local level. This presents the opportunity to learn from each other and benefit from our collective experience.

• As the Ontario Agency for Health Protection and Promotion becomes more operational, new capacity in such areas as assessing evidence, exchanging knowledge, collecting and analyzing data, and carrying out professional development activities will become available just as that additional capacity is needed.

• Performance management is about working smarter, not harder. The principles of performance management support working smarter by collecting data once for multiple uses and restricting collection to only the data that will be used to inform decisions. These principles will need to inform our work in order for everyone in the sector to see the benefits.

Conclusion

The ministry, in collaboration with MHP and MCYS, is pleased to be offering this report on public health in Ontario as an initial step towards implementing a new approach to performance management.

In the process of developing this report, with the advice of the Performance Management Working Group and others, experience has been gained as to the iterative decision making processes that are a vital and necessary part of developing this new performance management approach. Moving from a compliance framework to a performance management framework does not necessarily require new resources; what is most fundamental is a shift in thinking and in organizational culture to support continuous quality improvement.

The intended outcome of the performance management framework is to emphasize improvements through informed decision making, appropriate accountability, and sustainability of the Ontario public health system. Reaching this outcome will require that the ministries involved in public health continue to engage with organizations in Ontario’s public health sector as well as those in the broader health care sector. Partnerships and collaborative efforts are a vital aspect of supporting a strong, flexible, and responsive public health system that is able to demonstrate improvements and achievements over time.
Appendix 1: Peer Groups

A peer group is a cluster of health units with similar social and economic factors. From a practical perspective, the impact of social and economic factors on health outcomes can be seen more clearly by clustering the health units and comparing results within peer groups.

The peer groups used in this report are drawn from Statistics Canada’s 2007 peer groups, which use 2007 health region boundaries and 2001 Census data. Across Canada there are nine peer groups identified by letters A through I. Ontario health units fall into six of these peer groups. The following tables provide a breakdown of Ontario health units by peer groups, the principal characteristics of each of the peer groups, and the variables used in the cluster analysis to determine the peer groups.

The method used to determine the peer groups is described on the Statistics Canada website. Statistics Canada uses a statistical method to achieve maximum statistical differentiation between health regions. Twenty-four variables were chosen to cover as many of the social and economic determinants of health as possible, using data collected at the health region level mostly from the Census of Canada. Concepts covered include:
- basic demographics (for example, population change and demographic structure),
- living conditions (for example, socio-economic characteristics, housing, and income inequality), and
- working conditions (for example, labour market conditions)."

For additional information please refer to the website at the following address: http://www.statcan.gc.ca/pub/82-221-x/2008001/5202322-eng.htm
### Table A: Ontario health units by peer group

<table>
<thead>
<tr>
<th>2007 Peer Groups</th>
<th>Health Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peer Group A:</strong></td>
<td></td>
</tr>
<tr>
<td>Urban/Rural Mix</td>
<td>Brant County Health Unit</td>
</tr>
<tr>
<td></td>
<td>City of Hamilton Health Unit</td>
</tr>
<tr>
<td></td>
<td>Hastings and Prince Edward Counties Health Unit</td>
</tr>
<tr>
<td></td>
<td>Chatham-Kent Health Unit</td>
</tr>
<tr>
<td></td>
<td>Kingston, Frontenac and Lennox and Addington Health Unit</td>
</tr>
<tr>
<td></td>
<td>Lambton Health Unit</td>
</tr>
<tr>
<td></td>
<td>Middlesex-London Health Unit</td>
</tr>
<tr>
<td></td>
<td>Niagara Regional Area Health Unit</td>
</tr>
<tr>
<td></td>
<td>Peterborough County-City Health Unit</td>
</tr>
<tr>
<td><strong>Peer Group B:</strong></td>
<td></td>
</tr>
<tr>
<td>Urban Centre</td>
<td>Durham Regional Health Unit</td>
</tr>
<tr>
<td></td>
<td>Halton Regional Health Unit</td>
</tr>
<tr>
<td></td>
<td>City of Ottawa Health Unit</td>
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<tr>
<td></td>
<td>Peel Regional Health Unit</td>
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<tr>
<td></td>
<td>Waterloo Health Unit</td>
</tr>
<tr>
<td></td>
<td>Wellington-Dufferin-Guelph Health Unit</td>
</tr>
<tr>
<td></td>
<td>Windsor-Essex County Health Unit</td>
</tr>
<tr>
<td></td>
<td>York Regional Health Unit</td>
</tr>
<tr>
<td><strong>Peer Group C:</strong></td>
<td></td>
</tr>
<tr>
<td>Sparsely Populated Urban-Rural Mix</td>
<td>The District of Algoma Health Unit</td>
</tr>
<tr>
<td></td>
<td>North Bay Parry Sound District Health Unit</td>
</tr>
<tr>
<td></td>
<td>Sudbury and District Health Unit</td>
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<tr>
<td></td>
<td>Thunder Bay District Health Unit</td>
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<tr>
<td></td>
<td>Timiskaming Health Unit</td>
</tr>
<tr>
<td><strong>Peer Group E:</strong></td>
<td></td>
</tr>
<tr>
<td>Mainly Rural</td>
<td>Elgin-St. Thomas Health Unit</td>
</tr>
<tr>
<td></td>
<td>Grey Bruce Health Unit</td>
</tr>
<tr>
<td></td>
<td>Haldimand-Norfolk Health Unit</td>
</tr>
<tr>
<td></td>
<td>Haliburton, Kawartha, Pine Ridge District Health Unit</td>
</tr>
<tr>
<td></td>
<td>Huron County Health Unit</td>
</tr>
<tr>
<td></td>
<td>Leeds, Grenville and Lanark District Health Unit</td>
</tr>
<tr>
<td></td>
<td>Oxford County Health Unit</td>
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<tr>
<td></td>
<td>Perth District Health Unit</td>
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<tr>
<td></td>
<td>Renfrew County and District Health Unit</td>
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<tr>
<td></td>
<td>The Eastern Ontario Health Unit</td>
</tr>
<tr>
<td></td>
<td>Simcoe Muskoka District Health Unit</td>
</tr>
<tr>
<td><strong>Peer Group G:</strong></td>
<td></td>
</tr>
<tr>
<td>Metro Centre</td>
<td>City of Toronto Health Unit</td>
</tr>
<tr>
<td><strong>Peer Group H:</strong></td>
<td></td>
</tr>
<tr>
<td>Rural Northern Regions</td>
<td>Northwestern Health Unit</td>
</tr>
<tr>
<td></td>
<td>Porcupine Health Unit</td>
</tr>
</tbody>
</table>
Table B: Principal characteristics of peer groups

<table>
<thead>
<tr>
<th>Peer group</th>
<th>Principal characteristics</th>
</tr>
</thead>
</table>
| A          | Urban-rural mix from coast to coast  
             Average percentage of Aboriginal population  
             Low male population  
             Slow population growth from 1996 to 2001 |
| B          | Mainly urban centres with moderately high population density  
             Low percentage of government transfer income  
             Rapid population growth from 1996 to 2001 |
| C          | Sparsely populated urban-rural mix from coast to coast  
             Average percentage of Aboriginal population  
             Negative population growth |
| D          | Rural regions mainly in the central Prairies  
             Moderate Aboriginal population  
             Moderately high percentage of government transfer income  
             Almost equal numbers of men and women  
             Negative population growth |
| E          | Mainly rural regions in Quebec, Ontario and the Prairies  
             High proportion of people recently moved to or within these regions since 1996  
             Average percentage of Aboriginal population  
             Moderate population growth |
| F          | Northern and remote regions  
             Very high Aboriginal population  
             Moderately high percentage of government transfer income  
             Slightly higher male population  
             Moderate population growth |
| G          | Largest metro centres with an average population density of 3,934 people per square kilometre  
             Low Aboriginal population  
             Moderate percentage of government transfer income  
             High female population |
| H          | Rural northern regions  
             High Aboriginal population  
             High male population  
             Negative population growth |
| I          | Mainly rural Eastern regions  
             Very high percentage of government transfer income  
             Negative population growth  
             Low percentage of people having moved to or within these regions since 1996 |

Source: Statistics Canada. Health Indicators. 82-221-X., no. 1. Health regions and peer groups. Ottawa, Ont.: Minister of Industry; 2008. Adapted with permission.
### Variable Definitions Source

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definitions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 Population</td>
<td>Estimate of the total number of individuals living in a region.</td>
<td>Statistics Canada, Census 2001 (unadjusted)</td>
</tr>
<tr>
<td>Aboriginal Percentage</td>
<td>Proportion of a region’s total population self-identifying with an Aboriginal group.</td>
<td>Statistics Canada, 2001 Census, 2001 Census Coverage Studies, and Demography Division (population estimates)</td>
</tr>
<tr>
<td>Average Dwelling Value</td>
<td>Average expected value of an owner-occupied, non-farm, non-reserve dwelling (including the value of the land the dwelling is on) at the time of the Census.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Average Income</td>
<td>Average family income for persons aged 15 and over, from all sources.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Post-secondary graduates</td>
<td>Population aged 25 to 54 who have obtained a post-secondary certificate, diploma, or degree</td>
<td>Statistics Canada, 2001 Census (special tabulations)</td>
</tr>
<tr>
<td>Employment Rate (25 to 54)</td>
<td>Number of employed persons aged 25 to 54 divided by the total number of individuals between the ages of 25 and 54 in a given region.</td>
<td>Statistics Canada, 2001 Census (special tabulations) Health Region Peer Groups 2003, June 2004, Page 17</td>
</tr>
<tr>
<td>Government Transfer Income</td>
<td>Proportion of all income that came from government transfers (e.g., GIS/OAS, C/QPP, EI, etc.) for the population 15 years of age and older. EI, etc.) for the population 15 years of age and older.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Housing Affordability</td>
<td>Proportion of total households spending 30% or more of total household income on shelter.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Immigrant Percentage</td>
<td>Those immigrants who came to Canada from 1991 to 2001 as a proportion of the total population.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Median share of income</td>
<td>Proportion of income (from all sources) held by the bottom half of all households, based on the median household income for that specific community.</td>
<td>Statistics Canada, 2001 Census (special tabulations)</td>
</tr>
</tbody>
</table>
### Table C: Variables used in cluster analysis to define peer groups (cont’d)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definitions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Migrant Mobility</td>
<td>Proportion of people that lived in a different Canadian municipality at the time of the previous Census (5-year internal migrants). This excludes Canadians in households outside Canada (military and government personnel).</td>
<td>Statistics Canada, 2001 Census Health Region Peer Groups 2003, June 2004, Page 18</td>
</tr>
<tr>
<td>Lone-Parent Families</td>
<td>Proportion of lone-parent families among all census families living in private households. A census family refers to a married or common-law couple or lone parent with at least one never-married son or daughter living in the same household.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Long Term Unemployment Rate</td>
<td>Proportion of the labour force aged 15 and over who did not have a job any time during the current or previous year.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Low Income 15+</td>
<td>Proportion of persons in economic families and unattached individuals with 2000 incomes below the Statistics Canada low-income cut-off (LICO). The cut-offs represent levels of income where people spend disproportionate amounts of money for food, shelter, and clothing. LICOs are based on family size and degree of urbanization; cut-offs are updated to account for changes in the consumer price index. Data were not derived for economic families or unattached individuals in the Territories or on Indian Reserves.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Low Income Children</td>
<td>Proportion of children under age 18 living in economic families with 2000 incomes below Statistics Canada’s low-income cut-offs (LICO). Data were not derived for economic families or unattached individuals in the Territories or on Indian Reserves.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Male-Female Ratio</td>
<td>Total number of males in a given region in 2001 divided by the total number of females.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
</tbody>
</table>
### Table C: Variables used in cluster analysis to define peer groups (cont’d)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definitions</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner-Occupied Dwellings</td>
<td>Proportion of dwellings in which the owner also lives. Band housing and collective dwellings (i.e. rooming houses, nursing homes, military camps etc.) are excluded from both numerator and denominator.</td>
<td>Statistics Canada, 2001 Census, Health Region Peer Groups 2003, June 2004, Page 19</td>
</tr>
<tr>
<td>Population Density</td>
<td>Number of people per square kilometre.</td>
<td>Statistics Canada, 2001 Census and Geography Division (special tabulations)</td>
</tr>
<tr>
<td>Population under 15</td>
<td>Proportion of the population in a given region under the age of 15 (2001 population).</td>
<td>Statistics Canada, 2001 Census (unadjusted)</td>
</tr>
<tr>
<td>Population 65 Years and Older</td>
<td>Proportion of the population in a given region aged 65 years and older (2001 population).</td>
<td>Statistics Canada, 2001 Census (unadjusted)</td>
</tr>
<tr>
<td>Strong MIZ</td>
<td>Census Metropolitan and Census Agglomeration Influenced Zones represents the proportion of the population living in Census Metropolitan Areas (CMAs), Census Agglomerations (CAs) and communities that fall outside CMAs/CAs that have at least 30% of the employed labour force commuting to CMAs/CAs. The larger the proportion, the stronger the relationship between the specific community and a nearby CMA/CA.</td>
<td>Statistics Canada, 2001 Census (special tabulations)</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>Total number of unemployed individuals 15 and older divided by the total number of individuals 15 and older participating in the labour force.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
<tr>
<td>Visible Minority</td>
<td>Proportion of the population belonging to a visible minority group. As defined by the Employment Equity Act (1986), visible minorities are persons (other than Aboriginal people) who are non-Caucasian in race or non-white in colour.</td>
<td>Statistics Canada, 2001 Census</td>
</tr>
</tbody>
</table>
# Appendix 2: Health Unit Profile Variable Definitions

<table>
<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Definition</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Size of Region (km²)</td>
<td>Land area of health unit in square kilometres.</td>
<td>Statistics Canada, 2006 Census of Population</td>
</tr>
<tr>
<td>2</td>
<td>Population (2007)</td>
<td>Number of individuals residing in the health unit based on population estimates.</td>
<td>Provincial Health Planning Database (PHPDB), December 2008</td>
</tr>
<tr>
<td>3</td>
<td>Population Growth Rate (2002-2007)</td>
<td>The difference between the population at the end of the period and the population at the beginning of the period relative to the population at the beginning of the period; 2002 to 2007 Population Estimates Change (%).</td>
<td>Provincial Health Planning Database (PHPDB), December 2008</td>
</tr>
<tr>
<td>5</td>
<td>% Immigrants</td>
<td>Immigrants are persons who are, or have ever been, landed immigrants in Canada. A landed immigrant is a person who has been granted the right to live in Canada permanently by immigration authorities. Some immigrants have resided in Canada for a number of years, while others are more recent arrivals. Most immigrants are born outside Canada, but a small number were born in Canada. Includes immigrants who landed in Canada prior to Census Day, May 16, 2006 relative to the non-institutionalized population.</td>
<td>Statistics Canada, 2006 Census of Population</td>
</tr>
<tr>
<td>6</td>
<td>First Nations</td>
<td>A First Nation, or Band, is a group of people for whom lands have been set aside or declared to be a band for the purposes of the Indian Act.</td>
<td>First Nations Profiles, Indian and Northern Affairs Canada, 2008</td>
</tr>
</tbody>
</table>
## Employment Rate

Number of persons employed in the week (Sunday to Saturday) prior to Census Day (May 16, 2006), expressed as a percentage of the total population 15 years and over excluding institutional residents.

**Data Source:** Statistics Canada, 2006 Census of Population

## Housing Affordability

Households (total renters and owners) spending 30% or more of total household income on shelter expenses. Shelter expenses include payments for electricity, oil, gas, coal, wood or other fuels, water and other municipal services, monthly mortgage payments, property taxes, condominium fees and rent. This excludes band housing on First Nation reserves.

**Data Source:** Statistics Canada, 2006 Census of Population

## % of Persons under 18 years of age in Low Income Households (after tax)

Proportion of persons <18 years in low-income households relative to the total number of children <18 years in private households. Proportion of children <18 years living under LICOs after tax. After tax income refers to total income from all sources minus federal, provincial and territorial income taxes paid for 2005. Refers to the position of an economic family or a person 15 years and over not in an economic family in relation to Statistics Canada’s low income before-tax or after-tax cut-offs. Since each family member shares the income status of that family, percentages in low income can be derived for all persons in private households.

**Data Source:** Statistics Canada, 2006 Census of Population

## % with Post Secondary Education

Proportion of population ages 25-64 years completing a post-secondary education relative to the total non-institutional population 25-64 years of age. Post-secondary education includes: Apprenticeship or trades certificate or diploma; College, CEGEP or other non-university certificate or diploma; University certificate or diploma below the bachelor level; and University certificate, diploma or degree.

**Data Source:** Statistics Canada, 2006 Census of Population
### Appendix 2: Health Unit Profile Variable Definitions (cont’d)

<table>
<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Definition</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Size of Birth Cohort (2007)</td>
<td>Number of live births for the 2007 calendar year based on hospital newborn admissions weighing 500 grams or more. Note that the provincial total includes unknown but not out of province births as analyzed by residence of mother.</td>
<td>Provincial Health Planning Database (PHPDB), Inpatient Discharges, February 2009</td>
</tr>
<tr>
<td>12</td>
<td>% Francophone Population</td>
<td>Number of people with French as their mother tongue. Mother tongue refers to the first language learned at home in childhood and still understood by the individual at the time of the census. Definition of Francophone status includes a response of French as a first language including: French (single response); English and French (multiple); French and non-official language (multiple) + English and French and non-official language(s) (multiple).</td>
<td>Statistics Canada, 2006 Census of Population</td>
</tr>
<tr>
<td>13</td>
<td>% Speaking neither English nor French</td>
<td>Proportion of individuals who cannot conduct a conversation in either of the official languages of Canada (in English only, in French only, in both English and French).</td>
<td>Statistics Canada, 2006 Census of Population</td>
</tr>
<tr>
<td>14</td>
<td>Cost of Nutritious Food Basket for a Family of Four (2008)</td>
<td>The nutritious food basket is a food costing tool that is a measure of the cost of healthy eating based on Canada’s current nutrition recommendations. It consists of a weekly cost of a fixed basket of food items for various age/sex groups, expressed for a reference family of four (a man and woman, each aged 25-49 years; a boy, 13-15 years of age; and a girl 7-9 years old).</td>
<td>Submitted by Public Health Units to Ministry of Health Promotion, Chronic Disease Prevention &amp; Health Promotion Branch, 2008</td>
</tr>
</tbody>
</table>
### Appendix 2: Health Unit Profile Variable Definitions (cont’d)

<table>
<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Definition</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td># Food Premises (2006)</td>
<td>Encompass premises where food or milk is manufactured, processed, prepared, stored, handled, displayed, distributed, transported, sold or offered for sale, but does not include a private residence as defined under the <em>Health Promotion and Protection Act</em>. Included are the total number of high, moderate and low risk permanent (year round) food premises.</td>
<td>Ministry of Health and Long-Term Care, Food Safety Audit 2006.</td>
</tr>
<tr>
<td>16</td>
<td># Long-term Care Homes</td>
<td>Number of Long-Term Care Homes in the health unit. A long-term care (LTC) home provides care and services for people who no longer are able to live independently or who require onsite nursing care, 24-hour supervision or personal support. Nursing homes under the <em>Nursing Homes Act</em>, approved charitable homes for the aged under the <em>Charitable Institutions Act</em> and homes under the <em>Homes for the Aged and Rest Homes Act</em> are all LTC homes. This definition includes all Nursing Homes and Homes for Aged. It does not include temporary and interim facilities. It excludes retirement homes and supportive housing.</td>
<td>Provincial Health Planning Database (PHPDB), Institution Data [2008]. Updated on advice of individual public health units.</td>
</tr>
<tr>
<td>17</td>
<td># Hospital Sites</td>
<td>Number of hospital sites in the health unit.</td>
<td>Ministry of Health and Long-Term Care, 2008. Updated on advice of individual public health units.</td>
</tr>
<tr>
<td>18</td>
<td># Licensed Day Nurseries</td>
<td>Number of licensed child care centres under section 1 of the <em>Day Nurseries Act</em> in the health unit.</td>
<td>Based on data from Ministry of Children and Youth Services, 2008. Updated on advice of individual public health units.</td>
</tr>
</tbody>
</table>
## Appendix 2: Health Unit Profile Variable Definitions (cont’d)

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<thead>
<tr>
<th>#</th>
<th>Variable</th>
<th>Definition</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td># Personal Service Settings (estimated)</td>
<td>Estimated number of personal service settings as defined in the Infection Control in Personal Services Settings Protocol (1998) include any facility where there is a risk of exposure to blood, such as but not limited to, hairdressing and barber shops, tattoo and body piercing studios, electrolysis, and aesthetic clinics.</td>
<td>Board of Health Survey, 2008</td>
</tr>
<tr>
<td>20</td>
<td># Schools</td>
<td>Number of public and separate schools in a health unit. Excludes private schools. Schools that share facilities are counted individually.</td>
<td>Based on data from Ministry of Education, 2008. Updated on advice of individual public health units.</td>
</tr>
<tr>
<td>21</td>
<td># School Boards</td>
<td>Number of school boards in a health unit. Includes both English and French language school boards for public and separate schools. Does not include boards of private schools. The Ontario total reflects the number of unique school boards in Ontario. Because some school boards cross over into multiple health units the sum total of the column is different from the Ontario total.</td>
<td>Based on data from Ministry of Education, 2008. Updated on advice of individual public health units.</td>
</tr>
<tr>
<td>22</td>
<td># Small Drinking Water Systems</td>
<td>Number of small drinking water systems within each health unit as per the inventories submitted by health units and their review by the Environmental Health Branch. Small drinking water systems are defined as per O. Reg 318/08 and O. Reg 319/08 under the Health Protection and Promotion Act.</td>
<td>Ministry of Health and Long-Term Care, 2008.</td>
</tr>
</tbody>
</table>
## Appendix 2: Health Unit Profile Variable Definitions (cont’d)

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<tr>
<th>#</th>
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</thead>
<tbody>
<tr>
<td>23</td>
<td># Municipalities</td>
<td>Number of Ontario single and lower tier municipalities within each health unit.</td>
<td>Based on data from Ministry of Municipal Affairs and Housing, 2008. Updated on advice of individual public health units.</td>
</tr>
<tr>
<td>24</td>
<td>Board of Health Governance Model</td>
<td>There are five types of governance models as follows:</td>
<td>Ministry of Health and Long-Term Care, 2008.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Autonomous:</strong> Separate from any municipal organization but with multi-municipal representation (including citizen representatives appointed by municipalities); potential for provincial appointees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Autonomous/Integrated: Only one municipality appoints representatives (including citizen representatives); potential for provincial appointees. Operate within municipal administrative structure.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Regional:</strong> Boards are Councils of Regional Government (federations of local municipalities); no citizen representatives; no provincial appointees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Single-Tier:</strong> Boards are Councils of Single Tier Municipalities (area with only one level of municipal government); no citizen representatives; no provincial appointees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Semi-Autonomous:</strong> Single-tier Council appoints members to a separate “board of health” (including citizen representatives); Council approves budget and staffing; no provincial appointees.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3: Indicator Definitions

1. Teen Pregnancy

**Definition:**

The teen pregnancy rate estimates the number of pregnancies (resulting in live births, still births and therapeutic abortions) per 1,000 females age 15-19 years.

