

Ontario Annual Infectious Diseases Epidemiology Report, 2007

May 2011

Ministry of Health and Long-Term Care

TTY 1-800-387-5559. In Toronto, TTY 416-327-4282

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About this Report

The Ontario Annual Infectious Diseases Epidemiology Report is a publication of the Public Health Protection and Prevention Branch, Public Health Division of the Ontario Ministry of Health and Long-Term Care (MOHLTC). It is the first annual report on infectious diseases since the 2005 implementation of the integrated Public Health Information System (iPHIS). The report is an important component of the provincial infectious diseases surveillance system. It serves as one of the primary outlets for the public dissemination of information on infectious disease trends in Ontario. The report provides a descriptive analysis of 10 year trends in infectious diseases in Ontario and identifies diseases or disease-specific areas where public health responses are needed to anticipate and counter emerging trends. The epidemiological analyses will be a key resource for setting priorities for health practitioners and researchers involved in the planning, implementation and evaluation of public health policy and practice in Ontario. We anticipate that the general public will also find the report informative.

The scope of the report is limited to infectious diseases that are designated as reportable under the [Ontario Health Protection and Promotion Act, R.S.O. 1990, c. H.7](#) with a focus on diseases reported in 2007. The core of the report is a brief epidemiological analysis of these diseases, complete with interpretations of trends and contextual data to assist in drawing accurate conclusions. The report relies primarily on data extracted from the provincial infectious diseases surveillance system, iPHIS, except where noted. Comparative data at the national level are provided where available.

The data in this report are presented in five sections that align with either a specific mode of disease transmission or a recognized measure of prevention:

- Chapter 1: Enteric – Foodborne and Waterborne Diseases
- Chapter 2: Vaccine Preventable Diseases
- Chapter 3: Sexually Transmitted and Bloodborne Infections
- Chapter 4: Diseases Transmitted by Direct Contact and Respiratory Routes
- Chapter 5: Vectorborne Diseases

Within these sections, individual diseases are presented as chapters where sufficient data as reported in 2007 are available to enable meaningful analyses. The ten year trend is presented for all diseases, including diseases that are infrequently reported, in order to assess the relative burden (incidence and incidence rate) of reportable infectious diseases in Ontario.

Each disease chapter is presented alphabetically and is comprised of bulleted highlights and summary tables, maps and figures. The tables, maps and figures summarize the following data:

- Baseline trends over the previous 10 years in Ontario and Canada
- In-focus analysis of 2007 surveillance data including:
 - Distribution of reported cases per month (seasonality)
 - Age and sex-specific incidence
 - Disease incidence by etiologic agent, where applicable
 - Geographic distribution of reported cases
 - Frequency distribution of risk factors, risk settings and exposure sources, where applicable, and
 - Other relevant disease-specific data where applicable

It should be noted that there are some inherent limitations of the data and any interpretation or extrapolation should be made with caution. However, from the available data, it is possible to elucidate trends and estimate where the main burden of infectious diseases in Ontario lies. Data limitations specific to this report are laid out in the *Technical Notes* found at the end of this report.

The Epidemiologic Report on Reportable Infectious Diseases is new and the format and content will undergo revisions from year to year. Comments on the format or content of the report are most welcome and can be sent by email to IPHISsupport@ontario.ca.

The 2007 Epidemiologic Report on Infectious Diseases in Ontario can be found online at the MOHLTC's website <http://www.health.gov.on.ca/>. The suggested citation for this report is:

Ministry of Health and Long-Term Care, Public Health Division. The Epidemiologic Report on Reportable Infectious Diseases in Ontario: 2007 Annual Report. Toronto, ON: Queen's Printer for Ontario; 2011.

Report Highlights

- In 2007, the Ontario Ministry of Health and Long-Term Care (MOHLTC) monitored over 70 reportable infectious diseases.
- Infectious diseases continue to be an important public health concern in Ontario with over 50,000 confirmed infections reported province-wide in 2007, affecting 400 out of every 100,000 Ontarians.
- Sexually transmitted and bloodborne infections accounted for more than 60% of new infections reported in Ontario in 2007 and affected 260 Ontarians out of every 100,000 population. Chlamydia was the most commonly reported sexually transmitted infection with over 23,000 cases reported in 2007.
- The second most common category of infectious disease in Ontario in 2007 was enteric and zoonotic disease. Diseases in this category accounted for 21% of infectious diseases reported in Ontario in 2007, and affected 85 out of every 100,000 Ontarians.
- Diseases transmitted by direct contact or by respiratory routes ranked as the third most common cause of infectious diseases in Ontario in 2007, affecting 50 out of every 100,000 Ontarians. Most of these infections were due to influenza, which affected 40 out of every 100,000 Ontarians. Tuberculosis was also significant, affecting five out of every 100,000 Ontarians.
- Diseases routinely prevented by vaccine during childhood and vectorborne diseases made relatively smaller contributions to the overall incidence of infectious diseases in the Ontario in 2007. With almost 2,000 reported cases in 2007, vaccine preventable diseases affected 16 out of every 100,000 Ontarians.
- The relatively low incidence of vaccine preventable diseases in Ontario is indicative of the successful implementation of routine childhood and other immunization programs for these diseases. Notwithstanding, the number of cases reported provides an opportunity to identify sub-populations with lower levels of immunity and to improve vaccine uptake in these populations.
- Vectorborne diseases accounted for less than 1% of infectious diseases reported in Ontario in 2007 and affected two out of every 100,000 Ontarians.
- Incidence rates for most enteric diseases declined during the period 1998-2007 with declines occurring primarily among enteric diseases considered endemic in Ontario. Hepatitis A, shigellosis, campylobacteriosis, listeriosis and yersiniosis experienced the largest declines, while giardiasis, salmonellosis, *E. coli*, amebiasis and cyclosporiasis experienced modest declines.
- Over the same 10 year period, the incidence of botulism, paratyphoid fever, cryptosporidiosis and typhoid fever increased. The incidence of cholera remained low and unchanged over this period.

- Reports of several diseases in 2007 were the highest reported for the 10 year period, 1998-2007. Included in this category are cryptosporidiosis, mumps, gonorrhea, chlamydia, invasive group A streptococcus disease and Lyme disease.
- Simultaneous infections or co-infections were reported for several diseases in 2007. Thirty-five percent of syphilis cases had HIV, 5% of chlamydia cases had gonorrhea and 3% of tuberculosis cases were co-infected with HIV.
- Eighty-six percent of tuberculosis cases reported in Ontario between 1998 and 2007 were born outside Canada, 11% were born in Canada and 3% had an unknown country of origin. Since 1998, the proportion of foreign born tuberculosis cases has remained relatively stable ranging from 81% to 89%.
- From 2005 to 2007, the proportion of TB cases reporting resistance to one or more drugs decreased from 11% to 9%.
- Lyme disease is the most frequently reported endemic vectorborne disease in Ontario. Between 1998 and 2007, the incidence of Lyme disease increased steadily with the incidence of non-travel related cases more than doubling between 2005 and 2007.
- West Nile Virus illness has declined sharply in Ontario since first being reported in 2002. The incidence of WNV was 23 times lower in 2007 compared to 2002.
- Travel to, or recent immigration from malaria endemic countries accounted for 100% of malaria cases reported in Ontario in 2007.

Chapter 1: ENTERIC DISEASES

- The top five causes of enteric disease in Ontario in 2007 were campylobacteriosis (3,873 cases), salmonellosis (2,820 cases), giardiasis (1,623 cases), amebiasis (815 cases) and cryptosporidiosis (405 cases). These diseases represented 88% of all cases of enteric diseases reported in Ontario in 2007.
- Incidence rates for most enteric diseases declined during the period 1998-2007 with declines occurring primarily among enteric diseases considered endemic in Ontario. Hepatitis A (68%), shigellosis (53%), listeriosis (40%), campylobacteriosis (37%), and yersiniosis (34%) experienced the largest declines, while giardiasis (24%), salmonellosis (16%), *E. coli* (10%), amebiasis (3%) and cyclosporiasis (2%) experienced small to modest declines.
- The incidence of paratyphoid fever (300%), cryptosporidiosis (100%) and typhoid fever (75%) increased over the same ten year period. The incidence of cholera remained low and unchanged over this period.
- In general, males experienced higher incidence rates for most enteric diseases reported in 2007. There was no difference in the sex-specific incidence rates for listeriosis, paratyphoid fever and typhoid fever, and males had slightly lower incidence rates for cyclosporiasis, shigellosis and *E. coli*.
- The burden of enteric diseases was disproportionately distributed throughout 2007; the warmer months of May to October accounted for 62% of reported cases.
- Perth District (campylobacteriosis and cryptosporidiosis), Toronto Public Health (amebiasis and giardiasis) and Huron County (salmonellosis) reported the highest incidences of the top five enteric diseases in Ontario in 2007.
- In 2007, travel was the most common exposure setting for typhoid fever (84%), paratyphoid fever (83%), hepatitis A (67%), cyclosporiasis (59%) and shigellosis (43%). It accounted for 3-5% of listeriosis and VTEC cases reported in 2007.
- Consumption of poultry and poultry products was the most commonly reported food exposure for campylobacteriosis (60%) and salmonellosis (50%) cases that reported food as the most likely source of illness.

Table 1.1: Incidence of Enteric and Zoonotic Diseases: Ontario, 1998-2007

Enteric and Zoonotic Diseases ^{2,3}	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
Enteric Diseases																				
Amebiasis	839	7.4	769	6.7	925	7.9	851	7.2	825	6.8	771	6.3	678	5.5	772	6.1	659	5.2	815	6.4
Campylobacteriosis	5449	47.9	4192	36.4	5061	43.3	5033	42.3	4612	38.1	4127	33.7	3991	32.1	3796	30.2	3870	30.5	3873	30.2
Cryptosporidiosis	187	1.6	210	1.8	235	2.0	250	2.1	231	1.9	277	2.3	303	2.4	266	2.1	402	3.2	405	3.2
Cyclosporiasis	96	0.8	21	0.2	9	0.1	23	0.2	52	0.4	39	0.3	95	0.8	132	1.1	92	0.7	94	0.7
Giardiasis	2146	18.9	1990	17.3	2007	17.2	2060	17.3	1921	15.9	1633	13.3	1592	12.8	1626	12.9	1582	12.5	1623	12.7
Hepatitis A	321	2.8	261	2.3	157	1.3	175	1.5	151	1.2	143	1.2	185	1.5	150	1.2	206	1.6	121	0.9
Listeriosis	52	0.5	31	0.3	37	0.3	37	0.3	43	0.4	43	0.4	42	0.3	37	0.3	42	0.3	40	0.3
Paratyphoid Fever	12	0.1	17	0.1	12	0.1	12	0.1	27	0.2	21	0.2	47	0.4	55	0.4	51	0.4	47	0.4
Salmonellosis	3386	29.8	2351	20.4	2389	20.4	2564	21.6	2476	20.5	2008	16.4	2119	17.1	2956	23.5	2395	18.9	2820	22.0
Shigellosis	427	3.8	274	2.4	288	2.5	234	2.0	847	7.0	283	2.3	286	2.3	337	2.7	206	1.6	232	1.8
Typhoid Fever	46	0.4	42	0.4	53	0.5	62	0.5	60	0.5	50	0.4	69	0.6	68	0.5	92	0.7	86	0.7
<i>E. coli</i> , verotoxin producing	404	3.6	379	3.3	1746	14.7	358	3.0	394	3.3	462	3.8	318	2.6	259	2.1	343	2.7	365	2.9
Yersiniosis	359	3.2	370	3.2	338	2.9	314	2.6	383	3.2	329	2.7	297	2.4	354	2.8	364	2.9	269	2.1
Botulism	1	0.0	1	0.0	0	0.0	0	0.0	1	0.0	2	0.0	2	0.0	1	0.0	5	0.0	4	0.0
Cholera	1	0.0	0	0	0	0	3	0.0	1	0.0	2	0.0	0	0	1	0.0	1	0.0	1	0.0
Zoonotic Diseases																				
Brucellosis	4	0.1	2	0.2	2	0.1	3	0.1	5	0.1	4	0.0	3	0.1	6	0.0	2	0.0	3	0.0
Psittacosis/Ornithosis	0	0	0	0	2	0.0	0	0	2	0.0	1	0.0	0	0.0	0	0	0	0.0	0	0.0
Q-fever	8	0.1	19	0.2	12	0.1	12	0.1	1	0.1	8	0.0	6	0.1	2	0.0	4	0.0	3	0.0
Trichinosis	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	1	0.0	0	0.0	0	0.0
Tularemia	1	0.0	0	0.0	1	0.0	0	0.0	0	0.0	2	0.0	2	0.0	1	0.0	0	0.0	0	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note 1: Incidence rate per 100,000 population.

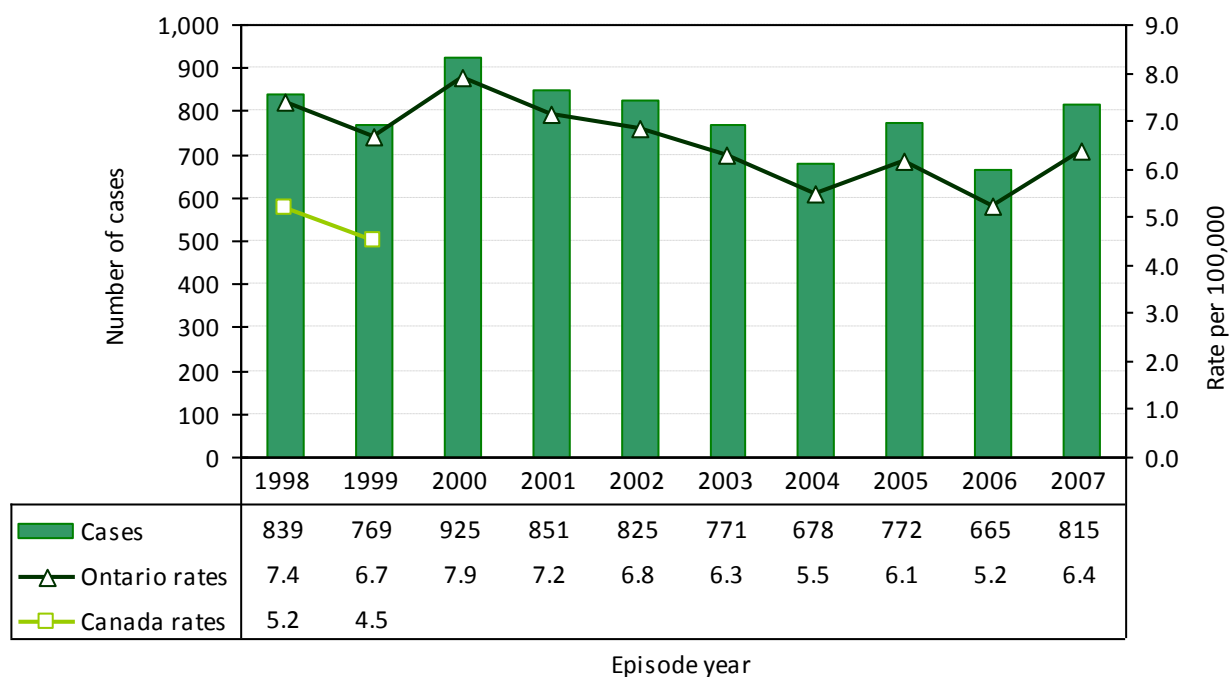
Note 2: No cases were reported for the following enteric and zoonotic diseases in Ontario during the period 1998-2007: anthrax, plague, rabies and Hantavirus pulmonary disease.

Note 3: Enteric diseases caused by etiologic agents other than those specified in table 1.1 are reported as food poisoning incidents; these incidents are not included in this report.

1.1 AMEBIASIS

- Amebiasis was the fourth leading cause of enteric diseases in Ontario in 2007, accounting for 7.5% of all enteric and zoonotic diseases reported that year (Table 1.1).
- In 2007, Ontario reported 815 confirmed cases of amebiasis, which represents an incidence rate of 6.4 cases per 100,000 population. (Table 1.1).
- During the period 1998 to 2007, the incidence of amebiasis averaged 790 cases per year. Between 2006 and 2007, cases of amebiasis increased by 24% (156) over the 2006 total of 659.
- Amebiasis has not been nationally reportable since 1999, but data for 1998 and 1999 show that the average incidence of amebiasis was lower for Canada (4.9 cases per 100,000) in those two years compared to that of Ontario (7.1 cases per 100,000) (Figure 1.1.1).
- Unlike most enteric diseases, amebiasis did not demonstrate a clear seasonal summer peak in the number of reported cases in 2007 (Figure 1.1.2).
- In 2007, the overall incidence rate of amebiasis among males (9.2 cases per 100,000 population) in Ontario was 2.5 (6.4 cases per 100,000 population) times that of their female counterparts (Figure 1.1.3, Table 1.1.1).
- The incidence rates of amebiasis in 2007 were higher for males compared to females in all age groups with incidence peaking at 16.9 cases per 100,000 population for males aged 40-49 years versus 5.7 cases per 100,000 population for females aged 20-29 years (Figure 1.1.3, Table 1.1.1).
- Toronto reported the highest incidence rate of amebiasis in 2007 with 15 cases per 100,000 population, followed by Ottawa with 11 cases per 100,000 (Map 1.1.1, Table 1.1.2).
- Travel outside of Ontario accounted for approximately one-quarter (24%) of amebiasis cases in 2007 who reported an exposure (Figure 1.1.4).

