

IN THIS ISSUE**Trends In Adolescent Pregnancy
In Ontario, 1981-1997**

University of Toronto.

COMMUNIQUÉ

Benchmarking in Public HealthOntario Public Health
Benchmarking Steering
Committee**Statistics**

- April 2001
- 1st Quarter 2001

Erratum

The article in the May 26, 2001, Volume 12, Number 5 issue of PHERO entitled "Descriptive Analysis of Endemic Cryptosporidiosis Cases Reported in Ontario 1996-1997" should have included the following statement: "Reprinted from the Canadian Journal of Public Health 2001;92(1):62-66 with permission from the publisher. All rights reserved."

PHERO apologizes for this omission.

The Public Health and Epidemiology Report Ontario is published monthly, by the:

Public Health Branch
Ministry of Health and Long-Term Care
8th Floor, 5700 Yonge Street,
Toronto, Ontario, M2M 4K5
Telephone (416) 327-7090
Facsimile (416) 314-7078
Email: Tracy.Collura@moh.gov.on.ca

Editorial Board: C. D'Cunha, G. Kettel, K. Kurji
Editor: Tracy Collura

The contribution of scientific articles by the staff of local Boards of Health is invited. Address all inquiries and submissions to the Editor.

Submission of articles to PHERO does not preclude publication elsewhere. The material in this publication does not necessarily reflect the policies of the Ministry of Health and Long-Term Care. It can be reprinted without permission, provided the source is credited.

ISSN 1181-960X

**TRENDS IN ADOLESCENT
PREGNANCY IN ONTARIO, 1981-
1997****Introduction**

Adolescent pregnancy is a complex issue, involving physical, psycho-social and financial factors. An increased risk of adverse reproductive outcomes in teen pregnancy (e.g., including low birth weight and preterm births), independent of socioeconomic status, has been well documented in the literature.^{1,2} Health risks to teen mothers, such as poor weight gain and pregnancy induced hypertension have also been reported.³ Psycho-social issues related to a lack of support systems, readiness for parenting and loss of educational and/or employment opportunities⁴ have both short and long term implications on the health and well-being of children born to teen mothers. In addition, the financial ramifications of teen motherhood, including costs to the health care system, define teen pregnancy as an important public health issue.

Despite reductions in national and provincial teen pregnancy rates over the last twenty- five years, this issue remains a challenge for the public health sector. In Ontario, a goal to reduce the teen pregnancy rate to 40 per 1,000 population by 2005 was established in late 1997, as part of the provincially mandated sexual health program.⁵ The on-going examination

Mailing Label Goes Here

of trends in provincial teen pregnancy rates is therefore necessary to assess progress towards achieving this goal. This information may also assist in evaluating the impact of adolescent pregnancy prevention programs implemented through local public health units, in addition to directing the planning of on-going and future preventive programs as well as resource and fund allocation.

The objective of the present report was to examine trends in provincial teen pregnancy rates from 1981 to 1997, and to discuss potential contributory factors. For the purposes of this report, definitions of terms⁶ have been included in Table 1.

Data sources

Information regarding live births, stillbirths and abortions among females aged 15 - 19 years was obtained from numerous sources. The number of teen live births and stillbirths was obtained from the Health Planning System (HELPS) database of the Public Health Branch, Ministry of Health and Long-Term Care (MOHLTC).⁷ Prior to 1992, information regarding all hospital therapeutic abortions in Canada and the United States was collected nationally by Statistics Canada as a means of monitoring abortion law and national trends in service utilization. Although the reporting of abortion data from hospitals is voluntary, these data are considered to be relatively complete. Following the implementation of free standing clinics in Ontario in 1992, clinic therapeutic abortion data became available, and were provided to the Finance and Information Management Branch of the MOHLTC. The reporting of clinic abortions is required as a condition of licensing, therefore this data source is assumed to be complete. In 1995, the abortion data collection responsibilities were transferred from Statistics Canada to the Canadian Institute of Health Information (CIHI). These data are supplied to CIHI by provincial/territorial ministries and private clinics in Canada and states in the USA. In 1998, abortion data were sent directly to CIHI from hospitals, and was then provided to provincial/territorial ministries. Population estimates were obtained from Statistics Canada, and provided through the HELPS database.

Data Limitations

Numerous limitations within the data sources used must be acknowledged. In regard to live birth data, a recent investigation revealed that a number of live births were

under-reported in the provincial vital statistics data base between 1991 and 1997.⁸ The number of unregistered births among females under 20 years of age was disproportionately higher than in women aged 20 years and older, having direct implications on the statistics included in the present report. With respect to stillbirths, data quality concerns were identified with 1991 statistics⁶, but were not reflected in teen stillbirth data (likely due to the small number of events in teens). Therefore, these figures were included in the present report. In addition, there is a small potential for stillbirths to be coded as abortions as the cause of fetal

Table 1. Definitions

- Teen pregnancy: total number of live births, therapeutic abortions and stillbirths to females aged 15-19 (calculated at the end of pregnancy)
- Teen pregnancy rate: the number of live births, stillbirths and therapeutic abortions to women aged 15-19 per population women aged 15 - 19 in a year⁶
- Teen fertility rate: the number of live births to women aged 15-19 relative to the number of women aged 15-19 in a year⁶
- Therapeutic abortion: induced abortion (termination of pregnancy)
- Teen abortion rate: the number of therapeutic abortions (TAs) in hospital and clinic to women aged 15-19 relative to the number of women aged 15-19 in a year⁶
- Teen abortion ratio: the number of abortions to women aged 15 - 19 per number of live births to women aged 15- 19⁶
- Still birth: product of conception weighing 500 grams or more or of 20 or more weeks gestation which, after being completely delivered shows no signs of life⁶
- Teen stillbirth rate: the number of stillbirths per stillbirths and live births to women aged 15-19 per year⁶

Source: Provincial Health Indicators Working Group. Provincial Health Indicators. Available online: www.cehip.org/apheo.

death, having implications on data accuracy. With respect to therapeutic abortions, quality issues have again been identified with the currently available (1996, 1997) data. Discussions are in progress within the MOHLTC to resolve these issues. The number of abortions performed in clinics became available only after 1992, therefore the number of pregnancies between 1981 and 1991 have been under-counted. Further, due to confidentiality restrictions, abortion data are provided to the Public Health Branch in semi-aggregate form, limiting the ability to which they may be manipulated and analyzed. Therefore, it was not possible to examine the numbers/rates of hospital vs. clinic abortion procedures in the present report. It should also be noted that data regarding therapeutic abortions pertain to the calendar year in which the abortion occurred, rather than the year of conception. Similarly, the teen pregnancy rate reflects the age at the end vs. the beginning of pregnancy, therefore most women who were aged 19 at conception would be excluded from present data. Statistics on Ontario residents who give birth out-of-province (including stillbirths) are not maintained provincially, and were therefore not available for the present analysis. The exclusion of the number of out of province abortions is also noteworthy. Although the number of abortions obtained in the United States by Ontario residents has likely decreased, particularly after the implementation of free-standing clinics in 1992, access to abortion services has remained an issue in certain provincial regions (i.e., Northern Ontario). Finally, there is a paucity of provincial data related to trends in teen sexual behaviour and contraceptive practices, as well as evaluative research related to preventive programs. It was therefore not possible to determine accurately the impact of these factors on the observed teen pregnancy trends.

Data Analyses

The total number of teen pregnancies was calculated annually as the sum of live births, abortions and fetal losses. The teen pregnancy rate was calculated as the number of pregnancies among females aged 15 - 19 per 1,000 population. The teen abortion rate was calculated as the number of abortions among females aged 15 - 19 per 1,000 population. The teen abortion ratio was calculated as the number of abortions per number of live births among females aged 15 - 19.

The teen fertility rate was calculated as the number of live births among females aged 15 - 19 per 1,000 population. The teen stillbirth rate was calculated as the number of stillbirths per number of live births and stillbirths to females aged 15 - 19. The proportion of teen pregnancies among all pregnancies was calculated as the number of pregnancies among females aged 15 - 19 divided by the number of pregnancies among all females.

Results

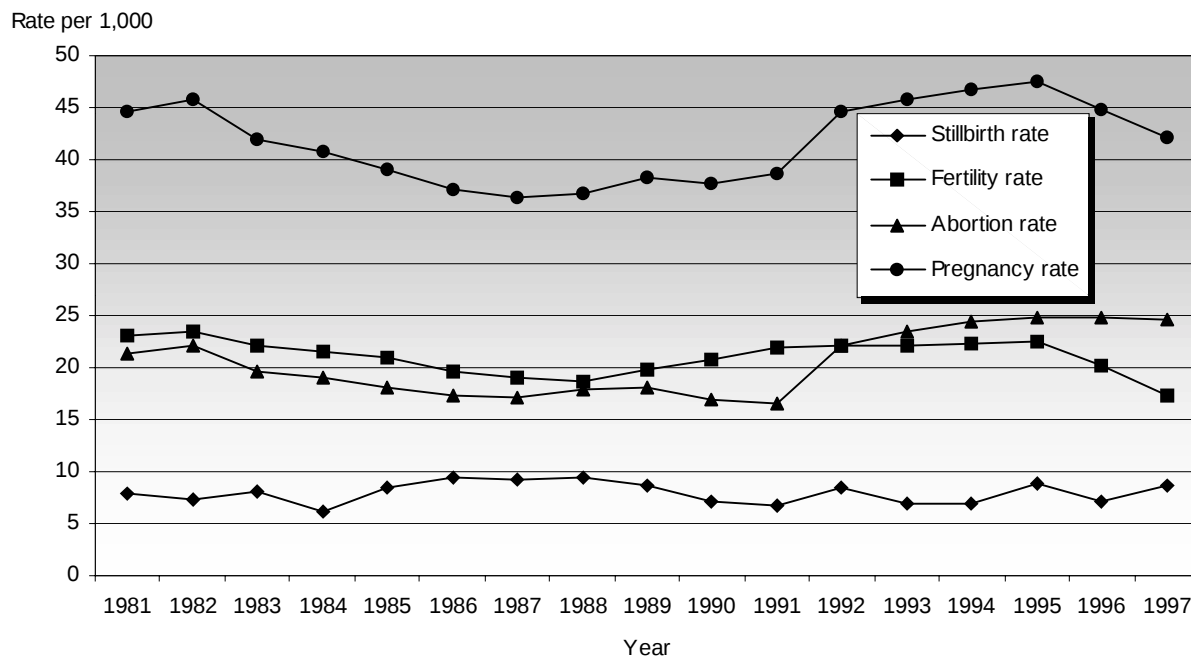
Figure 1 illustrates the rates of pregnancy, fertility, abortion and stillbirth among teenaged women in Ontario, from 1981 to 1997. Following a slight increase between 1981 and 1982, the teen pregnancy rate declined substantially between 1982 (45.7 per 1,000) and 1987 (38.4 per 1,000), representing a 20% decrease over five years. After remaining fairly constant until 1991 (38.7 per 1,000), the rate increased to 44.6 per 1,000 in 1992, and continued thereafter until 1995 (47.4 per 1,000). Provincial teen pregnancy rates have since declined to 41.7 per 1,000 in 1997, the most recent year for which Ontario statistics are available.

From the period 1981 to 1987, a decline in both fertility and abortion rates among teens was apparent. A gradual increase in the teen fertility rate was demonstrated between 1988 (18.7 per 1,000) and 1995 (22.5 per 1,000), decreasing thereafter to 17.3 per 1,000 in 1997. The teen abortion rate remained relatively constant between 1988 (17.8 per 1,000) and 1991 (16.6 per 1,000). A substantial increase in the teen abortion rate occurred between 1991 and 1992 (22.1 per 1,000). Following a gradual increase to 1994, the abortion rate has remained fairly constant. The teen fetal loss rate has been subject to a small amount of variation between 1981 to 1997, ranging between 6.2 and 9.3 per 1,000.

The number of teen pregnancies, live births, abortions, stillbirths and the abortion ratio are listed in Table 2. The total number of pregnancies declined between 1981 (17,639) and 1987 (12,757). Between 1990 and 1995 the number of teen pregnancies in Ontario rose from 13,179 to 16,450. In 1997, the number of teen pregnancies decreased to 14,917.