**Data Source(s):**

- **Numerator:** Number of deliveries (live birth and still births): Inpatient Discharges, Provincial Health Planning Database, Ministry of Health and Long-Term Care
  - Therapeutic abortions: Therapeutic Abortions Summary, Provincial Health Planning Database, Ministry of Health and Long-Term Care
- **Denominator:** Population Estimates, Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Total number of deliveries (live births and stillbirths) and therapeutic abortions for females age 15-19 years (2007 calendar year)}}{\text{Total number of females age 15-19 years (2007 calendar year)}} \right\} \times 1,000
\]

**Notes:**

- Intellihalth therapeutic abortions summary report was used to derive the number of therapeutic abortions for females ages 15-19 years
- IntelliHealth\20 - Ontario Special Reports\Therapeutic Abortion Summary. Report # 20-0001 was used to derive the number of therapeutic abortions
- Intellihealth\05 Inpatient Discharges\Hospital Births\ Deliveries - Ontario x Mother's Age: Report #: 05-0004 was used to derive the number of deliveries
- Analyzed by mother's usual place of residence, not place of birth
- Analyzed by ICD 10-CA codes containing Z37 for live births and stillbirths by mother's date of discharge, and mother's age at time of delivery
- Excludes births and therapeutic abortions to females residing out-of-province; excludes estimates of fetal loss; excludes abortions conducted with females residing out of province
2. Low Birth Weight

**Definition:**

The low birth weight rate indicator estimates the rate of singleton live births weighing 500-2499 grams immediately upon birth, based on the mother’s usual place of residence per the total for singleton live births weighing at least 500 grams per 1,000 births.

**Data Source(s):**

**Numerator:** Inpatient Services Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Denominator:** Inpatient Services (Hospital Data), Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Total number of singleton live births weighing between 500 and 2499 grams (2007 calendar year)}}{\text{Total number of singleton live births weighing at least 500 grams (2007 calendar year)}} \right\} \times 1,000
\]

**Notes:**

- Excludes births with weights recorded under 500 grams due to possible entry errors with still born births
- Excludes multiple births
- PHPDB Qualifications: Newborns (entry code=N) at date of admission; Patient Diagnosis Codes (beginning with Z380, Z381, Z382) for the Calendar Year (2007). Weights for singleton live births (greater than or equal to 500); Weights for low births weights (greater than or equal to 500 grams and less than 2500 grams)
- IntelliHealth\05 Inpatient Discharges\Hospital Births\Low Birth Weight, Singleton Births: Report # 05–0004 was used to derive both the numerator and denominator
- The indicator is not limited to full-term births and also includes pre-term births
- Analyzed by mother’s usual place of residence, not place of birth
- Excludes births to mothers who reside out of province
3. Breastfeeding Duration

Definition:

The breastfeeding duration rate indicator estimates the proportion of mothers age 15-55 years who breastfed (not exclusively) their last baby (born within the past five years) for a duration of six months or more.

Data Source(s):

*Numerator:* Canadian Community Health Survey Cycles 2.1, 3.1 and Canadian Community Health Survey 2007, Statistics Canada, Ontario Share Files distributed by the Ministry of Health and Long-Term Care

*Denominator:* Canadian Community Health Survey Cycles 2.1, 3.1 and Canadian Community Health Survey 2007, Statistics Canada, Ontario Share Files distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \text{Total weighted number of female respondents age 15-55 years who gave birth in the past five years and who breastfed (non-exclusively) their child for at least six months} \right\} \times 100
\]

\[
\frac{\text{Total weighted number of female respondents age 15-55 years who gave birth in the past five years}}{\text{Total weighted number of female respondents age 15-55 years who gave birth in the past five years}}
\]

Notes:

- This indicator was derived by combining three cycles of the Canadian Community Health Survey (CCHS) in order to obtain reportable and stable data for breastfeeding duration estimates at the public health unit level in Ontario. Simply using one survey to estimate for breastfeeding duration resulted in unstable estimates for the majority of public health units in Ontario, and in many cases the data was unreportable.
- Numerator: MEX_06 = Six Months (9), Seven to Nine Months (10), Ten to Twelve Months (11), One year or more (12)
- Denominator: MEX_01 = Has given birth in the last five years (1)
- Excluded not applicable (96) and not stated (99) responses to MEX_01. Exclusion of women who are currently breastfeeding (MEXC_05=2)
- PHU 3545 was dropped, 3547 = North Bay, and 3560 = Simcoe in CCHS 2.1 due to amalgamations of public health units
- There was insufficient sample size to stratify the data for each public health unit for CCHS 2007, and therefore cycles 2.1, 3.1, and CCHS 2007 of the CCHS were combined according to methods outlined by Thomas and Wannell. Both the separate and pooled approaches to combining cycles of the CCHS were considered. The separate approach to combining cycles of CCHS was used in the report.
- As there were not consistent trends over time over the 3 individual estimates for breastfeeding duration, combining the 3 cycles of the CCHS did not diminish the data output in any way
4. Postpartum Contact

Definition:

The postpartum contact indicator is defined as the percentage of families who consented to a post-partum phone call under the Healthy Babies Healthy Children (HBHC) program and who received a post-partum phone call or contact from the health unit within 48 hours of release from hospital after giving birth.

Data Source(s):

**Numerator:**
Integrated Services for Children Information System, Ministry of Children and Youth Services

**Denominator:**
Integrated Services for Children Information System, Ministry of Children and Youth Services

Formula:

\[
\left\{ \frac{\text{\# of families who were contacted by the health unit within 48 hours of hospital discharge (2007 calendar year)}}{\text{\# of families (with or without a Parkyn) who consented to be contacted by the health unit (2007 calendar year)}} \right\} \times 100
\]

Notes:

- Data extracted on July 27, 2008
- Not based on all live births. Families must have consented to receiving an HBHC phone call
- Items 21.1/21.0 on the ISCIS extract report were used
5. Smoking Prevalence

Definition:
The smoking prevalence indicator estimates the age-standardized proportion of people age 12 years and older who are current smokers (daily or occasional cigarette smokers).

- Current smoker – daily smoker or occasional smoker
- Daily smoker – smoking at least one cigarette per day
- Occasional smoker – does not have at least one cigarette per day

Data Source(s):

**Numerator:**
Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Denominator:**
Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Weighted number of respondents age 12+ years who are current (daily + occasional) cigarette smokers}}{\text{Weighted total number of respondents age 12+ years}} \right\} \times 100
\]

Notes:

- Numerator: SMK_DSTY= Daily Smoker (1) or Occasional Smoker (former daily smoker) (2) and Occasional Smoker (3)
- Denominator: SMK_DSTY= Daily (1), Occasional (2) Occasional (3) Former Daily Smoker (4) Former Occasional Smoker (5) and Never Smoker (6)
- Not Answered ((99), based on Don’t Know, Refusals, and Not Stated to at least one of the questions) responses were excluded
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
6. Youth Lifetime Smoking Abstinence

Definition:

The youth lifetime smoking abstinence indicator estimates the proportion of young people age 12-19 years who have never smoked a whole cigarette.

Data Source(s):

Numerator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Denominator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Weighted number of respondents age 12-19 years who have never smoked at least one whole cigarette}}{\text{Weighted total number of respondents age 12-19 years}} \right\} \times 100
\]

Notes:

- Based on CCHS Question SMK_01B “Have you ever smoked a whole cigarette?”
- Numerator: SMK_01=No (2)
- Denominator: SMK_01= Yes (1), No (2) or Not Applicable (6)
- Refusals (8) and Not Stated (9) responses were excluded
7. Adult Heavy Drinking

Definition:
The adult heavy drinking episode indicator estimates the age-standardized proportion of people age 20 years and older who reported consuming five or more drinks on at least one occasion during the previous 12 months.

Data Source(s):

Numerator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Denominator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{ \text{Weighted number of respondents who are age 20+ years who reported consuming 5 or more drinks, on at least one occasion during the previous 12 months} }{ \text{Weighted number of respondents age 20+ years who did or did not drink} } \right\} \times 100
\]

Notes:

- Numerator ALC_3=Less than once per month(2), Once per month(3), 2-3 times per month(4), Once per week(5), More than once per week (6)
- Denominator: ALC_1= Yes (1), No (2)
- Don’t Know (97), Refusal (98), Not Stated (99) responses were excluded
- Age groups in years used for direct age-standardization: 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
8. Youth Heavy Drinking

**Definition:**
The youth heavy drinking episode indicator identifies the proportion of people age 12-19 years who reported consuming five or more drinks on at least one occasion during the previous 12 months.

**Data Source(s):**

*Numerator:* Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

*Denominator:* Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Weighted number of respondents age 12-19 years who reported consuming 5 or more drinks on at least one occasion during the previous 12 months}}{\text{Weighted number of respondents age 12-19 years who did or did not drink}} \right\} \times 100
\]

**Notes:**
- Numerator: ALC_3=Less than once per month(2), Once per month(3), 2-3 times per month(4), Once per week(5), More than once per week (6)
- Denominator: ALC_1= Yes (1) No (2)
- Don’t Know (97), Refusal (98), Not Stated (99) responses were excluded
9. Physical Activity Index

Definition:

The physical activity index indicator estimates the age-standardized proportion of the population age 12 years and older by level of energy expenditure in the categories active and moderately active in their leisure time physical activity.

- Active = respondents who average 3.0+ kcal/kg/day of energy expenditure
- Moderately active = respondents who average 1.5-2.9 kcal/kg/day
- Inactive = respondents with energy expenditure levels less than 1.5 kcal/kg/day

Data Source(s):

Numerator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Denominator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Weighted number of respondents age 12+ years by physical activity index categories active and moderately active}}{\text{Weighted number of respondents age 12+ years}} \right\} \times 100
\]

Notes:

- Numerator: PACDPAI= active (1) or moderately active (2)
- Denominator: PACDPAI= active (1) and moderately active (2) and inactive (3)
- Excluded not stated responses (9) from denominator
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
- Respondents were asked about their participation in various types of physical activities in the previous three-month period, as well as the frequency and duration of each activity
10. Healthy Body Mass Index

Definition:
The healthy body mass index indicator estimates the age-standardized proportion of people age 18 years and older whose self reported height and weight denote a healthy body mass index (BMI). BMI is calculated using the person’s weight in kilograms divided by their height in metres squared. The International Standard for BMI is: <18.5 (underweight), 18.5-24.9 (acceptable weight), 25-29.9 (overweight), and 30 or higher (obese). The World Health Organization considers a BMI in the range of 18.5-24.9 to be healthy for most adults.

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI Category</th>
<th>Risk of developing health problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>Increased</td>
</tr>
<tr>
<td>“Normal or Healthy” Weight, Acceptable Weight Range</td>
<td>18.5 – 24.9</td>
<td>Least</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 – 29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese</td>
<td>30.0 – 34.9</td>
<td>High</td>
</tr>
<tr>
<td>Class I</td>
<td>35.0 – 39.9</td>
<td>Very high</td>
</tr>
<tr>
<td>Class III</td>
<td>≥ 40.0</td>
<td>Extremely high</td>
</tr>
</tbody>
</table>

Data Source(s):

**Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Weighted number of respondents age 18+ years (excluding pregnant women and breastfeeding women) with BMI of 18.5-24.9}}{\text{Weighted number of respondents age 18+ years (excluding pregnant women and breastfeeding women)}} \times 100 \right\}
\]

Notes:
- CCHS excludes pregnant women, as well as women age 18-49 years who did not answer the pregnancy question. The index is calculated for those age 18 years and over, excluding pregnant and lactating women, as well as persons less than 3 feet tall or greater than 6 feet 11 inches.\(^{130}\) There was an additional exclusion of women who were currently breastfeeding (MEX_05=1), and respondents who chose ‘Not applicable’ (96) or Not Stated (99) responses in the indicator calculation
- Numerator: HWTDISW = Normal or healthy weight (2)
- Denominator: HWTDISW = Underweight (1), Normal or healthy weight (2), Overweight (3), and Obese (4-6)
- Age groups in years used for direct age-standardization: 18-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
11. Fruit and Vegetable Consumption

**Definition:**

The fruit and vegetable consumption indicator estimates the age-standardized proportion of the population age 12 years and older that reported consuming fruits and vegetables five or more times per day.

**Data Source(s):**

**Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\{ \frac{\text{Weighted number of respondents age 12+ years who}}{\text{Consumed fruit and vegetables five or more times per day}} \} \times 100
\]

**Notes:**

- Numerator: FVCGTOT= 5 to 10 “servings” of fruit and vegetables (2) and more than 10 “servings” of vegetables (3)
- Denominator: FVCGTOT= less than 5 “servings” (1), 5 to 10 “servings” of fruit and vegetables (2) and more than 10 “servings” of vegetables (3)
- Excluded if answer was not stated
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
12. Fall-Related Hospitalizations among Seniors

**Definition:**

The fall-related hospitalization rate indicator estimates the age-standardized number of injury-related hospital separations that are due to falls in seniors age 65 years and older per 100,000 population.

**Data Source(s):**

- **Numerator:** Discharge Abstract Database, Canadian Institute for Health Information Distributed by Population Health Planning Database, Ministry of Health and Long-Term Care
- **Denominator:** Population Estimates, Population Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Number of hospital separations due to falls}}{\text{In those age 65+ years (2007 calendar year)}} \right\} \times 100,000
\]

\[
\left\{ \frac{\text{Total population age 65+ years (2007 calendar year)}}{\text{Total population age 65+ years (2007 calendar year)}} \right\}
\]

**Notes:**

- Age groups in years for direct age-standardization: 65-74, 75-85, and 85+
- Direct age-standardization to the 1991 Canadian population
- Includes Accidental Falls (ICD-10-CA: W00-W19) with external causes
- PHPDB Qualifications: Calendar Year (2007); Ages (greater than or equal to 65); Patient diagnosis beginning with W0 or W1 in ICD-10-CA Block Codes including diagnosis with external cause diagnoses
- IntelliHealth\Shared Reports\PHU\Fall Related Hospitalizations 65120
13. Enteric Illnesses Incidence

**Definition:**

The enteric illnesses age-standardized incidence rate estimates the total number of reported cases of selected enteric illnesses per 100,000 population.

Selected reporting fields include:

- Amebiasis
- Botulism
- Campylobacter Enteritis
- Cholera
- Cryptosporidiosis
- Cyclosporariasis
- Food Poisoning, All Causes
- Gastroenteritis, Institutional Outbreaks
- Giardiasis
- Hepatitis A
- Listeriosis
- Paratyphoid fever
- Typhoid Fever
- Salmonellosis
- Shigellosis
- Trichinosis
- Verotoxin producing E.coli including Hemolytic Uremic syndrome (HUS)
- Yersinia

**Data Source(s):**

- **Numerator:** Integrated Public Health Information System, Ministry of Health and Long-Term Care
- **Denominator:** Population Estimates, Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Total number of new reported cases of selected enteric illnesses (2007 Calendar year)}}{\text{Total population (2007 Calendar year)}} \right\} \times 100,000
\]

**Notes:**

- Data was extracted on February 3, 2009 from the Integrated Public Health Information System
- Includes both sporadic and outbreak reportable enteric cases that met the provincial surveillance case definition
- Age groups in years used for direct age-standardization: 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90+
- Direct age-standardization to the 1991 Canadian population
14. Respiratory Infection Outbreaks in Long-Term Care Homes

**Definition:**

The respiratory infection outbreak indicator estimates the number of confirmed respiratory infection outbreaks in long-term care homes between September 1, 2006 and August 31, 2007.

**Data Source(s):**

Integrated Public Health Information System, Ministry of Health and Long-Term Care

**Formula:**

Number of confirmed respiratory infection outbreaks in Long-Term Care homes for the 2006/2007 respiratory virus surveillance season.

**Notes:**

- Data was extracted on February 2, 2009 from the Integrated Public Health Information System.
- Indicated by selecting Long-Term Care Home option in the Exposure Setting Type Field for outbreaks in iPHIS
- Outbreaks that do not meet the case definition for a confirmed respiratory infection outbreak in a long-term care home were removed
- The report is called: List of created Outbreaks - Child Care Facilities Highlighted - for HU use
- Cognos ReportNet path: Public Folders > CRN 1.0 > Shared Communicable Diseases Reports > Management Reports > QA Reports
15. Chlamydia Incidence

Definition:

The age-standardized chlamydia incidence rate indicator estimates the total number of reported chlamydia cases per 100,000 population.

Data Source(s):

Numerator: Integrated Public Health Information System, Ministry of Health and Long-Term Care
Denominator: Provincial Health Planning Database, Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Total number of new reported cases of chlamydia (2007 calendar year)}}{\text{Total population (2007 calendar year)}} \right\} \times 100,000
\]

Notes:

- Data was extracted on February 3, 2009 from iPHIS.
- Age groups in years used for direct age-standardization: <10, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65+
- Direct age-standardization to the 1991 Canadian population
16. Immunization Coverage for Hepatitis B

**Definition:**
The immunization coverage for hepatitis B indicator estimates the proportion of grade 7 students who have completed the immunization series against hepatitis B by the end of grade 7.

**Data Source(s):**

- **Numerator:** As reported by public health units to Public Health Division, Ministry of Health and Long-Term Care
- **Denominator:** As reported by public health units to Public Health Division, Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{# of grade 7 students who have completed the immunization series against hepatitis B by the end of grade 7 (vaccinated before or during grade 7 by physician or public health) (2007/2008 school year)}}{\text{Total number of Grade 7 students (2007/2008 school year)}} \times 100
\]

**Notes:**

- Data as complete as of June 30, 2008 (2007/2008 school year) for grade 7 students (birth year 1995)
- Hepatitis B immunization is not a designated disease under the ISPA (*Immunization of School Pupils Act*) and therefore health units are not required to report Hepatitis B immunization rates; reporting is voluntary
- All public health units are required to report Hepatitis B coverage rates to the Ministry of Health and Long-Term Care. Some public health units also record Hepatitis B coverage rates in the IRIS reporting data system; use of this system is voluntary
- This indicator is specific to the school-based immunization program, and does not include all immunizations against Hepatitis B as administered by the public health unit (e.g. doses administered in other setting or populations/age groups, such as sexual health clinics)
17. Immunization Coverage for Measles, Mumps, and Rubella

**Definition:**

The immunization coverage for measles, mumps and rubella indicator estimates the proportion of school children age 7 years who are known to be complete for age for vaccination against measles, mumps and rubella.

**Data Source(s):**

- **Numerator:** Immunization Record Information System, 36 locally maintained databases shared with the Public Health Division, Ministry of Health and Long-Term Care
- **Denominator:** Immunization Record Information System, 36 locally maintained databases shared with the Public Health Division, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Number of school children age seven years who are known by the health unit to be complete for age for vaccination against measles, mumps and rubella (2007/2008 school year)}}{\text{Number of children enrolled in school (2007/2008 school year)}} \right\} \times 100
\]

**Notes:**

- Data as complete on June 30, 2008 (2007/2008 school year) for 7 year olds (birth year 2000)
- Data was extracted from IRIS, August 2008 to January 2009
- Vaccination information is collected only for children attending schools that public health units have screened
- Some children/students may not be eligible for a vaccine due to medical contraindication. This information may be collected and recorded in IRIS. However, ineligible children are not excluded from the denominator of vaccine coverage calculations since not all IRIS vaccine coverage reports summarize this information
- Children/students with exemptions (medical, philosophical, conscience or religious) or with no information are treated as incomplete
18. Adverse Water Quality Incidents

**Definition:**
Number of adverse water quality incidents from drinking water systems subject to O.Reg 170/03/O.Reg 252/05 and unregistered drinking water systems.

**Data Source(s):**
Drinking Water Programs Branch, Ministry of the Environment

**Formula:**
Number of adverse water quality incidents from drinking water systems subject to O.Reg 170/03/O.Reg 252/05 and unregistered drinking water systems for the 2007 calendar year

**Notes:**
- Exceedances from schools and day cares subject to O.Reg 243/07 not included in this summary
- O.Reg 170/03, a.k.a. Drinking Water Systems included year round residential systems as well as designated facilities including schools, daycares and nursing homes
- O.Reg 252/05 a.k.a. Non-Residential and Non-Municipal Seasonal Residential Systems That Do Not Serve Designated Facilities
Standard Population

The following 1991 Canadian population is the referent population used in the age-standardized indicators in this report.\textsuperscript{131}

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Total population by age</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>403,061</td>
</tr>
<tr>
<td>1-4</td>
<td>1,550,285</td>
</tr>
<tr>
<td>5-9</td>
<td>1,953,045</td>
</tr>
<tr>
<td>10-14</td>
<td>1,913,115</td>
</tr>
<tr>
<td>15-19</td>
<td>1,926,090</td>
</tr>
<tr>
<td>20-24</td>
<td>2,109,452</td>
</tr>
<tr>
<td>25-29</td>
<td>2,529,239</td>
</tr>
<tr>
<td>30-34</td>
<td>2,598,289</td>
</tr>
<tr>
<td>35-39</td>
<td>2,344,872</td>
</tr>
<tr>
<td>40-44</td>
<td>2,138,891</td>
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<tr>
<td>45-49</td>
<td>1,674,153</td>
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<td>50-54</td>
<td>1,339,902</td>
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<td>55-59</td>
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<td>1,190,217</td>
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<td>65-69</td>
<td>1,084,588</td>
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<tr>
<td>70-74</td>
<td>834,024</td>
</tr>
<tr>
<td>75-79</td>
<td>622,221</td>
</tr>
<tr>
<td>80-84</td>
<td>382,303</td>
</tr>
<tr>
<td>85-89</td>
<td>192,410</td>
</tr>
<tr>
<td>90+</td>
<td>95,467</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28,120,065</strong></td>
</tr>
</tbody>
</table>

Additional Age Groups Used

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Total population by age</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11</td>
<td>777,691</td>
</tr>
<tr>
<td>12-15</td>
<td>1,135,424</td>
</tr>
<tr>
<td>15-17</td>
<td>1,149,377</td>
</tr>
</tbody>
</table>
19. Total Board of Health Expenditures

**Definition:**

Total board of health expenditures in 2007 for “core and related public health programs and services”, including spending based on revenue from all sources including all government funding (federal, provincial and municipal), user fees (such as Part 8 inspection fees), one time funding, fee for service contracts, research funding, and all other grants and donations. Excludes projected expenditures for EMS and animal control services, which are not part of the public health mandate.