Figure 1.1.1: Incidence of Amebiasis in Ontario and Canada: 1998-2007



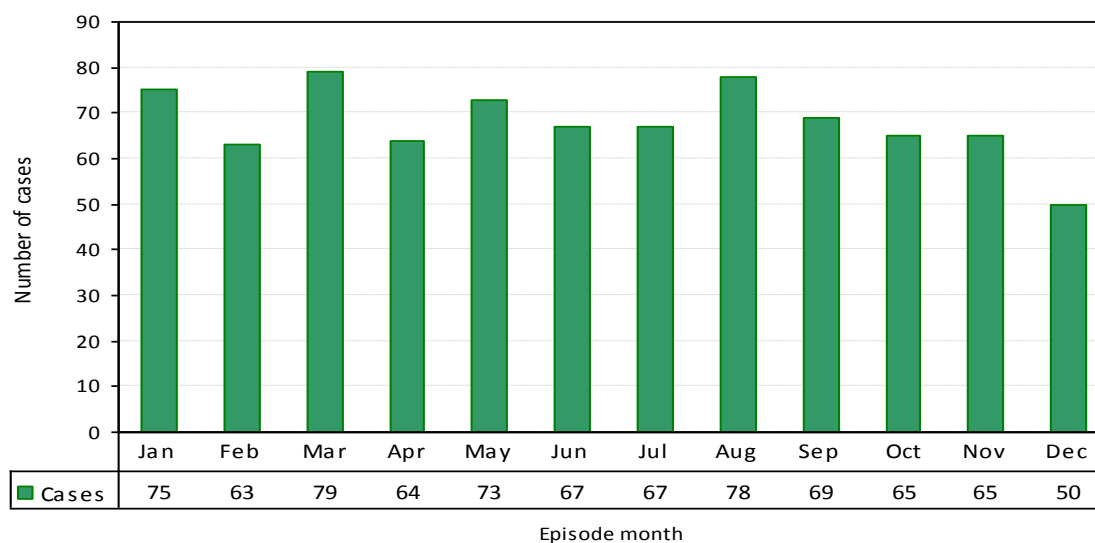
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Amebiasis was removed from the national notifiable diseases list in 1999.

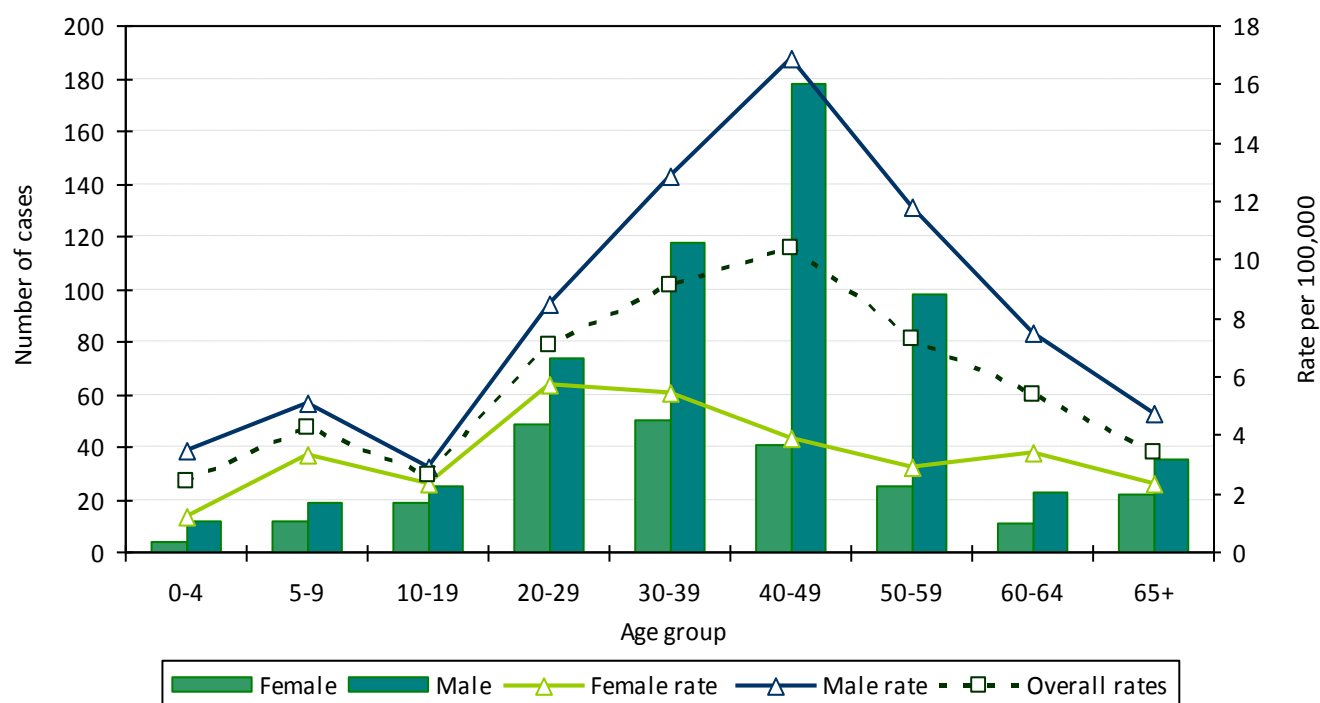
Figure 1.1.2: Incidence of Amebiasis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.1.3: Incidence of Amebiasis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

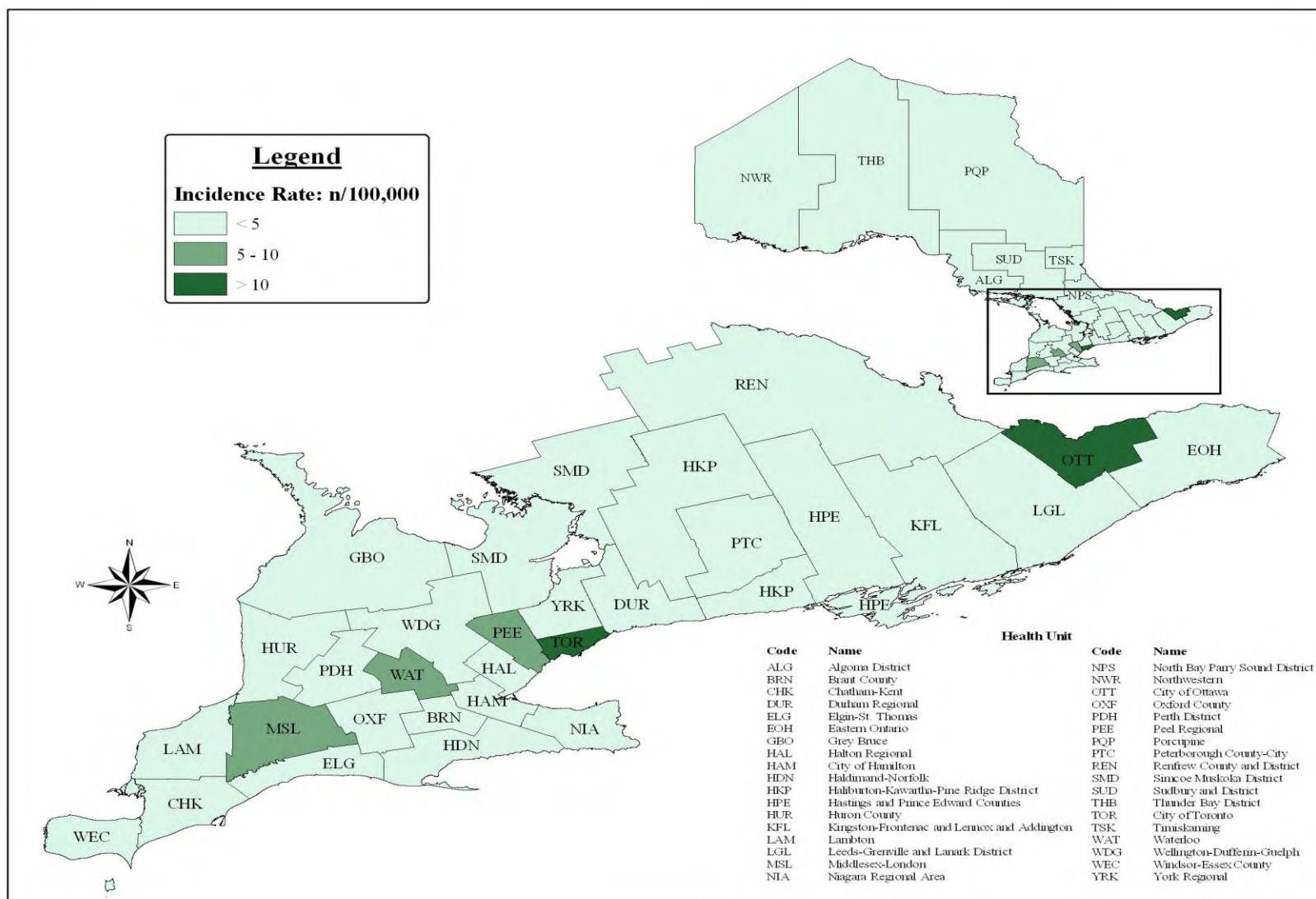
Table 1.1.1: Incidence of Amebiasis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	4	1.2	12	3.5	16	2.4
5-9	12	3.3	19	5.1	31	4.2
10-19	19	2.3	25	2.9	44	2.6
20-29	49	5.7	74	8.5	123	7.1
30-39	50	5.4	118	12.9	168	9.1
40-49	41	3.9	178	16.9	219	10.4
50-59	25	2.9	98	11.8	123	7.3
60-64	11	3.4	23	7.5	34	5.4
65+	22	2.3	35	4.7	57	3.4
Total	233	3.6	582	9.2	815	6.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 1.1.1: Incidence Rates of Amebiasis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.1.2: Incidence of Amebiasis by Public Health Unit: Ontario, 2007

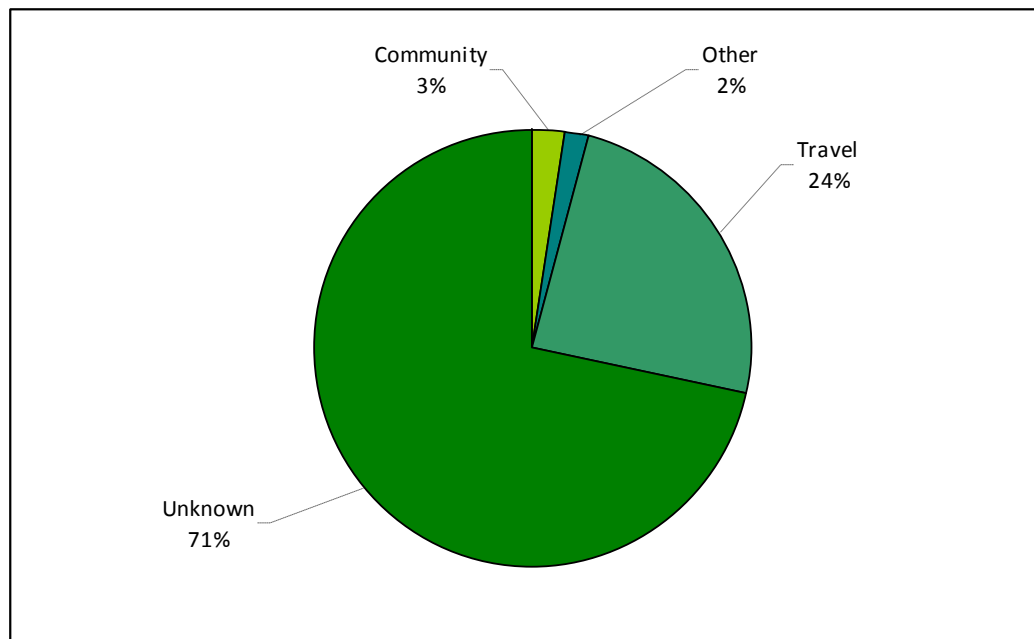
Public Health Unit	Number of cases	Rate/100,000 population
Toronto	402	15.2
Ottawa, City of	91	10.8
Peel Region	122	9.4
Waterloo Region	30	6.0
Middlesex-London	23	5.2
Hamilton, City of	24	4.6
Halton Region	18	3.8
Wellington-Dufferin-Guelph	10	3.8
Peterborough County	5	3.7
Leeds-Grenville and Lanark District	6	3.5
York Region	29	3.0
Thunder Bay District	4	2.6
Eastern Ontario	5	2.5
Niagara Region	11	2.5
Brant County	3	2.2
Kingston-Frontenac and Lennox and Addington	4	2.1
Renfrew County and District	2	2.0
Simcoe Muskoka District	9	1.8
Durham Region	10	1.7
Lambton County	2	1.5
Perth District	1	1.3
Hastings Prince Edward Counties	2	1.2
Northwestern	1	1.2
Haliburton-Kawartha-Pine Ridge District	1	0.6
Algoma District	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Huron County	0	0.0
North Bay Parry Sound District	0	0.0
Oxford County	0	0.0
Porcupine	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	815	6.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.1.4: Most Likely Exposures for Amebiasis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

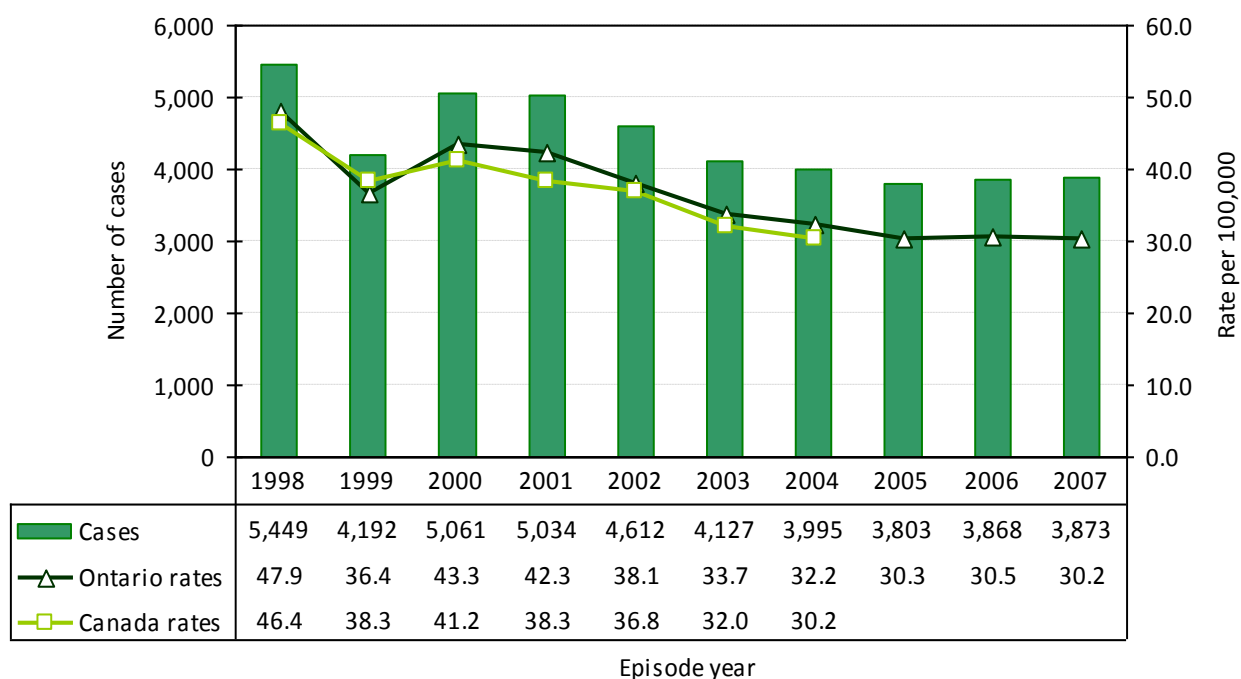
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 21% of cases; these cases were excluded

1.2 CAMPYLOBACTERIOSIS

- Campylobacteriosis was the leading cause of enteric disease in Ontario in 2007, accounting for 36% of enteric and zoonotic diseases reported in that year (Table 1.2.1).
- In 2007, Ontario reported 3,873 confirmed cases of campylobacteriosis, which represents an incidence rate of 30 cases per 100,000 (Table 1.2.1).
- Since 2005, the incidence rate of campylobacteriosis has remained stable at approximately 30 cases per 100,000 population (Figure 1.2.1).
- Confirmed cases of campylobacteriosis in 2007 demonstrated a seasonal peak that occurred in the warmer months of May to October. The total number of cases reported during this period accounted for 64% of campylobacteriosis cases reported in 2007 (Figure 1.2.2).
- In 2007, the incidence rate of campylobacteriosis was higher for males at 34 cases per 100,000 population compared to females at 26 cases per 100,000 population (Figure 1.2.3, Table 1.2.1).
- The incidence rate of campylobacteriosis was highest among the 0-4 age group at 55 cases per 100,000 population. Sex-specific incidence rates for this age group were also the highest at 47 and 62 cases per 100,000 population for females and males, respectively. (Figure 1.2.3, Table 1.2.1).
- Perth District (75 cases per 100,000 population), Huron County (67 cases per 100,000 population) and Grey-Bruce (42 cases per 100,000 population) reported the highest incidence rates of campylobacteriosis in 2007. Hastings and Prince Edward Counties reported the lowest incidence rate at 9.8 cases per 100,000 population (Map 1.2.1, Table 1.2.2).
- Of campylobacteriosis cases reporting an exposure in 2007, 60% reported an unknown setting, 17 % reported travel outside of Ontario, 13% reported exposures within their homes, 6% reported exposures at food premises, 2% reported on-farm exposures and 2% reported exposures in other settings (Figure 1.2.4).
- The most likely modes of transmission for non-travel related cases of campylobacteriosis in 2007 were foodborne (16%), animal-to-person (6%), person-to-person via the fecal-oral route (4%) and waterborne (1%); the mode of transmission was unknown for the remaining 73% of non-travel related cases (Figure 1.2.5).