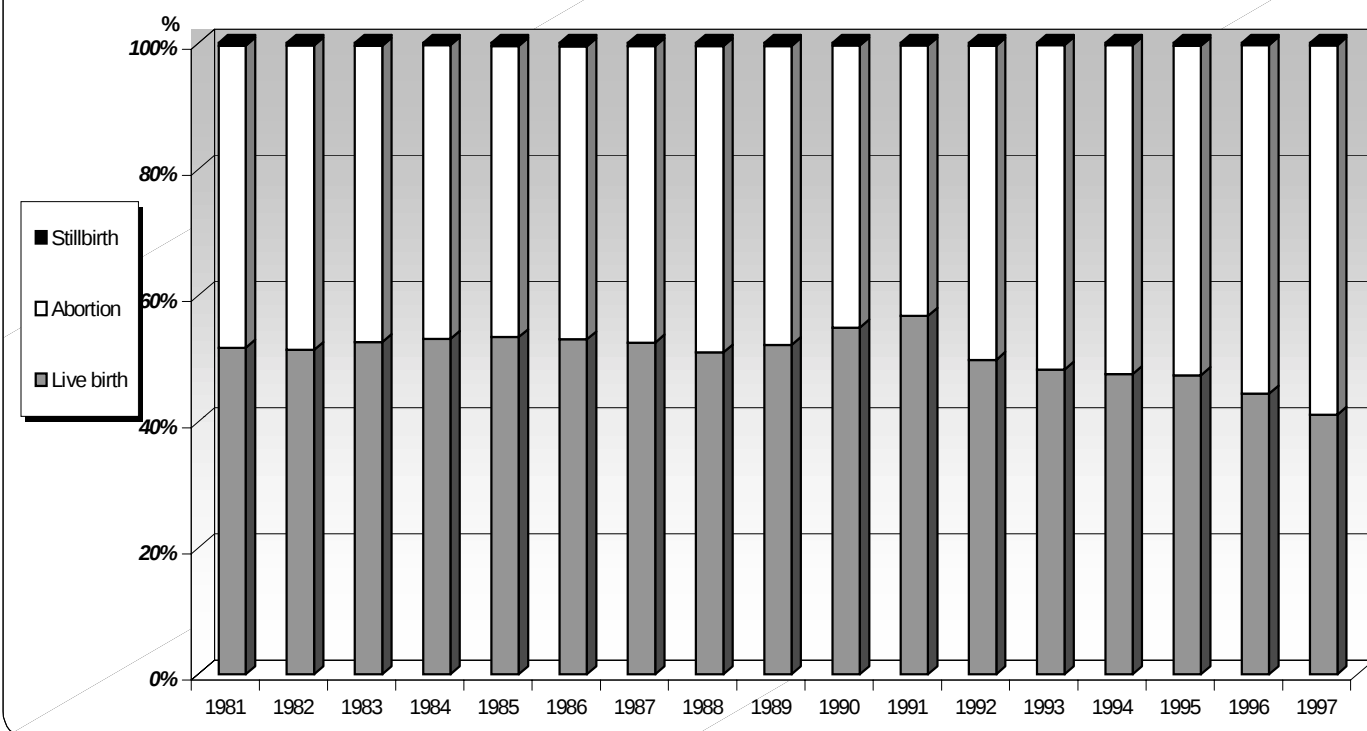
Figure 2 depicts the pregnancy outcomes of women aged 15 -19 from 1981 to 1997. The proportion of pregnancies ending in live births remained relatively stable between 1981 (51.7%) and 1988 (50.9%). This proportion increased to 56.8% in 1991, and has since

**Figure 1. Pregnancy, fertility, abortion and stillbirth rates of females aged 15 - 19
Ontario, 1981-1997**



Source: HELPS data base, Public Health Branch, Ontario Ministry of Health and Long-Term Care.

**Figure 2. Proportion of pregnancies ending in live birth, abortion and stillbirth in females aged 15 - 19
Ontario, 1981-1997**



Source: HELPS data base, Public Health Branch, Ontario Ministry of Health and Long-Term Care.

declined to 41.1% in 1997, representing a 27.6% decrease over six years. The proportion of pregnancies ending in abortion also remained relatively constant between 1981 (47.8%) and 1988 (48.5%). Between 1988 and 1991, this proportion declined to 42.8%, increasing thereafter to 58.5 % in 1997. In 1992, the proportion of teen pregnancies ending in abortion exceeded that of live births for the first time, and the teen abortion ratio has since remained over 1.0 (Table 2). With respect to all pregnancies among women residing in Ontario, the proportion of teen pregnancies declined markedly between 1981 (11.5%) and 1990 (7.2%) (Figure 3). This proportion increased to 8.1% in 1994, and remained fairly constant up to 1997 (8.2%).

According to a recent national report, the teen pregnancy rate in Canada declined from 1994 to 1997, reflecting lower teen fertility and fetal loss rates.⁹ The number and rate of abortions among females aged 15 to 19 in Canada now exceeds the number and rate of teen pregnancies, and is consistent with Ontario's trends. In 1997, the national teen pregnancy and abortion rates were 42.7 and 21.5 per 1,000 population⁹ respectively. Ontario's pregnancy rate was slightly below the national rate, whereas the provincial abortion rate was slightly higher.

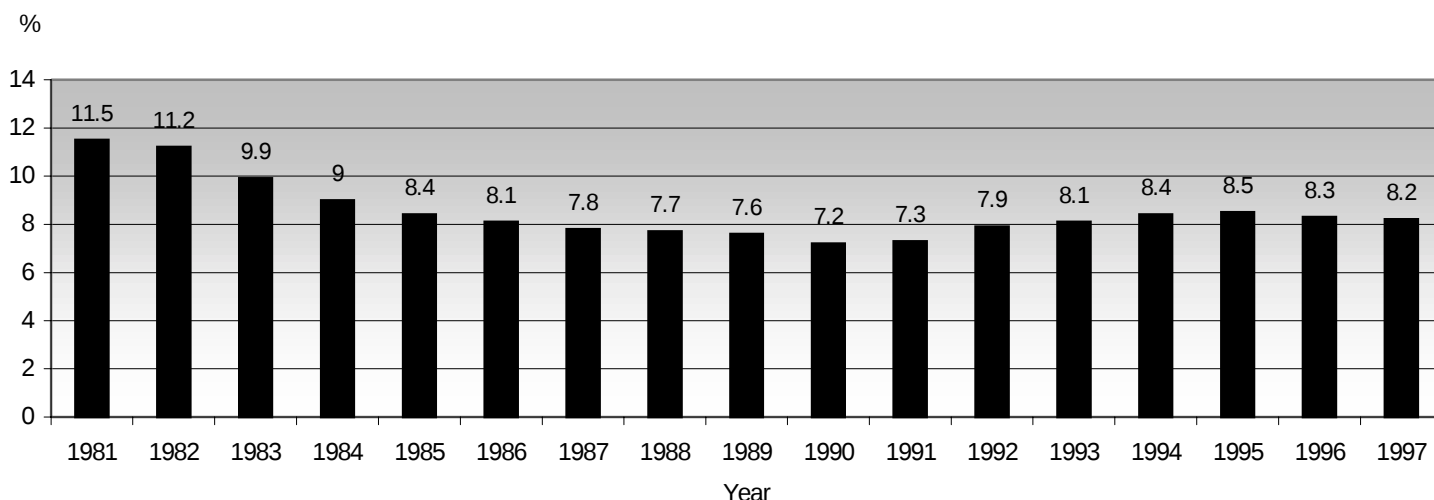
Discussion

Overall, the data indicate a declining trend in the provincial teen pregnancy rate from the early to late eighties, followed by an increase between the late eighties and the mid nineties. Ontario's teen pregnancy rate then declined by approximately 12% between 1995 (47.4 per 1000) and 1997 (41.7 per 1000). Teen fertility rates also declined between 1995 and 1997, whereas the teen abortion ratio increased from 1.10 in 1995 to 1.42 in 1997. The observed provincial trends paralleled national rates during this time period, although provincial rates have remained under the national rates. Several factors may have contributed to the observed provincial trends.

Adolescent Pregnancy Prevention Efforts in Public Health Units/Departments

Sexual health programs implemented through public health units/departments play a paramount role in adolescent pregnancy prevention. Consistent with the two step approach to healthy sexuality, numerous efforts have focused on delaying the onset of sexual activity followed by education regarding safer sex practices when intercourse begins. Focused efforts in sexual health education during the late seventies and early

Figure 3. Percentage distribution of teen pregnancies among total female population Ontario, 1981-1997



Source: HELPS data base, Public Health Branch, Ontario Ministry of Health and Long-Term Care.

Table 2.
Number of pregnancies, live births, abortions and stillbirths among females
aged 15 - 19: Ontario, 1981-1997

Year	Pregnancies	Live births	Abortions	Abortion Ratio	Stillbirths
1981	17,639	9,127	8,440	0.92	72
1982	17,529	9,003	8,460	0.94	66
1983	15,466	8,137	7,263	0.89	66
1984	14,460	7,684	6,728	0.88	48
1985	13,471	7,195	6,214	0.86	62
1986	13,011	6,903	6,043	0.88	65
1987	12,757	6,703	5,992	0.89	62
1988	12,905	6,579	6,264	0.95	62
1989	13,477	7,030	6,385	0.91	62
1990	13,179	7,238	5,889	0.81	52
1991	13,342	7,572	5,719	0.76	51
1992	15,280	7,610	7,605	1.00	65
1993	15,692	7,574	8,065	1.06	53
1994	16,116	7,662	8,401	1.10	53
1995	16,450	7,791	8,589	1.10	70
1996	15,767	7,009	8,708	1.24	50
1997	14,917	6,132	8,732	1.42	53

Source: HELPS database, Public Health Branch, Ontario Ministry of Health and Long-Term Care.

eighties, resulting from a prevention approach may explain the corresponding decline in rates. In the wake of the AIDS epidemic during the mid to late eighties, the diversion of resources within sexual health programs from family planning to AIDS/HIV prevention may have contributed, in part, to the corresponding increase in rates.

The observed increasing trend in the nineties, led to qualitative investigations involving adolescent participants. Programmatic gaps in service provision, related to both the quality and quantity of information provided were identified.^{10,11} In addition to the lack of awareness among adolescents regarding public health units as a resource for sexual health information, significant barriers to receiving sexual health information, including a lack of accessibility and the cost of birth control methods have been reported.¹¹ Geographical barriers, particularly in remote provincial regions may also limit access to sexual health information and services. These combined factors may have

negatively influenced teen pregnancy rates. While significant progress has occurred in many local municipalities, these reports suggest sub optimal use of health units as a sexual health resource, and the need for increased collaboration with the educational system.

At present, there is paucity of evaluative research regarding the effectiveness of preventive programs in sexual health. A recent systematic review of twenty international randomized controlled trials of adolescent sexual health programs identified several methodological limitations in the research conducted to date and the need for more rigorous design and investigation of multi-component programs in Ontario.¹² Although many of these studies were based on poorly designed evaluations, findings revealed that programs demonstrating effectiveness in delaying the onset of sexual activity, improving birth control use and reducing pregnancy rates were substantial in duration, theory-based and involved adolescent participants in program planning.