**Data Source(s):**

Survey of boards of health, 2008

**Formula:**

Total board of health actual expenditures from all sources

**Notes:**

- Consolidates reporting on existing board of health funding levels
- In this report and survey “related programs” refers to a group of programs that are defined by public health units as ancillary to their core public health programs and services. This definition was used in the data collection for this indicator in order to allow public health units to provide information on all current programs regardless of funding source. However, when used in the context of the Program Based Grants (PBG) funding agreement “Related Programs” refers to a specific group of programs that are funded through the PBG grant and these are: Infectious Diseases Control, West Nile Virus/VBD, PHRED, Unorganized Territories, AIDS Hotline, SIECCAN, Infection Prevention and Control Nurses (new in 2008/09), Small Drinking Water Systems, and one time funding received through PBG.
- The inclusion of one time or time limited funding may skew the reporting for some boards of health
- Lack of clear definition of categories of funding by “core public health”, “public health related” and “other services delivered by public health” resulted in some lack of congruence in categorization across all boards of health
- Data were collected on expenditures by program, but did not include information on funding sources or cost sharing arrangements
20. Board of Health Expenditure Variance

**Definition:**
Percent variance between a board of health's projected annual budget for “core and related public health programs and services”, and year-end actual expenditures in with revenue from all sources in 2007.

**Data Source(s):**
Survey of boards of health, 2008

**Numerator:**
Board of health year-end total expenditures and projected annual expenditures on core and related public health programs and services with revenues from all sources

**Denominator:**
Board of health projected annual expenditures on core and related public health programs and services reflecting revenue from all sources

**Formula:**
\[
\left\{ \frac{(\text{year-end actual expenditures} - \text{projected annual expenditures})}{\text{projected annual expenditures}} \right\} \times 100
\]

**Notes:**
- Note that these categories do not align with those used by the ministry in its Program Based Grant funding package, where “Related Programs” has a specific meaning; see notes under Total Board of Health Expenditures for further detail.
- Boards report that variances are usually program or funding source specific
- There has historically been underspending in board of health budgets due to the local municipal council control on the overall budget and the timing of ministry budget approvals. In some places, councils insist that program spending cannot exceed the prior year amount until ministry final budget approval is received
- Unexpected in year activities will impact actual expenditures of some boards of health, and therefore skew their variances
21. Expenditures on Training and Professional Development

**Definition:**
Percent of board of health total actual expenditures for “core and related public health programs and services” used to support staff training and professional development in 2007.

Staff training and professional development costs include training and educational services for vocational, technical training, professional courses and seminars; may include payments to external trainers, conference registration fees, tuition fees and payments for associated textbooks, registration and course delivery costs such as library access fees, costs associated with conferences, seminars and internally developed courses, as well as associated event costs such as payments to guest speakers, trainers, catering and space rental fees. Excludes any associated travel costs and any fees paid to register with a professional regulatory body.

**Data Source(s):**
Survey of boards of health, 2008

**Numerator:** Actual board of health expenditures on staff training and professional development

**Denominator:** Total board of health actual expenditures (core and related)

**Formula:**
\[
\left\{ \frac{\text{Board of health actual expenditures on staff training and professional development}}{\text{Total board of health actual expenditures}} \right\} \times 100
\]

**Notes:**

- Larger public health units may be able to achieve economies of scale that would lower their per staff cost for training and development
- Survey did not collect information on the number of staff trained or number of days of training purchased
- Reported expenditures may be estimates due to complexity of accessing training and development expenses that meet the proposed definition within the timeframe
- Excluding travel costs may limit the ability to interpret the overall impact of training costs on the budgets of health units with high travel costs (i.e. northern health units)
22. Number of FTEs by Job Category

**Definition:**

Indicates the number of full time equivalent (FTE) positions in 2007 in each of the following specified professional job categories. FTE is defined by local board of health HR policies.

a) Public Health Nurse  
b) Registered Nurse  
c) Registered Practical Nurse  
d) Nurse Practitioner  
e) Public Health Inspector  
f) Dentist  
g) Dental Hygienist/Dental Assistant  
h) Health Promoter  
i) Dietitian/Public Health Nutritionist  
j) Speech-Language Pathologist  
k) Epidemiologist  
l) Heart Health Coordinator  
m) Librarian

**Data Source(s):**

Survey of boards of health, 2008

**Formula:**

Number of FTEs per professional job category

**Notes:**

- Indicator does not cover all job categories within a board of health; a decision was made to collect data on direct service job categories of interest in relation to assessing local service capacity
- The number of FTEs does not necessarily reflect the number of staff working in these positions due to job sharing or part-time work
- Differences in local use of job titles may result in under-reporting or inconsistencies between categories
- Managers were excluded from this reporting, which may affect reporting on capacity where managers also work directly in programs
23. Number of Vacant Positions by Job Category

Definition:

The number of job vacancies for staff positions in the following job categories for which there had been a job posting and that had remained vacant between May 1, 2008 and date of survey in November, 2008.

a) Associate Medical Officer of Health  
b) Public Health Nurse  
c) Registered Nurse  
d) Registered Practical Nurse  
e) Nurse Practitioner  
f) Public Health Inspector  
g) Dentist  
h) Dental Hygienist/Dental Assistant  
i) Health Promoter  
j) Dietitian/Public Health Nutritionist  
k) Speech-Language Pathologist  
l) Epidemiologist  
m) Heart Health Coordinator  
n) Librarian

Data Source(s):

Survey of boards of health, 2008

Formula:

Number of vacant positions by job category

Notes:

- Indicator does not cover all job categories within a board of health; a decision was made to collect data on direct service job categories of interest in relation to assessing local service capacity
- Does not capture full length of vacancies that began before May 1, 2008
- Does not show full extent of lack of local capacity where vacancies are being managed by reassignment and backfilling by existing staff
24. Employment Status of Medical Officers of Health

**Definition:**
Indicates where a medical officer of health is employed on a permanent, full time basis with a board of health. FTE is defined by local board of health HR policies.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Number of positions by full time status, with values to not exceed 1.0 FTE

**Notes:**
- Some boards of health consider MOH time spent providing on call service to contribute to or exceed the requirement for full time status
- There is no standardized definition of “full time” across all boards of health
25. Staff Length of Service

**Definition:**
Indicates the percentage of current full and part time public health unit staff who have been employed continuously by the public health unit by length of service in years.

Periods of time for employment include: up to 1 year; more than 1 year but less than 5 years; more than 5 years but less than 10 years; more than 10 years but less than 20 years; and more than 20 years.

**Data Source(s):**
Survey of boards of health, 2008

**Numerator:** Number of public health unit staff employed for specific periods of time

**Denominator:** Total number of full and part time public health unit staff

**Formula:**
\[
\left\{ \frac{\text{Number of public health unit staff employed for specific periods of time}}{\text{Total number of public health unit staff}} \right\} \times 100
\]

**Notes:**
- Staff length of service may be influenced by overall demographics of the local workforce or the presence of training programs (influenced by recruitment through placements)
- Regionally and municipally based boards of health will not be able to disaggregate the data on employment length of service for staff that have worked for the organization in different departments throughout their careers. This will affect primarily administrative and information management staff, however, the overall effect on total employee length of service will be small
26. Familiarity with Public Health Unit Programs and Services

**Definition:**
Indicates whether a board of health has assessed local community members’ familiarity with any of the public health unit's programs and services.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes, with year and method of most recent assessment; no

**Notes:**
- Original intent was to report on degree of community members’ familiarity with public health unit programs and services based on local surveys
  - Although data was collected by most health units (through Rapid Risk Factor Surveillance System (RRFSS) or local survey), consent to share this data was not included in the instructions of the original surveys, and therefore local results are not available
  - RRFSS module includes seeking information on community members’ basic familiarity with the existence of public health services, use of health unit service, how respondent has heard about health unit program and service, and satisfaction with use of health unit program and service
- Lack of a consistent definition of “assessing community members' familiarity with public health unit programs and services” may contribute to inconsistency in reporting
27. Issuance of a Health Status Report

**Definition:**
Indicates whether a board of health has issued a health status report or other health intelligence or information product that considered inequities in health outcomes and health determinants at any time in the past.

A health status report or other health intelligence or information product is defined as including any publication that was designed for distribution to the public that used health status statistics and provided analysis of these statistics to describe the equity of health outcomes or health determinants.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes and year; no

**Notes:**
- Many public health units publish high quality local health status reports that are available on their websites
- There is no standardized definition of inequities in health outcomes in order to compare results between health units
- Assessing only the existence of a report without assessment of the scope of the publication
- Relevance of the data in local reports is time sensitive; older reports may not be reflective of current situations
- Reporting includes both focused health issue reports and comprehensive community wide health status reports
28. Strategic Plan

Definition:
Indicates whether a board of health reports having a strategic plan in place that covers the current period (2008).

Data Source(s):
Survey of boards of health, 2008

Formula:
Yes, with years of strategic plan; no

Notes:
- Having a strategic plan will improve organizational performance only where it is well implemented and amended over time in response to emerging situations
- Assesses only the existence of a strategic plan without assessment of the scope of the plan
- Lack of consistency in the content and rigor of strategic planning makes compilation of results difficult to interpret
- Does not provide information on how the strategic plan is used to influence operations and achieve strategic goals
29. Emergency Response Plan Tested

**Definition:**
Indicates whether a board of health has an internal board of health emergency response plan and whether the plan was tested between January 1, 2007 and the date of the survey in November, 2008. Testing an emergency response plan includes activities such as running a table top exercise, testing a telephone call out list of all staff, and holding a mock emergency scenario.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes, with description of testing method; no

**Notes:**
- Included as a measure of public health unit emergency preparedness; provides a starting point for the development of possible future indicators, which may relate to community awareness of public health's role in emergency preparedness or effectiveness of staff training in emergency preparedness
- Because municipalities are required to have an organizational emergency response plan, nil responses were not anticipated
- Criteria for testing the plan were self-defined and described by boards of health
- Lack of a threshold for adequacy of testing an emergency response plan will limit interpretation of results
30. Accreditation Status

**Definition:**
Indicates whether a board of health participates in an accreditation process by accrediting body and current accreditation status.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes, by specific accrediting body, by accreditation status; no

**Notes:**
- Boards of health may have been accredited in the past, but not currently accredited
- There are differences in scope of accreditation standards across different organizations
- Numbers include boards of health that are both accredited and currently in the process of becoming accredited
31. Medical Officer of Health Performance Evaluation

**Definition:**
Indicates completion of a regularly scheduled performance evaluation of the medical officer of health, by type of evaluator, and year of the most recent evaluation.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes, with date of most recent evaluation and type of evaluator; no

**Notes:**
- Capacity Review Committee (CRC) survey of board of health management governance practices found wide variations in depth and scope of MOH performance evaluation practices
- The methods of staff evaluations used and the rigor of the processes is influenced by different governance models across boards of health
- Does not capture performance evaluation practices relating to other executive officers, such as CAOs and CEOs
32. Medical Officer of Health Reporting Relationships

**Definition:**
Indicates medical officer of health attendance at board of health meetings and/or standing committee meetings, and whether he or she participated in the meetings. Participation includes attending meetings and providing reports, advice or presentations to the board.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes on reporting to board of health, standing committee or both; no
Yes on attending specific meetings; no

**Notes:**
- Survey data indicate that some medical officers of health participate in meetings of a standing committee as well as meetings of the board of health
- Does not describe the quality of the medical officer of health’s interaction with the board
33. Board Member Orientation

Definition:
Indicates situations where new board of health members are provided with an orientation to the roles and responsibilities of the board of health, the duties of members and information to understand public health functions and issues.

Data Source(s):
Survey of boards of health, 2008

Formula:
Yes; no

Notes:
- Presence of board orientation does not indicate whether orientations are influencing governance capacity or effectiveness
- Lack of consistency in the content and rigor of orientation of board members makes results difficult to interpret
34. Board Self-Evaluation

**Definition:**
Indicates whether a board of health has engaged in a process to evaluate its governance processes and organizational effectiveness.

**Data Source(s):**
Survey of boards of health, 2008

**Formula:**
Yes; no

**Notes:**
- Presence of board self evaluation does not indicate whether board self evaluations influence governance practices or effectiveness
- Lack of consistency in the content and rigor of board self evaluation makes results difficult to interpret
References


References


References


References


67 Beck KH, Treiman KA. The relationship of social context of drinking, perceived social norms, and parental influence to various drinking patterns of adolescents. Addict Behav. 1996;21(5):633-44.


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The purpose of this appendix is to further discuss the data sources used for the indicators presented in the Initial Report as well as to describe the indicator methodology in more detail to complement the narratives in the Initial Report. Below is a brief description of the data sources used in this report. The indicator methods and definitions provide further technical information including data sources and formulas used to calculate each indicator.

Data Sources used in the report:

1. Census 2006
2. Provincial Health Planning Database (PHPDB)
3. Integrated Services for Children Information System (ISCIS)
4. Canadian Community Health Survey (CCHS)
5. Integrated Public Health Information System (iPHIS)
6. Immunization Records Information System (IRIS)
7. Adverse Water Quality Incidents

Each indicator was developed with the participation of the members of the Public Health Performance Management Working Group as well as through feedback from subject matter experts. In addition to the methodology described under each indicator definition and analysis description, where appropriate, specific indicators have been age-standardized.

As many prevalence estimates and rates vary greatly by age, (weighted) estimates were directly age-standardized to the 1991 Canadian Population. (Appendix 3 of this report) Presentations of age-specific rates can be cumbersome, and age-standardized rates have the advantage of providing a single summary number that allows different populations to be compared; however, they present an “artificial” picture of the health outcomes in a community, and will vary from crude rates (i.e., not age-standardized) often presented in local health status reports.
1. Census 2006

The Canadian Census is conducted by Statistics Canada every five years to provide a reliable source for describing the characteristics of Canada’s people, dwellings and agricultural operations. The most recent Census of Canada took place on Tuesday, May 16, 2006. The data from this Census was released in stages during 2007 and 2008. Where available, 2006 data are used. Information is supplemented with 2001 data where necessary.

The Census provides the population and dwelling counts not only for Canada but also for each province and territory, and for smaller geographic units such as cities or districts within cities. The Census also provides information about Canada’s demographic, social and economic characteristics.\(^1\)\(^2\)

2. Provincial Health Planning Database (PHPDB)

The Provincial Health Planning Database (PHPDB) is a standardized database of health-related demographic, clinical, and statistical data derived from a variety of internal and external sources. The PHPDB is an information resource provided by the Health Data Branch of the Ontario Ministry of Health and Long-Term Care (MOHLTC). Queries on PHPDB are completed via an online portal called Intellihealth.

The PHPDB is one of the primary sources of morbidity and mortality data in Ontario. It is designed to make vast data holdings accessible to a variety of users, such as analysts, epidemiologists, planners, policy and decision makers and researchers. Data warehouse technology is used to store, manage and provide access to health-related information that has been consolidated from a range of sources. The end result is a database of standardized health information that can be collated and manipulated to satisfy specific needs.

The information holding includes selected hospital information, home care information, vital statistics (births and deaths), and population information. Key characteristics are patient location (geography) including public health unit and Local Health Integration Network (LHIN), hospital location, age, sex, birth date, newborn birth weights, admission/discharge information, triage (Emergency Room (ER) only), patient diagnoses, interventions performed when applicable, case groups and resource weighting. A feature of the database is the value-added attributes, not present in the original sources, designed to make querying easier and more “foolproof” for the end user.\(^3\)

3. Integrated Services for Children Information System (ISCIS)

The Integrated Services for Children Information System (ISCIS) encompasses three different provincial information systems that support five service delivery programs for children and youth. These programs are: Healthy Babies Healthy Children, Preschool Speech and Language, Infant Hearing, Blind Low Vision and the Autism Intervention Program. ISCIS was funded and developed by the Ministry of Health and Long-Term Care, and was transferred to the Ministry of Children and Youth Services when the programs were transferred.
The ISCIS data are the responsibility of the public health units. Individual health units are responsible for the accuracy and completeness of the data, including information provided by health professionals in the field.

There is potential for duplicate records for children or families in the Healthy Babies Healthy Children (HBHC) ISCIS. For example, the number of total live births can be extracted from the Reporting Statistics that are manually entered into ISCIS by the health unit. This number is obtained from hospitals and should reflect the number of live births for the health unit jurisdiction only. Home births would likely not be included in the total number of live births, unless they were forwarded to the health unit. Other databases can also routinely provide estimates on the number of live births in Ontario via hospital delivery records, or through birth registration records from ServiceOntario.

Generally, the ISCIS data are of good quality. Data comparisons across health units should not be made unless the data collection methodology between health units is deemed comparable.

4. Canadian Community Health Survey (CCHS)

The Canadian Community Health Survey (CCHS) is conducted by Statistics Canada. The survey provides cross-sectional (at one point in time) estimates of the factors that influence the population’s health status and their use of the health system for 126 health regions across Canada. It relies upon a large sample of respondents and is designed to provide reliable estimates at the health region level. The target population of the CCHS includes household residents in all provinces and territories, with the exclusion of populations on Indian Reserves, Canadian Forces Bases, and some remote areas. Sampling design is multi-stage. A single respondent within a household is randomly selected, and is asked questions on a wide range of health topics, including: physical activity, height and weight, smoking, exposure to secondhand smoke, alcohol consumption, general health, chronic health conditions, injuries, use of health care services and related socio-demographic information.

The CCHS has four content components: the core content, the theme content, the optional content and the rapid response content. The core content is collected from all survey respondents and will remain relatively unchanged over several years. The theme content, also collected from the entire sample, varies from year to year. The optional content fulfils the need for data at the health region level. This content, while often harmonized across the province, is unique to each region or province and may vary from year to year. Lastly, the rapid response component is offered to organizations interested in national estimates on an emerging or specific issue related to the population’s health. The rapid response content may be included in the survey in each collection period, that is, in every two month period. The vast majority of indicators presented in this report are specific to the core content.

Prior to 2007, data collection occurred every two years on an annual period. Data are available for the 2001, 2003 and 2005 periods. Each cycle comprised two distinct surveys:

- Cycle x.1 – a large sample survey in the first year designed to provide estimates at the sub-provincial level (Health Regions or combinations of Health Regions).
- Cycle x.2 – a smaller in-depth survey focused on a particular topic in the second year that provides estimates at the provincial and national levels.
In 2007, major changes were made to the survey design with the goal of improving its effectiveness and flexibility through data collection on an ongoing basis. Data collection now occurs every year. The CCHS produces an annual microdata file and a file combining two years of data. The CCHS collection years can also be combined by users to examine populations or rare characteristics. The majority of indicators included in this report are from CCHS 2007, with the exception of breastfeeding duration which uses data spanning three survey files.

Before any estimate is released, the number of respondents that contributed to the calculation of the estimate must be determined. It is recommended that if the number of respondents that contributed to the calculation of the estimate is less than 30, it should not be released regardless of the value of the coefficient of variation. Statistics Canada release guidelines for the CCHS survey were followed. Where the coefficient of variation exceeded 33.3, it was denoted with an $F$ and the estimate was suppressed due to unacceptable data quality. Where the coefficient of variation was between 16.6 and 33.2, estimates were denoted with $E$ indicating that high sampling variability is associated with the estimates. Lastly, estimates with a coefficient of variation between 0.0 and 16.5 required no special notation as they are considered acceptable for a general unrestricted release.

Sampling and non-sampling errors are two of the types of errors related to the CCHS.

Because the CCHS is a sample survey, rather than a census of the population under similar conditions, estimates are subject to sampling error. Sampling errors for CCHS estimates are calculated using the “bootstrap” re-sampling technique. Errors not related to sampling are called non-sampling errors (e.g., a respondent may misunderstand a question or a response may be recorded incorrectly). These types of errors may be present in any survey although much effort is expended to minimize these types of errors in the CCHS. Non-response (either item non-response or total non-response) is another potential source of non-sampling error. Total non-response occurs when a respondent either refused to participate in the survey or because the interviewer could not contact the selected respondent. Social desirability and recall bias are potential sources of bias in the CCHS.

5. Immunization Records Information System (IRIS)

The Immunization Records Information System (IRIS) is a DOS-based system that was developed for public health departments in 1993 to maintain the immunization and tuberculin testing records of all school-aged children within their jurisdictions. Immunization levels are calculated for each of the six diseases (diphtheria, tetanus, polio, measles, mumps and rubella) for which immunization is required under the *Immunization of School Pupils Act* (1982). Under the *Immunization of School Pupils Amendment Act*, 1984, parents are directly responsible for the immunization status of their children. Parents are obligated to report any vaccinations that their children receive in a doctor’s office to the public health unit and it is then entered into IRIS. At the moment, measles, mumps, rubella, diphtheria, tetanus, and polio vaccines are the only mandatory vaccines required under the Act. In addition to mandatory vaccines, IRIS also has the capacity to record most childhood vaccines, especially those that are publicly funded, including Hepatitis B, Varicella, Haemophilus, Pneumococcal Conjugate, Meningococcal Conjugate C, and human papillomavirus. This information belongs to the public health units and they are responsible for producing reports on the immunization status of their areas. Medical Officers of Health also use IRIS data to suspend pupils who have not completed the prescribed
program of immunization and do not have a medical or other exemption to these vaccinations, as outlined in the *Immunization of School Pupils Act.* In this report, data for Hepatitis B immunization is not necessarily from iPHIS; it is dependant on how the individual health unit has recorded Hepatitis B immunization information, and what information had been sent to the MOHLTC through survey.

Demographic, parent/guardian contact and school information for school-aged children is imported into IRIS from the Boards of Education and private schools within the boundaries of each health unit. The quality of demographic information in IRIS is largely dependent on the quality of this data and the import process. This data is used by IRIS as the denominator for generating vaccine coverage reports.1

The Ministry of Health and Long-Term Care is the facilitator for data transfer and provides the architecture for the application. There is a two-way exchange of data between the Ministry’s central immunization database and the individual public health units’ databases, to ensure information is correct and available when a child moves between public health units. The system information is aggregated at a high level to be used by policy analysts at the MOHLTC to support annual business planning. Occasionally, the information is shared with outside health organizations and is published in medical journals and reports.