Figure 1.2.1: Incidence of Campylobacteriosis in Ontario and Canada: 1998-2007



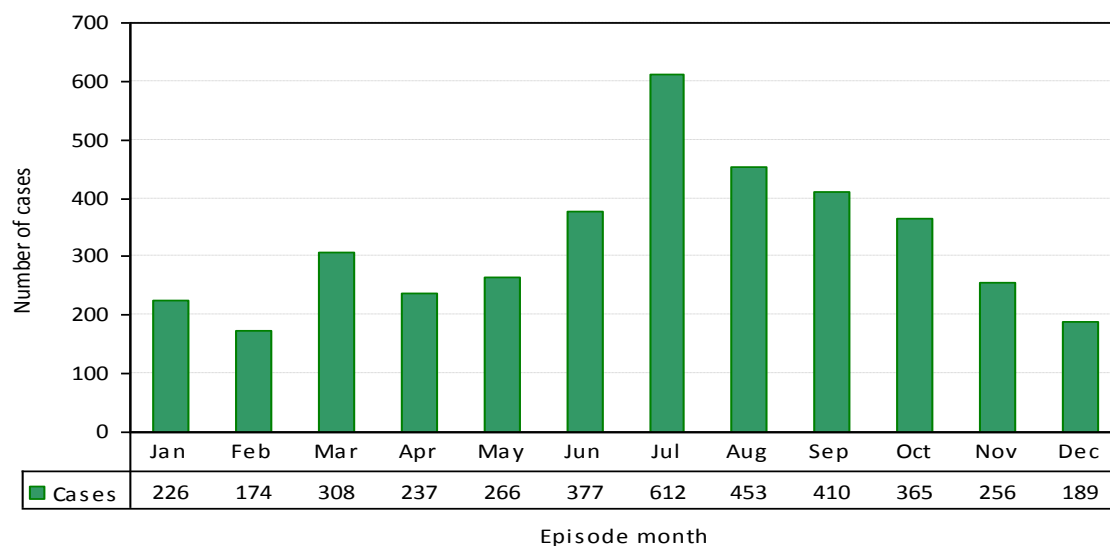
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

Figure 1.2.2: Incidence of Campylobacteriosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.2.3: Incidence of Campylobacteriosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Does not include 7 cases for which age and/or sex were unknown

Table 1.2.1: Incidence of Campylobacteriosis by Age and Sex: Ontario, 2007

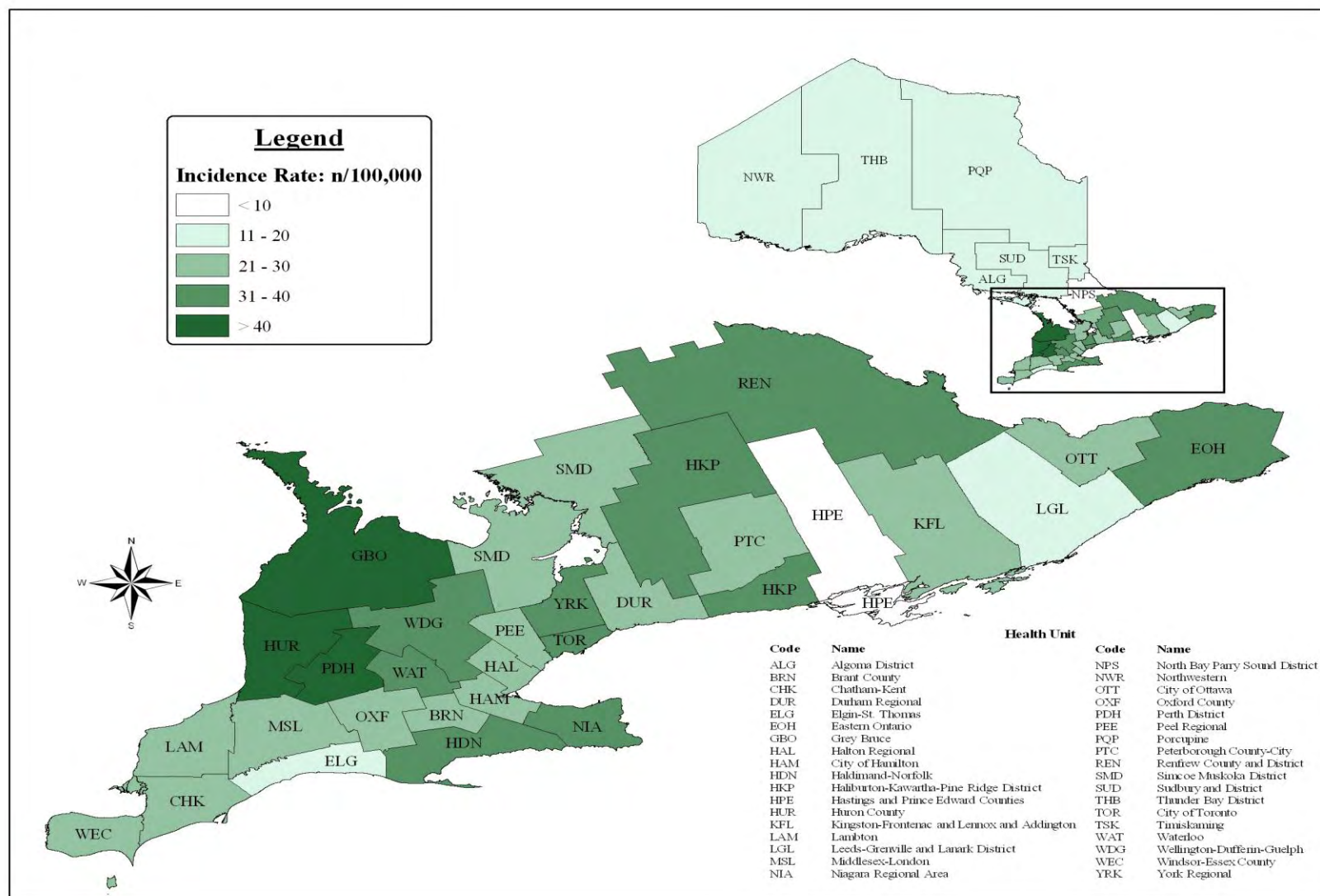
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	155	47.0	216	62.3	371	54.9
5-9	80	22.2	134	35.8	214	29.1
10-19	135	16.4	248	28.7	383	22.7
20-29	326	37.8	304	34.8	630	36.3
30-39	244	26.4	282	30.7	526	28.5
40-49	222	21.0	329	31.2	551	26.1
50-59	208	24.1	244	29.3	452	26.7
60-64	122	37.9	109	35.3	231	36.6
65+	223	23.6	285	38.5	508	30.1
Total	1,715	26.4	2,151	34.1	3,866	30.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 7 cases for which age and/or sex were unknown

Map 1.2.1: Incidence Rates of Campylobacteriosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.2.2: Incidence of Campylobacteriosis by Public Health Unit: Ontario, 2007

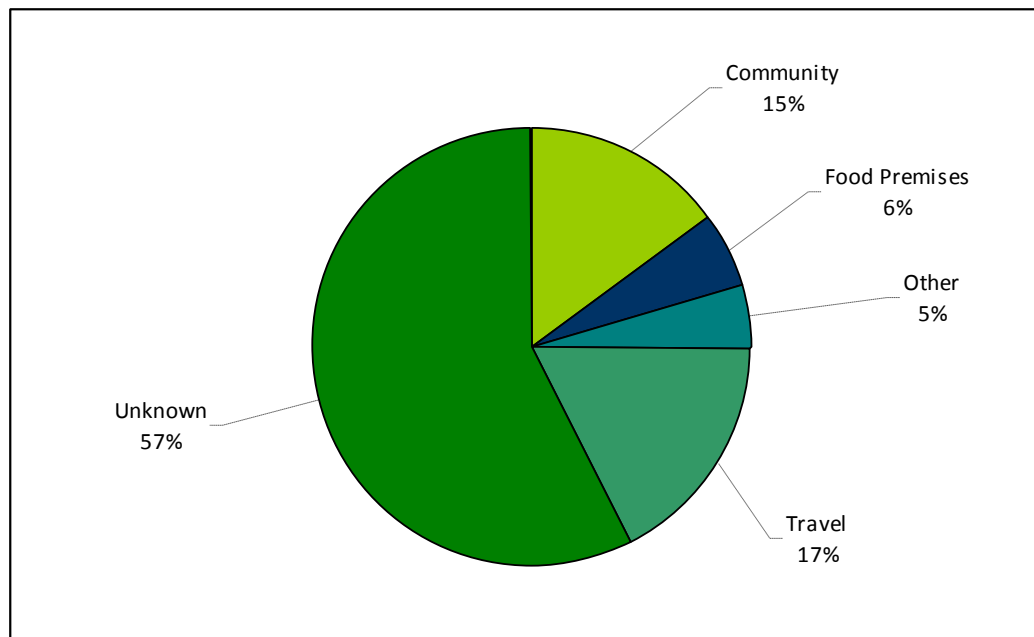
Public Health Unit	Number of cases	Rate/100,000 population
Perth District	58	75.2
Huron County	41	66.8
Grey-Bruce	68	42.0
York Region	368	37.7
Eastern Ontario	75	37.6
Toronto	982	37.0
Waterloo Region	183	36.9
Renfrew County and District	34	33.8
Wellington-Dufferin-Guelph	88	33.2
Haliburton-Kawartha-Pine Ridge District	58	33.1
Niagara Region	140	32.3
Haldimand-Norfolk	35	31.3
Peel Region	392	30.2
Halton Region	139	29.6
Ottawa, City of	244	28.8
Windsor-Essex County	110	27.2
Peterborough County	36	26.9
Simcoe Muskoka District	130	26.3
Durham Region	151	25.4
Oxford County	27	25.3
Middlesex-London	109	24.9
Lambton County	30	22.7
Kingston-Frontenac and Lennox and Addington	41	21.8
Brant County	29	21.2
Chatham-Kent	23	21.0
Hamilton, City of	107	20.6
Thunder Bay District	28	18.1
Algoma District	21	17.6
Timiskaming	6	17.4
Leeds-Grenville and Lanark District	28	16.5
Elgin-St. Thomas	14	15.4
Northwestern	12	15.0
Sudbury and District	27	13.6
Porcupine	10	11.5
North Bay Parry Sound District	13	10.4
Hastings Prince Edward Counties	16	9.8
Ontario	3,873	30.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.2.4: Most Likely Exposure Settings for Campylobacteriosis Cases: Ontario, 2007

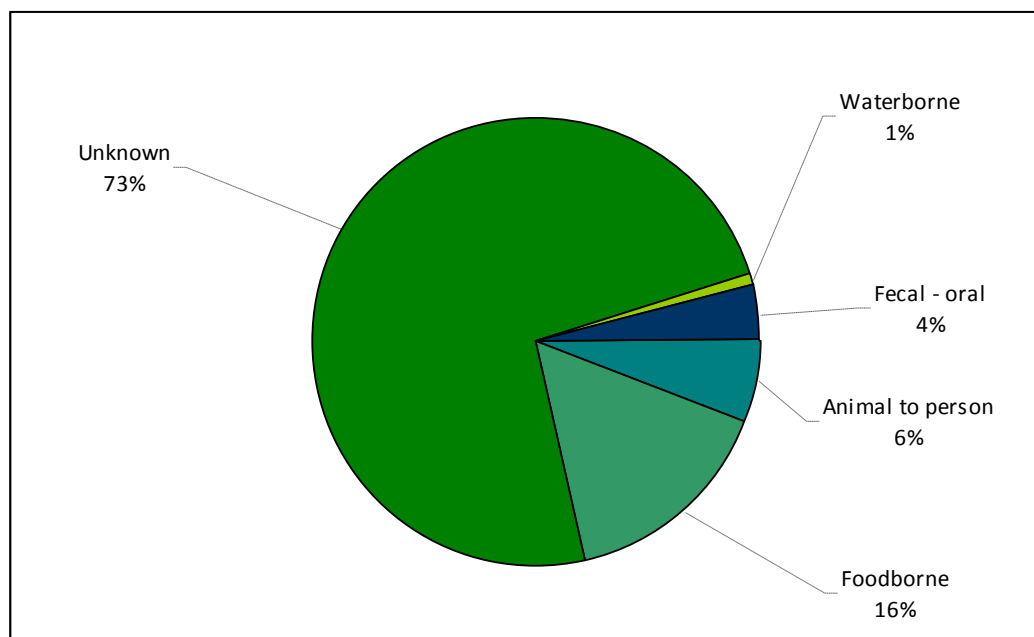


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 24% of cases; these cases were excluded

Figure 1.2.5: Most Likely Modes of Transmission for Campylobacteriosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

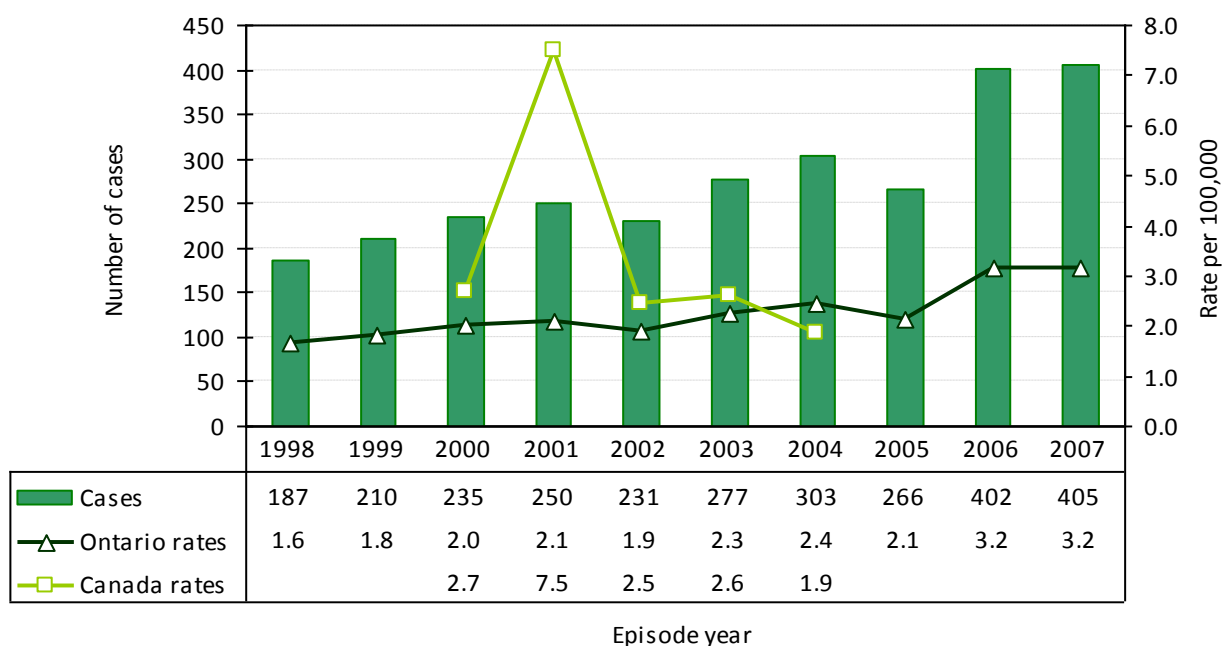
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 24% of cases; these cases were excluded; excludes travel-related cases

1.3 CRYPTOSPORIDIOSIS

- Cryptosporidiosis was the fifth leading cause of enteric diseases in Ontario in 2007 with a total of 405 confirmed cases, which represents an incidence rate of 3.2 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence rate for cryptosporidiosis in Ontario increased by 100% from 1.6 cases per 100,000 population in 1998 to 3.2 cases per 100,000 population in 2007. The number of cryptosporidiosis cases peaked in 2006 and 2007 at 402 and 405 cases, respectively, representing the highest annual counts since 1998 (Figure 1.3.1).
- From 2000 to 2003, the annual incidence rates for cryptosporidiosis in Ontario were lower than the national rates. The national incidence rate for 2001 was significantly higher than that of Ontario, likely due to a large waterborne outbreak of cryptosporidiosis in the Battlefords area of Saskatchewan (Figure 1.3.1).
- Similar to other years, Cryptosporidiosis cases demonstrated a seasonal trend in 2007, with the majority (44%) of cases occurring during the months of August and September (Figure 1.3.2).
- In 2007, males accounted for 55% (221) of cryptosporidiosis cases and had an incidence rate that was 25% higher than females (3.5 cases per 100,000 population compared to 2.8 cases per 100,000 population) (Figure 1.3.3, Table 1.3.1).
- The incidence rate for cryptosporidiosis decreased with increasing age and was highest for cases in the 0-4 and 5-9 years age groups (Figure 1.3.3, Table 1.3.1).
- Perth County (15.6 cases per 100,000 population), Oxford County (14.1 cases per 100,000 population) and Huron County (11.4 cases per 100,000 population) reported the highest incidence rates of cryptosporidiosis in 2007 (Map 1.3.1, Table 1.3.2).
- Travel outside of Ontario (34%) and exposure to recreational water sources (10%) were the two most common exposures for cryptosporidiosis cases who reported an exposure in 2007. On-farm exposures and exposures within private residences were the third most common exposures at 6% each (Figures 1.3.4, 1.3.5).
- Waterborne transmission (20%), animal-to-person transmission (14%) and person-to-person transmission (5%) were the most likely transmission modes for 39% of non-travel related cryptosporidiosis cases that reported an exposure in 2007 (Figure 1.3.6).