Sexual Health Education

Progress in the widespread implementation of sexual health education within Ontario school boards may have contributed to the observed trends. Due to their potential to reach a large number of adolescents and the conducive learning environment, schools are vital for sexual health education. To date however, collaborative efforts between school boards and public health units have been sub optimal. Sixteen years after the implementation of a sexual health program in Ontario, Orton and Rosenblatt (1993) found that school boards and community services lagged behind public health units in the provision of minimal core programs.¹³ Since then, efforts including the establishment of policy support from the ministries of health and education through the provincially mandated sexual health program,⁵ and the new Ontario Curriculum, Grades 1-12 (1998),¹⁴ have contributed to progress in this area. While an on-going challenge has been optimizing the comfort level among both students and professionals (i.e., teachers, nurses) in terms of providing and receiving the information in academic settings,¹⁰ survey research indicates that a large majority of parents and students endorse school based sexual health education.¹⁵ However, despite these advancements, the lack of universal implementation of sexual health education in all provincial schools may have a negative impact on adolescent pregnancy rates. A recent national report examined the status of sexuality and HIV education within schools and the public health sector. Among other findings, the report identified the need for sustained program support, improvements in coordination and communication, and clarification of goals and roles within the two systems.¹⁶

Sexual Health and Contraceptive Practices

The observed trends in teen pregnancy rates may also be attributable to changes in teen sexual health and contraceptive practices. According to the 1996/97 Ontario Health Survey, 41% of respondents aged 15 - 19 years were sexually active, 27% of whom had more than one sexual partner within the last year.¹⁷ Methodological differences in the collection of provincial data regarding adolescent sexual behaviour and contraceptive practices during 1981 to 1997 did not facilitate temporal comparisons or the measurement of their impact on the observed rates. However, universal access to sexual health education and contraception was demonstrated

to be effective in reducing teen pregnancy rates in Finland.¹⁸ Recently, worldwide and nationwide efforts have focused on increasing awareness and access to emergency contraception (EC). Increased availability and uptake of this second line of protection from unwanted pregnancy, in addition to condom distribution programs may partially explain recent declining trends in Ontario. In the spring of 2001, the Ontario Women's Health Council plans to implement a two-year, pharmacy-based, pilot effort to increase awareness, access and uptake of EC in the Toronto area.

Access to Abortion Services

Increased access to abortion services, particularly free-standing clinics, has contributed to changes in teen pregnancy rates. With the implementation of provincial funding to clinics in 1992, young women benefited financially, and through the provision of privacy and clinical support. Consequently, the number and proportion of pregnancies ending in abortion has increased dramatically over the last five years. In particular, between 1991 and 1995, the increasing trend in teen pregnancy rates was likely reflective of the increase in abortion rates during this time. More recently, the French abortion pill, RU-486 (mifepristone), has been subject to investigation in Canada through a clinical trial involving four cities (Montreal, Sherbrooke, Toronto and, Vancouver). Although this agent was approved for use by the United States Food and Drug Administration in October, 2000,¹⁹ it has not yet received a notice of compliance in Canada. The licensing of RU-486 would have numerous implications. The availability of a safe alternative to surgical abortion would result in increased access to abortion services. However, negative implications may include decreased use of contraception, on-going safety concerns for physicians providing the drug, and on-going opposition from pro-life organizations. If not approved, a number of women might resort to obtaining this service in the United States.

Other Factors

Additional factors may have contributed to the observed trends. The recession during the mid-nineties had a substantial impact on teen unemployment and poverty rates and may partially explain the corresponding increase in teen pregnancy rates. Changes in social service provision during this time, affecting welfare

and other family benefits may have also contributed to the observed increasing trend. Finally, artifactual influences, including the underreporting of births from 1991-1997, and abortion data quality concerns with the 1996 and 1997 statistics, could be reflected in the present report.

On-going influences within both the provincial and municipal government are anticipated. Recently, transfers in governmental funding from 100% provincial to a cost-shared system with the municipalities has occurred, which may have implications for sexual health programs in terms of service provision, budgets and evaluation.²⁰ The impact of these funding transfers should be monitored as the sexual health program is implemented by Boards of Health according to the Mandatory Health Programs and Services Guidelines.

In summary, after a gradually increasing trend in teen pregnancy rates from the late eighties to the early nineties, provincial teen pregnancy rates appear to be declining. If this trend continues, the provincial goal of decreasing the teen pregnancy rate to 40 per 1,000 by 2005 will likely be realized. This issue is complex, and numerous solutions, including, on-going collaborative efforts between the public health and educational sectors, involvement of adolescents in program development and the continued provision of accessible, comprehensive services will be required to achieve and maintain programmatic goals. Further research regarding provincial trends in adolescent sexual health practices and sexual health program evaluation is also warranted.

ACKNOWLEDGEMENTS

The author wishes to acknowledge the significant contribution of Brenda Perkins (Public Health Branch, Sexual Health Program, MOHLTC) for her feedback and direction throughout the preparation of this report. Gratitude must also be expressed to Dr. Evelyn Wallace (Public Health Branch, STD/AIDS/Sexual Health Unit) for her contributions, and the Population Health Service Staff (Elizabeth Rael, Chee Wong and Dr. Eng-Soon Chan) for their assistance with vital statistics and abortion data.



SOURCE

Ruth Diaz, BSc.,
MHSc (candidate), Community Health and Epidemiology,
University of Toronto.

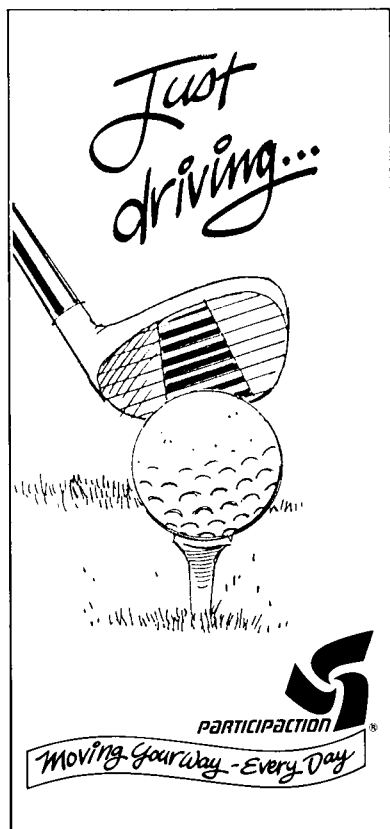
CONTACT

Brenda Perkins, RN, BScN, MHSc
Senior Consultant, Sexual Health Program
Disease Control Service
Public Health Branch

REFERENCES

1. Reichman NE, Pagnini DL. (1997). Maternal age and birth outcomes: data from New Jersey. *Family Planning Perspectives*; 29(6): 268-272.
2. Fraser AM, Brockert, JE, Ward RH. (1995). Association of Young Maternal Age with Adverse Reproductive Outcomes. *New England Journal of Medicine*; 332 (17): 1113-7.
3. Stevens-Simon C, White M. (1991). *Adolescent Pregnancy. Pediatric Annals*; 20: 322-331.
4. Wadhera S, Strachan J. (1991). Teen pregnancies, Canada, 1975-1989. (Statistics Canada, Catalogue no. 82-003-XPB). *Health Reports*; Vol 3(4): pp 327-346.
5. Ministry of Health and Long-term care, Ontario. Mandatory Health Programs and Services Guidelines, December, 1997.
6. Provincial Health Indicators Working Group. Provincial Health Indicators. Available online: www.cehip.org/apheo.
7. Health Planning Service (HELPS) data base. Public Health Branch, Ontario Ministry of Health.
8. Bienefeld M, Woodward GL. (2001). Underreporting of live births in Ontario: 1991-1997. Central East Health Information Partnership. (unpublished).
9. Dryburgh H. (2000). Teen pregnancy. (Statistics Canada, Catalogue no. 82-003-XPB). *Health Reports*; Vol (12)1: pp 9 - 19.
10. Haldimand-Norfolk Regional Health Department & Regional Niagara Health Department. (1998). Completing the Picture: Adolescents Talk About What's Missing in our Sexual Health Services.
11. Region of Ottawa-Carleton Health Department, Eastern Ontario Public Health Unit., Renfrew County & District Health Unit, Kingston, Frontenac & Addington Health Unit, Leeds, Grenville & Lanark District Health Unit, Hastings & Prince Edward County Health Unit. (1999). Sexual Health Clinics: an evolution based on need. *Take 5*; 3(3).
12. DiCenso A, Guyatt GG, Willan A. (1999). A systematic review of the effectiveness of adolescent pregnancy primary prevention programs. Effective Public Health Practice Project: Ontario Public Health Research Education and Development Program.
13. Jessop Orton M, Rosenblatt E. (1993). Sexual Health for youth: Three Sector Network in Ontario.
14. Ministry of Education and Training, Ontario. *The Ontario Curriculum*, Grades 1-12, Health and Physical Education, 1998.
15. McKay A, Pietrusiak MA, Hollowaty P. (1998). Parents' Opinions and attitudes towards sexuality education in the schools. *The Canadian Journal of Human Sexuality*; 7(2): 139-145.
16. Council of Ministers of Education, Canada, Health Canada. (1999). Schools, Public Health, Sexuality and HIV: A status report. Public Health Research Education and Development Program.

17. Report on the Health Status of the Residents of Ontario, Chapter 10: Family Health.
18. Kosunen E, Rimpela MK. (1996). Towards Regional Equality in Family Planning: Teenage Pregnancies and Abortions in Finland from 1976 to 1993. *Acta Obstet Gynecol Scan*; 75: 540-547.
19. U.S. Food and Drug Administration. (2001). *FDA Talk Paper, T01-05*. FDA's Report on New Health Care Products approved in 2000.
20. Hardwick D, Jessop Orton M, Koku E. (2001). Sexual Health Programs at Ontario Health Units: Part Downloading: First-Year Impact, 1998. Part B. Effective Combinations of Sexual Health Program Elements at Ontario Schools and Health Units, 1997. (unpublished).



Communiqué Public Health Research, Education and Development Program



**Collaborative initiative involving
PHRED, alPha, and OCCHA**

BENCHMARKING IN PUBLIC HEALTH

The following article describes how benchmarking is being used to support quality improvement in public health practice by the Ontario Public Health Benchmarking Partnership, a collaborative initiative involving: the Public Health Research, Education & Development Program (PHRED), the Association of Local Public Health Agencies (alPha), and the Ontario Council on Community Health Accreditation (OCCHA).

What is Benchmarking?

Benchmarking is the process of consistently researching for methods, practices and processes and of either adopting the practices or adapting the good features and implementing them to become the best of the best.¹ There are three commonly accepted forms of benchmarking.²

Standards Benchmarking:

Setting a standard of performance which an effective organization could be expected to achieve. The Mandatory Health Programs and Services Guidelines (1998)³ themselves are a form of standards benchmarking. The use of Mandatory Program standards as a basis for benchmarking between health units has not been useful due to the complexity of public health programs, the different resource bases and varying community contexts among health units.

Results Benchmarking:

Comparing the performance of a number of organizations providing a similar service through the publication of performance measures. In the public sector, this technique can serve to allow the public to judge whether their local provider makes effective use of resources or provides a level of service or outcome,

compared to similar providers. Examples are numerous in the treatment sector including publishing Caesarean Section rates or surgical mortality rates for different hospitals.

Process Benchmarking:

Undertaking a detailed examination within a group or organization of a process that produces a particular output, with a view to understanding the reasons for the variances in performance and incorporating best practices.

Process benchmarking is the approach taken by the Ontario Public Health Benchmarking Partnership. We assess performance through comparison with peer organizations for the purpose of improving that performance. It assists public health managers to improve the effectiveness and efficiency of their programs through comparison of their performance with their peers and adoption of superior practices.

The Ontario Experience

Under the auspices of the Benchmarking Partnership, the PHRED group has now done⁵ benchmarking projects; school immunization record process, food premises inspection, Chlamydia contact tracing, promotion of breastfeeding, and coalitions in heart health. These projects have been done in close cooperation with field practitioners to ensure that the level of effort is acceptable and that the results are of clear and immediate value to the front line manager.

The overall learnings about how to do benchmarking in public health are summarized in the following sections. Detailed findings of the individual pilots will be summarized in future editions of PHERO.

Framing for Benchmarking: Program Components, Performance Indicators, Practice Descriptions, and Logic Models.

The essence of benchmarking is the ability to compare programs and activities with those of peers. To do this effectively, the program must be structured and analyzed in a manner that facilitates comparison. Most Ontario health units are familiar with the use of program logic models to structure evaluations and develop performance indicators. An excellent guide to the use of program logic models is the Program Evaluation Toolkit⁴ also developed by PHRED. Program logic models have also

recently been endorsed as a key element of performance measurement and accountability for Ontario ministries by the Ontario Management Board of Cabinet.⁵ This makes the logic model the ideal framework to use to link practice and performance.