Low immunization coverage levels may appear in some years, mainly because children are at the age where their booster for a particular vaccine becomes overdue. In most cases, the child has been appropriately immunized, but due to the reporting lag in the IRIS model, the information may not be available for analysis. IRIS data is entered retrospectively when a child enters the school system or daycare. Early childhood vaccine information is not available in real time.5 As such, the criteria used to generate vaccine coverage reports from IRIS should be examined carefully before making comparisons across health units. IRIS vaccine coverage reports may report children who have complete vaccinations for their age based on a specified date or based on reference to the child’s date of birth. Reports are based on data available at the time the report is generated. Any updates to the data will change the output of subsequent reports.6,7

### 6. Integrated Public Health Information System (iPHIS)

In Ontario, the integrated Public Health Information System (iPHIS) is the information system used for reporting case information on all reportable communicable diseases for provincial and national surveillance, as described in Regulation 559 of the *Health Protection and Promotion Act* (HPPA). The HPPA requires that each public health unit in Ontario collect information about people with reportable diseases in their jurisdiction and report it to the Ministry of Health and Long-Term Care. This information is used for local, provincial and national surveillance.

In 2005, iPHIS replaced the Reportable Disease Information System (RDIS) and linked all Ontario health units into a common database. This was a major step in public health practice, as 36 standalone systems were integrated into one central, provincially managed, database. iPHIS uses an associated reporting tool called Cognos ReportNet to support the creation of provincial summaries and allows comparisons of rates of disease between health units. Upon implementation of the iPHIS system, each health unit converted selected variables associated with each RDIS case into iPHIS.
The most common source of case identification is through laboratory notification of confirmed test results (serology, microbiology cultures, etc.). Physicians are required to report cases that fulfill laboratory or clinical case definitions. The numbers of cases of reportable diseases included in iPHIS are an underestimate of the actual numbers since not all people with a reportable disease seek medical treatment, and therefore the disease goes unreported. Comparisons with other health units can be problematic because of inconsistencies with respect to data entry and case management across health units. In addition, it is possible that cases may be double-counted as people may interact with public health in more than one health unit for work or recreational purposes, or may move.

Rates and proportions based on counts less than 5 may be suppressed, depending upon circumstances. 8

7. Adverse Water Quality Incidents

Regular water sampling occurs on the water source, the sample is analyzed by an accredited lab, and results are shared with the Ministry of the Environment through reporting to the Spills Action Centre, in addition to the local public health unit. An adverse water quality incident does not mean the drinking water supply is unsafe; it may simply indicate that on one occasion, one of the water quality standards was not met. Data quality depends on compliance with the reporting requirements contained within regulations, and relies on both operators and health units having appropriate reporting practices in place.


A survey of Ontario’s 36 boards of health was conducted in October 2008. The survey was designed to collect data on questions related to finance, human resources, and governance.

The survey was conducted as a web-based survey using Survey Monkey. A webinar was conducted to review the survey questions and technology prior to release. Public health units were then given three weeks to complete the survey. Results were downloaded from Survey Monkey and compiled in Microsoft Excel. Results were analyzed and then returned to health units for review to ensure their accuracy.
1. Teen Pregnancy

**Definition:**

The teen pregnancy rate estimates the number of pregnancies (resulting in live births, still births and therapeutic abortions) per 1,000 females age 15-19 years.

**Data Source(s):**

**Numerator:**
- Number of deliveries (live birth and still births): Inpatient Discharges, Provincial Health Planning Database, Ministry of Health and Long-Term Care
- Therapeutic abortions: Therapeutic Abortions Summary, Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Denominator:**
- Population Estimates, Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{Total number of deliveries (live births and stillbirths) and therapeutic abortions for females age 15-19 years (2007 calendar year)}}{\text{Total number of females age 15-19 years (2007 calendar year)}} \times 1,000
\]

**Notes:**

- Intellihealth therapeutic abortions summary report was used to derive the number of therapeutic abortions for females ages 15-19 years
- IntelliHealth\20 – Ontario Special Reports\Therapeutic Abortion Summary. Report # 20-0001 was used to derive the number of therapeutic abortions
- Intellihealth\05 Inpatient Discharges\Hospital Births\Deliveries – Ontario x Mother’s Age: Report #: 05-0004 was used to derive the number of deliveries
- Analyzed by mother’s usual place of residence, not place of birth
- Analyzed by ICD 10-CA codes containing Z37 for live births and stillbirths by mother’s date of discharge, and mother’s age at time of delivery
- Excludes births and therapeutic abortions to females residing out-of-province; excludes estimates of fetal loss; excludes abortions conducted with females residing out of province
Limitations and Comments:

Indicators for teen pregnancy vary across jurisdictions depending on the type of data used. In Ontario, teen pregnancy rate estimates are generally considered a gross underestimate of the true rate of teen pregnancies for reasons that follow.

The number of live births and still births are estimated from hospital delivery data from inpatient records. These are not derived from the Vital Statistics collected by ServiceOntario because hospital data are currently considered more complete and up-to-date than live birth registration data. Birth registration data may be less complete due to the impact of municipal fees introduced in some municipalities starting in the late 1990s, resulting in an increase in unregistered births. In this case, an “unregistered birth” refers to cases where ServiceOntario receives the required form from the attending health care practitioner, but not from the parent(s). These municipal fees may have been a barrier for lower-income persons, including teens.\(^9\)

However, ServiceOntario has made substantial investments and progress toward eliminating potential barriers. As of July 27, 2009, the fully-electronic Newborn Registration Service (introduced in phases starting in March 2006) has been successfully implemented across the province. As a result, all birth registration documents are now submitted directly to ServiceOntario, bypassing municipalities and any associated fees. Moreover, when registering a birth using electronic or traditional channels, information provided by the parents and the attending health practitioner is corroborated. For example, significant differences between birth weights reported by the parents and by the health practitioner are investigated. Further checks are provided for clients using the electronic channel, including electronic edits and review screens throughout the application process to confirm information before proceeding. Finally, additional data quality initiatives, such as collaboration with research stakeholders, are also expected to improve the completeness and quality of Ontario vital statistics.

There are also issues of the timeliness of data with both hospitalization data and birth registration data. Physicians have a year to claim OHIP billings which supply hospital data. Similarly, a parent has up to one year to register the birth of a child.

The hospital delivery data do not include deliveries out of the hospital, although the number of at-home births for teens is likely small. The hospital delivery data also do not include out-of-province births.\(^9\)

Therapeutic abortions conducted outside of the province are excluded from this calculation. It is important to note that the numbers of out-of-province and out-of-country abortions are likely to be higher in health units which border other provinces or the US. The number of out-of-province and out-of-country procedures for Ontario teens is also dependent on the term of the pregnancy; later term pregnancies are likely to be referred to out-of-province clinics, particularly for pregnancies with greater than 20 weeks gestation.

The type of abortion conducted also affects the reported rate of teen pregnancies. There are a number of types of procedures that are excluded from the teen pregnancy estimate. Hospital and clinic abortion data do not include spontaneous abortions, abortions conducted in private abortion clinics, incomplete therapeutic abortion procedures, medical (non-surgical) abortion procedures, and procedures to uninsured clients. Medically/pharmacologically-induced abortions are not captured in the hospital and clinic data. Moreover, the data do not include abortions that are not performed by a recognized service provider as the number is difficult to estimate.
Although the estimates include data from both in-patient and day surgery tables, not all therapeutic abortions are captured in these tables as these data do not include all clinic-based therapeutic abortions. Data is only included for the free-standing clinics that have agreements with the ministry under the Independent Health Facilities agreement to provide these services out-of-hospital.\textsuperscript{10}

Estimates of fetal loss are also not included in the teen pregnancy indicator in this report; estimates of fetal loss are said to occur in approximately 10\% of pregnancies in this age group.\textsuperscript{11} Due to these data collection and reporting limitations, the reported teen pregnancy rate highlights only a proportion of the actual number of teen pregnancies.

Lastly, this calculation uses a count of the number of abortions that have occurred, and does not reflect the number of individuals undergoing therapeutic abortion procedures. Therefore, the number of pregnancies reported per calendar year will not reflect the number of individual teens who become pregnant more than once within a year. Teens who have been pregnant before are at greater risk for subsequent teen pregnancies.\textsuperscript{12,13}

Understanding the teen pregnancy indicator relies on an understanding of these data collection issues and the method used to derive the teen pregnancy indicator. Women less than 15 years of age are not included in this indicator. Some reports define teenage pregnancy for females 10 to 19, while others may use 13 to 17 years of age to define teen or adolescent pregnancy.\textsuperscript{14}

Older teens are more likely to be sexually active than younger teens, and therefore, there are likely to be variations in the pregnancy rates specific to age.\textsuperscript{15} Categorizing teen pregnancies by the age group 15-19 years does not acknowledge the different implications of pregnancy at 15 years of age compared to pregnancy at 19 years of age.\textsuperscript{16} Many teenagers are sexually active, sometimes at very early ages in adolescence.\textsuperscript{13} Thus in the future, the teen pregnancy age range may need to reflect the decline in first sexual contact age. The sequelae of teen pregnancy (medical and social) may also be modified by the effect of age.

Teen pregnancy is a complex issue involving physical, psychological, social and economic factors.\textsuperscript{10} Adolescent pregnancy rates may vary in certain religious, cultural, and ethnic groups, particularly those where birth control is not allowed and where marriage before age twenty is common.\textsuperscript{17} The teen pregnancy rate is also influenced by access to sexual health education, counseling, and services for contraception and pregnancy options (including abortions).\textsuperscript{18}

Fewer pregnancies, and a higher proportion of abortions, are experienced by teens in higher socio-economic groups.\textsuperscript{19} The inverse is true in lower socio-economic groups, where more adolescents choose to give birth than to undergo abortions.\textsuperscript{19}

There has been a declining trend in teen pregnancy across Canada as well as in Ontario over the past few years.\textsuperscript{10} Although fewer teens are becoming pregnant, fewer of those who do become pregnant are giving birth.\textsuperscript{11} The related increase in abortions as the outcome of teen pregnancy is a shift seen in several of the more populous provinces including Ontario.\textsuperscript{11} The number of miscarriages or stillbirths is estimated to be small, although fetal loss is said to be underreported. While the number of still births is recorded in hospitalization and Vital Statistics data, estimating the number of miscarriages is difficult as they may not come to the attention of the medical system.\textsuperscript{11}
For a very large majority of adolescents, pregnancy is not a deliberate choice, as indicated by the high rates of abortion.\textsuperscript{19} The wide statistical variations in pregnancy rates and their outcomes originate from complex causes ranging from public policies to sociological and economic circumstances and culturally diverse conditions.\textsuperscript{19}

Factors associated with teens becoming pregnant include: young age of sexual initiation, unprotected sexual activity, having friends at risk or who have become pregnant, sexual assault, violence or abuse within a couple relationship, dropping out of school, drug, alcohol or gambling dependency, having an older sexual partner, previous abortion accepted under pressure, already being an adolescent mother, having a mother who was an adolescent mother, lack of access to birth control, living in an urban area, high rates of poverty, and social acceptability of teen parenting. Other factors that have been associated with teenage pregnancy include poor school ethos, disaffection, truancy, and poor employment prospects.\textsuperscript{20,21}

Comparison of teen or adolescent pregnancy rates across jurisdictions is difficult due to varying data sources and definitions of teen pregnancy. Even within Ontario, some sources report teen pregnancy using Vital Statistics data, while others use hospitalization data to determine the number of live and still births for the calculation.\textsuperscript{9} Some teen pregnancy rates include estimates of fetal loss (spontaneous abortion and ectopic pregnancy) in their calculation while other jurisdictions may omit these data elements from their calculations. The only source for spontaneous abortion or miscarriage information is hospitalization data, which greatly underestimates spontaneous abortion.\textsuperscript{14} This underestimate has increased over time as an increasingly larger number of women have been treated by family physicians rather than in hospital.\textsuperscript{14} Statistics Canada and CIHI (1995) have included miscarriages in their published pregnancy rates, which may affect comparability across jurisdictions.\textsuperscript{14}

In the past, Ontario has been criticized for the quality of Vital Statistics birth registration data; and at times Ontario data has been omitted from federal reporting.\textsuperscript{22} There are persistent concerns specific to the under-registration of live births, in particular among vulnerable populations, including teenage mothers.\textsuperscript{9} Additionally, there have been serious concerns about the consistent and substantial underreporting of still birth infants or infant deaths in Ontario. The Canadian Perinatal System Surveillance project found that over 40% of infant deaths in Ontario in 2003 resulted in a non-link to a corresponding birth record as compared with 1% of unlinked infant deaths in all other provinces and territories combined.\textsuperscript{22} ServiceOntario reports that they have registered an average of just over 700 infant deaths per year from 2003 to 2007, compared to over 135,000 live births per year in the same period.

As indicated above, ServiceOntario has made progress and continues to work to make it easier for parents to register the birth of their child. Electronic registration initiatives have already shown modest improvement in reducing under-registration and further improvement is expected in the near future, enabling better comparison across jurisdictions.
2. Low Birth Weight

**Definition:**

The low birth weight rate indicator estimates the rate of singleton live births weighing 500-2499 grams immediately upon birth, based on the mother’s usual place of residence per the total for singleton live births weighing at least 500 grams per 1,000 births.

**Data Source(s):**

- **Numerator:** Inpatient Services Provincial Health Planning Database, Ministry of Health and Long-Term Care
- **Denominator:** Inpatient Services (Hospital Data), Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{Total number of singleton live births weighing between 500 and 2499 grams (2007 calendar year)}}{\text{Total number of singleton live births weighing at least 500 grams (2007 calendar year)}} \times 1,000
\]

**Notes:**

- Excludes births with weights recorded under 500 grams due to possible entry errors with still born births
- Excludes multiple births
- PHPDB Qualifications: Newborns (entry code = N) at date of admission; Patient Diagnosis Codes (beginning with Z380, Z381, Z382) for the Calendar Year (2007). Weights for singleton live births (greater than or equal to 500); Weights for low births weights (greater than or equal to 500 grams and less than 2500 grams)
- Intellihealth 05 Inpatient Discharges Hospital Births Low Birth Weight, Singleton Births: Report # 05-0004 was used to derive both the numerator and denominator
- The indicator is not limited to full-term births and also includes pre-term births
- Analyzed by mother’s usual place of residence, not place of birth
- Excludes births to mothers who reside out of province
Limitations and Comments:

There are numerous types and ways to define low birth weight, and indicators vary across Ontario. Compounding this variation are the different data sources that can be used to derive birth weight estimates.

The Association of Public Health Epidemiologists in Ontario (APHEO) presents several different ways of calculating birth weight including: Very Low Birth Weight Rate; Extremely Low Birth Weight Rate; Rate of High Live Birth Weight or Large for Gestational Age; and Low Birth Weight Rate for Full-term Singleton Live Births. Other sources may also include a calculation for Low Birth Weight for Gestational Age in their reporting.

The low birth weight indicator in this report is calculated by including both full-term and pre-term singleton births. Other reports often limit the calculation to only include singleton full-term births as most premature infants are born with low birth weights.

This indicator includes births to women who are less than 15 years of age and is not restricted to the population of women formally defined as of childbearing age. This method of calculation also includes only live births with a known birth weight. Multiple births (i.e. twins, triplets, etc) have been excluded due to the higher likelihood of low birth weights. Thus, the indicator is independent of temporal changes in the proportion of births that are multiples.

The number of live births and still births are estimated from hospital delivery data from inpatient records. These are not derived from the Vital Statistics records administered by ServiceOntario because hospital data are currently considered more complete and up-to-date than live birth registration data. Birth registration data may be less complete due to the impact of municipal fees introduced in some municipalities starting in the late 1990s, resulting in an increase in unregistered births. In this case, an “unregistered birth” refers to cases where ServiceOntario receives the required form from the attending health care practitioner, but not from the parent(s). These municipal fees may be a barrier for lower-income persons, including teens.

There are also issues of the timeliness of data with both hospitalization data and birth registration data. Physicians have a year to claim OHIP billings which supply hospital data. Similarly, a complete year of birth registration data can be delayed up to 12 to 15 months from the end of a calendar year due to delayed registrations (a parent has up to one year to register the birth of a child).

The inpatient data do not include deliveries out of the hospital, although the number of at-home deliveries is estimated to be currently less than 5% of all births in Ontario. The hospital delivery data also do not include out-of-province births.

In addition to Vital Statistics and Inpatient Hospital data, low birth weight data can also be obtained from other databases. Data can be obtained from the Integrated Services for Children Information System (ISCIS). ISCIS data reflects only information obtained from consenting parents for all live births (including preterm births and multiples) and may not include midwife data for all home delivered births. Data is also available through the Niday Perinatal Database, but it is not fully available for all 36 health units in Ontario. Hospital participation in using Niday has increased in all areas of the province, and in the future, this may offer another data source of comparable health indicators in the province. Improvements made following the transition from Niday to the Ontario Perinatal Surveillance System are expected to further increase the coverage of the surveillance to all hospitals in Ontario.
The Ontario midwifery database also collects data on births and birth outcomes from all registered midwives in Ontario. Midwifery services are usually specific to low-risk births for a small population of women giving births, and thus the proportion of low birth weight infants in this population may be smaller than in the total Ontario population.

Low birth weight rates must be interpreted with caution as a result of several data quality issues pertaining to Ontario. Changes to Ontario law in 1996 allowed municipalities to introduce an administrative fee for processing birth registration documents. The implementation of this fee was associated with a rise in unregistered births. In particular, the administrative fee may have affected vulnerable populations (low-income populations, adolescent mothers, parents of multiples) which are also populations associated with higher risk of low birth weight births. Therefore, low birth weight rates are likely underestimated in Ontario using historical Vital Statistics data. Issues related to how birth weight and gestational age values are recorded have also been noted in Ontario, and appear to have been resolved as of 2002. The inclusion of pre-term singleton births is a likely contributor to a higher rate of low birth weights as pre-term births are more likely to be a lower birth weight.

Despite historical issue with birth registration data, ServiceOntario has made substantial investments and progress toward eliminating registration fees as a potential barrier. As of July 27, 2009, the fully-electronic Newborn Registration Service (introduced in phases starting in March 2006) has been successfully implemented across the entire province. Birth registration documents, both from the parents and the attending health care practitioner, are now submitted directly to ServiceOntario, bypassing municipalities and any associated fees. Moreover, other initiatives, including outreach to remote communities, streamlining of registration processes and collaboration with the Ontario Perinatal Surveillance System, are also expected to improve the completeness and quality of Ontario vital statistics.

In developed countries, such as Canada, the majority of low birth weight infants are the result of prematurity rather than growth retardation so it is important to consider gestational age when examining birth weight. Consideration of whether the children were born preterm or at term gestation, and the conditions associated with the low birth weight are important due to their different contributing factors and outcomes. However, the low birth weight indicator in this report has the advantage of estimating the burden of low birth weights. Length of gestation is subject to inaccuracies in reporting as length of gestation can be determined from several factors including: recall of date of sexual intercourse; menstrual cycles of the mother; physician examination and ultrasound. In particular, when length of gestation is based on menstrual dates, there is more likely to be an error, in part due to recall, post-conception bleeding, irregular or long/short menstrual cycles, delayed ovulation, and unrecognized fetal loss. These inaccuracies may result in variations in the rate of preterm birth due to errors in the reporting of gestational age. However, errors have diminished in recent decades because ultrasound, which can more accurately confirm gestational age, is now widely used in Canada. Small for gestational age (SGA) babies are more likely to be delayed in subsequent development and to remain small. SGA data can also be used to further refine low birth weight information. Many low birth weight indicators now refer to “small for gestational age” rather than “low birth weight.” In Canada, most low birth weight infants are due to pre-term births, as opposed to delayed intrauterine growth.
Some factors thought to be related to the recent increase in the preterm birth rate include higher numbers of multiple births from reproductive technology, medically indicated preterm birth for pregnancy complications, the trend of Canadian women becoming pregnant at older ages, increases in the number of unmarried mothers, and more accurate estimates of gestational age through the use of ultrasound.\textsuperscript{23,13}

There is a large difference in perinatal and infant mortality by birth weight.\textsuperscript{35} Much of this is attributable to access to health services with dedicated technology and services, which tends to result in lower mortality rates. The trend in Canada has been for decreasing infant and perinatal mortality rates.\textsuperscript{36} While infant mortality rates may be declining due to improved access to medical care, low birth weight rates may increase as pregnancies that would not previously have been viable are now able to continue to a live birth. However, the importance of socio-environmental factors cannot be underestimated, as demonstrated by the fact that in urban Canada, the incidence of low birth weight and infant mortality rates are relatively higher in the lowest income neighborhoods.\textsuperscript{37}

Lastly, the comparison of birth weights between jurisdictions may vary based on the limitations listed above. In Ontario alone, there are several standard birth weight calculations and data sources. The population of a jurisdiction or other country may have even greater variation in their definition of birth weight. For example, as registration of stillbirths and live births varies internationally, OECD data include all live births weighing less than 2500 grams.\textsuperscript{38} Therefore, interpretation of low birth weights should be approached with caution.
3. Breastfeeding Duration

**Definition:**

The breastfeeding duration rate indicator estimates the proportion of mothers age 15-55 years who breastfed (not exclusively) their last baby (born within the past five years) for a duration of six months or more.