Figure 1.3.1: Incidence of Cryptosporidiosis in Ontario and Canada: 1998-2007



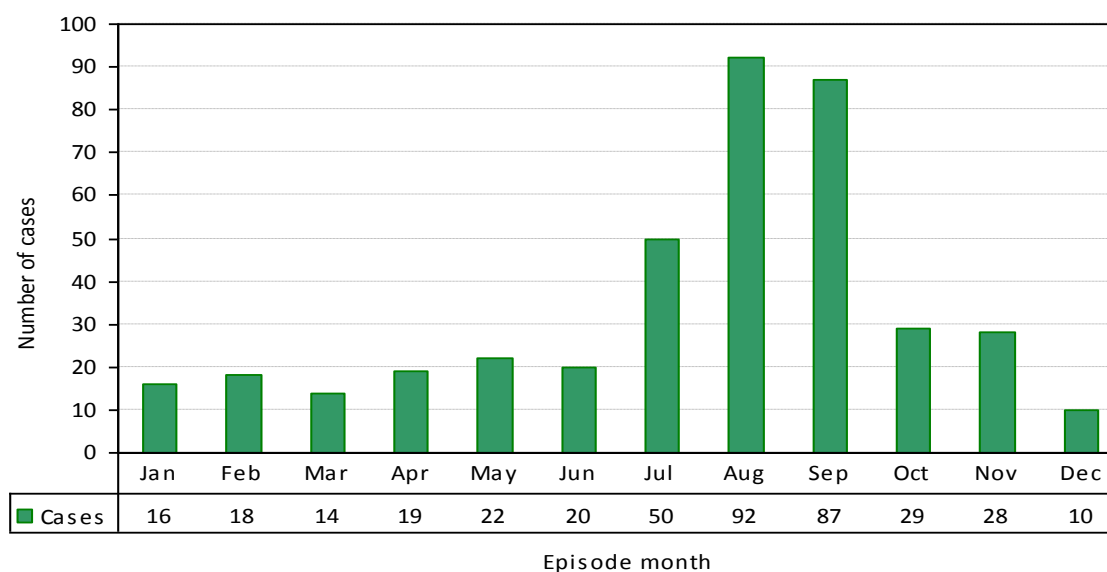
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canada rates): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Cryptosporidiosis became nationally reportable in 2000; Canadian statistics available up to 2004.

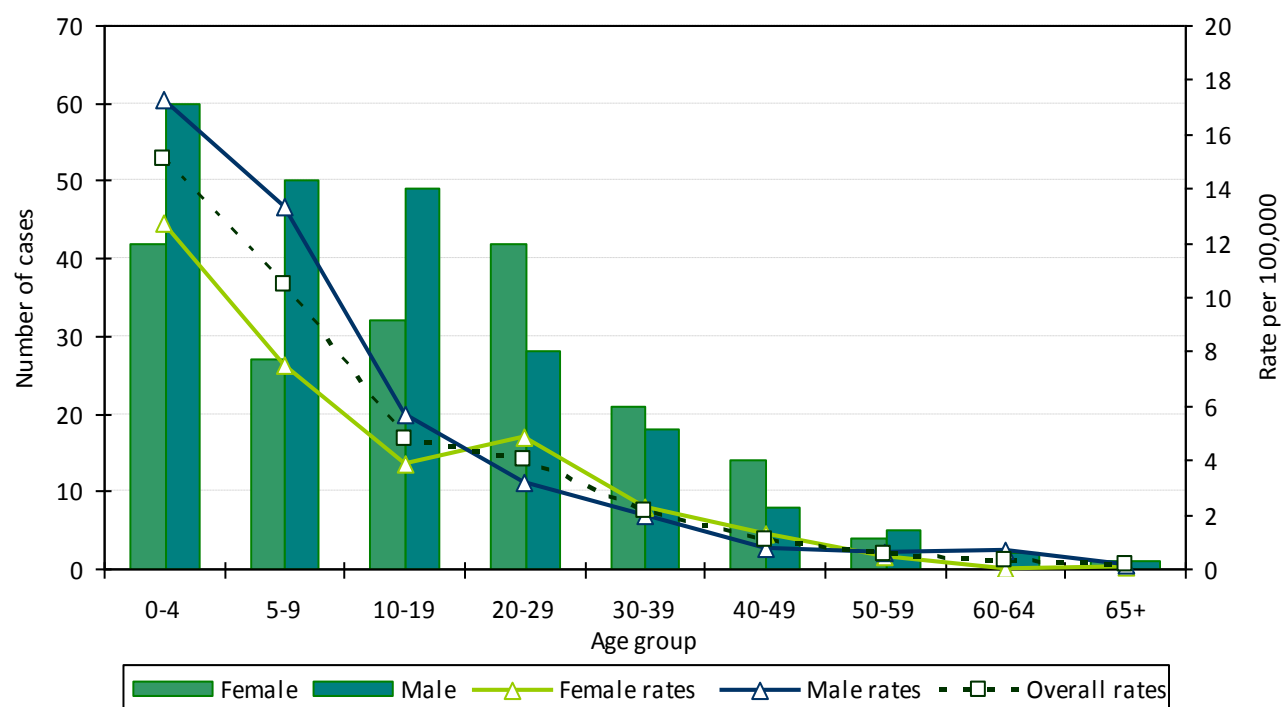
Figure 1.3.2: Incidence of Cryptosporidiosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.3.3: Incidence of Cryptosporidiosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 case for which sex and/or age was unknown

Table 1.3.1: Incidence of Cryptosporidiosis by Age and Sex: Ontario, 2007

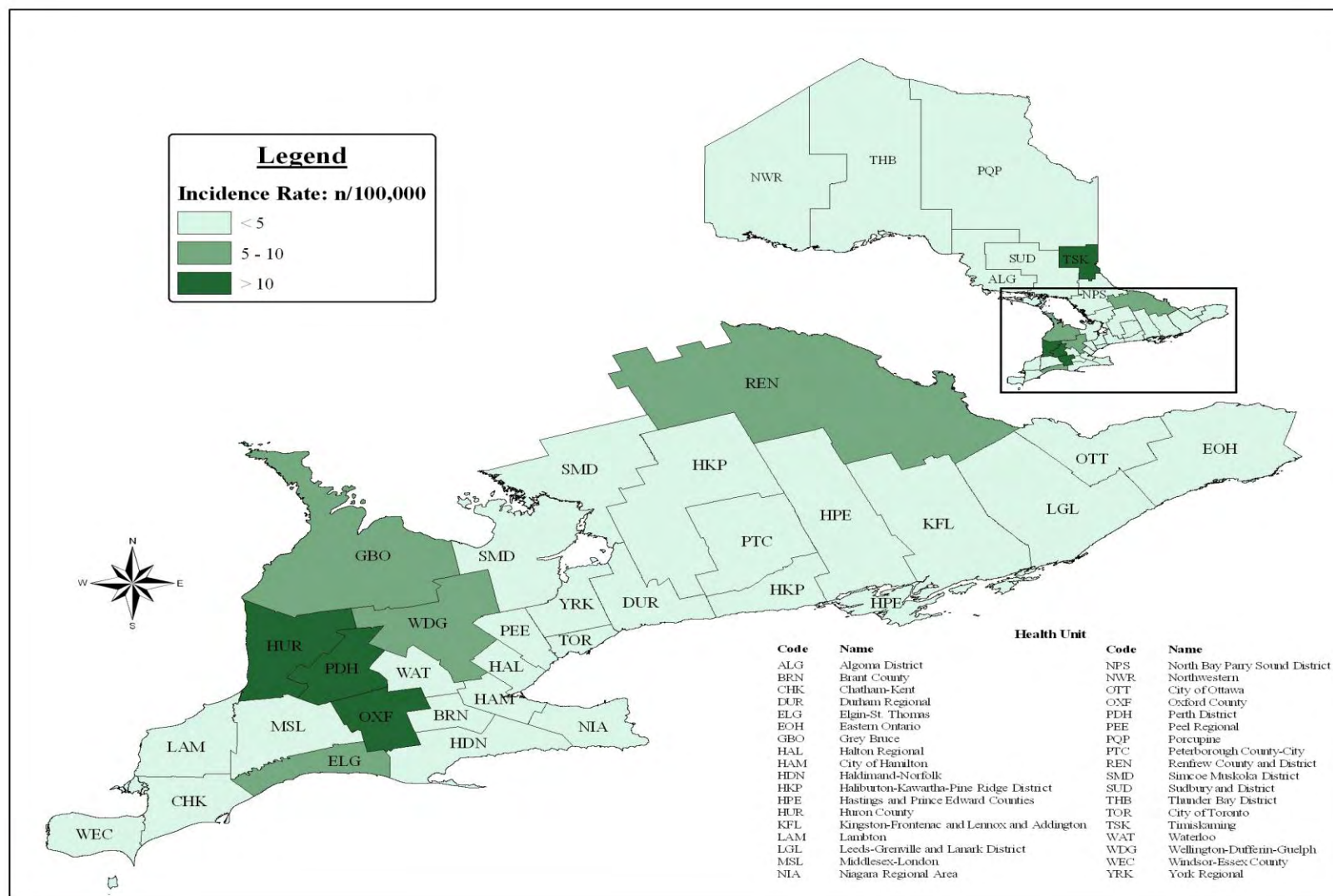
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	42	12.7	60	17.3	102	15.1
5-9	27	7.5	50	13.3	77	10.5
10-19	32	3.9	49	5.7	81	4.8
20-29	42	4.9	28	3.2	70	4.0
30-39	21	2.3	18	2.0	39	2.1
40-49	14	1.3	8	0.8	22	1.0
50-59	4	0.5	5	0.6	9	0.5
60-64	0	0.0	2	0.6	2	0.3
65+	1	0.1	1	0.1	2	0.1
Total	183	2.8	221	3.5	404	3.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 case for which sex and/or age was unknown

Map 1.3.1: Incidence Rates of Cryptosporidiosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.3.2: Incidence of Cryptosporidiosis by Public Health Unit: Ontario, 2007

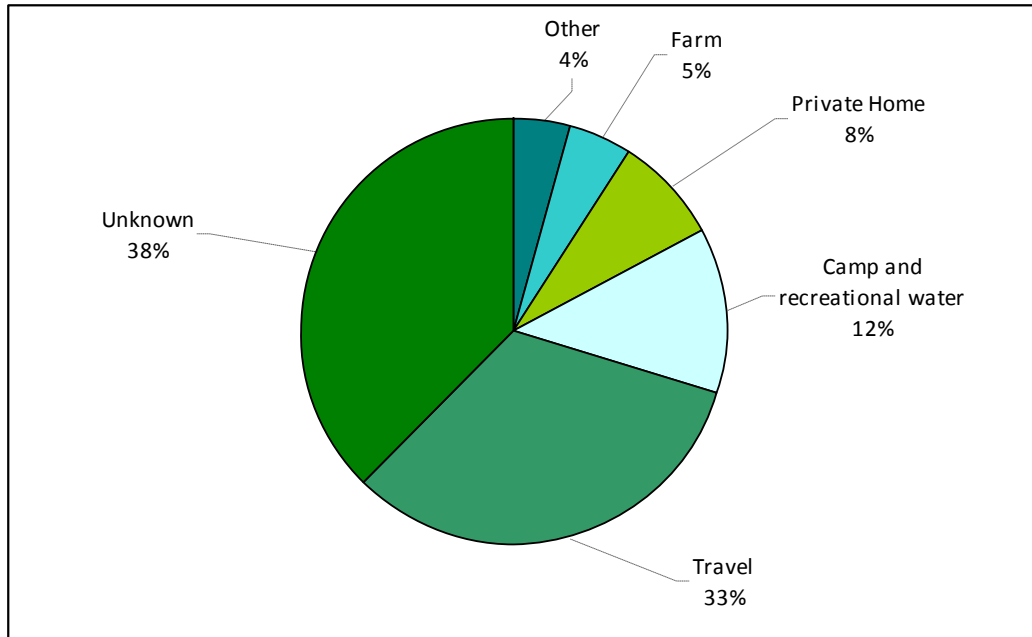
Public Health Unit	Number of cases	Rate/100,000 population
Perth District	12	15.6
Timiskaming	5	14.5
Oxford County	15	14.1
Huron County	7	11.4
Elgin-St Thomas	9	9.9
Grey-Bruce	15	9.3
Renfrew County and District	9	9.0
Wellington-Dufferin-Guelph	24	9.0
Haliburton-Kawartha-Pine Ridge District	8	4.6
Porcupine	4	4.6
Peterborough County-City	6	4.5
Hastings Prince Edward Counties	7	4.3
Eastern Ontario	8	4.0
Waterloo	20	4.0
Peel Region	41	3.2
Windsor-Essex County	13	3.2
Ottawa, City of	25	3.0
Brant County	4	2.9
Chatham-Kent	3	2.7
York Region	26	2.7
Hamilton, City of	13	2.5
Middlesex-London	11	2.5
Northwestern	2	2.5
Toronto	66	2.5
North Bay Parry Sound District Health Unit	3	2.4
Simcoe Muskoka District Health Unit	11	2.2
Niagara Region	9	2.1
Thunder Bay District	3	1.9
Durham Region	11	1.8
Leeds-Grenville and Lanark District	3	1.8
Algoma District	2	1.7
Halton Region	8	1.7
Lambton County	1	0.8
Kingston Frontenac and Lennox and Addington	1	0.5
Haldimand-Norfolk	0	0.0
Sudbury and District	0	0.0
Ontario	405	3.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.3.4: Most Likely Exposure Settings for Cryptosporidiosis Cases: Ontario, 2007

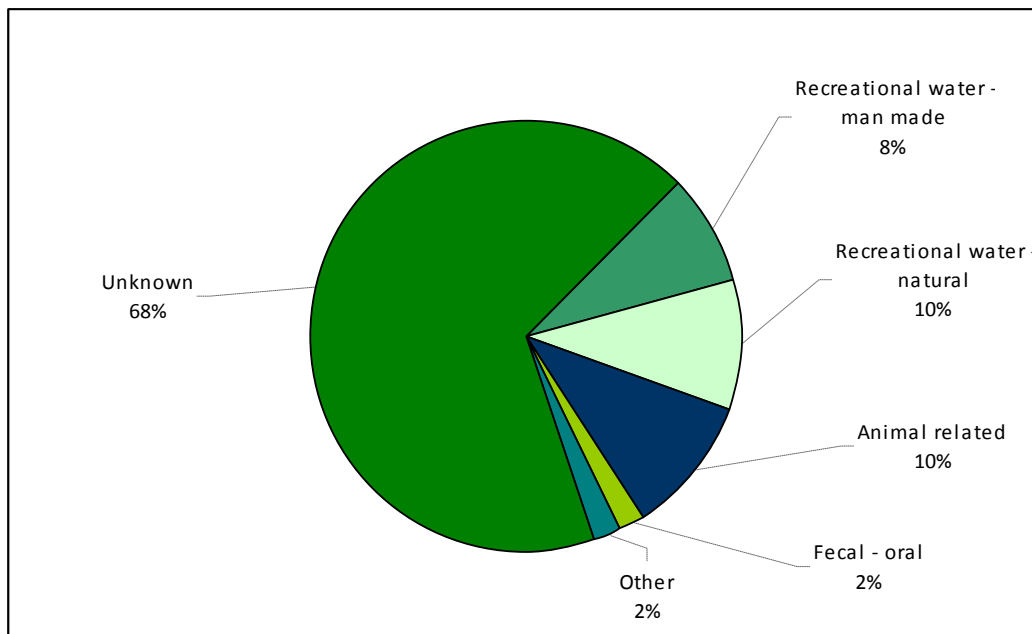


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 20% of cases; these cases were excluded

Figure 1.3.5: Most Likely Sources of Illness for Cryptosporidiosis Cases: Ontario, 2007

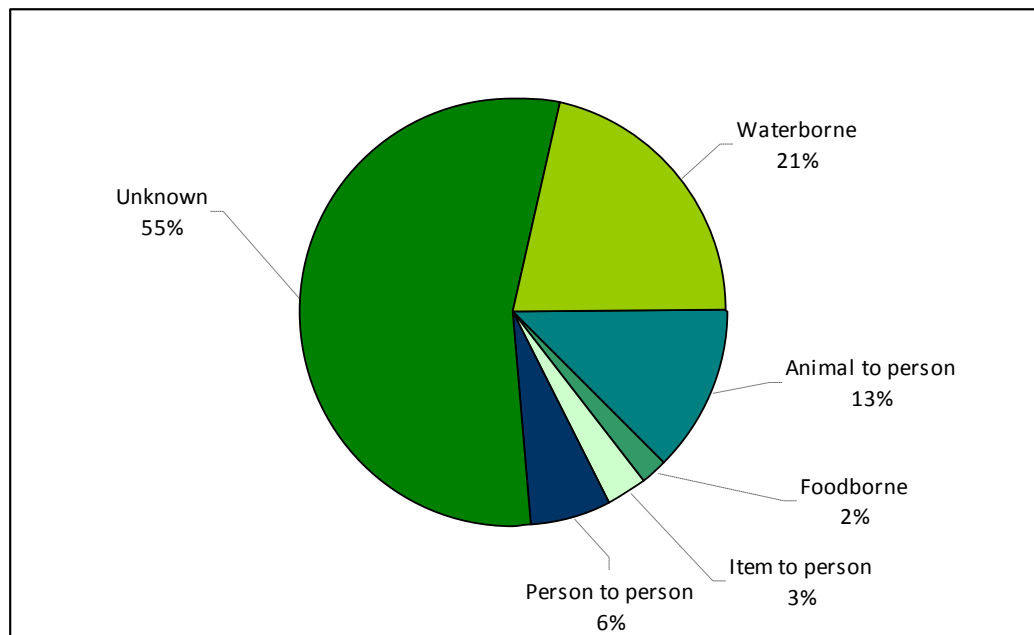


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 20% of cases; these cases were excluded. Excludes travel-related cases