Elements of this structure are as follows:

- program components and subcomponents
- performance indicators; overall and for each component or subcomponent
- common format for describing practices within each component or subcomponent
- combination of the above elements into a program logic model

Program Components and Subcomponents: the Columns of the Logic Model

After selecting a program to benchmark, (such as school immunization record process or food premises inspection), the program components (and subcomponents, if needed) are defined. Components should have independent performance indicators that can be assigned to distinct sets of activities. As well, the components should be at a sufficiently high level that they are consistent with the activities and organization of most health units. These components will form the columns of the program logic model and performance indicators and activities will be defined within them.

For example, in the school immunization record process we identified the following components and subcomponents:

- Documenting and ensuring the adequacy of the immunization of entrants in a school board of the health unit.
 - Documenting and ensuring the adequacy of the immunization of new entrants (first time in school in JK, SK, Grade 1) in a school board of the health unit.
 - Documenting and ensuring the adequacy of the immunization of other entrants in a school board of the health unit.
- Updating the immunization records and maintaining the adequacy of immunization of those in schools in the health unit.

Performance Indicators

For each program component and for the overall program, we identify two kinds of performance indicators: effectiveness and efficiency. These are the short-term outcomes of each program component in the logic model. In the pilots, data was frequently not available to support ideal performance indicators. Alternative indicators, for which data was available, were then used. This will be further discussed below in the Data Quality and Availability section.

For effectiveness indicators, we measure as directly as possible the outcomes or impacts of program activities. Due to lack of these data in most health units, we have had to restrict ourselves to indicators describing the conduct and reach of activities (i.e., process measures, which describe which requirements and standards have been fulfilled) rather than their population impact.

For efficiency indicators, we look at the health unit resources, expressed as staff hours (to represent dollars) that are required to do the activities or achieve the impact.

Description of Practices

For effective benchmarking, we need to identify elements of practice where there is considerable variability across health units. Ideally, practices are described within each program component so they can be related to particular performance indicators. Descriptions that are primarily numeric or categorical facilitate ready comparison.

Figure 1: Eight Step Benchmarking Process

- Divide your program into standard components and subcomponents.
- Document your performance and practices within each subcomponent.
- Choose programs or program components where you wish to improve your performance.
- Choose a group of comparator health units whose performance you wish to compare with your own.
- Compare performance.
- Look at differences in practice and context in better performing health units, and identify changes in practice that may yield improved performance.
- Change practice.
- Monitor performance indicators for improvement over an appropriate time frame.
- Repeat.

For example, in food premises inspection, we looked at the following practices:

- Use of Hazard Analysis Critical Control Point (HACCP) audits
- Inspection frequencies for different risk premises
- Use of routine swabs and samples
- Management/consultation activities
- Food handler training
- Enforcement activities

Comparator Health Units

Public health programs are complex and varied across the province. Their content and emphasis will depend on context, other community resources, and on community need. Comparison of performance and practice (benchmarking) is best done among health units that are most similar in the context and challenges which they face. We have identified a number of health unit characteristics that are deemed to be useful for comparison including size, region of the province, and degree of urbanization and linguistic/ethnic profile. In addition, other factors may be relevant within specific programs, (e.g. number and concentration of food premises).

Web-Based System to Facilitate Benchmarking among Health Units

Plans are now underway by the Partnership to implement a web based Ontario public health benchmarking system towards the end of 2001. The system uses an eight step process which is outlined in Figure 1. This process is based on the concepts detailed above and on the experience of conducting the benchmarking pilots.

The system is designed to facilitate the benchmarking process for health units by having them enter their own data in a standardized fashion and then follow the benchmarking steps to compare their practices and performance with that of other health units. The system is planned to begin with two programs, school immunization and the promotion of breastfeeding.

Current Limitations on Benchmarking Public Health in Ontario

Data Quality and Availability

Benchmarking is easiest if there are provincial systems in place that permit ready comparison of performance. In the pilots, we looked at two systems: IRIS

(Immunization Record Information System) and CISS (Computerized Inspection Services System). In both instances, the systems provided an excellent basis for benchmarking. The process of comparison and analysis did identify places where lack of standardization of definitions and/or differences in recording practices affected the quality of the data from these systems which, in turn, lead to inaccuracies in key indicator measurements. In fact, the process of benchmarking brought these discrepancies to light. The benchmarking perspective also suggested new analyses, and reports which would render the data contained in these systems much more useful for local program management.

In the absence of provincial systems, routine data collection in health units primarily documents activities that have been conducted and does not capture the impact of that activity. In consultation with the participating health units, we limited the indicators to those where the data was available in most health units or could be collected with a level of effort that was sustainable. As well, managers had to agree that the indicators would be valuable to them in their day-to-day management of the program. The benchmarking process led health units to adapt or combine existing information in different ways. We made every effort to minimize new data collection.

With a round of data collection and then a detailed review of the information by all health units together, standardization was usually possible. While the indicators developed in this manner were not perfect, managers in the pilot sites generally agreed that the information collected and analyzed in this manner was superior to their current management information. Combined with the ability to compare their results with other health units, the effort of extra data collection was easily justified and was felt to be sustainable. A key result of the breastfeeding project was a recommendation for standardized survey questions that could be used by all health units for their breastfeeding surveys.

Health units generally do not have activity reporting systems that permit program costing. Most efficiency indicators from the pilots could only be calculated at the program level, and even then were based on managers' estimates of time spent on that activity. In most health units, staff perform activities in multiple programs and detailed activity reporting is not done.

Relationship of Benchmarking to Best Practices

Benchmarking has often been discussed in conjunction with best practices. It is important to recognize that benchmarking does not identify a single set of best practices that apply to all health units. It helps health units select practices which best suit local circumstances and which are most cost beneficial. Health units that benchmark demonstrate a commitment to continuous quality improvement by ongoing measurement of their performance and by comparing that performance to their peers. In that process, they are continually refining their own practice to optimize their performance given their particular context.

Conclusions

The experience of the benchmarking pilots is that the quality of health unit programs can be improved when managers and staff measure and reflect on program performance and compare that performance and related practices with their peers. This process is greatly facilitated if there is agreement on indicators and if data is collected in a common fashion. This is not yet the case for most public health programs in Ontario. Benchmarking can obtain this agreement, optimize the use of existing data systems and improve their comparability and quality. Ultimately, however, common provincial data systems will be needed.

The benchmarking process itself does not lead directly to a list of best practices that all health units should follow. The challenges facing individual health units are too different. Quality improvement in health unit programs requires ongoing monitoring of performance, judicious comparison of that performance with peers, and willingness to adopt and/or adapt practices that may lead to improved performance.

The goal is to contribute to an Ontario public health system oriented to continuous quality improvement and performance measurement through common information systems and an ongoing exchange of ideas and innovation among its practitioners. While a great deal remains to be done, a basic process and infrastructure will soon be in place. The enthusiastic involvement of front line practitioners in the development of this approach augurs well for its ongoing, effective utilization.



AUTHORS

Geoff Dunkley
Monique Stewart
Sheela Basrur
Charlene Beynon
Meighan Finlay
Donna Reynolds
Ruth Sanderson
Verna Wilson

All authors are members of the Ontario Public Health Benchmarking Steering Committee.

REFERENCES

¹ Balm, G.J. Benchmarking: A Practitioner's guide for becoming and staying the best of the best. Schaumburg, Illinois: QMPA Press, 1992.

² Government of Ontario. Performance Measurement in the Business Planning Process: A Reference Guide for Ministries. December 2000.

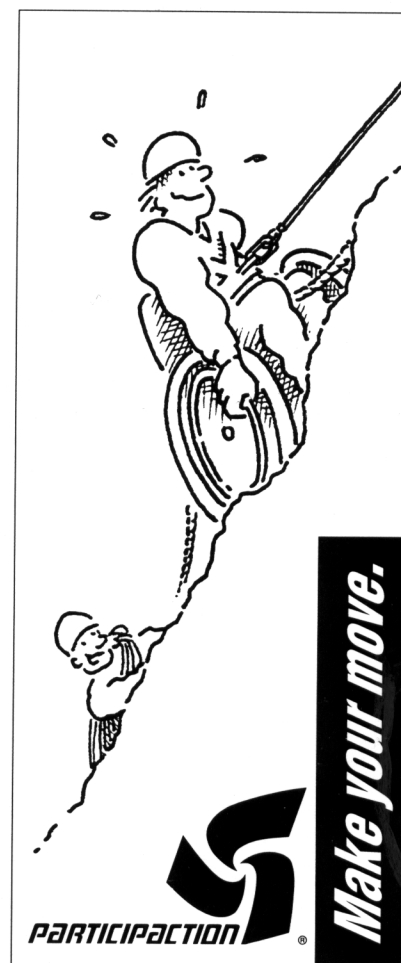
³ Mandatory Health Programs and Services Guidelines, Queen's Printer for Ontario, 1998.

⁴ Porteous NL, Sheldrick BJ, Stewart PJ Program Evaluation Toolkit: A Blueprint for Public Health Management. Public Health Research Education and Development Program Ottawa-Carleton Health Department, 1997.

⁵ Government of Ontario. Performance Measurement in the Business Planning Process: A Reference Guide for Ministries. December 2000.

⁶ Note that we have created two subcomponents of new enterers because health units had developed very different sets of practices around these two groups, which health units would want to evaluate and compare separately.

⁷ Note that the attribution of population outcomes to board of health activity is a complex issue that is beyond the scope of this discussion. It is discussed in detail in the PHRED paper Towards Outcome Measurement for Ontario Boards of Health, under review by the Public Health Branch at the time this article was submitted..



Summary of Reportable Diseases in April, 2001

Health Units by Region	1996 Population	AIDS	Campylo.	Chicken- pox	Chlamydia	Enceph./ Meningitis	GAS	Gonorrhea
Algoma	123,953		1	10	11	1		
North Bay	93,841			3	10			
Northwestern	80,235		1	2	17			
Porcupine	97,437				11			
Sudbury	201,154		1		20			
Thunder Bay	161,187				27	1		2
Timiskaming	38,847							
Total - Northern	796,654		3	15	96	2		2
Eastern Ontario	185,314		2		10			
Hastings-Prince Edward	143,790		1	6				
Kingston-Frontenac	175,568				17		1	
Leeds-Grenville	156,129		1	60	2			
Ottawa-Carleton	721,136		14		88	3	2	12
Renfrew	97,634		1		1			
Total - Eastern	1,479,571		19	66	118	3	3	12
Durham Region	458,616		3	121	48		1	4
Haliburton-Kawartha	165,039		5		11	1		
Muskoka-Parry Sound	78,675			5	1			
Peel Region	852,526		20		59	1	4	12
Peterborough	123,448		3	18	9	1		
Simcoe County	329,865	1		16	14	1		1
Toronto City - total	2,385,421	1	59	108	458	3	14	119
North	589,653		17	29	97	1	3	22
South	653,734	1	17	15	152	1	6	55
West	475,252		11	10	142		3	26
East	666,782		14	54	67	1	2	16
York Region	592,445		13		7		1	
Total - Central East	4,986,035	2	103	268	607	7	20	136
Bruce, Grey-Owen Sound	153,312		4	2	4	1		
Elgin-St. Thomas	79,159		1	54	9			
Huron	60,220		3	17	2	1		
Chatham-Kent	109,650			5	4			
Lambton	128,975	1			1			
Middlesex-London	389,616		3		12			2
Oxford	97,142				3	1		
Perth	72,106		2	8	4			
Windsor-Essex	350,329		6	50	48	2		5
Total - Southwest	1,440,509	1	19	136	87	5		7
Brant	114,564			19	20	1	1	4
Haldimand-Norfolk Region	102,575		1	21	10			
Halton Region	339,875		4		11		2	2
Hamilton-Wentworth	467,799		7	8	54		1	8
Niagara Region	403,504		7		26		4	7
Waterloo Region	405,435		9		47	2	2	5
Wellington-Dufferin	217,052		9	9	10			
Total - Central West	2,050,804		37	57	178	3	10	26
April 2001	10,753,573	3	181	542	1,086	20	33	183
* Total YTD 2001	-	15	909	4,367	4,907	111	142	874
* Total YTD 2000	-	20	880	12,888	4,771	101	186	937

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto; West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