**Data Source(s):**

**Numerator:** Canadian Community Health Survey Cycles 2.1, 3.1 and Canadian Community Health Survey 2007, Statistics Canada, Ontario Share Files distributed by the Ministry of Health and Long-Term Care

**Denominator:** Canadian Community Health Survey Cycles 2.1, 3.1 and Canadian Community Health Survey 2007, Statistics Canada, Ontario Share Files distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{Total weighted number of female respondents age 15-55 years who gave birth in the past five years and who breastfed (non-exclusively) their child for at least six months}}{\text{Total weighted number of female respondents age 15-55 years who gave birth in the past five years}} \times 100
\]

**Notes:**

- This indicator was derived by combining three cycles of the Canadian Community Health Survey (CCHS) in order to obtain reportable and stable data for breastfeeding duration estimates at the public health unit level in Ontario. Simply using one survey to estimate for breastfeeding duration resulted in unstable estimates for the majority of public health units in Ontario, and in many cases the data was unreportable.
- Numerator: \( \text{MEX}_06 = \text{Six Months} (9), \text{Seven to Nine Months} (10), \text{Ten to Twelve Months} (11), \text{One year or more} (12) \)
- Denominator: \( \text{MEX}_01 = \text{Has given birth in the last five years} (1) \)
- Excluded not applicable (96) and not stated (99) responses to \( \text{MEX}_01 \). Exclusion of women who are currently breastfeeding (\( \text{MEXC}_05 = 2 \))
- PHU 3545 was dropped, 3547 = North Bay, and 3560 = Simcoe in CCHS 2.1 due to amalgamations of public health units
- There was insufficient sample size to stratify the data for each public health unit for CCHS 2007, and therefore cycles 2.1, 3.1, and CCHS 2007 of the CCHS were combined according to methods outlined by Thomas and Wannell. Both the separate and pooled approaches to combining cycles of the CCHS were considered. The separate approach to combining cycles of CCHS was used in the report.
- As there were not consistent trends over time over the three individual estimates for breastfeeding duration, combining the 3 cycles of the CCHS did not diminish the data output in any way.
Limitations and Comments:

The survey designed for estimating breastfeeding uptake asks women if and how long they have breastfed their last child (born within the past 5 years). Thus in CCHS 2007, a woman may describe the breastfeeding patterns with her last child born in 2002; in Cycle 2.1 (2002-2003) a woman may be describing breastfeeding patterns with a child born as early as 1997. The combination of three cycles incorporates behaviours over an 11-year time span, which will obscure the changes in breastfeeding patterns that occurred over this time period.

Although breastfeeding initiation rates are quite high, breastfeeding duration rates are much lower. Breastfeeding uptake is influenced by a variety of factors, including the use of general anesthetic at birth, multiparity, marital status, having previously breastfed, being a smoker, completing post-secondary education, decision to breastfeed early on in pregnancy, and having attended prenatal classes.

It may be difficult to sustain the duration of breastfeeding for a number of reasons: physical problems with lactation; return to work; lack of support; and feelings of depression are associated with lower breastfeeding duration. Other factors that may influence breastfeeding uptake and duration include: maternal age; income; and socio-cultural norms. Breastfeeding rates may also be affected by access to professional support, such as registered nurses or lactation consultants, whether in-hospital or through at-home visits such as through the Healthy Babies Healthy Children Program.

The term breastfeeding may encompass many definitions. Breastfeeding uptake or initiation is the attempt to breastfeed. Exclusive breastfeeding usually entails the exclusive use of breast milk, but will vary, depending on whether the inclusion of vitamin drops is considered within the definition of exclusivity. Non-exclusive breastfeeding may entail a range of behaviours including occasional supplementation for medical reasons, a combined mixture of breast milk and formula, and regular supplements of formula. In this use, the indicator includes responses of mothers who have breastfed both exclusively and non-exclusively.

In 2001, the World Health Organization (WHO) recommended that infants should be exclusively breastfed for six months. Exclusive breastfeeding is defined by the WHO as only breast milk, including expressed breast milk and medicines or vitamins but excluding any artificial breast milk substitute, water, solid foods, or other liquids.

In 2004, Health Canada adopted WHO’s recommendation of exclusive breastfeeding for the first six months as the best method for feeding full term healthy infants. The Canadian Pediatric Society followed with the same recommendation shortly after in March 2005. The Health Canada and WHO recommendation is that breast milk should be the only food or drink for the first 6 months of life and after that breastfeeding should continue along with the gradual introduction of solid foods for 2 years and older.

Prior to 2001, it was recommended that mothers exclusively breastfeed for four to six months. Given that this recommendation may be more recent than a proportion of the surveyed mother’s who likely breastfed, rates may be somewhat lower than expected when compared to the more recent guideline. These estimates may be somewhat higher in the future due to the increased adoption of the WHO and Health Canada’s recommendations, as well as with more recent data collection.
Lastly, due to the survey design in the Canadian Community Health Survey, we cannot estimate how long mothers who are currently breastfeeding have breastfed. The survey questionnaire does not ask currently breastfeeding mothers how long they have been breastfeeding. Therefore, it is possible that mother may be currently breastfeeding for a duration of greater than 6 months, but would not be included in this breastfeeding duration estimate.

The lack of consistency among many studies and surveillance systems in the definition of breastfeeding, coupled with differing study or system design, may lead to contradictory results. In Ontario, public health units can obtain breastfeeding estimates from a variety of sources such as the Canadian Community Health Survey, the Rapid Risk Factor Surveillance System, the Niday Perinatal Database, the Integrated Services for Children Information System (ISCIS), as well as any other local surveillance systems or studies in place.

At the time of this report, the Canadian Community Health Survey had available data to derive breastfeeding duration estimates at the public health unit level and the ability to combine cycles in order to derive stables estimates. In the future there may be additional comparable data sources to derive stable rates of breastfeeding duration across public health units in Ontario.

Breastfeeding has been a difficult health-related behaviour to quantify. Many surveys lack sufficient sample size to provide stable estimates or have an inappropriate study design to capture the range of breastfeeding behaviours. Despite these difficulties, breastfeeding duration estimates have been calculated through combing CCHS survey cycles for the purpose of this report, with the caution that there may be many interpretation points specific to this indicator.
4. Postpartum Contact

**Definition:**

The postpartum contact indicator is defined as the percentage of new mothers who were contacted and who consented to a post-partum phone call under the Healthy Babies Healthy Children (HBHC) program who received a post-partum phone call or contact within 48 hours of release from hospital after giving birth.

**Data Source(s):**

**Numerator:** Integrated Services for Children Information System, Ministry of Children and Youth Services

**Denominator:** Integrated Services for Children Information System, Ministry of Children and Youth Services

**Formula:**

\[
\left\{ \frac{\text{# of families who were contacted by the Healthy Babies and Healthy Children public health nurse within 48 hours of hospital discharge (2007 calendar year)}}{\text{# of families who were contacted and who consented to being contacted by the HBHC program (2007 calendar year)}} \right\} \times 100
\]

**Notes:**

- Data extracted on July 27, 2008
- Not based on all live births. Families must have consented to receiving an HBHC phone call
- Items 21.1/21.0 on the ISCIS extract report were used

**Limitations and Comments:**

**Contact for Program Inquiries**

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5. Smoking Prevalence

**Definition:**

The smoking prevalence indicator estimates the age-standardized proportion of people age 12 years and older who are current smokers (daily or occasional cigarette smokers).

- Current smoker – daily smoker or occasional smoker
- Daily smoker – smoking at least one cigarette per day
- Occasional smoker – does not have at least one cigarette per day

**Data Source(s):**

**Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Weighted number of respondents age 12+ years who are current (daily + occasional) cigarette smokers}}{\text{Weighted total number of respondents age 12+ years}} \right\} \times 100
\]

**Notes:**

- **Numerator:** SMK_DSTY = Daily Smoker (1) or Occasional Smoker (former daily smoker) (2) and Occasional Smoker (3)
- **Denominator:** SMK_DSTY = Daily (1), Occasional (2) Occasional (3) Former Daily Smoker (4) Former Occasional Smoker (5) and Never Smoker (6)
- Not Answered ((99), based on Don’t Know, Refusals, and Not Stated to at least one of the questions) responses were excluded
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
Limitations and Comments:

There are multiple important surveillance indicators related to tobacco use. The calculation used for this indicator is specific to current smokers, including both those that smoke daily and those that smoke occasionally. This indicator does not describe the full picture and changing patterns of tobacco use in Ontario. Other important indicators related to tobacco use include: smoking initiation; smoking experimentation; age at smoking initiation; daily smoking; occasional smoking; frequency of cigarette consumption; smoking cessation; smoking cessation attempts, and environmental tobacco exposure.52

The definition of ‘smoker’ has many different variations. For the purposes of this report, current smoking prevalence for both daily and occasional smokers is used. This definition is consistent with both indicators developed by Statistics Canada, and the Association of Public Health Epidemiologists in Ontario,53,54

This indicator definition fails to account for type of smoker (daily or occasional), the length of time an individual has smoked, the amount or types of tobacco smoked, any attempts to quit, or exposure to second-hand smoke. However, current smoking prevalence is an important indicator that defines current smoking patterns in the population which measures one of the outcomes of tobacco control programming and policies, and outlines a priority population for continued tobacco control programming.

There are numerous surveys that collect tobacco use data across Ontario and at the federal level, including the Ontario Tobacco Survey, Rapid Risk Factor Surveillance System, and the General Social Survey to name a few.55 However, the CCHS is a valid tool that allows measurement of tobacco use at the level of the public health units, which is an important factor in selecting a data source for this report.

Not all of the sources that collect tobacco use data necessarily have a focus on health or on tobacco use itself. Although the General Social Survey collects smoking prevalence data, it is not aimed at tobacco research or even at health outcomes. The Youth Smoking Survey tracks smoking behaviors in youth grades 5 to 9, and more recently up to grade 12, but does not allow for measuring smoking at the larger population level for each health unit.

The Canadian Tobacco Use Monitoring Survey (CTUMS) has a near-exclusive focus on tobacco use. The survey is designed to track changes in smoking status, particularly for populations most at risk such as 15- to 24-year-olds. It allows for estimates of smoking prevalence for the 15- to 24-year-old and the 25-and-older groups by province and by gender on a semi-annual basis.56

The data source used for this indicator is the Canadian Community Health Survey, in contrast with CTUMS data, which is often used by Smoke Free Ontario for provincial estimates reported by the Ministry of Health Promotion. CTUMs data are timelier with semi-annual estimates. However the CCHS allows for measuring smoking prevalence at a local level on an annual basis for public health units, which is not available in CTUMs.

Based on a review by the Canadian Tobacco Control Research Initiative, 2006, it was concluded that both CTUMS and CCHS are suitable sources for smoking indicators. While CTUMS may be considered the most appropriate choice for provincial-level data, the large sample size of CCHS makes it most suitable for examining data at a health unit level.57,58
Understanding the CCHS survey design related to measuring tobacco use is of importance when interpreting the results of this indicator. Of note, tobacco use questions are based on self-reported data and estimates are not validated via biochemical testing. However, self-reported population-based data on current smoking status have high validity when compared with measured serum cotinine levels. Self-reported data are subject to recall bias which may underestimate the proportion of current smokers in the community. Respondents may be unable to accurately report the regularity of their smoking habit. Underreporting may also occur due to social desirability bias as an associated stigma of smoking, i.e., individuals may be reluctant to identify themselves as smokers. In particular, underreporting may be relevant among pregnant women, youth, parents of small children, and young adults.

The prevalence of current cigarette smoking varies substantially among population subgroups. Factors associated with smoking prevalence include age, sex, education, socio-economic status, income, occupation, and smoking bans in the household. Other factors that have an impact on tobacco-use behaviors include social marketing campaigns, tobacco control programs, and policies regarding the taxation of tobacco, accessibility, and environmental and occupational exposure.

In the last decade, there have been reports of a decline in smoking prevalence as well as a decline of cigarette consumption in daily smokers. Smoking bans in the household have been associated with drops in smoking prevalence rates. However, while the percentage of people who smoked daily declined, the rate for occasional smoking did not. Ontario is one of the lowest prevalence provinces in Canada for smoking. Although the prevalence of smoking in Canada continues to decline, these declines have been achieved through substantial effort, and there are significant gains yet to be made.

As tobacco control activities move towards their goals of reducing smoking prevalence rates, surveillance efforts may need to focus on subgroups of smokers to evaluate specific priority populations. There has been a concern expressed over the increasing challenge of obtaining sufficient sample sizes, and of justifying the larger samples necessary, to obtain sufficient statistical power to measure these trends. A focused survey of non-daily smokers would be a difficult and expensive undertaking to obtain a sufficiently robust sample size.

Comparing smoking prevalence rates between jurisdictions requires a careful examination of the methods used to define the type of smoking and the methods used to obtain this information. This indicator is consistent with Health Indicators produced by CIHI and Statistics Canada in that smoking is defined the same way and both use the Canadian Community Health Survey as a data source. In addition, the comparable health indicator for Healthy Canadians also uses the CCHS as the data source and the same calculations specific to teens ages 12 to 19 years for their reporting.
6. Youth Lifetime Smoking Abstinence

**Definition:**

The youth lifetime smoking abstinence indicator estimates the proportion of young people age 12-19 years who have never smoked a whole cigarette.

**Data Source(s):**

**Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Weighted number of respondents age 12-19 years who have never smoked at least one whole cigarette}}{\text{Weighted total number of respondents age 12-19 years}} \right\} \times 100
\]

**Notes:**

- Based on CCHS Question SMK_01B “Have you ever smoked a whole cigarette?”
- **Numerator:** SMK_01 = No (2)
- **Denominator:** SMK_01 = Yes (1), No (2) or Not Applicable (6)
- Refusals (8) and Not Stated (9) responses were excluded

**Limitations and Comments:**

In addition to the several types of smoking, there are also several corresponding types of behaviours and definitions of non-smokers. The U.S. CDC defines a “never-smoker” as someone who has smoked <100 cigarettes per lifetime.64 A “puffer” is an individual who has just tried a few puffs of a cigarette, yet has never smoked a whole cigarette. Someone who has ever smoked a cigarette, even a few puffs, may be classified as an individual who has ever tried a cigarette. Someone who has never smoked or puffed a cigarette would be classified as a “never-smoker.” The term “lifetime smoker” refers to anyone who has ever tried a cigarette.65

The indicator presented in this report is specific to those individuals who have never smoked a whole cigarette. Therefore this calculation also includes those who may be classified as “puffers”. Those classified as “abstainers” in this indicator who are “puffers” could also be characterized as “lifetime ever smokers”. Other relevant indicators can further examine smoking abstinence in terms of “never smokers” who have seriously thought about smoking, and those “never smokers” who have never seriously thought about smoking.65

The data source for this indicator is consistent with the smoking prevalence indicators, i.e., the Canadian Community Health Survey. However, there are numerous surveys that collect tobacco use and abstinence data across Ontario and at federal levels, such as the Ontario Tobacco Survey, Rapid Risk Factor Surveillance...
Data Sources and Population Health Indicator Limitations

System (RRFSS), and the Youth Smoking Survey.\textsuperscript{55} They might be the data sources for this indicator as well but the CCHS is a valid tool that allows measurement of tobacco use at the level of the public health units, which is an important factor in selecting a data source for this report.

The RRFSS, and CTUMS all require respondents to have smoked at least 100 cigarettes in their lifetime to be considered a smoker; this is not a requirement in CCHS.\textsuperscript{54} If including a 100 cigarette condition in a youth smoking indicator, the reporting would be specific to the inclusion of established smokers to smoking prevalence; and would include various types of smoking behaviours in youth not specific to abstinence. This combination of smoking behaviours would not provide the most benefit to public health tobacco programming. Never smokers, triers, and current smokers form three separate and distinct groups for public health interventions.\textsuperscript{66} For tobacco control programming for youth, focusing on smoking abstinence is a more appropriate indicator to aid in program development and monitoring.

The data source used for this indicator (CCHS) is in contrast to the Canadian Tobacco Use Monitoring Survey often used by Smoke Free Ontario and provincial estimates reported by the Ministry of Health Promotion. CTUMS are more timely data with semi-annual estimates, however the CCHS allows for measuring smoking prevalence at a sub-provincial level on an annual basis for public health units. Based on a review by the Canadian Tobacco Control Research Initiative, 2006, it was concluded that both CTUMS and CCHS are suitable for sources of smoking indicators.\textsuperscript{57,58} CTUMS may be considered the most appropriate choice for provincial-level data, while the large sample size of CCHS makes it most suitable for examining data at a health unit level.\textsuperscript{58}

However, this indicator simply measures cigarette use and does not measure other types of tobacco products which may be applicable to tobacco use. In addition to cigarettes, other tobacco products may include cigars, pipes, chewing tobacco and snuff. Some youth may try other tobacco products in addition to cigarettes, whereas other youth may exclusively use or experiment with these non-cigarette tobacco products.

Tobacco use prevention is an important component of tobacco control strategies. Given that the CCHS is a general health survey, the questions aimed at abstinence or delayed onset of tobacco use may not be as comprehensive as surveys dedicated specifically to tobacco use. Preventing experimentation with tobacco products during adolescence is therefore very likely to result in non-smoking during adulthood. Delayed initiation of smoking is also likely to result in reduced nicotine dependency and severity of smoking during adulthood. While abstinence rates are inversely correlated with age and school grade, sample size often requires the grouping of the age groups from ages 12 to 19 in order to have a statistically significant sample size by health unit.

The CCHS survey design, in which tobacco use is measured, is of importance to its interpretation. In addition to how the measure is calculated the survey design is of importance when interpreting the results of this indicator. The tobacco use questions are based on self-reported data. Estimates of cigarette smoking are not validated via biochemical testing; however, self-reported population-based data on current smoking status have high validity when compared with measured serum cotinine levels.\textsuperscript{68,59} Self-reported data is subject to recall bias, which may underestimate the proportion of current smokers in the community. Respondents may be unable to accurately report the regularity of their smoking habit. Underreporting may also occur due to social desirability bias as given the associated stigma of smoking, individuals may be reluctant to identify themselves as smokers. Underreporting may be particularly relevant among pregnant women, youth, parents of small children, and young adults.\textsuperscript{52}
Tobacco use prevention is a key pillar of Ontario’s Smoke-Free Ontario (SFO) Strategy and is focused on preventing children and youth from starting to use tobacco industry products. Adolescence is often a time of experimentation and risk-taking. Nearly all first use of tobacco occurs before high school graduation; this finding suggests that if adolescents can be kept tobacco-free, most will never start using tobacco. People typically begin smoking during their teenage years, so the percentage of Canadians who have not started by age 20 is an indicator of future smoking rates. The onset of tobacco use generally occurs before age 18; therefore, prevention of smoking initiation among children and adolescents is a powerful strategy for preventing much of the illness and mortality associated with tobacco use.

Youth tobacco use is associated with a variety of personal, behavioural, environmental, and socio-demographic factors, including: lower self esteem, lower academic achievement, lower socio-economic status, peer smoking, use of alcohol and marijuana, living in homes with smoking bans, and access to tobacco products. Longitudinal data has indicated that Canadian youth living in smoke-free homes are much less likely to start smoking. Smoking status is also associated with increasing age in youth; younger youth are more likely to abstain from smoking (include puffing) than older youth.

In the past decade there have been significant downturns in youth smoking rates. There was a decrease in smoking trends in Canada. Increases in smoking abstinence may account for these decreases in addition to other factors like increased cessation and relapse in youth smokers.

There are several types of youth smoking and non-smoking indicators in addition to multiple sources of data that can be used to examine tobacco-related behaviours in youth. Although this indicator is not used in other comparable federal or national health indicator reporting, it is consistent with the Canadian Tobacco Control Research Initiatives framework for monitoring youth tobacco use. The comparable Health Indicators for Healthy Canadians use teen smoking prevalence which is an often reported indicator on teen tobacco use. In addition many other indicator reporting agencies and groups use a variety of tobacco use-related indicators. Given that the data source for the youth smoking abstinence indicator is the CCHS, there would be readily comparable data across both health units in Ontario, between provinces/territories, and federally. This indicator is a part of a suite of metrics that examine patterns of tobacco use across youth and the larger population.
7. Adult Heavy Drinking Episodes

**Definition:**

The adult heavy drinking episode indicator estimates the age-standardized proportion of people age 20 years and older who reported consuming five or more drinks on at least one occasion during the previous 12 months.

**Data Source(s):**

- **Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care
- **Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left( \frac{\text{Weighted number of respondents who are age 20+ years who reported consuming 5 or more drinks, on at least one occasion during the previous 12 months}}{\text{Weighted number of respondents age 20+ years who did or did not drink}} \right) \times 100
\]

**Notes:**

- **Numerator** ALC_3 = Less than once per month (2), Once per month (3), 2-3 times per month (4), Once per week (5), More than once per week (6)
- **Denominator** ALC_1 = Yes (1), No (2)
- **Don’t Know** (97), **Refusal** (98), **Not Stated** (99) responses were excluded
- **Age groups** in years used for direct age-standardization: 20-34, 35-49, 50-64, 65-74, 75+
- **Direct age-standardization** to the 1991 Canadian population

**Limitations and Comments:**

The heavy drinking episodes indicator is based on self-reported survey results of alcohol drinking habits in adults. Binge drinking is defined as five or more standard drinks for men, and four or more standard drinks for women, on a single occasion. However, the CCHS survey question specifically asks about drinking five or more drinks on one occasion. The CCHS data would therefore not be able to assess binge drinking in women using the definition of four or more drinks.

Several alcohol-use indicators are commonly used to describe population based alcohol use patterns. Indicators can include following low-risk drinking guidelines, current drinkers, former drinkers, abstainers from alcohol use, alcohol use during pregnancy, per capita alcohol consumption, drinking frequency patterns (occasionally, monthly, weekly, daily) and prevalence of alcohol-related harms (e.g., impact of drinking on relationships, injury, unplanned sexual intercourse) and characteristics of problem drinkers (e.g., age, gender, socio-economic status).
There are some criticisms of using the term heavy drinking.\textsuperscript{78,79} In particular, there are criticisms of using an alcohol-related indicator that does not measure many of the factors that may confound or be an effect modifier to the results of this heavy drinking episode. For example, there is no differentiation to other factors that may affect the effects of alcohol consumption such as time component of consumption, body size, individual tolerance, and whether or not food has been consumed.\textsuperscript{80,81} This indicator definition also does not differentiate between social drinking, drinking alone, or for self-medication, or the length of time over which drinks have been consumed.

The CCHS states the measure of one standard unit of alcoholic drink as one bottle or can of beer or glass of draft, one glass of wine or wine cooler, or one drink or cocktail with one and a half ounces of liquor. However, despite this clarification of how a standard unit of an alcoholic drink is measured, an individual may have difficulty recalling the number of units of alcoholic drinks consumed. This method of capturing units of alcohol consumption may also underestimate the magnitude of alcohol consumption as this may not account for the varying measures of alcohol in the unit of a drink.

CCHS respondents are asked about their alcohol consumption by asking if they have had 5 or more drinks in one sitting. This data is subject to recall and social desirability bias; respondents may not remember the exact details of their alcohol consumption, and may feel reluctant to report the true number of alcoholic drinks consumed, or the true number of drinking occasions. This measure therefore, likely underestimates the proportion of the population engaging in heavy drinking episodes. In addition, it is generally believed that surveys underestimate the proportion of heavy drinkers in the population due to the difficulty in reaching this population.\textsuperscript{82} The CCHS relies on self-reported data and does not complete any screening tests for alcohol dependence or validate responses by performing biochemical tests (such as urine and blood tests); however, for alcohol use patterns over the last 12 months it may be inappropriate to conduct these tests.