Figure 1.3.6: Most Likely Modes of Transmission for Cryptosporidiosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

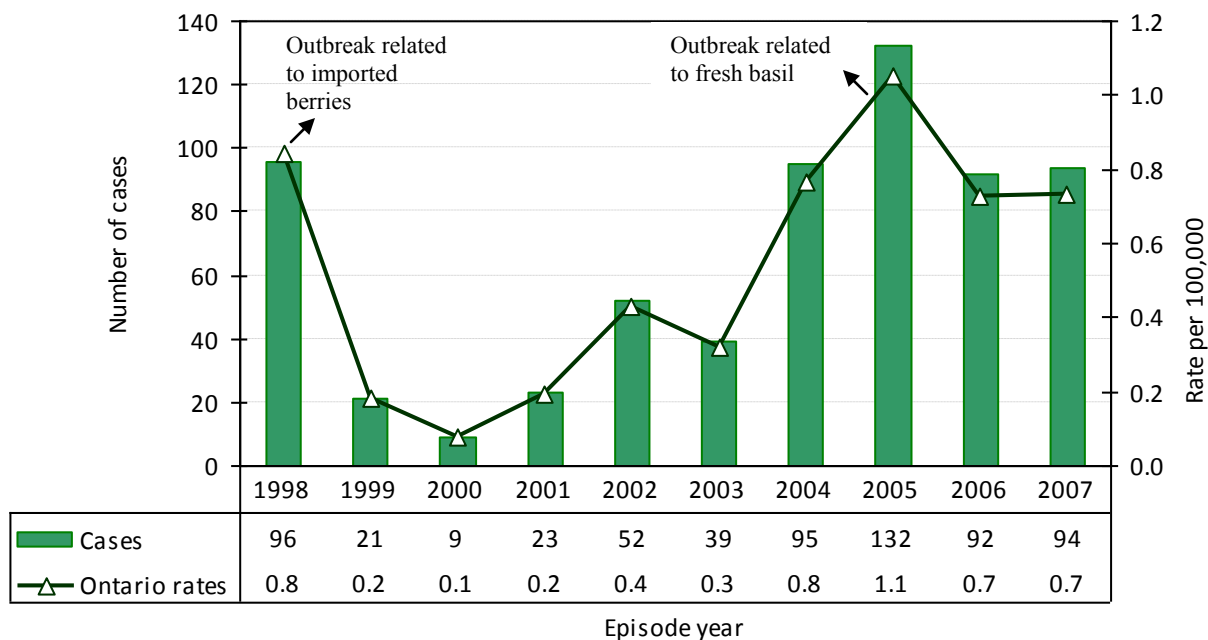
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 20% of cases; these cases were excluded. Excludes travel-related cases

1.4 CYCLOSPORIASIS

- In 2007, Ontario reported 94 cases of cyclosporiasis, representing an incidence rate of 0.7 cases per 100,000 population (Table 1.1).
- During the period 1998 to 2007, the incidence of cyclosporiasis in Ontario fluctuated. Since 2004, reports of cyclosporiasis have remained relatively stable with the exception of a marked increase in 2005 attributed to an outbreak linked to the consumption of fresh basil (Figure 1.4.1).
- Confirmed cases of cyclosporiasis in 2007 demonstrated two distinct seasonal peaks; the larger peak occurred from May to July (46% of cases) and the smaller peak from October to November (20% of cases) (Figure 1.4.2).
- In 2007, the incidence rate of cyclosporiasis was 33% higher for females at 0.8 cases per 100,000 population compared to males at 0.6 cases per 100,000 population (Figure 1.4.3, Table 1.4.1).
- The incidence of cyclosporiasis was highest in the 20-29 age group, with persons aged 20 years and older accounting for 96% (90 out of 94) of confirmed cyclosporiasis cases (Figure 1.4.3, Table 1.4.1).
- Six health units (Elgin-St. Thomas, Halton Region, Kingston- Frontenac- Lennox and Addington, Renfrew, Toronto and Wellington-Dufferin-Guelph) reported incidence rates for cyclosporiasis that were at least 50% higher than the provincial rate of 0.7 cases per 100,000 population (Map 1.4.1, Table 1.4.2).
- Fifty-nine percent of cyclosporiasis cases who reported an exposure in 2007, reported travel as their most likely exposure, 6% reported settings not related to travel and 35% reported unknown exposures (Figure 1.4.4).

Figure 1.4.1: Incidence of Cyclosporiasis in Ontario: 1998-2007

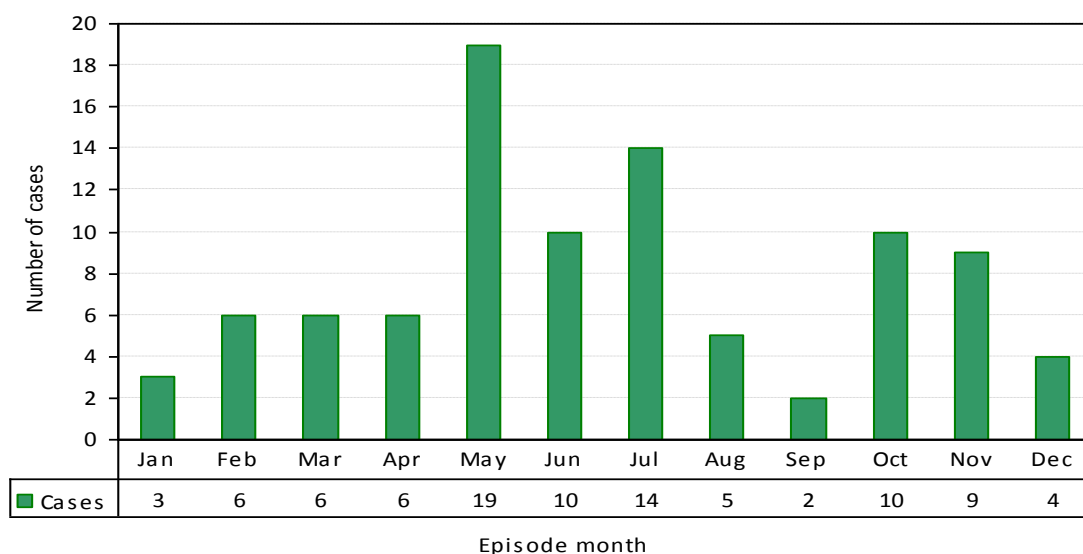


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Cyclosporiasis has been a nationally notifiable disease since 2000; Canadian statistics not available on Notifiable Diseases On-line.

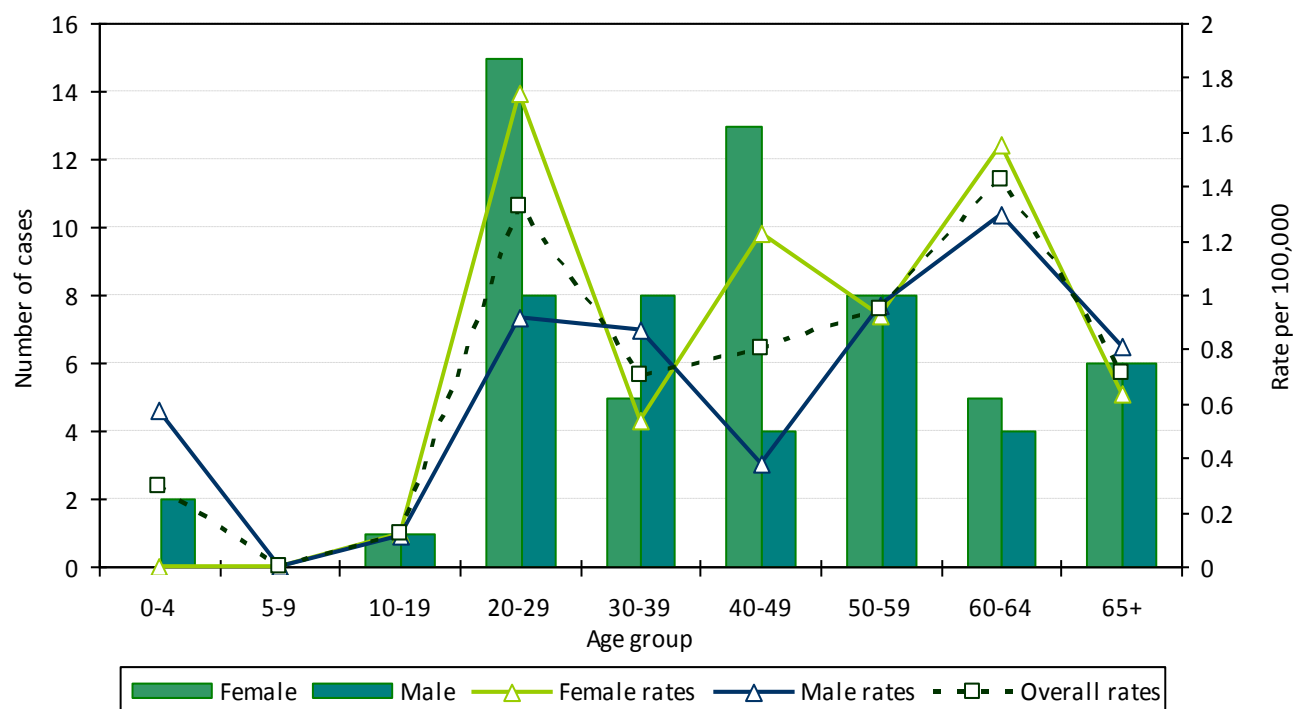
Figure 1.4.2: Incidence of Cyclosporiasis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.4.3: Incidence of Cyclosporiasis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

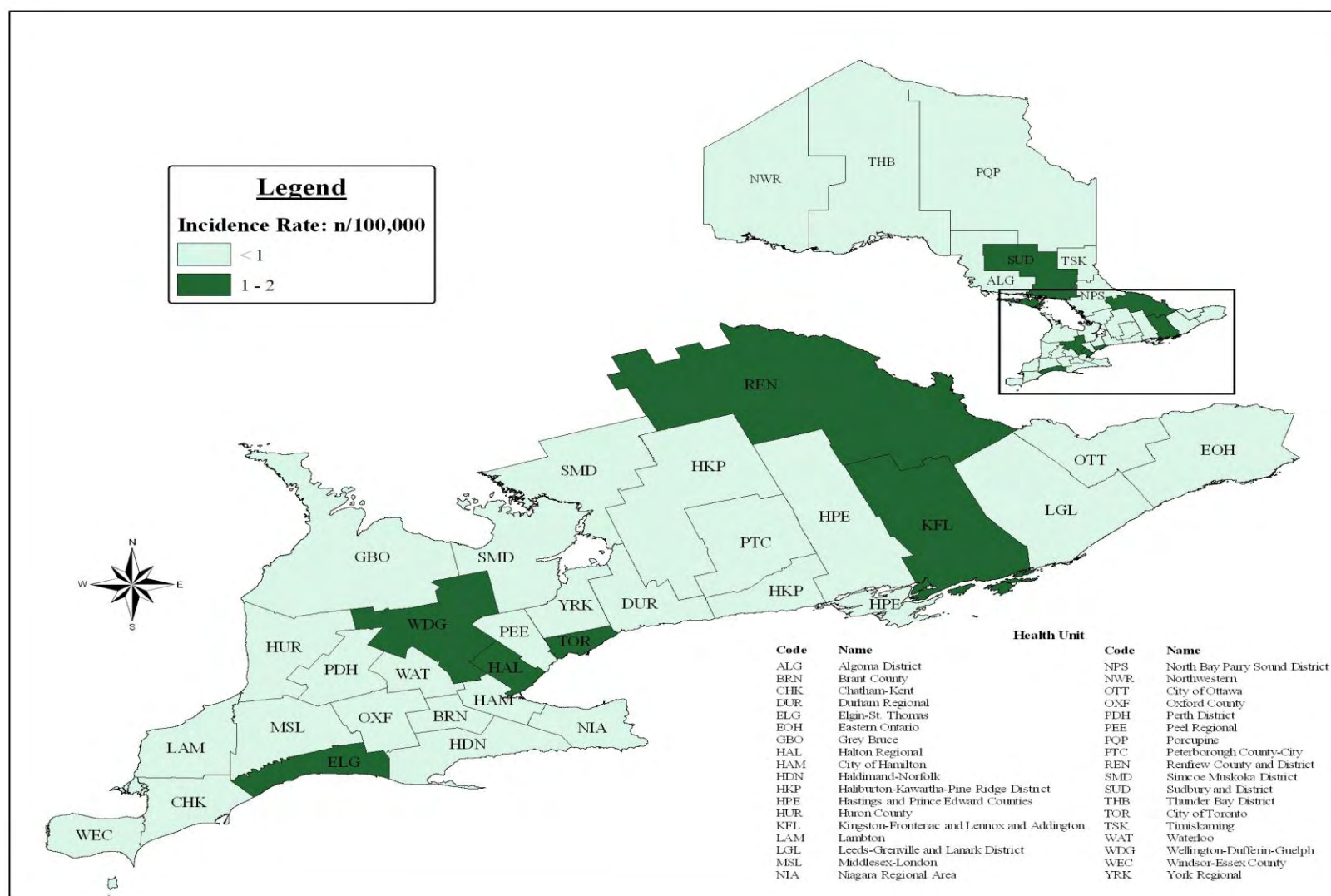
Table 1.4.1: Incidence of Cyclosporiasis by Age and Sex: Ontario, 2007

Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	0	0.0	2.0	0.6	2	0.3
5-9	0	0.0	0.0	0.0	0	0.0
10-19	1	0.1	1.0	0.1	2	0.1
20-29	15	1.7	8.0	0.9	23	1.3
30-39	5	0.5	8.0	0.9	13	0.7
40-49	13	1.2	4.0	0.4	17	0.8
50-59	8	0.9	8.0	1.0	16	0.9
60-64	5	1.6	4.0	1.3	9	1.4
65+	6	0.6	6.0	0.8	12	0.7
Total	53	0.8	41	0.6	94	0.7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 1.4.1: Incidence Rates of Cyclosporiasis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.4.2: Incidence of Cyclosporiasis by Public Health Unit: Ontario, 2007

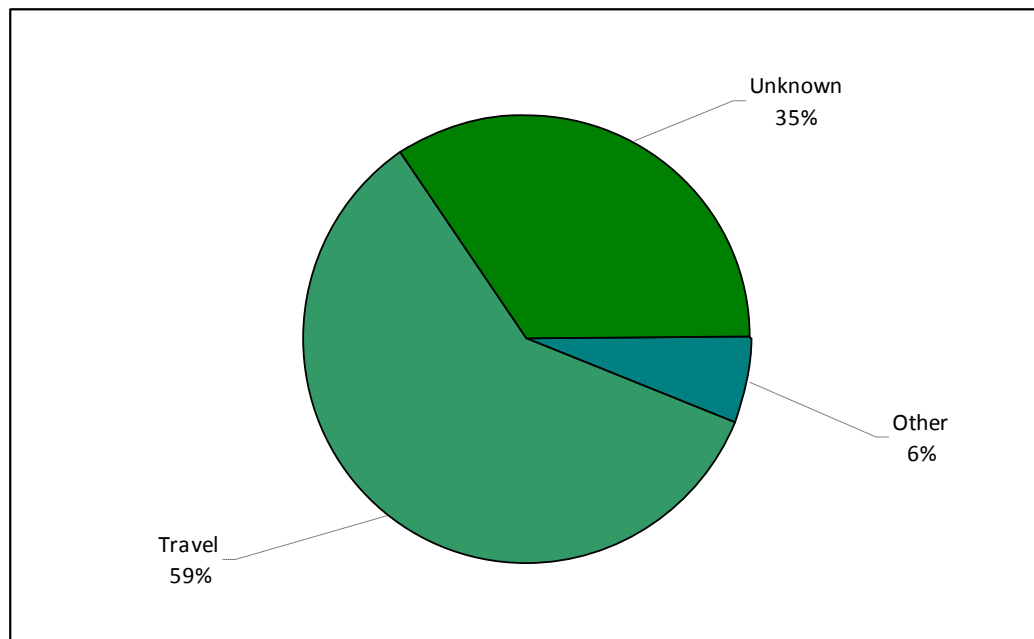
Public Health Unit	Number of cases	Rate/100,000 population
Renfrew County and District	2	2.0
Wellington-Dufferin-Guelph	5	1.9
Toronto	37	1.4
Elgin-St Thomas	1	1.1
Halton Region	5	1.1
Kingston Frontenac and Lennox and Addington	2	1.1
Sudbury and District	2	1.0
Oxford County	1	0.9
Peel Region	12	0.9
Lambton County	1	0.8
North Bay Parry Sound District Health Unit	1	0.8
Brant County	1	0.7
Haliburton-Kawartha-Pine Ridge District	1	0.6
Hamilton, City of	3	0.6
Ottawa, City of	5	0.6
Thunder Bay District	1	0.6
Waterloo	3	0.6
Eastern Ontario	1	0.5
Middlesex-London	2	0.5
York Region	5	0.5
Durham Region	1	0.2
Simcoe Muskoka District Health Unit	1	0.2
Windsor-Essex County	1	0.2
Algoma District	0	0.0
Chatham-Kent	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Leeds-Grenville and Lanark District	0	0.0
Niagara Region	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Timiskaming	0	0.0
Ontario	94	0.7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.4.4: Most Likely Exposure Settings for Cyclosporiasis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