Summary of Reportable Diseases in April, 2001

Health Units by Region	1996 Population	PPNG	Hepatitis A	Hepatitis B	Hepatitis C	Hib	Influenza	Measles	Meningo- coccal
Algoma	123,953		1		2		1		
North Bay	93,841			1	1		2		
Northw estern	80,235				1				
Porcupine	97,437				1		2		
Sudbury	201,154				4		2		
Thunder Bay	161,187		1	1	8				
Timiskaming	38,847								
Total - Northern	796,654		2	2	17		7		
Eastern Ontario	185,314				2				
Hastings-Prince Edward	143,790				2		1		
Kingston-Frontenac	175,568				15		1		
Leeds-Grenville	156,129			1	5				
Ottawa-Carleton	721,136				25		5		
Renfrew	97,634								
Total- Eastern	1,479,571			1	49		7		
Durham Region	458,616						5		1
Haliburton-Kaw artha	165,039			1	3		2		
Muskoka-Parry Sound	78,675								
Peel Region	852,526		1		27		4		
Peterborough	123,448				5				
Simcoe County	329,865				1		2		
Toronto City - total	2,385,421	1	11	5	103		6		
<i>North</i>	589,653		4		31		2		
<i>South</i>	653,734	1		5	41		1		
<i>West</i>	475,252		6		15		1		
<i>East</i>	666,782		1		16		2		
York Region	592,445						3		
Total - Central East	4,986,035	1	12	6	139		22		1
Bruce, Grey-Owen Sound	153,312				2				
Elgin-St. Thomas	79,159				3				
Huron	60,220								
Chatham-Kent	109,650			1	2		2		
Lambton	128,975								
Middlesex-London	389,616				4		1		
Oxford	97,142				1				
Perth	72,106				2				
Windsor-Essex	350,329				12				
Total - Southwest	1,440,509			1	26		3		
Brant	114,564	3					3		1
Haldimand-Norfolk Region	102,575		1	2	1		1		
Halton Region	339,875		1		4				1
Hamilton-Wentworth	467,799	3			29		6		1
Niagara Region	403,504				25		3		1
Waterloo Region	405,435			1	22		2		
Wellington-Dufferin	217,052				1				
Total - Central West	2,050,804	6	2	3	82		15		4
April 2001	10,753,573	7	16	13	313		54		5
* Total YTD 2001	-	47	44	56	1,510	1	725	6	44
* Total YTD 2000	-	77	43	62	2,014	2	1,511	3	39

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto; West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

Summary of Reportable Diseases in April, 2001

Health Units by Region	1996 Population	Mumps	Pertussis	Rubella	Salmon.	Shigellosis	Syphilis (Prim/Sec)	VTEC
Algoma	123,953				1			
North Bay	93,841				3			
Northwestern	80,235							
Porcupine	97,437							
Sudbury	201,154				3			1
Thunder Bay	161,187							
Timiskaming	38,847							
Total - Northern	796,654				7			1
Eastern Ontario	185,314		1		2			
Hastings-Prince Edward	143,790				7			
Kingston-Frontenac	175,568		1					
Leeds-Grenville	156,129				1			1
Ottawa-Carleton	721,136		3		13	2		2
Renfrew	97,634							
Total - Eastern	1,479,571		5		23	2		3
Durham Region	458,616				4			
Haliburton-Kawartha	165,039				6			
Muskoka-Parry Sound	78,675				1			
Peel Region	852,526		2		24	2	1	2
Peterborough	123,448		8		2			
Simcoe County	329,865				1			
Toronto City - total	2,385,421		2	1	55	3		
North	589,653				18	1		
South	653,734		1		19	2		
West	475,252			1	11			
East	666,782		1		7			
York Region	592,445		3		17	2		
Total - Central East	4,986,035		15	1	110	7	1	2
Bruce, Grey-Owen Sound	153,312		1					
Egin-St. Thomas	79,159				1			
Huron	60,220				1			
Chatham-Kent	109,650							
Lambton	128,975							
Middlesex-London	389,616				1			
Oxford	97,142		1					
Perth	72,106				2			
Windsor-Essex	350,329		1		6			
Total - Southwest	1,440,509		3		11			
Brant	114,564							
Haldimand-Norfolk Region	102,575				1			
Halton Region	339,875		3		3			
Hamilton-Wentworth	467,799			1	8			1
Niagara Region	403,504		2		3	1		1
Waterloo Region	405,435				6			2
Wellington-Dufferin	217,052		1		4			1
Total - Central West	2,050,804		6	1	25	1		5
April 2001	10,753,573		29	2	176	10	1	11
* Total YTD 2001	-		146	9	705	70	2	56
* Total YTD 2000	-	16	151	3	629	103	5	53

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto; West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

Summary of Reportable Diseases

1st Quarter, 2001

Ministry of Health and Long-Term Care



Summary of Reportable Diseases in Ontario - 1st Quarter 2001

Health Units by Region	1996 Population	AIDS	Campylo.	Chicken- pox	Chlamydia	Enceph./ Meningitis	GAS	Gonorrhea
Algoma	123,953		5	14	50	1	4	1
North Bay	93,841		2	50	41		2	1
Northwestern	80,235		2	6	40		1	
Porcupine	97,437		4	21	23			
Sudbury	201,154		7		69	2	3	1
Thunder Bay	161,187		1		60	1	1	4
Timiskaming	38,847		1		19			
Total - Northern	796,654		22	91	302	4	11	7
Eastern Ontario	185,314		6	1	24	2		
Hastings-Prince Edward	143,790		6	13	30			1
Kingston-Frontenac	175,568		12		68	4	2	1
Leeds-Grenville	156,129		4	83	29	1	1	
Ottawa-Carleton	721,136		56	120	288	9	5	40
Renfrew	97,634		6		18	1	2	
Total - Eastern	1,479,571		90	217	457	17	10	42
Durham Region	458,616		14	498	142	3	3	24
Haliburton-Kawartha	165,039		10		12		4	
Muskoka-Parry Sound	78,675		2	55	12		1	
Peel Region	852,526		81	718	342	13	11	68
Peterborough	123,448		2	49	28	4	1	1
Simcoe County	329,865	1	3	136	94	3	2	20
Toronto City - total	2,385,421	7	221	908	1,436	12	19	414
North	589,653		44	183	307	3	1	73
South	653,734	6	94	299	455	1	8	170
West	475,252	1	44	46	451	6	5	114
East	666,782		39	380	223	2	5	57
York Region	592,445	2	57	167	66	8	5	6
Total - Central East	4,986,035	10	390	2,531	2,132	43	46	533
Bruce, Grey-Owen Sound	153,312		12	7	16	2		1
Elgin-St. Thomas	79,159		3	217	18	2	1	1
Huron	60,220		7	26	6		1	
Chatham-Kent	109,650		4	68	30		1	1
Lambton	128,975	1	6		1			
Middlesex-London	389,616	1	13		137	4	10	25
Oxford	97,142		1		12		3	1
Perth	72,106		9	47	16	1	1	
Windsor-Essex	350,329		24	176	114	5	1	9
Total - Southwest	1,440,509	2	79	541	350	14	18	38
Brant	114,564		4	45	58	2	1	6
Haldimand-Norfolk Region	102,575		8	13	21			
Halton Region	339,875		21	43	40	6		6
Hamilton-Wentworth	467,799		22	30	179	1	12	23
Niagara Region	403,504		35	232	122		3	24
Waterloo Region	405,435		26	59	126	2	7	11
Wellington-Dufferin	217,052		31	23	34	2	1	1
Total - Central West	2,050,804		147	445	580	13	24	71
1st Quarter 2001	10,753,573	12	728	3,825	3,821	91	109	691
* Total YTD 2001	-	12	728	3,825	3,821	91	109	691
* Total YTD 2000	-	16	641	8,681	3,643	77	141	728

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto;
West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

Summary of Reportable Diseases in Ontario - 1st Quarter 2001

Health Units by Region	1996 Population	PPNG	Hepatitis A	Hepatitis B	Hepatitis C	Hib	Influenza	Measles	Meningo- coccal
Algoma	123,953		1		19		5		
North Bay	93,841				10		2		
Northwestern	80,235				3		7		
Porcupine	97,437				7		21		
Sudbury	201,154			2	29		8		
Thunder Bay	161,187				17				
Timiskaming	38,847								
Total - Northern	796,654		1	2	85		43		
Eastern Ontario	185,314				10		25		
Hastings-Prince Edward	143,790				7		18		
Kingston-Frontenac	175,568			2	87		15		
Leeds-Grenville	156,129			7	47		3		
Ottawa-Carleton	721,136	4	1	4	117		100		3
Renfrew	97,634		1		4		6		
Total - Eastern	1,479,571	4	2	13	272		167		3
Durham Region	458,616	1					39		1
Haliburton-Kawartha	165,039		1	4	26		10		
Muskoka-Parry Sound	78,675				3				
Peel Region	852,526	2	2	3	87		36		
Peterborough	123,448		1	1	22		7		
Simcoe County	329,865				3		32		
Toronto City - total	2,385,421	22	12	13	327		83	3	10
<i>North</i>	589,653	2	3	1	78		16		2
<i>South</i>	653,734	11	3	11	116		23		2
<i>West</i>	475,252	7	2		78		25	3	2
<i>East</i>	666,782	2	4	1	55		19		4
York Region	592,445	2	1	2		1	34		1
Total - Central East	4,986,035	27	17	23	468	1	241	3	12
Bruce, Grey-Owen Sound	153,312			2	16		12		1
Elgin-St. Thomas	79,159				6				
Huron	60,220				4		5		
Chatham-Kent	109,650				8		1		
Lambton	128,975				5				1
Middlesex-London	389,616	4			34		10		7
Oxford	97,142				4		9		1
Perth	72,106				5		9		1
Windsor-Essex	350,329		1	3	37		6		
Total - Southwest	1,440,509	4	1	5	119		52		11
Brant	114,564		2		1		17		
Haldimand-Norfolk Region	102,575				5		8		1
Halton Region	339,875	1	1		14		32		2
Hamilton-Wentworth	467,799	4	3		75		42	3	7
Niagara Region	403,504		1		78		39		2
Waterloo Region	405,435				69		15		1
Wellington-Dufferin	217,052				11		15		
Total - Central West	2,050,804	5	7		253		168	3	13
1st Quarter 2001	10,753,573	40	28	43	1,197	1	671	6	39
* Total YTD 2001	-	40	28	43	1,197	1	671	6	39
* Total YTD 2000	-	67	33	50	1,610	2	1,495	2	31

The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto;
West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