It may be the case that surveys underestimate the proportions of heavy drinkers more than they do the proportions of infrequent drinkers. Surveys identify relatively few drinkers who consume five or more drinks in one sitting; usually the figure is less than 10\% of those surveyed. This measure may therefore be insufficient to accurately identify the numbers of very heavy drinkers, for example those who drink 10 or more drinks per day.\textsuperscript{81,82}

There are other population-based surveys where heavy drinking use can be measured. The Rapid Risk Factor Surveillance System (RRFSS) measures alcohol use with estimates available at the health unit level. However, the questionnaire structure does not allow for a comparable heavy drinking episodes indicator. The CAMH (Centre for Addiction and Mental Health) Monitor measures both heavy drinking episodes and binge drinking episodes; however, these results are not available at the health unit level. The Canadian Addiction Survey completed in 2004 also measured heavy drinking episodes; however it was only conducted once in 2004 and is not available at the health unit level.
Alcohol is influenced by a range of social, cultural, economic, and environmental factors. Both population level influences and individual risk factors are important considerations in understanding alcohol use patterns. There are several risk factors associated with heavy drinking episodes including: age, sex, income, education, family history of alcohol use, and peer influences. Attendance at post-secondary education institution and year in college/university has also been a focus of research.

Almost 8 out of 10 Canadians drink alcohol which indicates that although alcohol use is wide-spread, there is a large difference between alcohol use and heavy drinking episodes. Heavy drinking is more likely to occur in younger adults and in men in their forties. Heavy drinking rates peak among young adults between the ages of 20 and 35 and then decline with increasing age. There is also a marked difference in heavy drinking episodes between males and females across most age groups; men are more likely to engage in heavy drinking episodes and do so more frequently than women.

Some of the sequelae (direct and indirect) associated with heavy drinking include chronic disease, injuries/ and accidents, acute health conditions, and both acute and chronic social behaviour patterns. In particular, heavy drinking is associated with increases in drinking and driving, fall-related injuries, drowning, unprotected sex, unplanned pregnancy, sexual assault, and in the longer-term, chronic diseases such as high blood pressure, stroke, liver disease, and neurological damage.

The patterns of alcohol use (quantity, frequency and regularity) required to develop alcoholism vary greatly from person to person. Drinking patterns have been suggested to be more important than the total consumption of alcohol as important indicators for alcohol dependence, thus the saliency of heavy drinking episodes for alcohol-related problems.

Given that there are several alcohol use-related indicators and data sources the examination of comparable indicators will enable the comparison of different publications and jurisdictions that report on heavy drinking episodes. Previous Statistics Canada Health Indicators reports have been consistent with the definition of heavy drinking as used here; consuming 5 or more alcohol drinks in one occasion at least once in the last 12 months. Previously, Statistics Canada considered ‘heavy drinking’ to be drinking five or more drinks on one occasion, while ‘regular heavy drinking’ was defined as drinking heavily at least 12 times in the previous 12 months. The current indicator definition differs from both of these earlier indicators with respect to the “frequency” of consuming five or more drinks.

Changes over time in how the indicator is defined makes it difficult to carry out a temporal comparison. The most recent Health Indicators report, released during the production of this report, reports heavy drinking episodes as having five or more drinks per occasion at least 12 times a year; this is consistent with the recently revised indicator as developed by APHEO. However, because the data source for this indicator is the CCHS, and because the questions asked can be used for either calculation of various indicators, it is possible to reproduce indicators for all health units in Ontario and health regions in Canada using either definition provided here.
8. Youth Heavy Drinking Episodes

**Definition:**

The youth heavy drinking episode indicator identifies the proportion of people age 12-19 years who reported consuming five or more drinks on at least one occasion during the previous 12 months.

**Data Source(s):**

- **Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care
- **Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Weighted number of respondents age 12-19 years who reported consuming 5 or more drinks on at least one occasion during the previous 12 months}}{\text{Weighted number of respondents age 12-19 years who did or did not drink}} \right\} \times 100
\]

**Notes:**

- **Numerator:** ALC_3 = Less than once per month (2), Once per month (3), 2-3 times per month (4), Once per week (5), More than once per week (6)
- **Denominator:** ALC_1 = Yes (1) No (2)
- Don’t Know (97), Refusal (98), Not Stated (99) responses were excluded

**Limitations and Comments:**

The youth heavy drinking indicator is calculated in much the same way as the adult heavy drinking indicator with the exception of the age range of the survey respondents. Other salient indicators related to youth heavy drinking include abstainers from alcohol use, average number of drinks per day, number of drinks per week, binge drinking, underage drinking, drinking and driving, prevalence of alcohol-related harms (e.g., impact of drinking on relationships, injury, unplanned sexual intercourse) and characteristics of problem drinkers (e.g., age, gender, socio-economic status (SES)).

Although binge drinking is an important clinical measure, this indicator is specific to heavy drinking episodes. Binge drinking is defined as five or more standard drinks for men, or four or more for women on one occasion. However, because the survey question in the CCHS asks specifically about drinking five or more drinks on one occasion, it is not possible to assess binge drinking in women using the definition of four or more drinks. Previously, Statistics Canada considered ‘heavy drinking’ to be drinking five or more drinks on one occasion while ‘regular heavy drinking’ was defined as drinking heavily at least 12 times in the previous 12 months. The Ontario Student Drug Use Survey defines heavy episodic drinking as having consumed five or more drinks on one occasion in the last four weeks. The CAMH Monitor and the Canadian Campus Survey define it as having five or more drinks on one occasion at least once in the past 12 months.
There are some criticisms of using the term heavy drinking.\textsuperscript{78,79} In particular, there are criticisms of using an alcohol-related indicator that does not measure many of the factors that may confound or be an effect modifier to the results of this heavy drinking episode; this may be especially pertinent for examining heavy drinking episodes in youth. For example, there is no differentiation to other factors that may affect the effects of alcohol consumption such as time component of consumption, body size, individual tolerance, and whether or not food has been consumed.\textsuperscript{80,81} In youth, these factors may be more pronounced due to smaller body sizes and less tolerance to alcohol. This indicator definition also does not differentiate between social drinking, drinking alone or for self-medication or the length of time in which a person has been drinking.

The CCHS states the measure of consumption of one standard unit of an alcoholic drink as one bottle or can of beer or glass of draft, one glass of wine or wine cooler, or one drink or cocktail with one and a half ounces of liquor. However, despite this clarification of how a standard unit of an alcoholic drink is measured, an individual may have difficulty recalling the number of units of alcoholic drinks consumed. This method of capturing units of alcohol consumption may also underestimate the magnitude of alcohol consumption as this may not account for the varying measures of alcohol in the unit of a drink.

CCHS respondents are asked about their alcohol consumption by asking if they have had 5 or more drinks on one occasion. This data is subject to recall and social desirability bias; respondents may not remember the exact details of their alcohol consumption, and may feel reluctant to report the true number of alcoholic drinks consumed, or the true number of drinking occasions. This measure, therefore, likely underestimates the proportion of the population engaging in heavy drinking episodes. Moreover, in youth, there may be additional reluctance to disclose alcohol use if it is related to underage drinking. Alternately, depending on the peer subculture, youth may exaggerate their drinking behaviour. In addition, it is generally believed that surveys also underestimate the proportion of heavy drinkers in the population due to the difficulty in reaching this population.\textsuperscript{82} The CCHS relies on self-reported data and does not complete any screening tests for alcohol dependence or validate responses by performing biochemical tests (such as urine and blood tests); however, for alcohol use patterns within the last 12 months it may be inappropriate to conduct these tests.

It may be the case that surveys underestimate the proportions of heavy drinkers more than they do the proportions of infrequent drinkers. Surveys identify relatively few drinkers who consume five or more drinks on one occasion; usually the figure is less than 10\% of those surveyed. This measure may therefore be insufficient to identify large numbers of very heavy drinkers, for example those who drink 10 or more drinks per day.\textsuperscript{81,82}

There are other population-based surveys where heavy drinking use can be measured. The Rapid Risk Factor Surveillance System (RRFSS) measures alcohol use, with estimates available at the health unit level. However, the questionnaire structure does not allow for a comparable heavy drinking episodes indicator. The Canadian Campus Survey also includes information on heavy drinking episodes in youth; however it was last completed in 2004 and focused on the population attending college or university, that is, not all youth ages 12 to 19 years.\textsuperscript{100} The CAMH Monitor measures both heavy drinking episodes and binge drinking episodes; however, these results are not available at the health unit level and the sampling frame is specific to adults 18 years of age and older.\textsuperscript{99} The Canadian Addiction Survey completed in 2004 also measured heavy drinking episodes; however it only sampled Canadians ages 15 years and over was only conducted once in 2004 and is not available at the health unit level.\textsuperscript{101} The Ontario Student Drug Use Survey samples Ontario youth from grades 7 to 12; however this data is not available at the health unit level.\textsuperscript{98}
Similar to adults, the majority of youth use alcohol. Many adolescents experiment with alcohol, and its use escalates over the teenage years. Underage drinking is not uncommon. Those who consume alcohol at an early age, by age 16 or younger, are at a higher risk of alcohol dependence or abuse.\textsuperscript{102,103}

Factors predicting heavy drinking in youth include experimentation with alcohol or cigarettes, having a majority of one's friends drink and having had poor behavioral self-control in early adolescence. In boys, positive alcohol expectancies predicted greater levels of heavy drinking later in adolescence, while in girls, friends' smoking predicted greater levels of heavy drinking later in adolescence.\textsuperscript{104} Other factors reported to be associated with binge drinking include: sex, attendance at college/university and year of study, and family history of alcohol use.\textsuperscript{80} It is also reported by Health Canada that Aboriginal youth are at two to six times greater risk for every alcohol-related problem than their counterparts in the general population, and that they begin using alcohol at a much earlier age than non-Aboriginal youth.\textsuperscript{105}

Binge drinking rates increase with age and school grade. Students who binge drink are more likely than both nondrinkers and current drinkers who did not binge to report poor school performance and involvement in other health risk behaviors such as riding with a driver who had been drinking, being currently sexually active, smoking cigarettes or cigars, being a victim of dating violence, attempting suicide, using illicit drugs, as well as being at-risk for delayed physical development. A strong dose-response relationship has been found between the frequency of binge drinking and the prevalence of other health risk behaviors.\textsuperscript{106,107,108} Individuals who were heavy episodic drinkers in adolescence were more likely to experience negative health effects (such as obesity and high blood pressure), and to have poor health practices (such as unsafe driving practices), at age 24.\textsuperscript{80} Moreover, patterns of youth heavy drinking and alcohol use may carry over into adulthood alcohol use patterns.\textsuperscript{109}

The transition between school levels for youth has also been an area of interest for examining patterns of substance use and misuse. Epidemiological research has shown that binge drinking increases in the late teens before peaking in the early 20s, and then decreasing again.\textsuperscript{110,111} College/university students are at the age with the highest prevalence of most heavy drinking and those attending post-secondary institutions are more likely to engage in heavy drinking more often than most non-attending counterparts.\textsuperscript{112}

Patterns of heavy drinking in high school youth predict heavy alcohol use in college; approximately 80% of high school heavy drinkers are likely to be post-secondary student heavy drinkers. Heavy drinking in college/university has been shown to be a continuation or escalation of earlier established drinking patterns.\textsuperscript{113} Approximately 80% of high school heavy drinkers are likely to be post-secondary student heavy drinkers.\textsuperscript{114} In post-secondary studies, heavy drinking is much more common, in particular early in the semester and orientation (i.e. “frosh week”).\textsuperscript{111,113} Although rates of daily drinking are low, when these youth do drink, heavy drinking episodes are common.\textsuperscript{115} The time during secondary and post-secondary education is an important time for education, career trajectory and self-mastery; adverse consequences of heavy drinking may jeopardize these aspects of development into adulthood.\textsuperscript{116,117}
Previous Statistics Canada Health Indicators reports have been consistent with the definition of heavy drinking as used here; consuming 5 or more alcohol drinks on one occasion at least once in the last 12 months. This is what Statistics Canada previously referred to as regular heavy drinking. However, this indicator is reported for heavy drinking episodes for the population ages 12 years and older, and not specific to youth. The most recent Health Indicators report released during the production of this report now reports on heavy drinking episodes being defined as having five or more drinks per occasion at least 12 times a year. Previously, APHEO had an indicator specific to youth heavy drinking, however now the recommended indicator is similar to that as reported by Statistics Canada. However, because the data source for this indicator is the CCHS, it is therefore theoretically possible to reproduce the same indicator for all health units in Ontario and health regions in Canada using either definition, provided that there is sufficient sample size for the jurisdiction. One of the issues of reporting youth heavy drinking at the local health unit level is insufficient sample size that often requires suppression due to reporting standards. In addition, some of the estimates that are published should be interpreted with caution due to variability in sampling.
9. Physical Activity Index

**Definition:**

The physical activity index indicator estimates the age-standardized proportion of the population age 12 years and older by level of energy expenditure in the categories active and moderately active in their leisure time physical activity.

- **Active** = respondents who average 3.0+ kcal/kg/day of energy expenditure
- **Moderately active** = respondents who average 1.5-2.9 kcal/kg/day
- **Inactive** = respondents with energy expenditure levels less than 1.5 kcal/kg/day

**Data Source(s):**

- **Numerator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care
- **Denominator:** Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Weighted number of respondents age 12+ years by physical activity index categories active and moderately active}}{\text{Weighted number of respondents age 12+ years}} \right\} \times 100
\]

**Notes:**

- **Numerator:** PACDPAI = active (1) or moderately active (2)
- **Denominator:** PACDPAI = active (1) and moderately active (2) and inactive (3)
- Excluded not stated responses (9) from denominator
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population
- Respondents were asked about their participation in various types of physical activities in the previous three-month period, as well as the frequency and duration of each activity

**Limitations and Comments:**

The physical activity index indicator is based on a series of questions assessing type and duration of physical activity for the previous three-month period. Those considered “physically active” are individuals who report active or moderately active levels of physical activity. These categories of activity, as well as inactive levels of physical activity are calculated by assessing Energy Expenditure (EE). Average EE per day is assessed using frequency and duration of each session of physical activity and the metabolic equivalent (i.e. how much energy is burned during the activity). Those with a total EE between 1.5 and 2.9 kcal/kg/day are considered “moderately active,” and those individuals with a total EE of 3.0 kcal/kg/day or more are considered “active.” Those individuals with a total EE of less than 1.5 kcal/kg/day are considered “inactive.”

\[^{30,119,120}\]
Through presenting an overall EE there is information on the amount or level of physical activity yet no information on frequency, duration, intensity, and type of physical activity. This overall level of energy expenditure does not describe the prevalence of physical activity. Using a physical activity index defines the number of individuals who are active within each category. This method is also advantageous as it may be better to detect changes in prevalence; as well, being a population-based measure allows for estimated levels of physical activity in large populations. However, the physical activity index values as presented in this indicator may not necessarily correspond to the Public Health Agency of Canada’s physical activity recommendations. The Public Health Agency of Canada’s *Physical Activity Guide to Healthy Active Living* recommends engaging in endurance activities 4-7 days a week, flexibility activities 4-7 days a week, and strength activities 2-4 days a week, accumulating 60 minutes of physical activity per day. The time needed depends on effort – as one progresses to moderate activities, the time can be cut down to 30 minutes, 4 days per week.

The types of activities included in the suite of survey questions used to assess physical activity are: walking for exercise, gardening or yard work, swimming, cycling, popular or social dance, home exercise, ice hockey, ice-skating, in-line skating or rollerblading, jogging or running, golfing, exercise class or aerobics, downhill skiing or snowboarding, bowling, baseball or softball, tennis, weight-training, fishing, volleyball, basketball, soccer, and any other physical activity. Since the survey question asks for reported physical activity in the past three months, results may be affected by the time of the survey as responses may not capture the variation of physical activity between seasons.

This indicator only captures leisure-time physical activity and does not capture occupational physical activity. Some individuals may expend a considerable amount of energy in their non-leisure time from occupational activities, school, commuting to work, or from carrying out household chores. In particular, occupational-related physical activity plays a large part of variation in health outcomes due to the substantial variation in the energy expended to earn a living.

Several different surveys assess physical activity. This indicator is based on information from the CCHS. The CCHS has replaced the cross-sectional component of the National Population Health Survey, which previously assessed physical activity comparably to the CCHS methodology. The Physical Activity Monitor (PAM), conducted by the Canadian Fitness and Lifestyle Research Institute, is a survey series that assesses physical activity in detail. Although the PAM is national, the most recent results of this survey are from 2006 and results are not available at the health unit level. RRFSS also assesses physical activity within the past week, but it is not comparable to the way physical activity is assessed in the CCHS. Both the National Longitudinal Survey of Children and Youth (NLSCY) and the Health Behaviour in School-Aged Children (HBSC) surveys include information on physical activity participation among children, additionally, the PAM also often reports on the physical activity levels of children. The Canadian General Social Survey also measures aspects of physical activity. Lastly, Statistics Canada is currently developing the Canadian Health Measures Survey which will include measures related to physical activity. Currently, the CCHS is administered every year with stable and publishable estimates available at the health unit level.

Leisure-time physical activity is based on self-reporting in the CCHS. There may be several types of bias that may affect the reported physical activity levels by the survey respondents. Recall bias may be introduced as survey respondents may have difficulty accurately recalling their activities in the past three months. Respondent and social desirability bias may also occur, as individuals may feel compelled to overestimate their physical activity.
activity levels, in particular due to the widely publicized benefits and importance of physical activity. This increased awareness of physical activity has also promoted other activities of daily living such as walking, gardening and yard work that may not have always previously been viewed as exercise. When comparing results to previous cycles, this may account for an artificial increase in reporting physical activity levels.121

The types of physical activity questions have changed between CCHS cycles. In previous CCHS cycles, soccer was not included in the suite of physical activity prompts, and in more current survey cycles it is. All activities in the “other” category (i.e., those that do not have specific prompts) are assigned an average intensity value; now that soccer is one of the prompted activities with a high intensity activity score, there may be artefactual increases in physical activity index values.127 Direct assessment of physical fitness would likely have higher accuracy and reliability than estimates based on self-report, however that may be too resource-intensive for valid population estimates.

There are a number of socio-economic characteristics associated with active leisure-time physical activity. Participation in active leisure is influenced by cultural and social attitudes.124 Individuals with more leisure time are more likely to participate in active leisure; more available time means more opportunity to do something active.124

Studies show that Canadians who engage in leisure-time physical activity are more likely to be women, be university-educated, born in Canada, living with a partner in a married or common-law relationship, to have an income of $60,000 and over, and to report that their lives had a relatively low level of time stress.124,130 Canadians living in the most urban centres are more likely to be the most active versus Canadians living in sub-urban and rural areas.131

Although leisure-time physical activity has increased in the last 20 years, it is only one small component of total waking-time activity.132,130 The trend toward automation of tasks may affect physical activity rates, as does the built environment. The volume and type of physical activity is dependant on the built environment. Although Canadians living in highly-central areas were more likely to be physically active than their counterparts, their types of physical activity have been due to active travel during their daily activities.131 In contrast, residents of suburban areas are much more apt to get their exercise by performing outside work (gardening, yard work and cleaning). The built environment, and neighbourhoods that encourage physical activity may be an important factor to encourage activity in those individuals who are less inclined to play organized sports or consciously exercise.131 It is also important to consider factors that may affect uptake or sustaining physical activity in order to meet public health goals for physical activity to combat obesity, to promote physical fitness and to improve public health.30,133 Many predictors of starting or sustaining activity were the same: sex, age, educational attainment, smoking, and sense of mastery. However, some factors were significant for one sex only. For women, deterrent factors included being overweight and the presence of children, yet not for men. Social involvement and smoking status were significant deterrents for men, but not for women.133

The physical activity index indicator is reported identically across many different reports and jurisdictions. Self-reported physical activity is one of the comparable healthy indicators in Health Canada’s Healthy Canadians: a federal report on comparable health indicators.30 This indicator is reported identically in the Health Indicators as Physical Activity during leisure time.119 Additionally, APHEO also has the Leisure Time Physical Activity Indicator (previously known as Physical Activity Index) as one of its Core Indicators.127 Lastly, the data source for this indicator is the CCHS, and therefore it is possible to reproduce the same indicator using either definition for all health units in Ontario and health regions in Canada.
10. Healthy Body Mass Index

Definition:

The healthy body mass index indicator estimates the age-standardized proportion of people age 18 years and older whose self reported height and weight denote a healthy body mass index (BMI). BMI is calculated using the person’s weight in kilograms divided by their height in metres squared. The International Standard for BMI is: <18.5 (underweight), 18.5-24.9 (acceptable weight), 25-29.9 (overweight), and 30 or higher (obese). The World Health Organization considers a BMI in the range of 18.5-24.9 to be healthy for most adults.

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI Category</th>
<th>Risk of developing health problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>Increased</td>
</tr>
<tr>
<td>“Normal or Healthy” Weight, Acceptable Weight Range</td>
<td>18.5 – 24.9</td>
<td>Least</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 – 29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class I</td>
<td>30.0 – 34.9</td>
<td>High</td>
</tr>
<tr>
<td>Class II</td>
<td>35.0 – 39.9</td>
<td>Very high</td>
</tr>
<tr>
<td>Class III</td>
<td>≥ 40.0</td>
<td>Extremely high</td>
</tr>
</tbody>
</table>

Data Source(s):

Numerator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Denominator: Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

Formula:

\[
\left\{ \frac{\text{Weighted number of respondents age 18+ years (excluding pregnant women and breastfeeding women) with BMI of 18.5-24.9}}{\text{Weighted number of respondents age 18+ years (excluding pregnant women and breastfeeding women)}} \right\} \times 100
\]

Notes:

- CCHS excludes pregnant women, as well as women age 18-49 years who did not answer the pregnancy question. The index is calculated for those age 18 years and over, excluding pregnant and lactating women, as well as persons less than 3 feet tall or greater than 6 feet 11 inches. There was an additional exclusion of women who were currently breastfeeding (MEX_05 = 1), and respondents who chose ‘Not applicable’ (96) or Not Stated (99) responses in the indicator calculation.
• **Numerator:** HWTDISW = Normal or healthy weight (2)
• **Denominator:** HWTDISW = Underweight (1), Normal or healthy weight (2), Overweight (3), and Obese (4-6)
• **Age groups in years used for direct age-standardization:** 18-34, 35-49, 50-64, 65-74, 75+
• **Direct age-standardization to the 1991 Canadian population**

**Limitations and Comments:**

BMI is the most common method for determining whether an adult’s weight is healthy. The BMI is not a direct measure of body fat, but it is the most widely investigated and most useful indicator, to date, of health risk associated with being under and overweight. BMI classifies weight into health risk categories. The system is recommended for use among Canadian adults aged 18+ years.\(^{134}\) The BMI is not applicable to pregnant or breastfeeding women, however, most tabulations of BMI include breastfeeding women because in surveys, women are generally not asked if they are currently breastfeeding. Pregnant women are not included in the BMI variable from the CCHS survey results, and therefore are not included in this indicator.