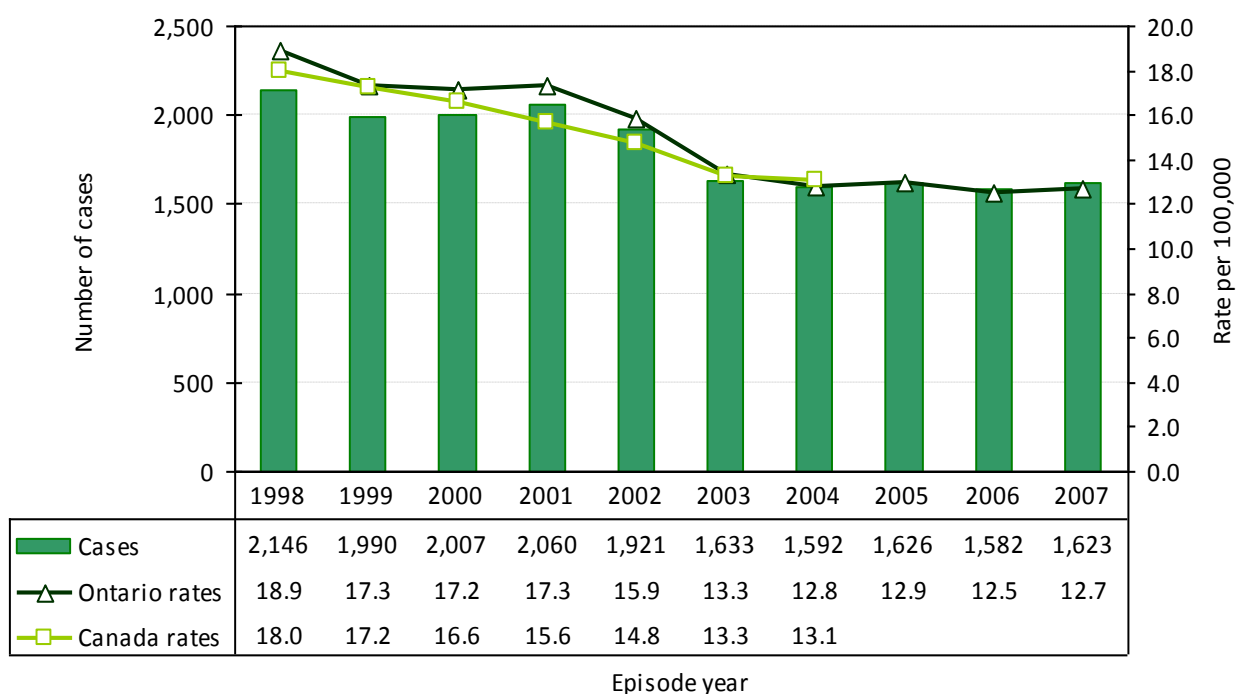
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 14% of cases; these cases were excluded

1.5 GIARDIASIS

- In 2007, giardiasis was the third leading cause of enteric disease in Ontario, accounting for 15% of all enteric diseases reported in that year (Table 1.1).
- Ontario reported a total of 1,623 confirmed cases of giardiasis in 2007, which represents an incidence rate of 13 cases per 100,000 population (Table 1.1).
- During the period 1998 to 2007, the incidence rate of giardiasis in Ontario declined by 33% from 19 cases per 100,000 population in 1998 to 13 cases per 100,000 population in 2007. Since 2003, the incidence rate of giardiasis has remained stable at approximately 13 cases per 100,000 population (Figure 1.5.1).
- Cases of giardiasis occur throughout the year but tend to be more frequently reported towards the end of summer and early fall. In 2007, August (198 cases) and September (174 cases) accounted for the highest number of cases (Figure 1.5.2).
- In 2007, males accounted for 60% of confirmed cases of giardiasis reported in Ontario with an incidence rate of 15.4 cases per 100,000 population. Females accounted for the remaining 40% of cases with a corresponding incidence rate of 9.9 cases per 100,000 population (Figure 1.5.3, Table 1.5.1).
- The incidence rates of giardiasis were highest among persons in the 0-4 age group at 30.8 cases per 100,000 population. Sex-specific incidence rates for males in every age group were higher than those of females in corresponding age groups (Figure 1.5.3, Table 1.5.1).
- In 2007, seven Ontario health units (19%) reported incidence rates for giardiasis that exceeded the provincial incidence rate of 13 cases per 100,000 population. Toronto reported the highest incidence rate at 20 cases per 100,000 population (Map 1.5.1, Table 1.5.2).
- Of giardiasis cases reporting an exposure setting in 2007, travel outside of Ontario accounted for the largest proportion of giardiasis cases at 29% (Fig 1.5.4).

Figure 1.5.1: Incidence of Giardiasis in Ontario and Canada: 1998-2007



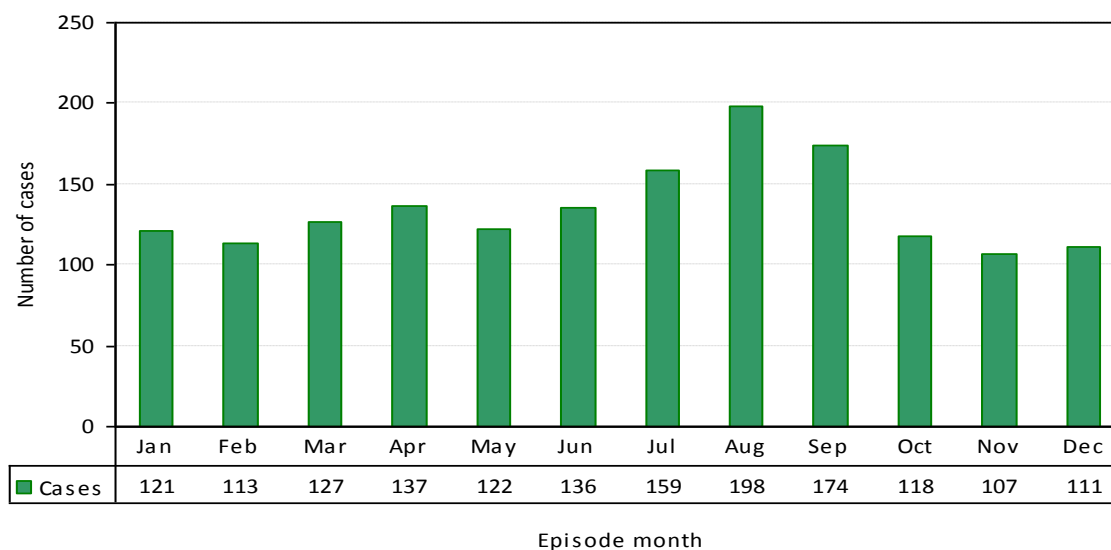
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

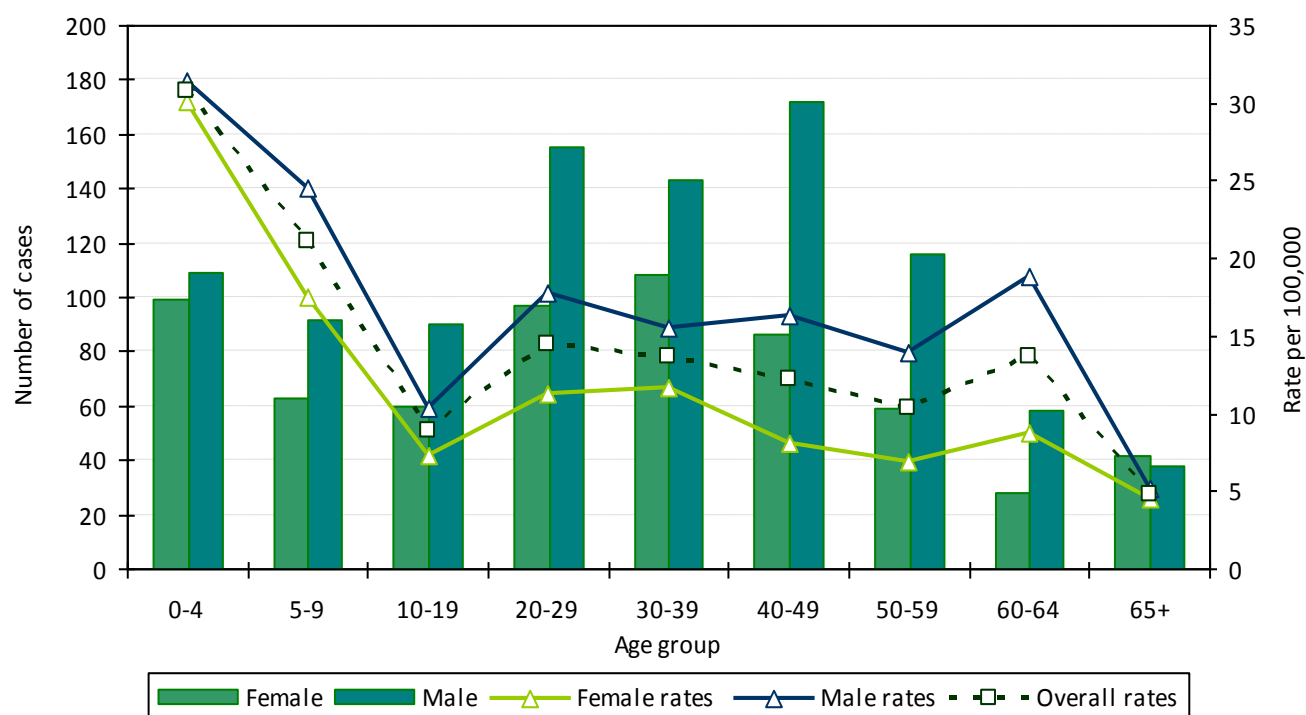
Figure 1.5.2: Incidence of Giardiasis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.5.3: Incidence of Giardiasis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 8 cases for which age and/or was unknown

Table 1.5.1: Incidence of Giardiasis by Age and Sex: Ontario, 2007

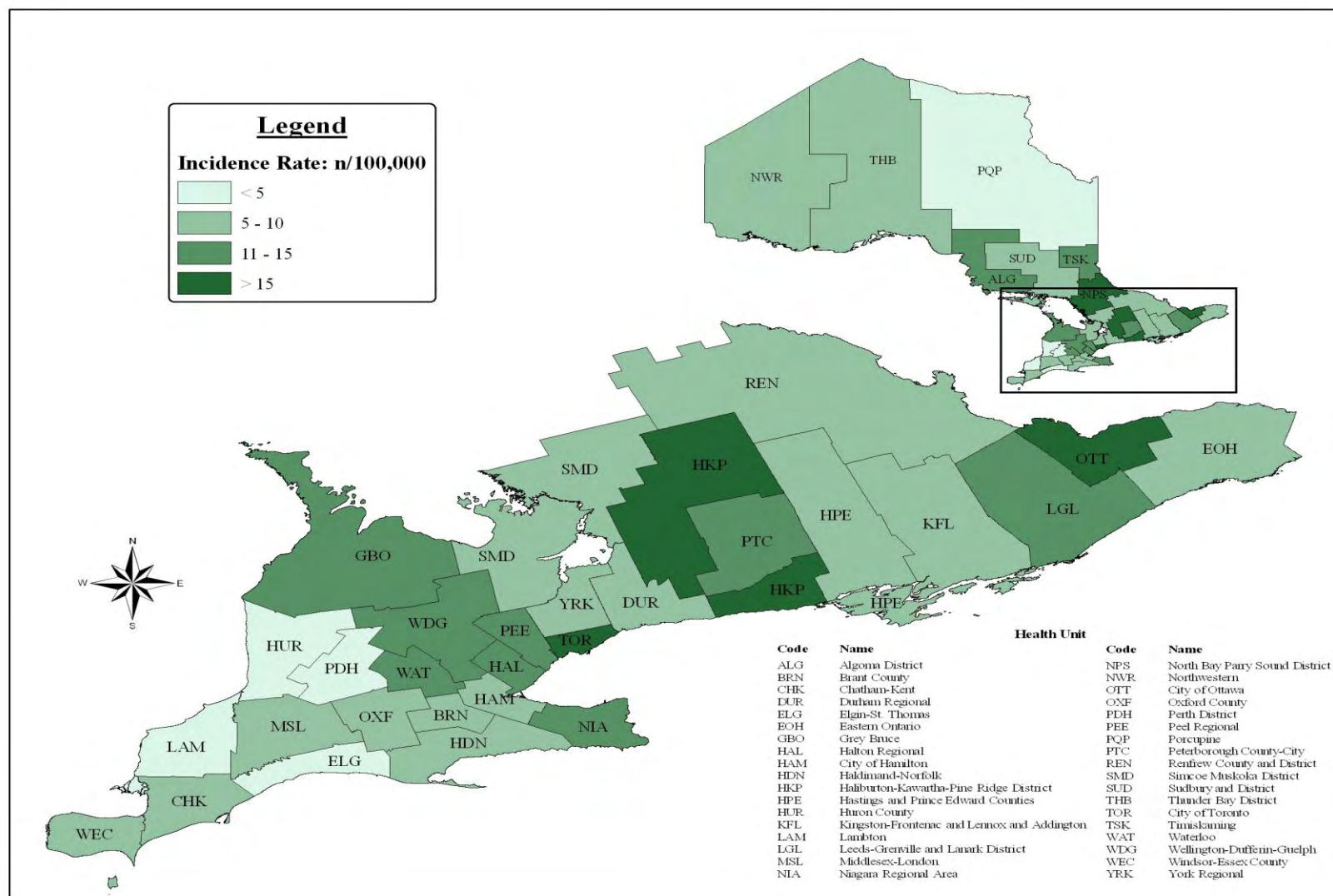
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	99	30.0	109	31.4	208	30.8
5-9	63	17.5	92	24.6	155	21.1
10-19	60	7.3	90	10.4	150	8.9
20-29	97	11.3	155	17.7	252	14.5
30-39	108	11.7	143	15.6	251	13.6
40-49	86	8.1	172	16.3	258	12.2
50-59	59	6.8	116	13.9	175	10.3
60-64	28	8.7	58	18.8	86	13.6
65+	42	4.4	38	5.1	80	4.7
Total	642	9.9	973	15.4	1,615	12.6

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Does not include 8 cases for which age and/or was unknown

Map 1.5.1: Incidence Rates of Giardiasis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.5.2: Incidence of Giardiasis by Public Health Unit: Ontario, 2007

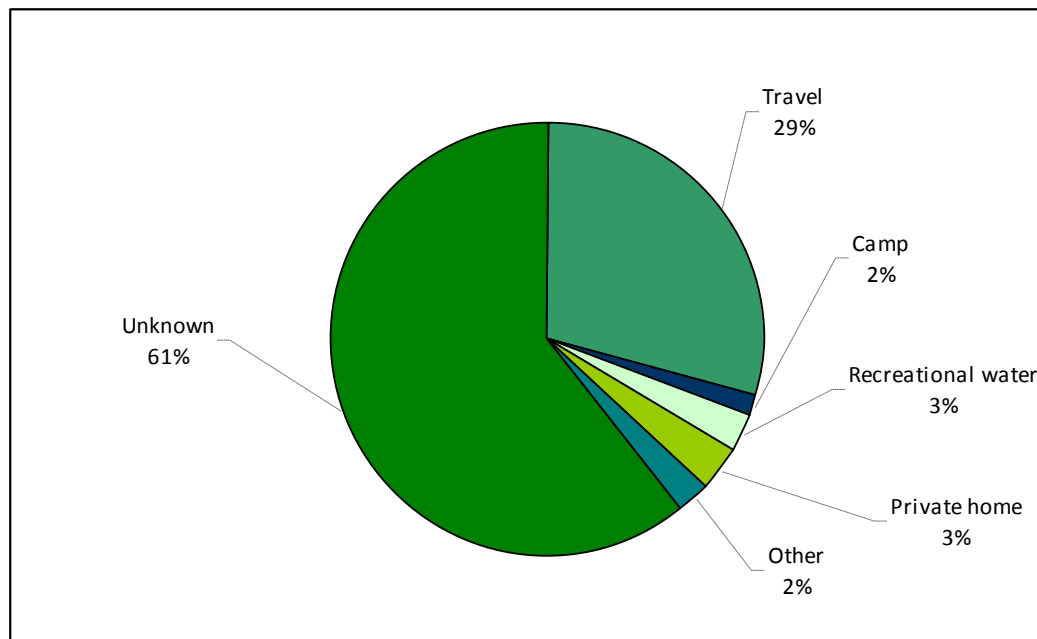
Public Health Unit	Number of cases	Rate/100,000 population
Toronto	536	20.2
Haliburton-Kawartha-Pine Ridge District	34	19.4
Ottawa, City of	151	17.8
North Bay Parry Sound District	20	16.0
Peel Region	194	15.0
Algoma District	17	14.3
Halton Region	65	13.9
Wellington-Dufferin-Guelph	31	11.7
Timiskaming	4	11.6
Grey-Bruce	18	11.1
Niagara Region	48	11.1
Waterloo Region	53	10.7
Leeds-Grenville and Lanark District	18	10.6
Peterborough County	14	10.5
Thunder Bay District	16	10.3
Simcoe Muskoka District	50	10.1
Hamilton, City of	48	9.2
Sudbury and District	18	9.1
Northwestern	7	8.7
York Region	80	8.2
Haldimand-Norfolk	9	8.1
Middlesex-London	35	8.0
Durham Region	45	7.6
Kingston-Frontenac and Lennox and Addington	13	6.9
Windsor-Essex County	28	6.9
Hastings Prince Edward Counties	11	6.7
Brant County	9	6.6
Oxford County	7	6.6
Eastern Ontario	13	6.5
Renfrew County and District	6	6.0
Chatham-Kent	6	5.5
Huron County	3	4.9
Lambton County	6	4.5
Elgin-St. Thomas	4	4.4
Perth District	3	3.9
Porcupine	3	3.4
Ontario	1,623	12.7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.5.4: Most Likely Exposure Settings for Giardiasis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