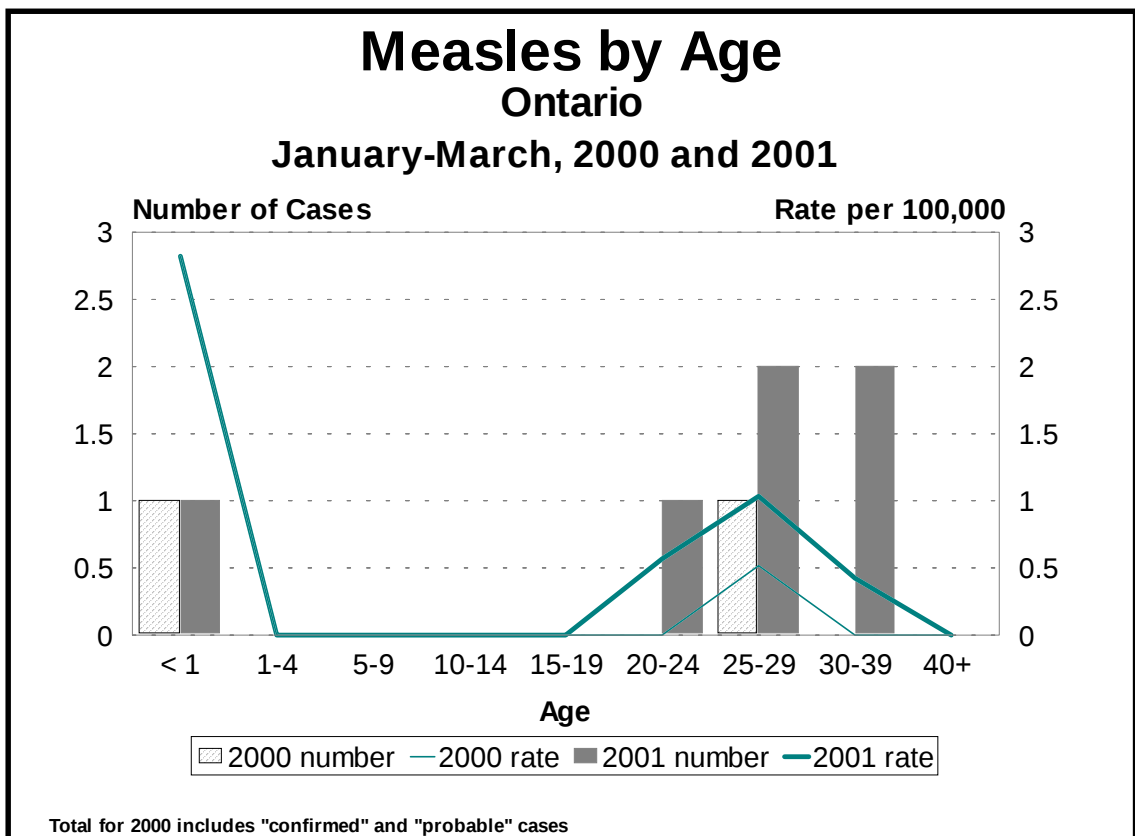
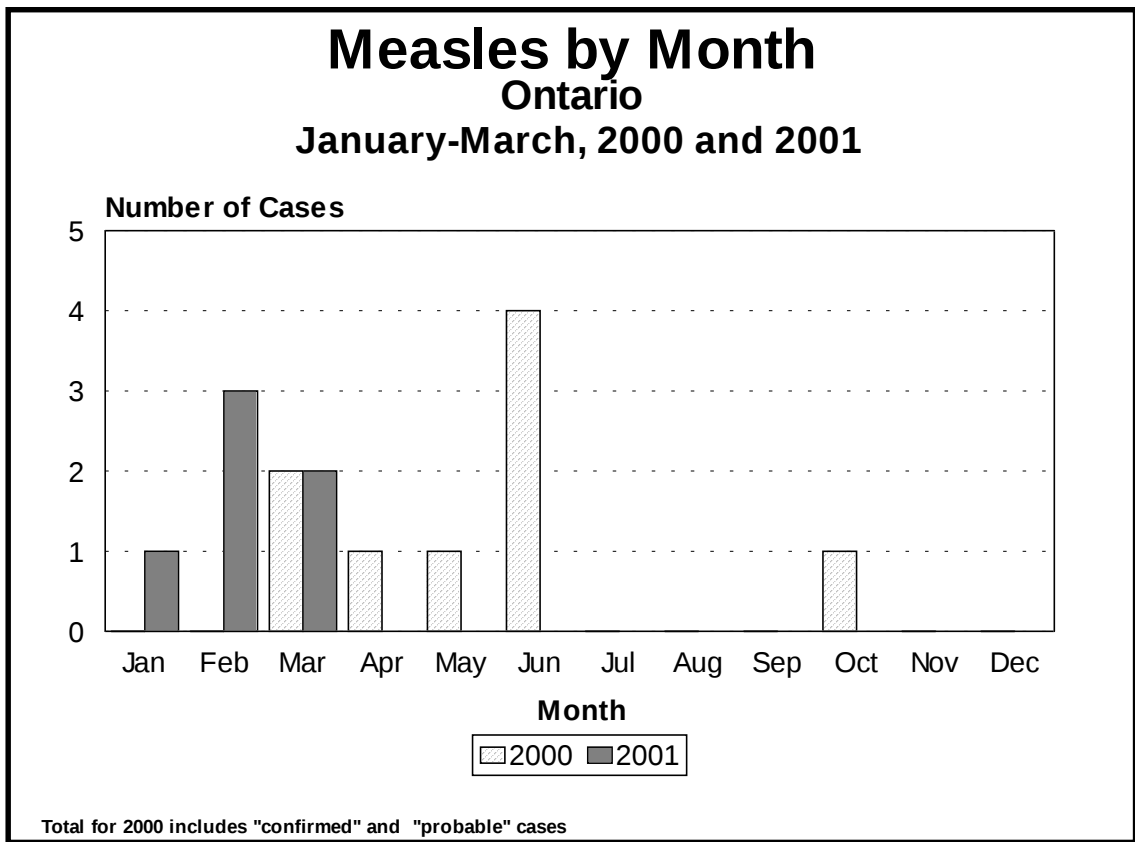
Summary of Reportable Diseases in Ontario - 1st Quarter 2001

Health Units by Region	1996 Population	Mumps	Pertussis	Rubella	Salmon.	Shigellosis	Syphilis (Prim/Sec)	VTEC
Algoma	123,953				4			
North Bay	93,841				3			1
Northwestern	80,235		5		4			
Porcupine	97,437							
Sudbury	201,154		2		8	1		2
Thunder Bay	161,187				4			
Timiskaming	38,847				1			1
Total - Northern	796,654		7		24	1		4
Eastern Ontario	185,314		3		6	2		1
Hastings-Prince Edward	143,790		1		19	2		1
Kingston-Frontenac	175,568		8		9	1		
Leeds-Grenville	156,129		7		6	1		
Ottawa-Carleton	721,136		6		35	9		4
Renfrew	97,634				6			
Total - Eastern	1,479,571		25		81	15		6
Durham Region	458,616		12		13			
Haliburton-Kawartha	165,039				13			1
Muskoka-Parry Sound	78,675				6			
Peel Region	852,526		9		69	6		2
Peterborough	123,448		6		7			1
Simcoe County	329,865				9			2
Toronto City - total	2,385,421		21	6	124	19	1	10
<i>North</i>	589,653		11	1	36	2	1	3
<i>South</i>	653,734		4	3	28	10		
<i>West</i>	475,252		4	2	39	3		4
<i>East</i>	666,782		2		21	4		3
York Region	592,445		6		43	5		3
Total - Central East	4,986,035		54	6	284	30	1	19
Bruce, Grey-Owen Sound	153,312				10			
Elgin-St. Thomas	79,159				2			
Huron	60,220				5			1
Chatham-Kent	109,650		2		3			
Lambton	128,975		5		3			
Middlesex-London	389,616				8	3		1
Oxford	97,142				1			2
Perth	72,106				1	1		1
Windsor-Essex	350,329		7		23			1
Total - Southwest	1,440,509		14		56	4		6
Brant	114,564				6			
Haldimand-Norfolk Region	102,575				4			
Halton Region	339,875		4		10	2		1
Hamilton-Wentworth	467,799		2		19	1		4
Niagara Region	403,504		2	1	17	6		2
Waterloo Region	405,435		8		19			2
Wellington-Dufferin	217,052		1		9	1		1
Total - Central West	2,050,804		17	1	84	10		10
1st Quarter 2001	10,753,573		117	7	529	60	1	45
* Total YTD 2001	-		117	7	529	60	1	45
* Total YTD 2000	-	14	122	2	487	79	4	39

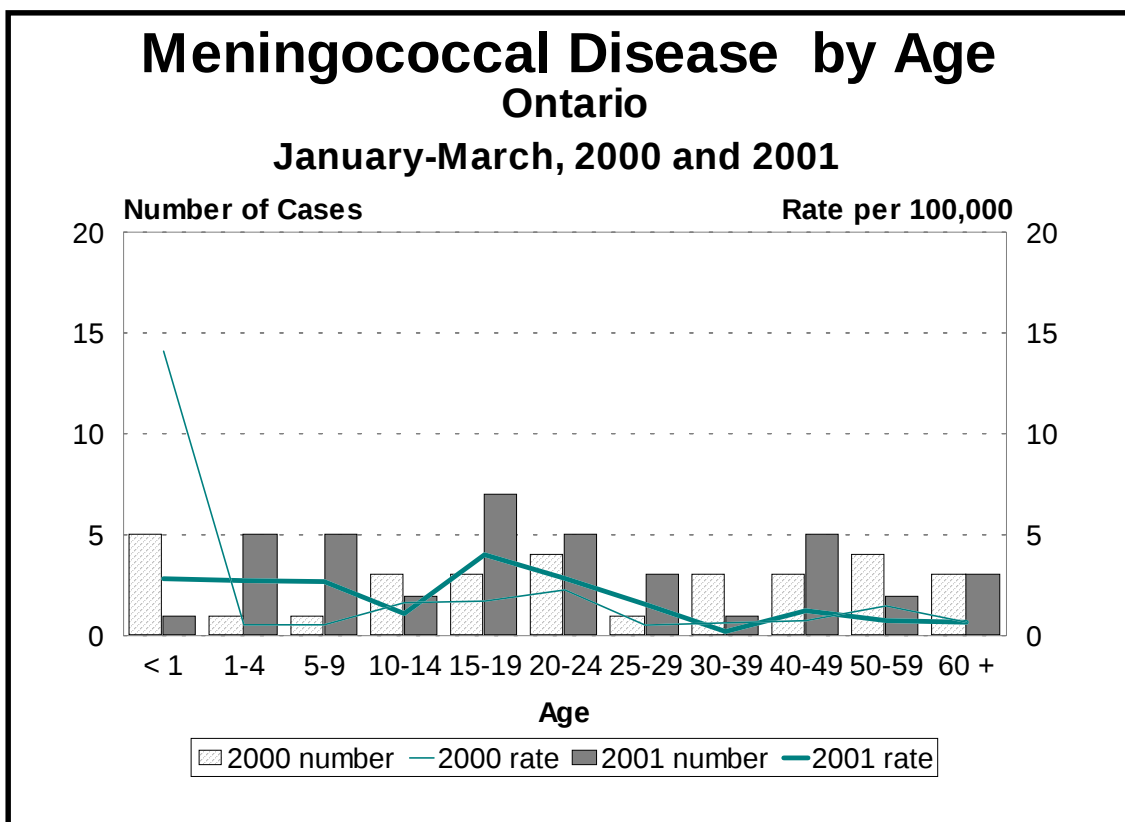
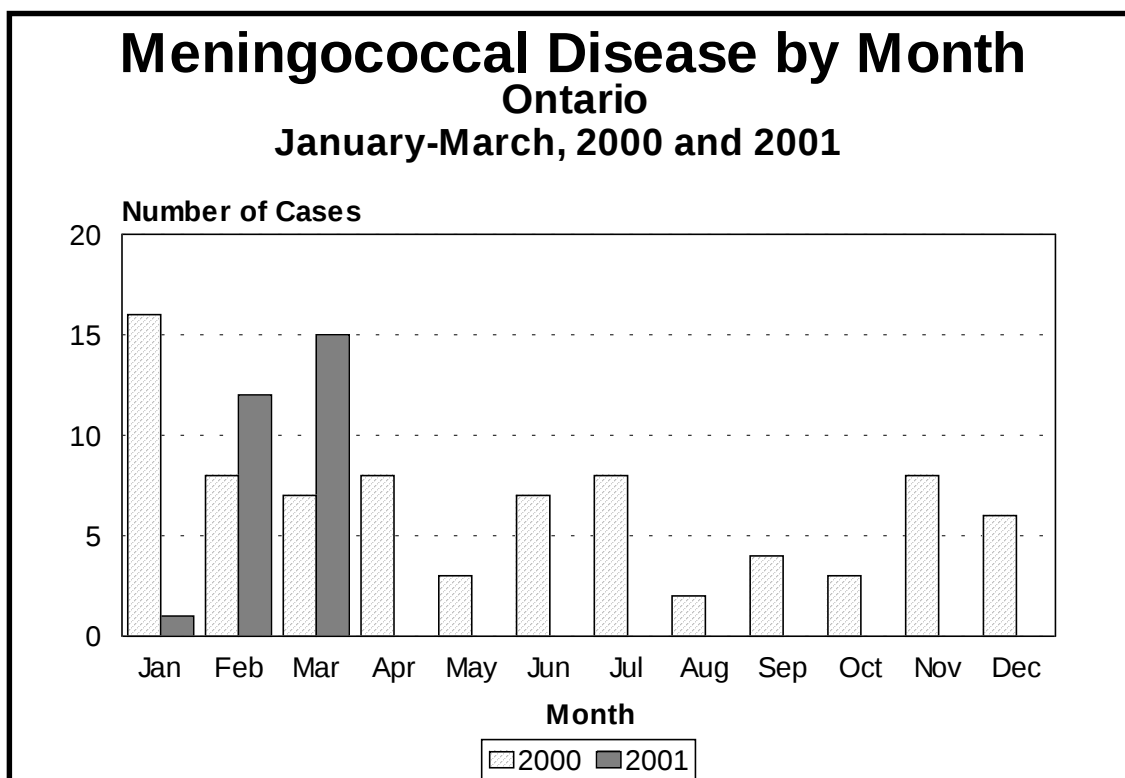
The Toronto City regions above are now defined as: North - former North York; South - former City of Toronto;
West - former Etobicoke and City of York; East - former Scarborough and East York

* Adjusted for deletions and late reports.