Other indicators specific to healthy weights can include waist circumference, waist-to-hip ratio to measure body fat distribution, and measures of % body fat.\(^{135}\) However, these measures are not collected for all public health units or at the population level for the province of Ontario. Prevalence of underweight, overweight and/or obese population are also other options of presenting BMI data as collected for the adult healthy BMI indicator.

Some research suggests that health risks may differ in seniors, specifically that the “normal” or healthy range may begin slightly above BMI 18.5 and extend into the “overweight” range.\(^{136}\) As such, when used in the assessment of individual seniors, BMI categories should be used with some flexibility. Special considerations are also required for young adults who have not reached full growth; adults who are naturally very lean; adults with a very muscular body build; and certain ethnic or racial groups. BMI estimates for Aboriginal people are generally higher than for the Canadian population as a whole. A study of Aboriginal people aged 19 to 50 in Ontario and the western provinces (excluding reserves) found that, in 2004, they were 2.5 times more likely to be obese or overweight as their non-Aboriginal contemporaries.\(^{137}\)

The adult BMI categories should not be used for children and adolescents. Instead, BMI-for-age is plotted on gender specific growth curves. For example, growth curves are used by health professionals to determine whether the growth of a child or a foetus is within normal limits. The growth charts currently used in Canada for height, weight and body mass index (BMI) are based on US data.\(^{138}\)

For most Canadian Community Health Survey (CCHS) cycles, BMI is based on heights and weights as reported by respondents themselves. Since people tend to underestimate their weight and overestimate their height, the values likely overestimate the prevalence of healthy body weights (and under-estimate overweight and obesity) in the population. Healthy Body Mass Index prevalence data based on physical measures would likely be lower. Self-reported weights may also differ from true weights due to a lack of information at the time of the survey (e.g., not weighed recently, poorly adjusted scale in the home). In addition, recall bias may mean that the survey participants differ from those who did not respond. BMI does not take bone density into account. BMI measures
body weight at one point in time and may not capture the risk for people whose weight has changed (a sudden increase or decrease in weight may be a signal of additional health problems). Studies estimate that obesity rates would likely be higher if calculations were based on observed data.\textsuperscript{139,140}

Healthy weight is influenced by the interaction of biological, lifestyle, social, cultural and environmental factors.

Biological factors include genetic predisposition, prenatal determinants, metabolic susceptibility, appetite control and satiety, childhood obesity, race/ethnicity, gender, and age. Another factor, low birth weight, has been associated with high BMI rates later in life.\textsuperscript{141}

Lifestyle factors that are known to have an impact on healthy weights include dietary intake and pattern, physical activity pattern, alcohol consumption and stress. Social and cultural factors are also implicated, including family life style (e.g., excessive television viewing, physical inactivity, use of labour-saving household appliances, excessive use of internet and computer games); socio-economic status; and education. Environmental factors associated with changes in BMI include the community environment, workplace, schools and food industry influences. Urban areas may limit living space and provide fewer parks, walking paths and bicycling opportunities. Urban sprawl may increase dependence on use of vehicles and positioning of elevators/escalators relative to stair access can either enhance or decrease opportunity for physical activity during daily routines. Workplace and school environments may limit access to nutritious food by providing insufficient time for lunch or by promoting use of pre-packaged lunch kits. Many workplaces involve limited physical activity. Reduced time for physical activity during school hours and increased access to vending machines, cafeterias and tuck shops also influence BMI.

Data for this indicator can also be obtained using the Rapid Risk Factor Surveillance System (RRFSS), however, it should be noted that RRFSS recommends different age categories for analysis and the survey methodology does not exclude women who are breastfeeding.\textsuperscript{142} In addition, RRFSS data is not currently available for every public health unit in Ontario. Ultimately, CCHS was chosen for this report in order to support reporting across all health units. The Canadian Health Measures Survey (CHMS) began in 2007 and, once completed, will provide physical measures of height and weight to be used to calculate actual BMI of the Canadian population. This information will complement physical measures of height and weight taken for the Canadian Community Health Survey Cycle 2.2 (2004), and will provide important baseline data and insight into the assumptions identified earlier regarding reporting biases in the CCHS. This will enable more accurate analysis of future survey data. Waist circumference (WC) is another indicator being measured by the CHMS that is often used in combination with BMI.\textsuperscript{143}

Other health indicator reports that report BMI data include \textit{Health Indicators 2009} and \textit{Healthy Canadians}.\textsuperscript{30,144} \textit{Health Indicators} reports both adult and youth BMI indicators, presented as overweight, obese, or overweight and obese in their data tables.\textsuperscript{144} \textit{Healthy Canadians} also reports the adult BMI indicator presented as all index categories, including obesity classes I to III.\textsuperscript{30}
11. Fruit and Vegetable Consumption

**Definition:**

*The fruit and vegetable consumption indicator estimates the age-standardized proportion of the population age 12 years and older that reported consuming fruits and vegetables five or more times per day.*

**Data Source(s):**

*Numerator:* Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care  
*Denominator:* Canadian Community Health Survey 2007, Statistics Canada, Ontario Share File distributed by the Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{Weighted number of respondents age 12+ years who}}{\text{Consumed fruit and vegetables five or more times per day}} \times 100
\]

**Notes:**

- **Numerator:** FVCGTOT = 5 to 10 “servings” of fruit and vegetables (2) and more than 10 “servings” of vegetables (3)
- **Denominator:** FVCGTOT = less than 5 “servings” (1), 5 to 10 “servings” of fruit and vegetables (2) and more than 10 “servings” of vegetables (3)
- Excluded if answer was not stated
- Age groups in years used for direct age-standardization: 12-19, 20-34, 35-49, 50-64, 65-74, 75+
- Direct age-standardization to the 1991 Canadian population

**Limitations and Comments:**

The measure assessing consumption of fruits and vegetables was established based on Canada’s Food Guide to Healthy Eating which was in use from 1992 to 2007. A revised guide, Eating Well with Canada’s Food Guide was released in 2007 and recommends between 4 and 10 food guide servings of vegetables and fruit per day, depending on age and gender. It is important to note that the indicator is reflective of the earlier guideline which recommended 5 to 10 servings of vegetables and fruit each day for people aged four years and older without age and gender differences.

Other examples of fruit and vegetable consumption indicators may include deriving the number of times per day fruit and vegetables are consumed in relation to the Canada Food Guide based on age and sex of the respondents. Also, fruit and vegetable consumption may be presented in percentiles to determine the distribution of fruit and vegetable consumption across the population of interest.
Five of the six Canadian Community Health Survey (CCHS) survey questions ask respondents to identify how many times in a day they have consumed fruits and/or vegetables. These questions are used as a proxy to determine the number of servings consumed. This assumption may result in an under or over estimate of the consumption of fruits and vegetables.

Although this indicator estimates the number of servings of vegetables and fruits consumed per day, it is not possible to assess the appropriateness of nutrient intake based on the questions asked of respondents and the survey design.

Individuals may have consumed several servings of vegetables at one time or only a portion of a serving and yet would still be accurate in their response to the survey question. Dietary recall has additional challenges as individuals are often unclear of their actual consumption when questioned. Estimates of fruit and vegetable intake may also be overestimated due to the social desirability of maintaining a healthy lifestyle, including diet. Also, dietary intake varies significantly on a daily, weekly and seasonal basis. The timing of the survey in conjunction with seasonal availability of fruits and vegetables or weekly schedule variations (i.e., weekend versus week day menu planning) may have significant impacts on fruit and vegetable consumption. Increased costs associated with seasonal availability of food products may also be a prohibitive factor to food security (i.e., consumption) as costs increase in autumn and winter.\textsuperscript{148,149,150}

Ethnicity is another factor that may influence the consumption of fruits and vegetables. Studies in the U.S. using the Behaviour Risk Factor Surveillance System (BRFSS) have shown significant variations amongst various ethnic populations.\textsuperscript{151} A limitation for analysis is that sample size for many ethnic groups is not large enough to yield acceptably precise estimates. Interpretation of the results for ethnic or cultural subgroups should be done with basic understandings of the respective ethnic group and culture.

Factors that have been shown to influence this indicator include age, sex, socioeconomic status (income and education levels), not smoking and healthy weights. Access to affordable and acceptable (e.g., culturally appropriate, of acceptable quality) fruits and vegetables are also a consideration when interpreting this indicator. Access to affordable fruits and vegetables has been associated with location (e.g., difficulties in very Northern and remote areas). Individuals with lower income and/or education demonstrate lower levels of fruit and vegetable consumption.\textsuperscript{152} Men consistently eat fewer fruits and vegetables than women in all age groups.\textsuperscript{153} Additional important factors associated with this indicator are BMI and rates of physical activity. Individuals with high BMIs are less likely to consume fruits and vegetables than those with low or normal BMIs. Research has also demonstrated that increased physical activity is related to increased fruit and vegetable consumption.\textsuperscript{154}

The Rapid Risk Factor Surveillance System (RRFSS) also collects information on the consumption of fruits and vegetables for some health units in the province. There are slight variations in the questions between the CCHS and RRFSS surveys. Caution is required when comparing results. Health Indicators also includes fruit and vegetable consumption in their report. Statistics Canada’s Health Indicators uses the same definition of fruit and vegetable consumption, (i.e., at least 5 times per day).\textsuperscript{155}

CCHS data was chosen for this report as information was available for all 36 health units and it is the most commonly reported data across jurisdictions in Canada.
12. Fall-Related Hospitalizations Among Seniors

**Definition:**

The fall-related hospitalization rate indicator estimates the age-standardized number of injury-related hospital separations that are due to falls in seniors age 65 years and older per 100,000 population.

**Data Source(s):**

- **Numerator:** Discharge Abstract Database, Canadian Institute for Health Information
  Distributed by Population Health Planning Database, Ministry of Health and Long-Term Care
- **Denominator:** Population Estimates, Population Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Number of hospital separations due to falls}}{\text{In those age 65+ years (2007 calendar year)}} \right\} \times 100,000
\]

\[
\frac{\text{Total population age 65+ years (2007 calendar year)}}{\text{In 2007 calendar year}}
\]

**Notes:**

- Age groups in years for direct age-standardization: 65-74, 75-85, and 85+
- Direct age-standardization to the 1991 Canadian population
- Includes Accidental Falls (ICD-10-CA: W00-W19) with external causes
- PHPDB Qualifications: Calendar Year (2007); Ages (greater than or equal to 65);
  Patient diagnosis beginning with W0 or W1 in ICD-10-CA Block Codes including diagnosis with external cause diagnoses
- IntelliHealth\Shared Reports\PHU\Fall Related Hospitalizations 65120

**Limitations and Comments:**

Fall-related hospitalizations for a specific population are a good estimate of all falls resulting in serious injury for that population. However, this data source does not capture information on injurious falls of lesser severity, which may be treated at hospital emergency departments or physicians’ offices, or falls for which medical treatment was not sought.\(^{156}\) In summary, it does not capture data for injury-related deaths occurring outside of the hospital in-patient setting.\(^{157}\) It should also be noted that an individual can be admitted to hospital more than once for the treatment of the same injury and that injury separation data are simply the numbers of discharges or deaths following admission where the primary diagnosis was coded as injury. They do not represent either the number of injuries that led to the separations or the number of injured people who separated from the hospital (i.e., a person may be hospitalized for more than one occurrence of the same injury classification or discharged from more than one hospital for the same injury event in a given period). Although the aim of this
Data Sources and Population Health Indicator Limitations

indicator is to include only falls in the community, a very small number of falls that occurred during hospital inpatient stays are included in this indicator. Other related indicators specific to fall-related events in seniors include fall-related mortality and fall-related emergency department visits.

In addition to the above mentioned challenges, the Discharge Abstract Database (DAD)\textsuperscript{158} captures all hospitalization discharges where the primary diagnosis is injury, however, in instances where there is no external cause to describe the circumstances of the event that caused the injury, the data cannot be included in this calculation (i.e., only if a fall has been identified as the external cause for the injury does the discharge contribute to the calculation of this indicator). Given the confluence of circumstances identified above, it is assumed that estimates based on data taken from the DAD will be low relative to actual rates of fall-related injuries in seniors 65 years and older.

Revisions to codes in the International Classification of Disease (changes from ICD-9 to ICD-10) greatly affected the coding of data in hospitals around the world and affected data on fall injuries.\textsuperscript{159,160} There is an important difference in the classification of falls between ICD-9 and ICD-10. In ICD-9 the ‘Falls’ section includes cases where the external cause of injury is specified as “Fracture, cause unspecified (E887).” These cases, which account for a large proportion of fatal falls among the elderly, are not classified as ‘Falls’ in ICD-10, or in the U.S. recommended framework for presenting injury mortality data.\textsuperscript{161} Additionally, ICD-10 has a greater specificity than ICD-9. Therefore, care must be taken in comparisons of data based on the two different classifications. Other data sources for fall-related injuries include self-reported data from the CCHS as well as from the Rapid Risk Factor Surveillance System (RRFSS) which is currently only available for participating health units.

In Ontario, females are more likely to be admitted to hospital due to injury than males, amongst those aged 65 years or older.\textsuperscript{162,163} The majority of injuries resulting in hospitalization in seniors are falls.\textsuperscript{164} There are many factors that may influence this indicator including biological/medical, behavioural, environmental and socio-economic factors.

As people age, there are many changes to the musculoskeletal system that might predispose an individual to falls including reductions in flexibility, strength, balance and coordination. Maintaining balance is also dependant on neurological input which may be affected by disorders such as Parkinson’s or visual changes which alter depth perception. Corrective lenses for visual changes may require individuals to learn to adjust to the change in their visual acuity. Chronic conditions such as arthritis, osteoporosis, hypotension, etc. may create challenges in meeting activities of daily living, resulting in a fall. Acute illness is often accompanied by increased fatigue and fever which may result in dizziness, postural hypotension and confusion, thereby increasing risk of falls. Physical disability, including recovery from a previous fall, diminishing touch and sensation in limbs resulting from diabetes and gait disorders can contribute to a rise in this indicator. Cognitive impairment such as dementia and memory loss also increases risks for falls.\textsuperscript{165}

The ability to perform activities of daily living is often taken for granted until an individual finds he or she is not able to perform the activities safely due to other factors such as biological or medical changes. In many instances, these activities result in falls before changes to behaviours can be adopted to modify the risk. These activities can include housekeeping chores such as vacuuming or dusting a ceiling fan by standing on a chair; home maintenance such as painting, or pruning hedges; or, something as simple as getting dressed in the morning without the aid of a chair or assistive device for balance support. Any of these activities can become risk-taking and are considered factors contributing to falls in individuals over 65 years of
age. Prescribed or over-the-counter medications designed to address illnesses may also cause dizziness or confusion and result in an increased number of falls in seniors. The interaction between medications (both prescribed and over-the-counter) may further exacerbate symptoms and create the conditions for a fall. Poor diet, inadequate physical activity and alcohol consumption also contribute to increased falls in seniors over 65 years of age.\(^{166}\)

The built environment is another factor that influences the results of this indicator. Accessibility both within and outside the home is a challenge for seniors as they age and experience increased mobility limitations. Within and around the home, stairways without railings, bathrooms without bars and loose rugs or carpets are all potential fall hazards. Clutter, storage spaces built high and furniture that is too low can create conditions that might increase the risk of fall-related hospitalizations. Inadequate lighting, uneven garden paths and slippery walkways are also high risk environments. Away from the home environment are faulty sidewalks, limited accessibility to buildings, poor lighting and long distances between sitting areas and facilities, which can create problems for individuals over 65 years. Finally, improper or inadequate use of assistive devices including canes, walkers, etc., can contribute to falls.\(^{167}\)

People who live in less affluent neighbourhoods are also at increased risk of injury due to falls than those in more affluent neighbourhoods. It is difficult to determine whether socioeconomic factors directly result in increased falls or if these factors affect the risk of falls indirectly. Indirect factors may contribute to other factors that result in increased falls. Either way, seniors experiencing socioeconomic challenges experience an increased number of falls compared to their counterparts.\(^{168}\)

The issue of falls among seniors and the impact falls have on the health care system is captured in many different ways across various health system reports. Fall-related injuries are a significant component of seniors’ well-being, independence, and the impact on their quality of life and life course. Injuries are a gateway and risk for other health conditions (hospitalizations, infections, onset of dementia), and loss of independence. Falls contribute to half of all injury-related deaths in seniors.

Fall-related mortality rates are monitored by many jurisdictions as a means of monitoring outcomes of prevention strategies. In its 2009 report, the Ontario Health Quality Council used the rate of falls among seniors (aged 65+) resulting in an emergency department visit or inpatient hospitalization (per 100 resident-years in long-term care homes in Ontario for 2002/2003 to 2007/2008) as a means of assessing the quality of care in institutions.\(^{169}\) They also assessed in-hospital hip fracture event rates, which is another related indicator. This indicator is the risk-adjusted rate of in-hospital hip fractures among acute care in-patients age 65 and older per 1,000 discharges. This indicator is often expanded in other reports, including the Health Indicators 2009 report, to assess overall hospitalization due to hip fracture events.\(^{170}\) Specifically, a fall-related indicator would include the age-standardized rate of new hip fractures admitted to an acute care hospital per 100,000 population age 65 and older.

CIHI and Statistics Canada include injury hospitalization rates and self-reported injury rates under the Health Indicators for health conditions. CIHI supports the measurement of age-standardized rates of acute care hospitalization due to injury resulting from the transfer of energy (excluding poisoning and other non-traumatic injuries), per 100,000 population using the National Trauma Registry. Statistics Canada uses the Canadian Community Health Survey (CCHS) to assess the population aged 12 and over who sustained injuries in the past 12 months serious enough to limit one's normal activities, but not including repetitive strain injury as another population-based measure of assessing the burden of injury.
13. Enteric Illnesses Incidence

**Definition:**

The enteric illnesses age-standardized incidence rate estimates the total number of reported cases of selected enteric illnesses per 100,000 population.

**Selected reporting fields include:**
- Amebiasis
- Botulism
- Campylobacter Enteritis
- Cholera
- Cryptosporidiosis
- Cyclosporariasis
- Food Poisoning, All Causes
- Gastroenteritis, Institutional Outbreaks
- Giardiasis
- Hepatitis A
- Listeriosis
- Paratyphoid fever
- Typhoid Fever
- Salmonellosis
- Shigellosis
- Trichinosis
- Verotoxin producing E.coli including Hemolytic Uremic syndrome (HUS)
- Yersiniosis

**Data Source(s):**

- **Numerator:** Integrated Public Health Information System, Ministry of Health and Long-Term Care
- **Denominator:** Population Estimates, Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Total number of new reported cases of selected enteric illnesses (2007 Calendar year)}}{\text{Total population (2007 Calendar year)}} \right\} \times 100,000
\]

**Notes:**
- Data was extracted on February 3, 2009 from the Integrated Public Health Information System
- Includes both sporadic and outbreak reportable enteric cases that met the provincial surveillance case definition
- Age groups in years used for direct age-standardization: 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90+
- Direct age-standardization to the 1991 Canadian population
Limitations and Comments:

The enteric illnesses incidence rate is a composite indicator that includes reporting on the incidence of a group of reportable diseases. Using the suite of enteric illnesses for reporting allows for much more stable rates.

There may be considerable under-reporting of actual cases for some enteric illnesses. Individuals with mild symptoms may not seek medical care or, for those who do consult physicians, laboratory testing may not be performed. Age-standardized incidence rates may be most appropriate in order to compare health units amongst peer groups or to provide comparisons to the Ontario rate due to the varying age structures of the population and due to the clinical nature of enteric illnesses having greater incidence in specific age groups.

Enteric illnesses are reported by health units using the integrated Public Health Information System (iPHIS), which was implemented in Ontario in 2005. Prior to this, data was captured by the Reportable Disease Information System (RDIS) which was first implemented in 1990. Over time, some of the disease case definitions changed, resulting in data integrity issues with time series data. With respect to enteric illnesses, new case definitions were implemented in 2009, and as such, comparisons to future enteric-related indicators should take changing case definitions under consideration.

Data comparisons across health units can be problematic because of inconsistencies in data collection and entry, and due to differing interpretations of case definitions in use across the province. Data quality is further compromised by possible duplication of cases as individuals move across various health unit boundaries. It is also possible to double count cases that have not been resolved as information is transferred between health units. However, the duplicate management system in iPHIS is expected to reduce the duplicates both within and between health units. Despite the risk of duplication of some cases, it is thought that the under reporting of enteric illnesses is of greater concern.

Factors that influence the rate of enteric illnesses include changes in population demographics and behaviours, changes in industry/technology, globalization and economic development, and changes in land use. Increased reliance on prepared foods, a proliferation of globally accessible produce and increased use of fast food are behaviours that can be linked to increases in enteric illnesses. Large scale farming and food processing, along with the impacts of globalization which provide consumers with access to foods from around the world, all contribute to increased opportunities for contamination. These same trends make it harder to trace the source of a foodborne illness than in the past, when outbreaks were usually linked to local food sources. Changes in farming practices including expanding technology and land use issues also impact on the prevalence of diseases known to cause foodborne illnesses. Higher density of animals in smaller, more condensed spaces may create opportunities for increased disease transmission between animals or humans. This increased land use density may also result in cross-contamination from other land uses such as disposal of farm refuse, other forms of farming or industrial lands that may now exist in closer proximity to each other.

Coupled with increasingly virulent strains of bacteria for some diseases, some specific groups or sectors of the population are at higher risk for becoming ill. Increases in chronic diseases and an aging population contribute to increased numbers of immuno-compromised individuals who are more susceptible to enteric illnesses and their complications. The peak incidence of enteric diseases is typically highest among children under the age of four. Young children may have higher risks because their immune systems are not be fully developed, their lower body weight may require a smaller amount of pathogens to make them ill, they have limited control over food-safety risks, and may not practice appropriate hand washing.