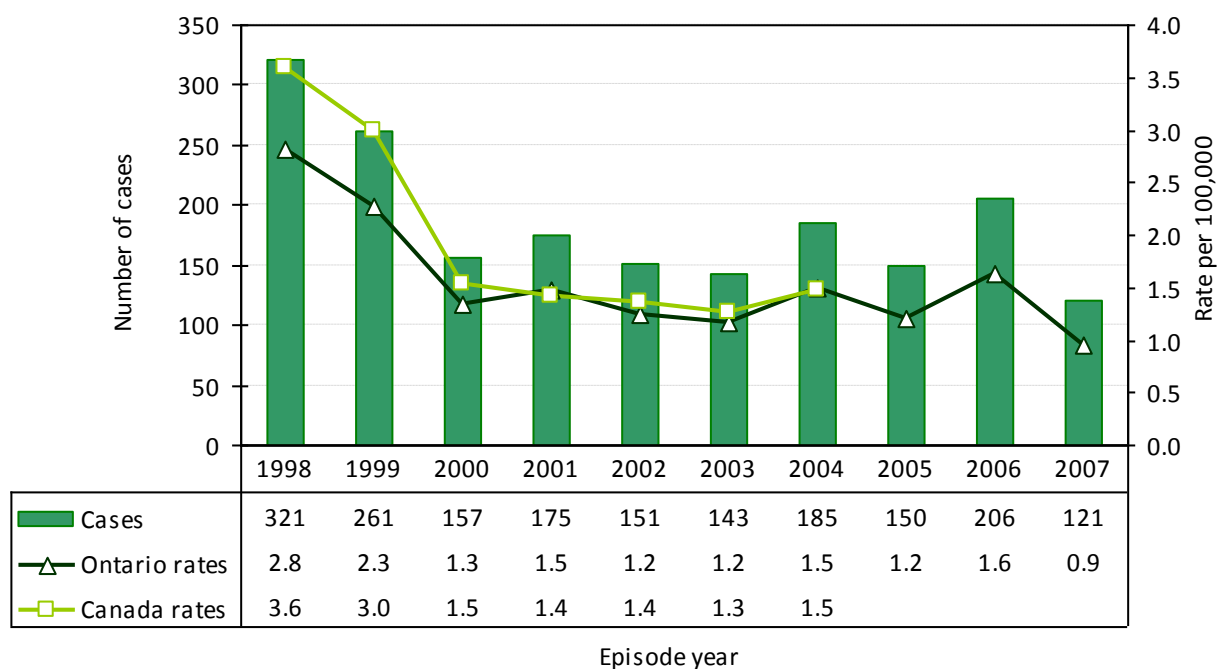
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 24% of cases; these cases were excluded

1.6 HEPATITIS A

- In 2007, Ontario reported 121 confirmed cases of Hepatitis A, which represents an incidence rate of 0.9 cases per 100,000 population (Table 1.1).
- The incidence of hepatitis A in Ontario declined by 68% from 2.8 cases per 100,000 population in 1998 to 0.9 cases per 100,000 population in 2007. In 2007, there was a 41% decline from the 206 Hepatitis A cases reported in 2006.
- From 2000 to 2004, the incidence rate of hepatitis A in Ontario was comparable to the national rate (Figure 1.6.1).
- Seasonal variation of hepatitis A cases reported in 2007 was less pronounced than most other enteric diseases. August accounted for the highest monthly case count with 18 cases (Figure 1.6.2).
- In 2007, males accounted for over half (55%) of reported cases of hepatitis A in Ontario. Cases aged 10-19 reported the greatest difference in incidence; the incidence among males was more than double that of females (Figure 1.6.3, Table 1.6.1).
- Overall incidence rates were highest in the 5-9 age group at 1.8 cases per 100,000 population. In 2007, males aged 10-19 years and females aged 60-64 years reported the highest incidences of hepatitis A at 2.1 and 1.6 cases per 100,000 population, respectively (Figure 1.6.3, Table 1.6.1).
- Toronto Public Health reported the highest number of confirmed hepatitis A cases in Ontario in 2007 (31 cases), whereas Grey Bruce, Thunder Bay and Northwestern health units reported the highest incidence rates at 3.1, 2.6 and 2.5 cases per 100,000 population, respectively (Map 1.6.1, Table 1.6.2).
- Among hepatitis A cases in 2007 reporting an exposure, travel outside of Ontario accounted for the largest proportion of cases at 46%; exposures in the home accounted for 8% of cases (Figure 1.6.4).

Figure 1.6.1: Incidence of Hepatitis A in Ontario and Canada: 1998-2007



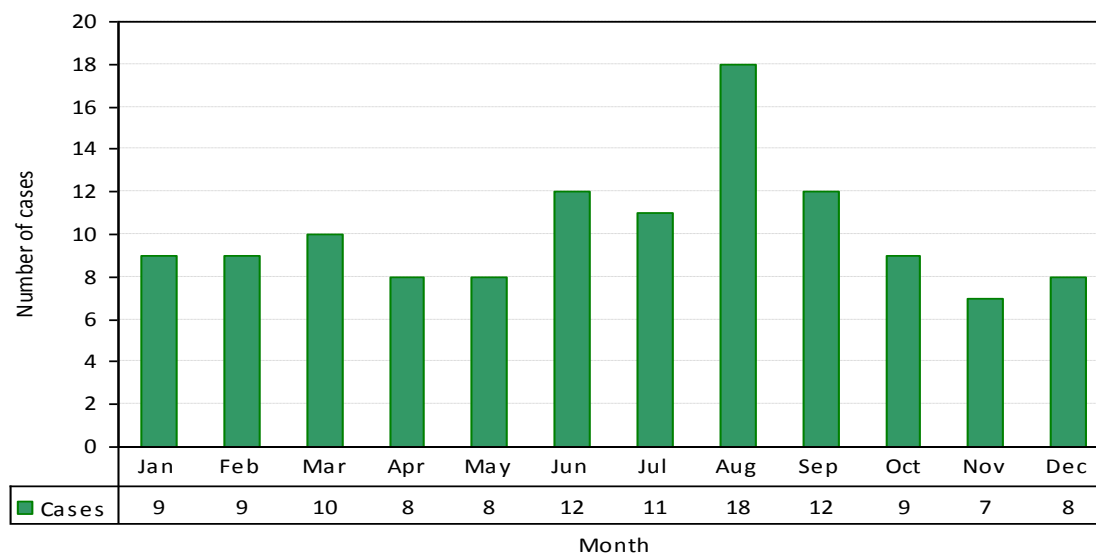
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

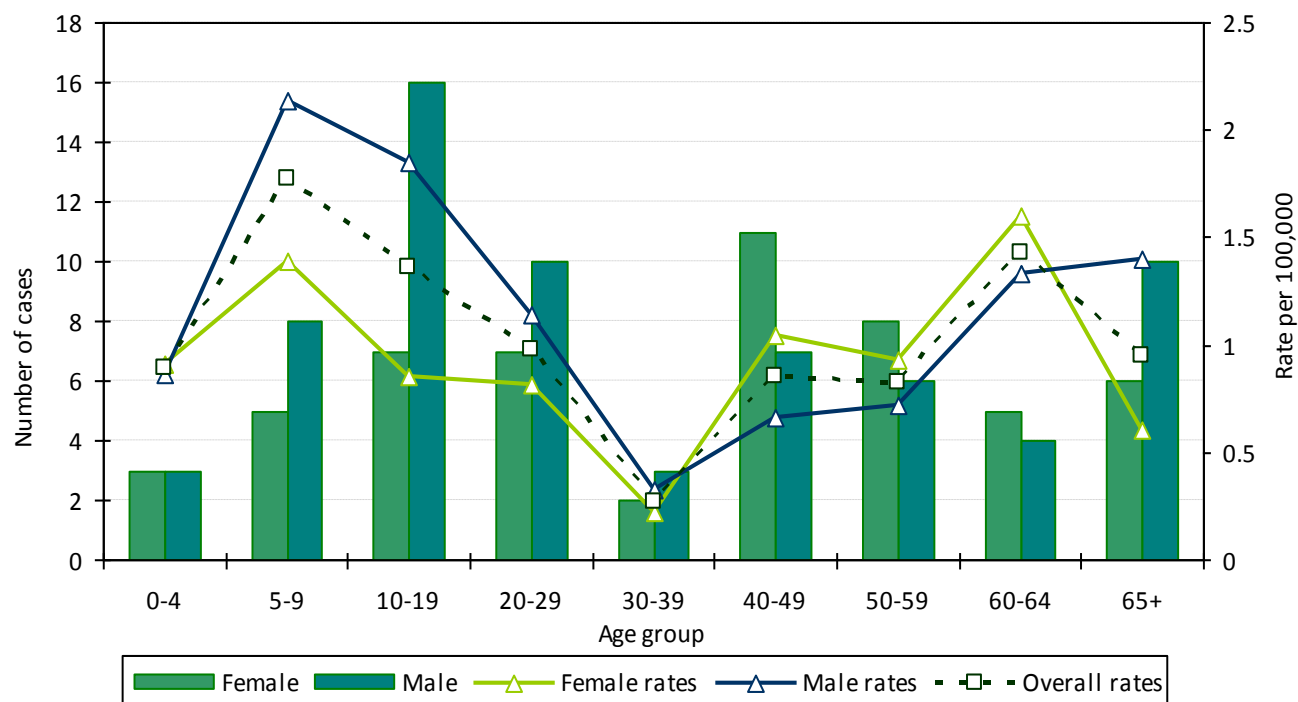
Figure 1.6.2: Incidence of Hepatitis A by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.6.3: Incidence of Hepatitis A by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

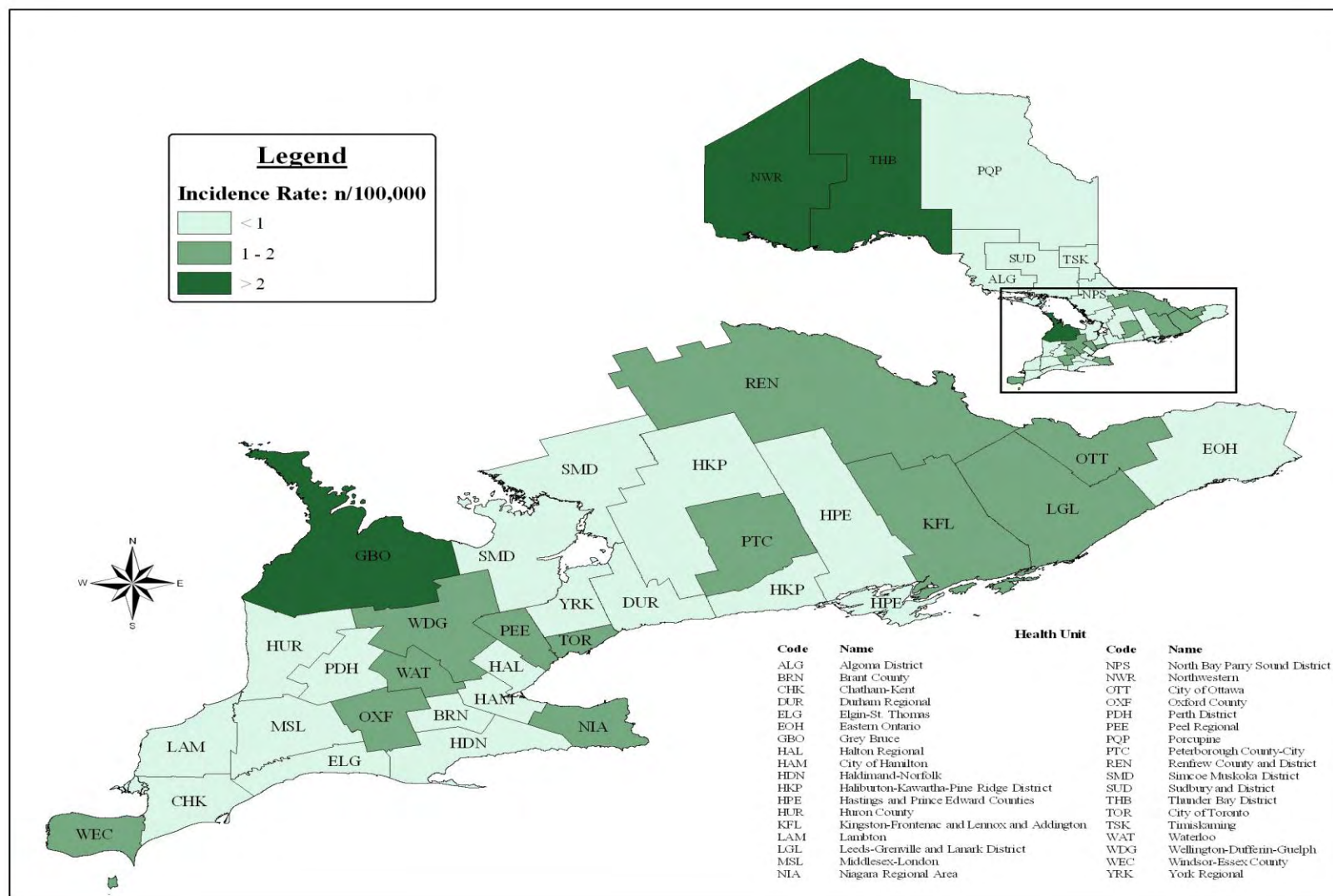
Table 1.6.1: Incidence of Hepatitis A by Age and Sex: Ontario, 2007

Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	3	0.9	3	0.9	6	0.9
5-9	5	1.4	8	2.1	13	1.8
10-19	7	0.8	16	1.8	23	1.4
20-29	7	0.8	10	1.1	17	1.0
30-39	2	0.2	3	0.3	5	0.3
40-49	11	1.0	7	0.7	18	0.9
50-59	8	0.9	6	0.7	14	0.8
60-64	5	1.6	4	1.3	9	1.4
65+	6	0.6	10	1.4	16	0.9
Total	54	0.8	67	1.1	121	0.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009]

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 1.6.1: Incidence Rates of Hepatitis A by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.6.2: Incidence of Hepatitis A by Public Health Unit: Ontario, 2007

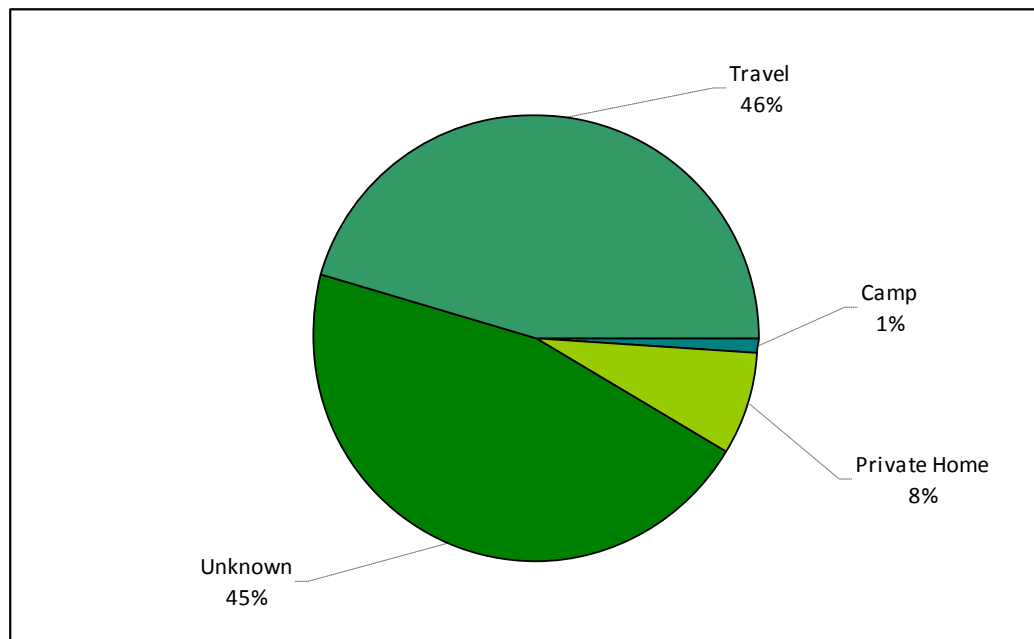
Public Health Unit	Number of cases	Rate/100,000 population
Grey-Bruce	5	3.1
Thunder Bay District	4	2.6
Northwestern	2	2.5
Oxford County	2	1.9
Wellington-Dufferin-Guelph	5	1.9
Peterborough County	2	1.5
Ottawa, City of	11	1.3
Leeds-Grenville and Lanark District	2	1.2
Niagara Region	5	1.2
Toronto	31	1.2
Waterloo Region	6	1.2
Windsor-Essex County	5	1.2
Kingston-Frontenac and Lennox and Addington	2	1.1
Peel Region	14	1.1
Renfrew County and District	1	1.0
Chatham-Kent	1	0.9
Haldimand-Norfolk	1	0.9
Halton Region	4	0.9
Middlesex-London	4	0.9
Brant County	1	0.7
York Region	7	0.7
Hamilton, City of	2	0.4
Simcoe Muskoka District	2	0.4
Durham Region	2	0.3
Algoma District	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Lambton County	0	0.0
North Bay Parry Sound District	0	0.0
Perth District	0	0.0
Porcupine	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Ontario	121	0.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.6.4: Most Likely Exposure Settings for Hepatitis A Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