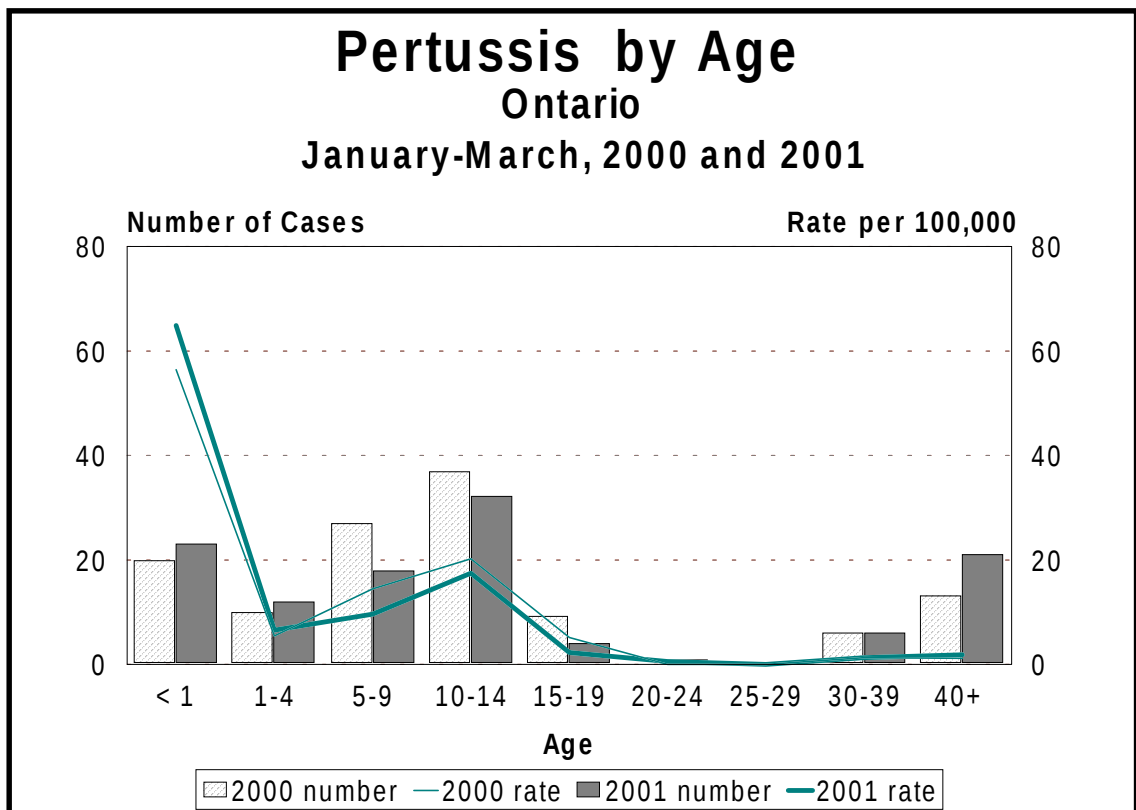
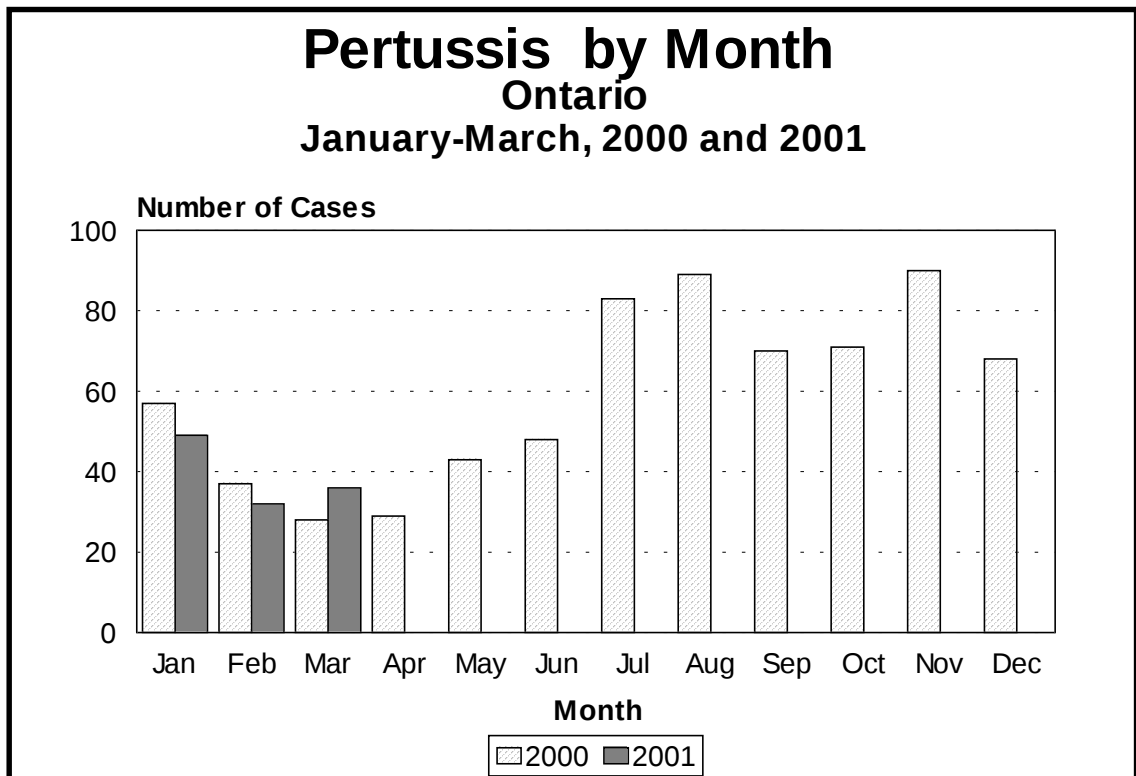
Vaccine Preventable and Other Diseases



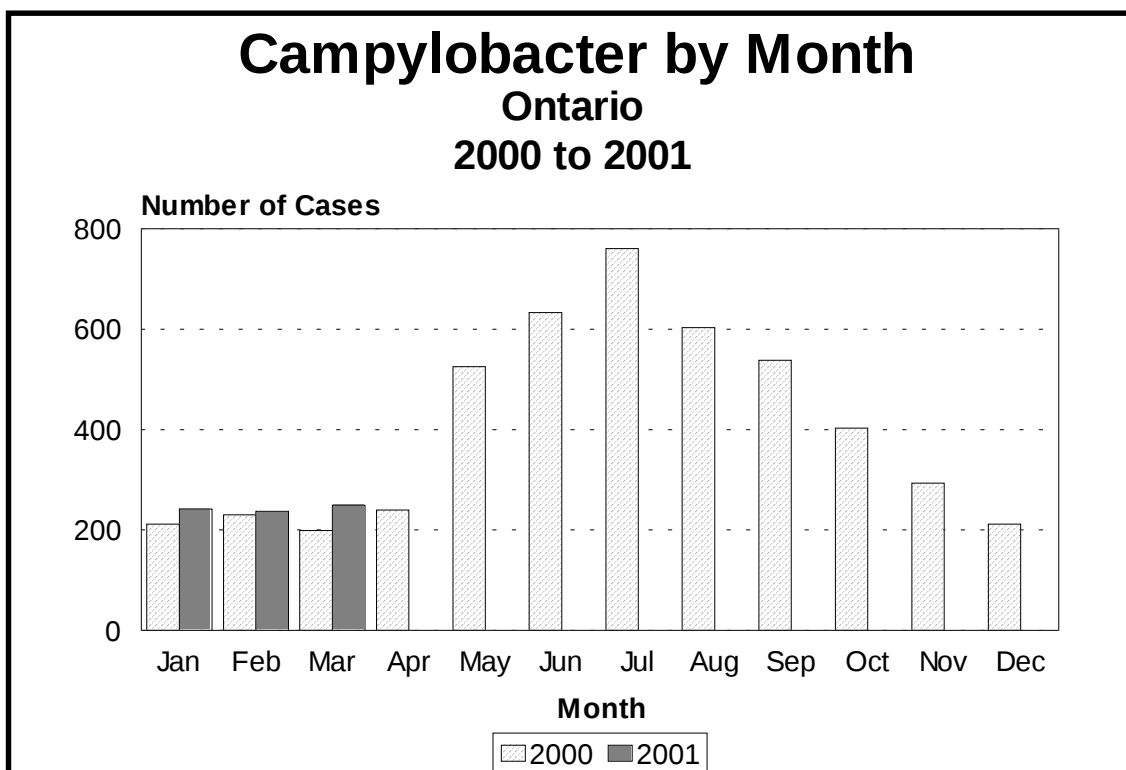
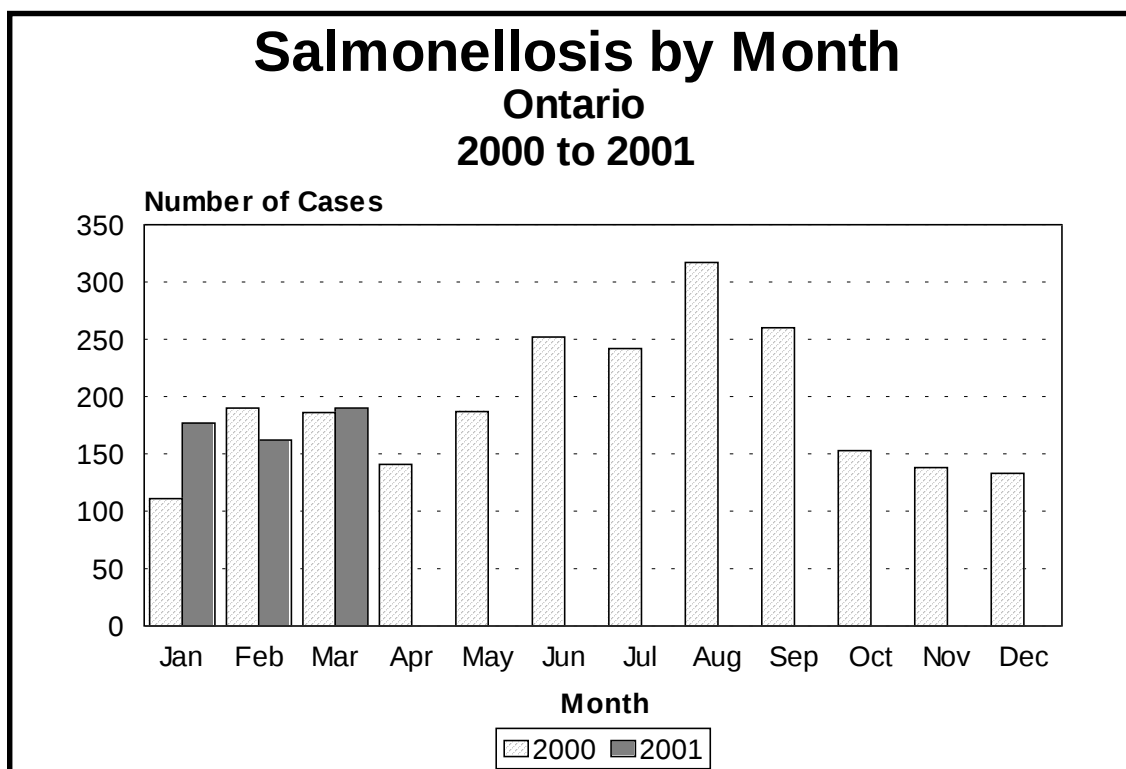
Vaccine Preventable and Other Diseases