Young children...
are also at-risk for contracting enteric illnesses through transmission of pathogens during play by sharing of toys, touching play surfaces, and sharing food. This is particularly the case where groups of young children are in close proximity to each other such as in daycare settings, nursery schools, and day camps. Reported enteric rates for young children may also peak due to the susceptibility to first exposure, incidents being reported, and partly that medical care is quickly sought for this population.\textsuperscript{177}

Enteric illnesses incidence rates have been found to be sensitive to seasonal variations with the majority of cases occurring in the summer months.\textsuperscript{172,178} This fact is particularly important for public health units that see large increases in the population over these months and may likely impact their rates. Incidence rates of Verotoxogenic E. Coli are monitored and reported across Canada as one of the key comparable indicators, however this specific indicator grouping enteric-illnesses disease incidence is not reported.\textsuperscript{30} While enteric diseases are under reported, enteric diseases incidence rates are good indicators of risk within the community and are often used to assess the effectiveness of prevention efforts.\textsuperscript{179}
14. Respiratory Infection Outbreaks in Long-Term Care Homes

**Definition:**

The respiratory infection outbreak indicator estimates the number of confirmed respiratory infection outbreaks in long-term care homes between September 1, 2006 and August 31, 2007.

**Data Source(s):**

Integrated Public Health Information System, Ministry of Health and Long-Term Care

**Formula:**

Number of confirmed respiratory infection outbreaks in Long-Term Care homes for the 2006/2007 respiratory virus surveillance season.

**Notes:**

- Data was extracted on February 2, 2009 from the Integrated Public Health Information System.
- Indicated by selecting Long-Term Care Home option in the Exposure Setting Type Field for outbreaks in iPHIS
- Outbreaks that do not meet the case definition for a confirmed respiratory infection outbreak in a long-term care home were removed
- The report is called: List of created Outbreaks - Child Care Facilities Highlighted – for HU use
- Cognos ReportNet path: Public Folders > CRN 1.0 > Shared Communicable Diseases Reports > Management Reports > QA Reports

**Limitations and Comments:**

Respiratory infections resulting in outbreaks can be caused by many different pathogens. The number of respiratory infection outbreaks in long-term care homes is a measure of the absolute number of reported outbreaks. This indicator does not take into account the following factors: the size of the population within the facility; the demography of the population; the concentration of long-term care and acute care facilities in the geographic area; the scope of practice of the facility; types of residents; the distinction between staff and resident infections; or the number of individuals affected beyond the minimum requirements of the case definition; the number and severity of circulating respiratory pathogens in the home’s community.

This indicator does not measure the frequency of individual long-term care home outbreaks, or more importantly, the impact an outbreak may have in terms of morbidity and mortality, nor does it measure the appropriateness of response to the outbreaks. These are all important factors to consider when comparing the number of outbreaks. The validity of presenting a standardized respiratory outbreak indicator is largely dependent on the confluence of locally-driven factors. Nonetheless, this indicator does demonstrate the volume and incidence of respiratory infections and underscores the capacity needed to manage these outbreaks in a timely manner.
Respiratory infections resulting in outbreaks are reported by health units using the Integrated Public Health Information System (iPHIS), which was implemented in Ontario in 2005. Prior to this, data was captured by the Reportable Disease Information System (RDIS) which was first implemented in 1990. Over time, some of the disease case definitions changed, resulting in data integrity issues with time series data.\(^1\)

Data comparisons across health units can be problematic because of inconsistencies in data collection and entry, and due to differing case definitions in use across the province. Data quality is further compromised by possible duplication of cases as individuals move across various health unit boundaries; however this is less likely with a long-term care homes resident, than a staff member. It is also possible to double count cases that have not been resolved as information is transferred between health units.\(^1\) However, the duplicate management system in iPHIS is expected to reduce the duplicates both within and between health units. Despite the risk of duplication of some cases, it is thought that the underreporting of respiratory illnesses is of greater concern.\(^1\)

Factors impacting this indicator include proper notification of health units by long-term care homes of a possible outbreak, the control measures implemented in the facility upon suspicion of an outbreak and inconsistencies in the application of case definitions regarding what constitutes an outbreak.

The virulence of a particular strain of disease may create an atypical rate of respiratory outbreaks in a region.\(^1\) Although respiratory illnesses occur all year, there are seasonal influences when some pathogens are more prevalent, such as with influenza viruses in the winter months.

Influenza immunization may decrease the number of influenza-related respiratory infections and complications, however this change may be impacted by the degree of match between the influenza vaccine strains and the circulating strains within a flu season. Another influencing factor is the immune response of certain populations. Vaccine efficacy in the elderly can be lower than for other populations. Therefore, timing of doses provided to elderly and immuno-compromised populations in combination with the duration of circulating strains can also impact institutional outbreaks.\(^1\) This disease burden is also impacted by staff immunization rates.

While this indicator is not included in other Ontario or Canadian population health reports, other indicators that assess the incidence rates of the various pathogens that cause respiratory illness, morbidity and mortality rates associated with related diseases and rates of hospitalization as a result of respiratory disease are monitored and reported regularly within Ontario by health units, hospitals and academic institutions as a means of assessing population health.\(^1\)

While there are no other reports that identify this particular indicator, other indicators assessing the incidence rates of the various pathogens that cause respiratory illness, morbidity and mortality rates associated with related diseases and rates of hospitalization as a result of respiratory disease are monitored and reported regularly as a means of assessing population health.\(^1\) Other related indicator may include Emergency Room wait times for respiratory illness; seniors living in long-term care homes with co-morbidities; influenza vaccination rates for seniors; and, influenza vaccination rates for health professionals working in long-term care homes. If this indicator were to be measured across the jurisdictions in the future, it would largely be dependant on comparable legislative requirements for reporting infectious diseases and outbreaks, case definitions, data quality and the systems that integrate this information.
15. Chlamydia Incidence

**Definition:**

*The age-standardized chlamydia incidence rate indicator estimates the total number of reported chlamydia cases per 100,000 population.*

**Data Source(s):**

- **Numerator:** Integrated Public Health Information System, Ministry of Health and Long-Term Care
- **Denominator:** Provincial Health Planning Database, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{Total number of new reported cases of chlamydia (2007 calendar year)}}{\text{Total population (2007 calendar year)}} \right\} \times 100,000
\]

**Notes:**

- Data was extracted on February 3, 2009 from iPHIS.
- Age groups in years used for direct age-standardization: <10, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65+
- Direct age-standardization to the 1991 Canadian population

**Limitations and Comments:**

The calculation of the chlamydia incidence rate is based on reported cases of chlamydia. Reported cases of chlamydia must be confirmed through detection of *C. trachomatis* by appropriate laboratory techniques in genitourinary specimens. This indicator is specific to new reported cases of chlamydia and does not differentiate between repeat infections or describe co-infections with other sexually transmitted infections. Other related sexual health indicators are total sexually transmitted infections (STI) incidence, co-infections with other sexually transmitted or bloodborne infections, and patients who return for treatment. Screening for chlamydia and the extent of contact tracing may be considered as adjunct indicators.

Although provincial reportable disease legislation\(^{184,185}\) requires all cases of chlamydia to be reported to local public health units, it is thought that the number of reported cases underestimates the true burden of disease due to underreporting.\(^ {186}\) Ontario’s surveillance system only captures cases of chlamydia that are diagnosed and confirmed through laboratory testing and reported to the health unit.
Chlamydia infections can occur in individuals without symptoms and therefore asymptomatic cases are unlikely to be tested. Individuals that seek treatment may be more likely to present with symptoms. However, asymptomatic individuals may be diagnosed when seeking medical care for other issues (e.g. oral contraceptives, pre-natal consultations) or through opportunistic screening for chlamydia. Asymptomatic individuals may also present for testing through contact tracing performed by the public health unit.

Other factors that may affect the rates of chlamydia detection and reporting include: adolescents who may be reluctant to seek care due to embarrassment or concerns about their confidentiality; health care providers may have limited awareness of chlamydia as an issue; providers that may lack the time, knowledge and skills to manage and discuss sexual health issues.

The data source for this indicator is iPHIS. There is a legislated requirement that local public health units report all cases of chlamydia and enter case information into iPHIS in a timely manner. Comparisons across health units can be problematic because of inconsistencies in data collection and entry. Data quality is further compromised by possible duplication of cases as individuals move between health units. It is also possible to double count cases that have not been resolved as information is transferred between health units. However, the duplicate management system in iPHIS may reduce duplicates both within and across health unit boundaries. In addition, the ministry undertook an initiative to clean iPHIS data in the Fall of 2008 for STI cases reported for 2007, thereby further improving the data quality of the indicator.

Chlamydia is the most commonly reported STI in Ontario and Canada. If left untreated in women, it can cause complications such as pelvic inflammatory disease, which can lead to ectopic pregnancies and infertility. Other possible complications include transmission to newborns which may result in longer-term ocular and respiratory infections. In men, untreated infections can cause inflammation of the testicles and prostate which can also lead to infertility.

The highest incidence rate of chlamydia infections is found in young adults aged 15-24. There may be a confluence of factors for increased risk in younger adults: increased numbers of sexual partners, high-risk sexual behaviours that contribute to susceptibility, age and physiological development (in adolescence, particularly females, cervical epithelial cells are developmentally immature thus increasing susceptibility to infection). Women of childbearing age may also be screened for chlamydia while seeking medical treatment for reproductive-related care or access to oral contraceptives. Men are more likely to present for testing due to symptomatic infection.

Risk factors for chlamydia infection include new or multiple sex partners, greater number of sexual partners, inconsistent condom use, past STI infection, and presence of another STI. Other factors that may be associated with seeking treatment include the severity of symptoms and increased awareness on testing for chlamydia. Barriers to seeking treatment may be access to care locations (i.e., sexual health clinics, or primary care services), lack of information, and perceived stigma with accessing services.
In recent years, the number of reported cases of chlamydia has been increasing. The relatively higher incidence rates for chlamydia than other STI may be because chlamydia is a more sensitive indicator of change in risk behaviours and reflects the effectiveness of increased awareness of screening and testing.\(^{195}\)

Although the increase in the incidence rate may be partly due to improved detection through the use of a more sensitive diagnostic test for chlamydia that was introduced in 2001 (nucleic acid amplification test or NAAT), it is believed that the true incidence of chlamydia and other sexually transmitted infections have continued to increase.\(^{190,195}\) There has also been an increase in awareness of screening and testing for chlamydia which may lead to further case finding of infections.\(^{196}\) Other factors that may also be contributing to increased incidence rates are believed to include an increase in rates of partner notification and expanded screening efforts.

Most jurisdictions report on chlamydia incidence. It is one of the Comparable Health Indicators reported across Canada.\(^{195}\) The Ontario Health Quality Council also reports on age-standardized chlamydia rates for the province.\(^{197,198}\) There will be minor variations in reported rates of chlamydia across public health units and other jurisdictions due to several factors including data entry delays, differing cut-off dates, updates to data, the use of standardization or age-specific rates, and date of access to Statistics Canada’s population estimates.
16. Immunization Coverage for Hepatitis B

**Definition:**

The immunization coverage for hepatitis B indicator estimates the proportion of grade 7 students who have completed the immunization series against hepatitis B by the end of grade 7.

**Data Source(s):**

- **Numerator:** As reported by public health units to Public Health Division, Ministry of Health and Long-Term Care
- **Denominator:** As reported by public health units to Public Health Division, Ministry of Health and Long-Term Care

**Formula:**

\[
\left\{ \frac{\text{# of grade 7 students who have completed the immunization series against hepatitis B by the end of grade 7 (vaccinated before or during grade 7 by physician or public health) (2007/2008 school year)}}{\text{Total number of Grade 7 students (2007/2008 school year)}} \right\} \times 100
\]

**Notes:**

- Data as complete as of June 30, 2008 (2007/2008 school year) for grade 7 students (birth year 1995)
- Hepatitis B immunization is not a designated disease under the ISPA (Immunization of School Pupils Act) and therefore health units are not required to report Hepatitis B immunization rates; reporting is voluntary
- All public health units are required to report Hepatitis B coverage rates to the Ministry of Health and Long-Term Care. Some public health units also record Hepatitis B coverage rates in the IRIS reporting data system; use of this system is voluntary
- This indicator is specific to the school-based immunization program, and does not include all immunizations against Hepatitis B as administered by the public health unit (e.g., doses administered in other setting or populations/age groups, such as sexual health clinics)

**Limitations and Comments:**

This is the first time these figures have been available publicly. This indicator reflects the Hepatitis B vaccination rate that occurs through school-based immunization programs undertaken by public health units. This service delivery model is in contrast to other immunization activities in Ontario where the majority of childhood immunizations are administered by primary care professionals.

This indicator calculates the immunization status of grade 7 students, as that is the age when the public health program administers the 2 doses to students. Students who miss one or more doses in grade 7 are usually “caught-up” in grade 8 when public health nurses are visiting to immunize the next year's grade 7 students.
However, this model produces a variance in reporting structures. Some health units choose to measure coverage at the end of the school year at grade 7, where other health units may measure coverage at the end of grade 8 in order to capture students who complete the immunization cycle in this grade. This difference in practice impacts the comparability of the data across health units.

Some groups of students are underrepresented in these coverage rates, including home-schooled students, students who are immunized due to disease contact or as a travel requirement and students from communities where immunization is not culturally acceptable. Other students may refuse immunization due to the anti-immunization movement. Health units with large populations of these student groups are likely to have lower immunization rates irrespective of their effectiveness at delivering the Hepatitis B vaccine program.

At present, hepatitis B vaccination policies vary by province/territory across Canada. All provinces include some form of universal immunization, offered to all newborns or to adolescents, as well as to individuals at high risk of acquiring hepatitis B. Therefore, hepatitis B immunization rates cannot be compared to jurisdictions outside of Ontario. Along with Ontario, the provinces that offer adolescent hepatitis B immunization programs are Alberta, Saskatchewan, Manitoba, Quebec, Nova Scotia and Newfoundland and Labrador.

It should be noted that it is possible to have high immunization uptake rates and still have low immunization coverage or efficacy rates. This may be due to factors that affect the effectiveness of the immunization program, such as incomplete vaccination series, cold chain failures or vaccine that was improperly administered. Methods to confirm immunity conferred though immunization are possible and include methods such as measuring the seroprevalence of hepatitis B in a representative population. However, this method requires significant laboratory capacity and is expensive to conduct. Another possible confirmatory method would be to estimate the rate of seromarkers in the population prior to immunization, although this method is not well suited for young children.

The coverage data used in this indicator has not been independently verified. Health unit reporting on hepatitis B immunization rates is voluntary, since hepatitis B is not a designated disease under the Immunization of School Pupils Act (ISPA). Health units report hepatitis B immunization data to the ministry in a number of ways, including through the Immunization Records Information System (IRIS) and through ministry surveys. The decentralized nature of this reporting increases the likelihood of variable data quality due to the inconsistent and incomplete reporting. Therefore, caution should be used when comparing coverage rates across health units and with other jurisdictions.

Because this indicator is not reported in other performance reports, such as the Comparable Health Indicators, or within Health Indicators, there is no comparable data that can be used to compare the figures reported here. This may also be a function of the varying types of hepatitis B immunization programs implemented across other provinces and territories. Other possible public health indicators related to hepatitis B include incidence of hepatitis B, which is a reportable disease in Ontario; hepatitis B-related morbidity and mortality incidence and prevalence rates (i.e. acute viral hepatitis, liver disease); initiation and drop-out of hepatitis B immunization series; hepatitis B immunization-related adverse events; and, hepatitis B vaccine wastage.
17. Immunization Coverage for Measles, Mumps, and Rubella

**Definition:**

The immunization coverage for measles, mumps and rubella indicator estimates the proportion of school children age 7 years who are known to be complete for age for vaccination against measles, mumps and rubella.

**Data Source(s):**

- **Numerator:** Immunization Record Information System, 36 locally maintained databases shared with the Public Health Division, Ministry of Health and Long-Term Care
- **Denominator:** Immunization Record Information System, 36 locally maintained databases shared with the Public Health Division, Ministry of Health and Long-Term Care

**Formula:**

\[
\frac{\text{Number of school children age seven years who are known by the health unit to be complete for age for vaccination against measles, mumps and rubella (2007/2008 school year)}}{\text{Number of children enrolled in school (2007/2008 school year)}} \times 100
\]

**Notes:**

- Data as complete on June 30, 2008 (2007/2008 school year) for 7 year olds (birth year 2000)
- Data was extracted from IRIS, August 2008 to January 2009
- Vaccination information is collected only for children attending schools that public health units have screened
- Some children/students may not be eligible for a vaccine due to medical contraindication. This information may be collected and recorded in IRIS. However, ineligible children are not excluded from the denominator of vaccine coverage calculations since not all IRIS vaccine coverage reports summarize this information
- Children/students with exemptions (medical, philosophical, conscience or religious) or with no information are treated as incomplete

**Limitation and Comments:**

Under the *Immunization of School Pupils Act*, all children are required to have the MMR vaccine to attend a licensed school in Ontario. Children who are not immunized can be suspended from school, however enforcement of this varies across health units. Immunization information is collected only for children attending schools that the public health units screen and have jurisdiction to screen and therefore will not accurately reflect the true immunization coverage rate for the community. For example, health units only screen 'licensed' schools. Health units with high rates of unlicensed schools (home schooling, some private religious schools) may appear to have especially low vaccination rates.
Some children are not eligible for this vaccine because of medical contraindication and are considered 'ineligible'. This information can be recorded in IRIS. Because this data is not always provided, ineligible children are included in the denominator value for immunization coverage. However, this group of children is likely to be very small and thus will have limited impact on immunization coverage estimates. Other children receive exemptions from the MMR vaccine because of parental philosophical or religious objections. Health units with high rates of ineligible children or children who receive exemptions will also have lower vaccination coverage rates.

Data on MMR vaccine uptake is reported by health units into the IRIS system. Data collection is conducted retrospectively at age 7 as part of school enrolment. Thus, data for this indicator is not available in real time and reflects the children who have been immunized by age 7 only, and does not capture the children younger than age 7 who are currently immunized. As well, because IRIS is individually maintained by each health unit, time delays in records entry can also impact the validity of the data and the comparability of data across health units. Vaccination coverage data is faxed to the Ministry from the health unit, which may also cause an additional lag in the timeliness in data.

Factors that influence MMR vaccine uptake include:

- Access to care
- The acceptability of the MMR vaccine or of vaccination within certain communities
- High profile outbreaks of measles in the community
- High profile media campaigns linking the MMR vaccine to autism and irritable bowel syndrome may penetrate communities differently based on access to media material; and
- Outbreaks of vaccine preventable disease can occur when immunization rates decline.

Coverage against MMR immunization is not currently included in other major health indicator reports such as Healthy Canadians and Health Indicators. However, MMR coverage is regularly reported by health units for several purposes including program reach and effectiveness, health status, program planning, and for enforcement of school suspension. Other relevant immunization specific indicators may include incidence of measles, mumps and rubella, which are reportable diseases in Ontario; measles, mumps, rubella related morbidity and mortality incidence and prevalence rates; adverse events following immunization (AEFI) with MMR vaccine; MMR vaccine wastage rate; Diphtheria, Polio and Tetanus (DPT) immunization rates in children; influenza immunization rate; and vaccine wastage.
18. Adverse Water Quality Incidents

**Definition:**

Number of Adverse Water Quality Incidents from Drinking Water Systems subject to O.Reg 170/03/O. Reg 252/05 and unregistered Drinking Water Systems for the 2007 Calendar year.

**Data Source(s):**

Drinking Water Programs Branch, Ministry of the Environment

**Formula:**

Number of Adverse Water Quality Incidents from Drinking Water Systems subject to O.Reg 170/03/O. Reg 252/05 and unregistered Drinking Water Systems for the 2007 Calendar year

**Notes:**

- Exceedences from schools and day cares subject to O.Reg 243/07 not included in this summary
- O. Reg 170/03 is specific to Drinking Water Systems included year round residential systems as well as designated facilities including schools, daycares and nursing homes
- O. Reg 252/05 is specific to Non-Residential and Non-Municipal Seasonal Residential Systems that do not serve Designated Facilities. These are also considered small drinking water systems

**Limitations and Comments:**

The adverse water quality incidents (AWQI) indicator is based on the reported number of AWQI in regulated drinking water systems, as reported by licensed laboratories to local public health units and the Ministry of the Environment.

There are several regulations that relate to different types of drinking water systems in Ontario, under the *Drinking Water Systems* regulation (O.Reg. 170/03) and the *Non-Residential and Non-Municipal Seasonal Residential Systems That Do Not Serve Designated Facilities* regulation (O. Reg. 252/05). These two regulations apply to the majority of drinking water systems in the province, and require the reporting of adverse water quality incidents.

O. Reg. 170/03 regulates municipal and private water systems that provide water to year-round residential developments and designated facilities that serve vulnerable populations such as children and the elderly. Designated facilities include children's camps, child and youth care facilities, health care and social care facilities, and schools (including private schools).
Non-Residential and Non-Municipal Seasonal Residential Systems That Do Not Serve Designated Facilities

Regulation O. Reg 252/05 is specific to primarily smaller water systems including non-residential systems in municipal and public facilities as well as seasonal residential systems (e.g., campgrounds and trailer parks).

The indicator data is reported by licensed laboratories to the operator, their local public health unit and to the Ministry of the Environment through the Spills Action Centre (SAC). Data quality depends on compliance with the reporting requirements contained within these regulations, and relies on both operators and health units having appropriate reporting practices in place.

O. Reg 170/03 specifies that when adverse test results are obtained from a licensed laboratory, immediate verbal and written notice must be provided to the owner/operator, the local Medical Officer of Health and the Ministry of the Environment. This reporting obligation is imposed upon the owner/operator of the drinking water system, as well as upon the laboratory that performed the testing. When there is receipt of a report of an adverse drinking water quality incident, there are specific tools and processes in place to address the issue.

The purpose of reporting adverse drinking water incidents is to protect users from being exposed to unsafe water, as well as to provide information on the quality of drinking water. There are wide variations in the size and complexity of the drinking water systems that fall under the drinking water regulations. These variations have a direct bearing on the frequency of water sampling and testing.

The Chief Drinking Water Inspector's Annual Report for 2007-2008 reports that Ontario's drinking water regulations require testing based on a strict set of health-based standards which provides Ontario with a drinking water safety net. Most jurisdictions do report on various drinking water quality measures, and although the regulatory framework is not identical, the data from different jurisdictions may be somewhat comparable.

An alternative indicator would be to report on the number of adverse drinking water notifications. However this approach would require the development of a consistent approach to data collection and reporting to the ministry.
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Data Sources and Population Health Indicator Limitations


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