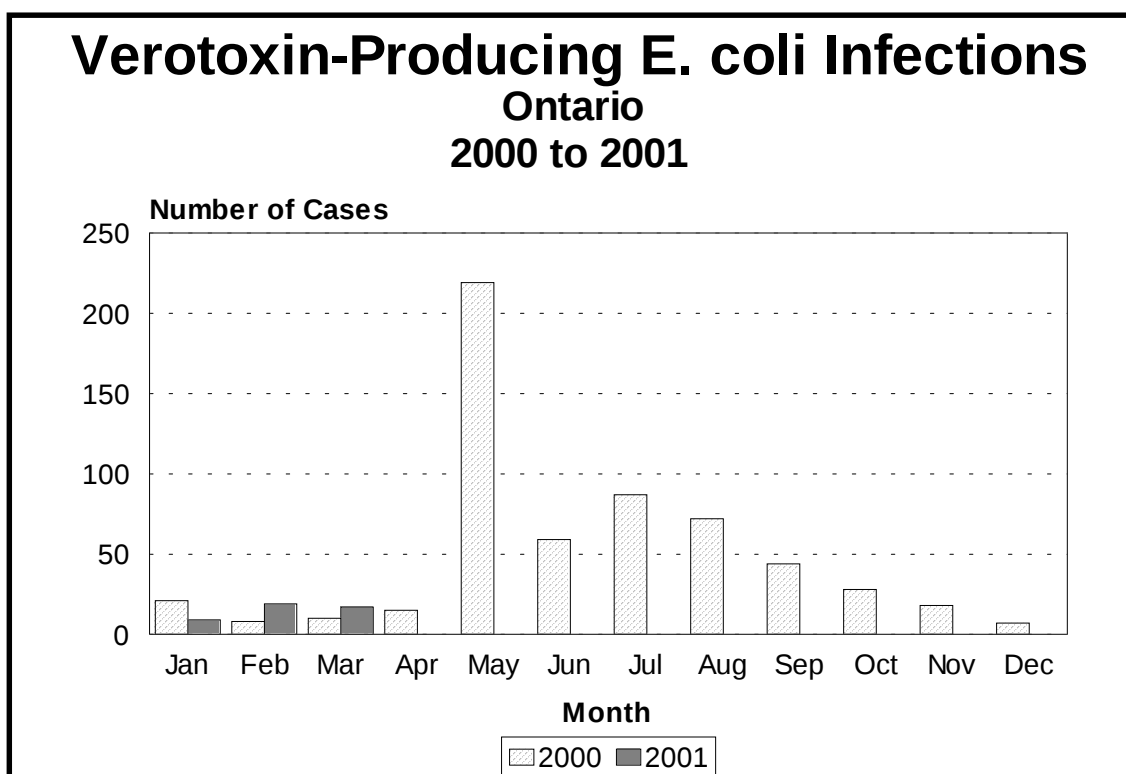
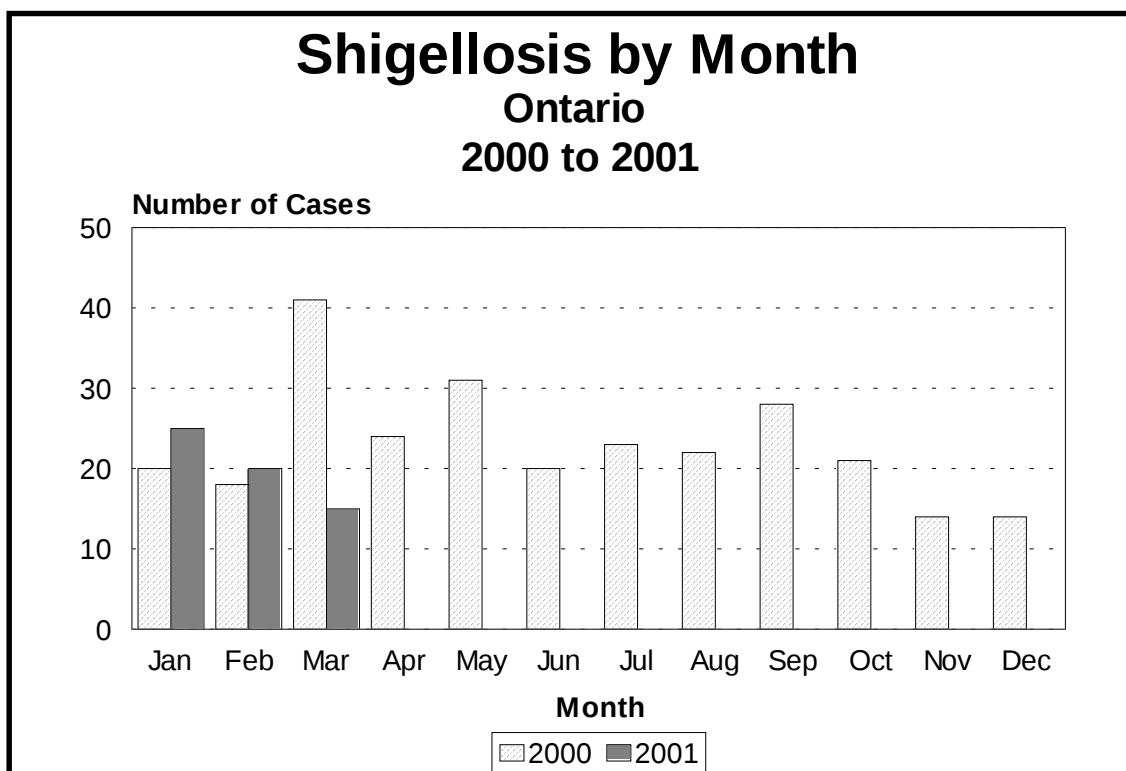
Vaccine Preventable and Other Diseases



Enteric Diseases

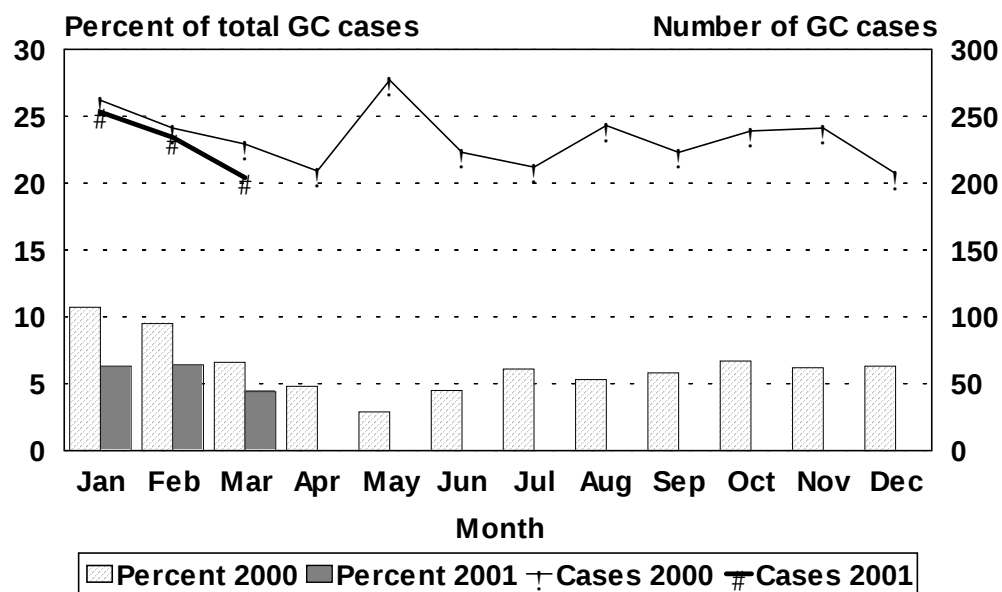


Enteric Diseases



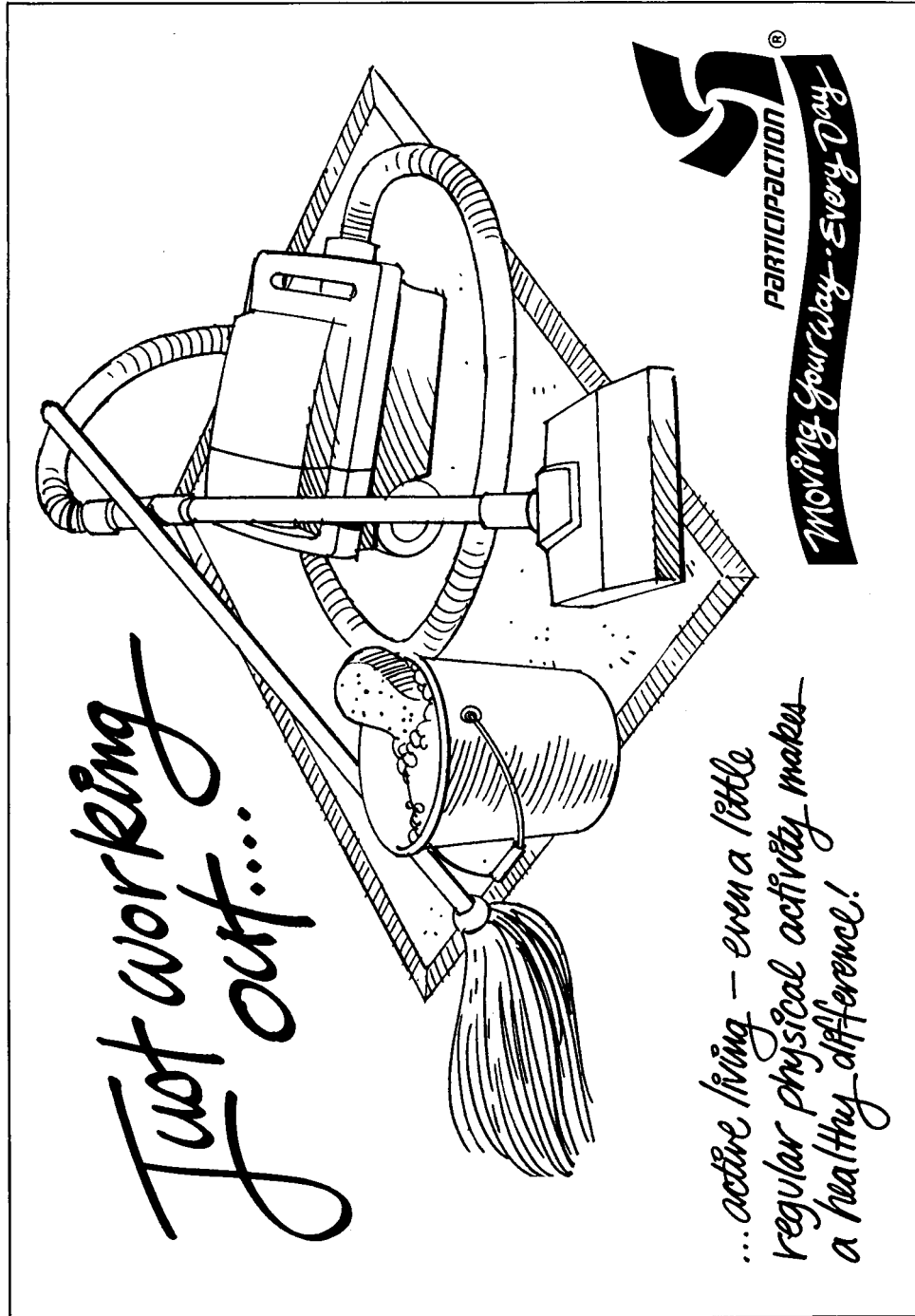
Sexually Transmitted Diseases

PPNG as a Proportion of Total Gonorrhea Ontario 2000 to 2001



Reportable Disease Summary for First Nations and Inuit Health Branch Ontario Region, January 1 - March 31, 2001

DISEASE	15-19		20-24		25-29		30-34		35-39		40-49		50-59		Over 60		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Chlamydia trachomatis infections																	105
Giardiasis																	3
Group A Strep																	6
Influenza																	37
Rubella																	1
Tuberculosis																	1
On-Reserve Population for First Nations & Inuit Health Branch - Ontario Region = 66,700																	1



Just working
Out...

...active living - even a little
regular physical activity makes
a healthy difference!

PARTICIPATION
Moving Your Way - Every Day