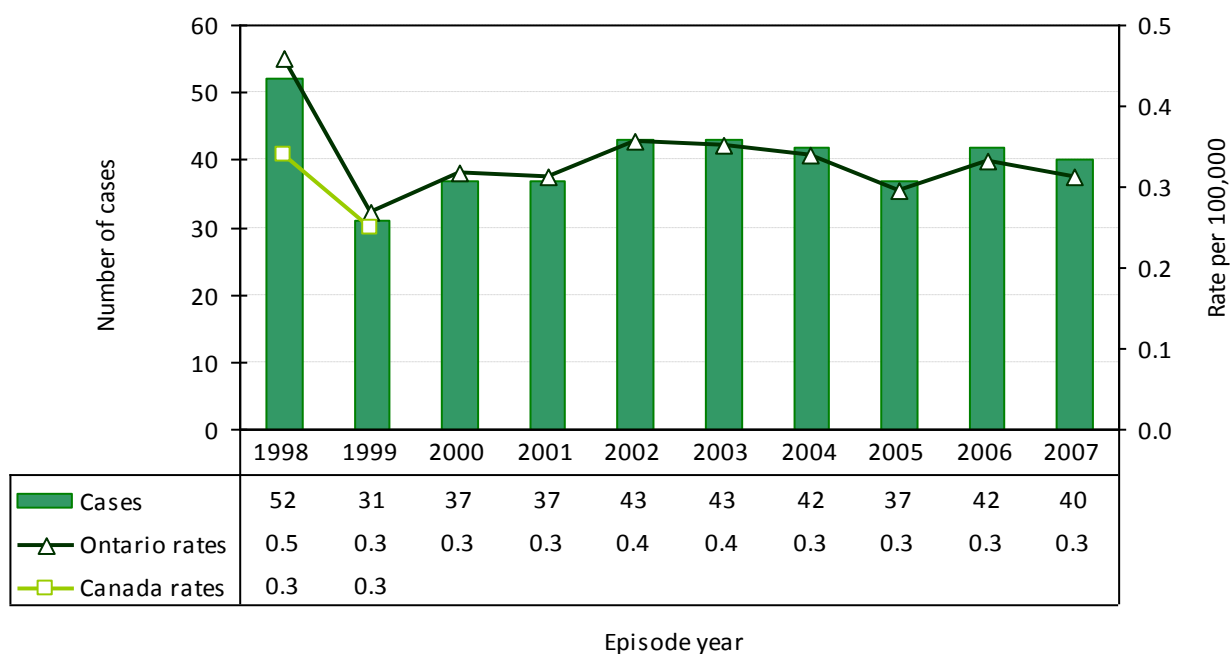
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 24% of cases; these cases were excluded

1.7 LISTERIOSIS

- In 2007, Ontario reported 40 cases of listeriosis, representing an incidence of 0.3 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, Ontario experienced the highest number of listeriosis cases in 1998. In that year, there were 52 cases, exceeding the Canadian rate by 67% with 0.5 cases per 100,000 population compared to 0.3 cases per 100,000 population. However, since 1999, the incidence rate for listeriosis has remained fairly stable with an average of 40 reported cases per year (Figure 1.7.1).
- There was no seasonal trend in the distribution of listeriosis cases in 2007. October accounted for the highest number of cases (6 cases) (Figure 1.7.2).
- In 2007, persons aged 65 years and older accounted for 65% of confirmed cases of listeriosis. The incidence of listeriosis among this age cohort was also the highest at 1.5 cases per 100,000 population, which was five times higher than the provincial incidence rate (Figure 1.7.3, Table 1.7.1).
- Grey-Bruce and Oxford County both reported the highest incidence rate at 1.9 cases per 100,000 population. North Bay Parry Sound reported the second highest rate of listeriosis at 1.6 cases per 100,000 population (Map 1.7.1, Table 1.7.2).
- Compared to other enteric diseases reported in Ontario in 2007, listeriosis cases were less likely to have acquired their illness while travelling outside of the province. Of cases reporting exposures, 18% occurred in institutional settings (6%), food premises (6%), private residence (3%) and travel outside of Ontario (3%) (Figure 1.7.4).

Figure 1.7.1: Incidence of Listeriosis in Ontario and Canada: 1998-2007



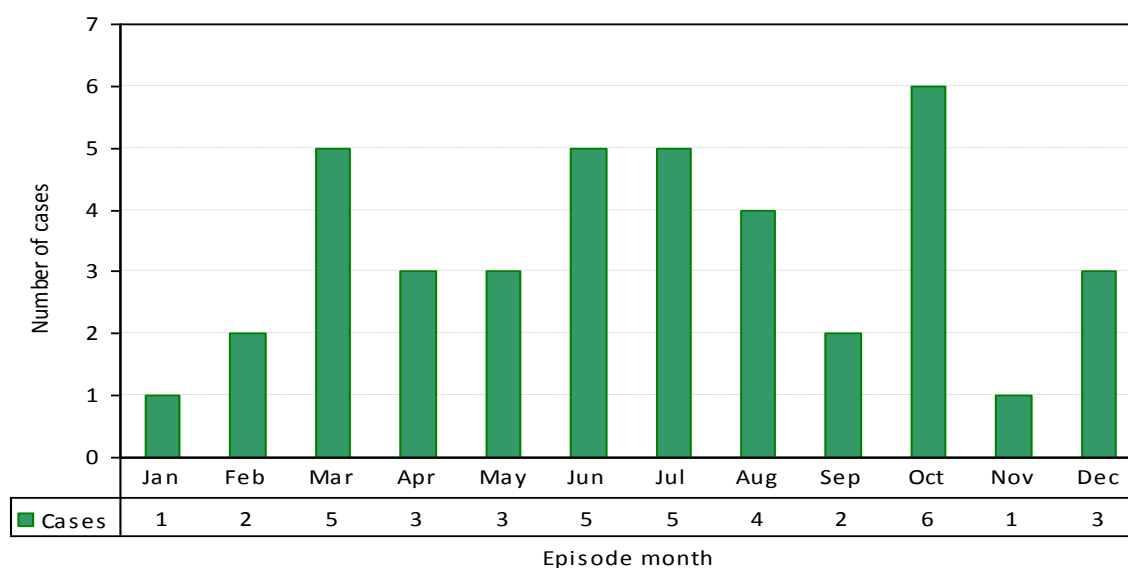
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available only for 1998-1999.

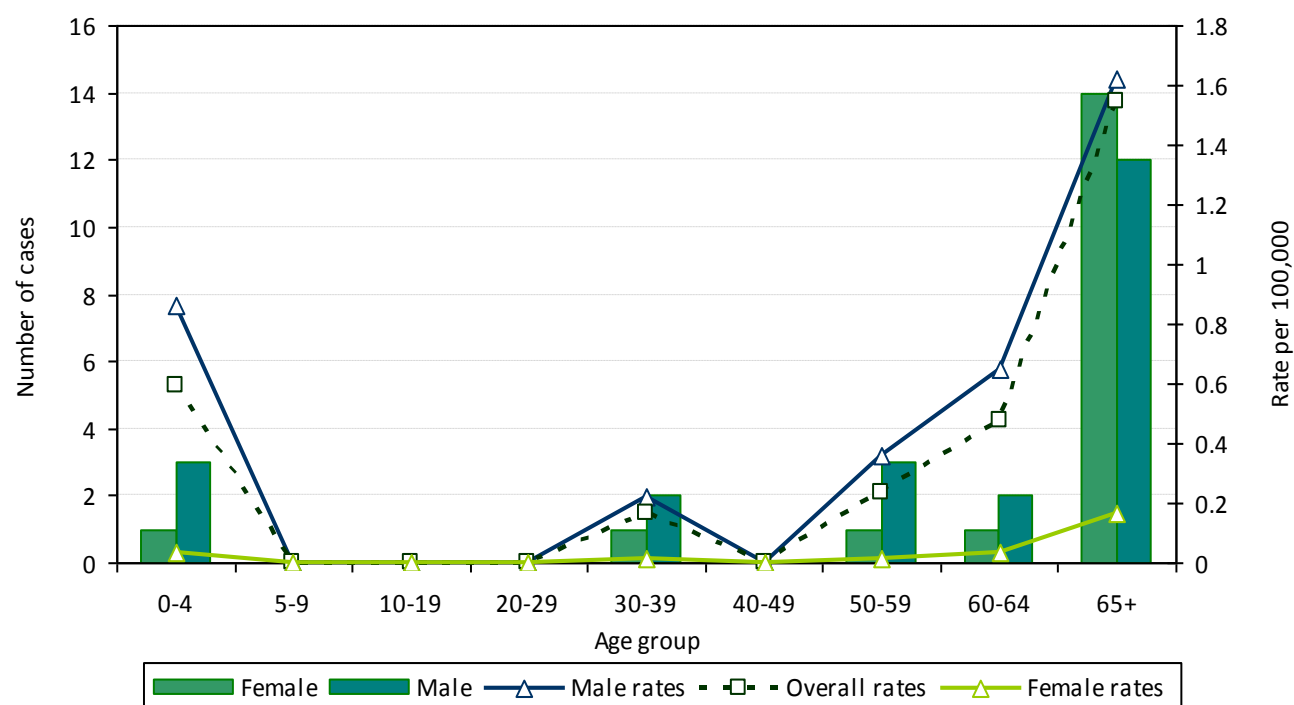
Figure 1.7.2: Incidence of Listeriosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.7.3: Incidence of Listeriosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

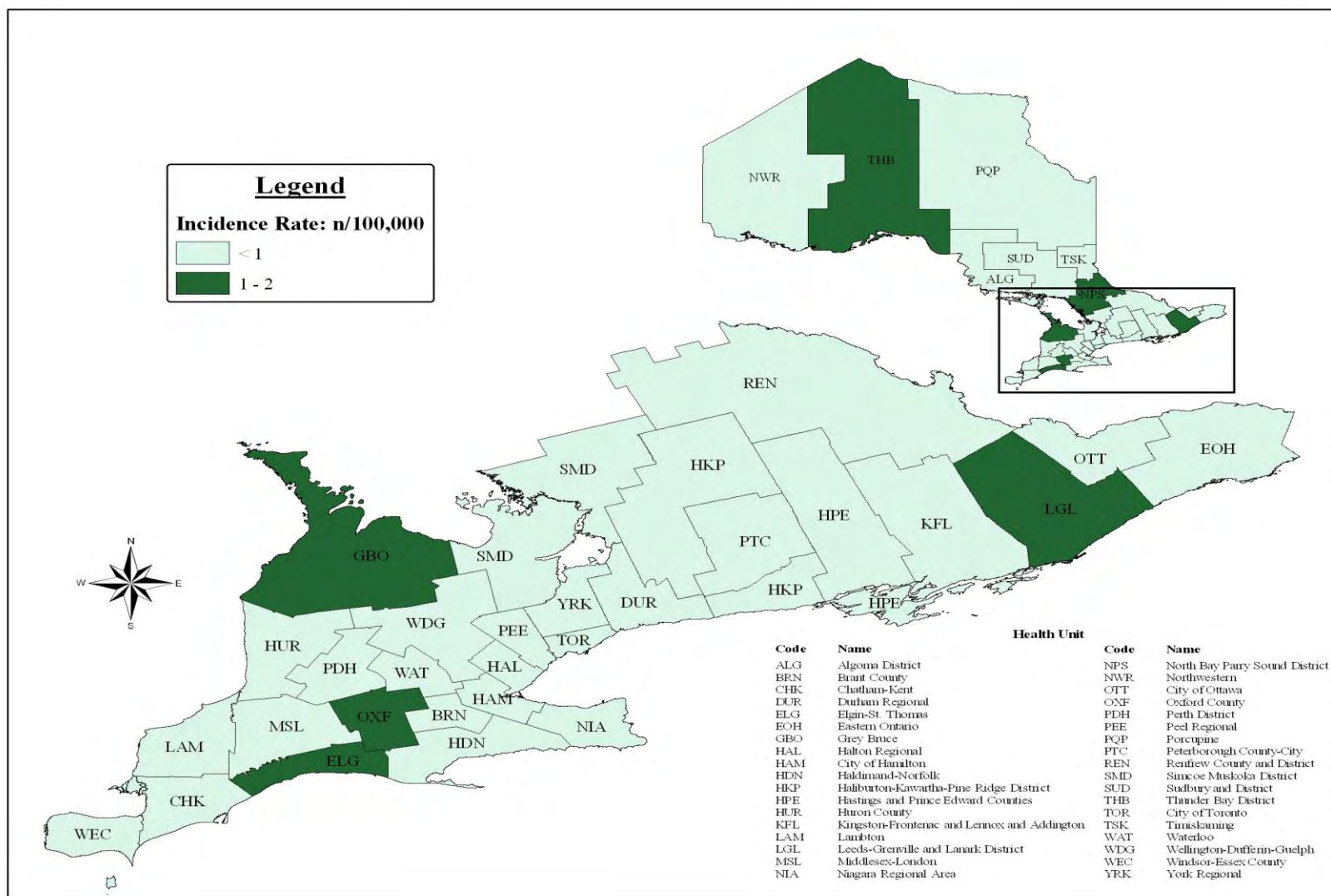
Table 1.7.1: Incidence of Listeriosis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	1	0.3	3	0.9	4	0.6
5-9	0	0.0	0	0.0	0	0.0
10-19	0	0.0	0	0.0	0	0.0
20-29	0	0.0	0	0.0	0	0.0
30-39	1	0.1	2	0.2	3	0.2
40-49	0	0.0	0	0.0	0	0.0
50-59	1	0.1	3	0.4	4	0.2
60-64	1	0.3	2	0.6	3	0.5
65+	14	1.5	12	1.6	26	1.5
Total	18	0.3	22	0.3	40	0.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 1.7.1: Incidence Rates of Listeriosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.7.2: Incidence of Listeriosis by Public Health Unit: Ontario, 2007

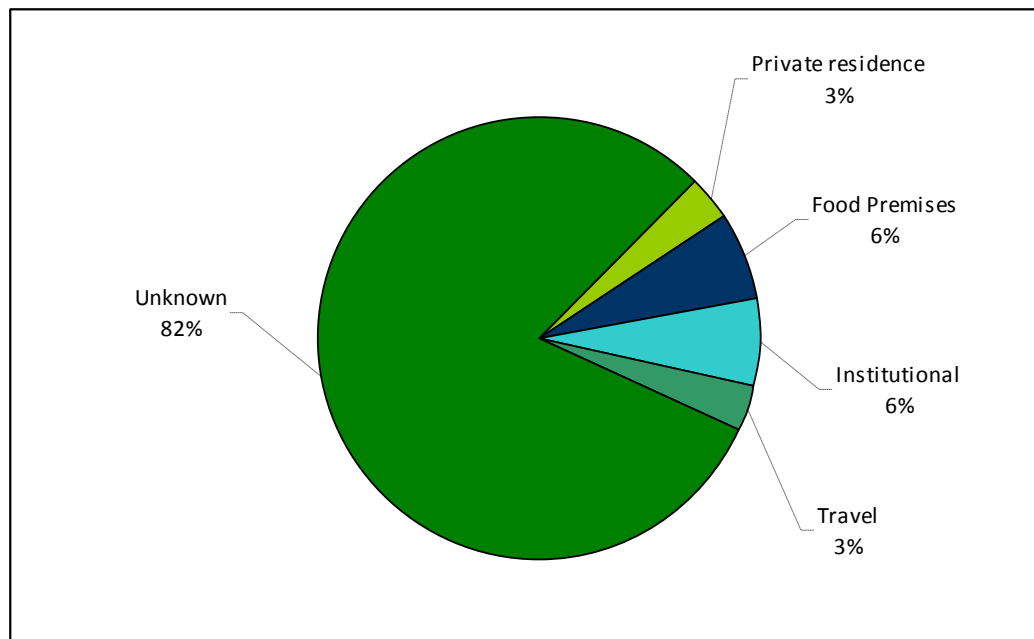
Public Health Unit	Number of cases	Rate/100,000 population
Grey-Bruce	3	1.9
Oxford County	2	1.9
North Bay Parry Sound District	2	1.6
Thunder Bay District	2	1.3
Leeds-Grenville and Lanark District	2	1.2
Elgin-St. Thomas	1	1.1
Ottawa, City of	4	0.5
Toronto	13	0.5
Waterloo Region	2	0.4
Wellington-Dufferin-Guelph	1	0.4
Durham Region	1	0.2
Halton Region	1	0.2
Hamilton, City of	1	0.2
Middlesex-London	1	0.2
Niagara Region	1	0.2
Peel Region	2	0.2
York Region	1	0.1
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Kingston-Frontenac and Lennox and Addington	0	0.0
Lambton County	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	40	0.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.7.4: Most Likely Exposure Settings for Listeriosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

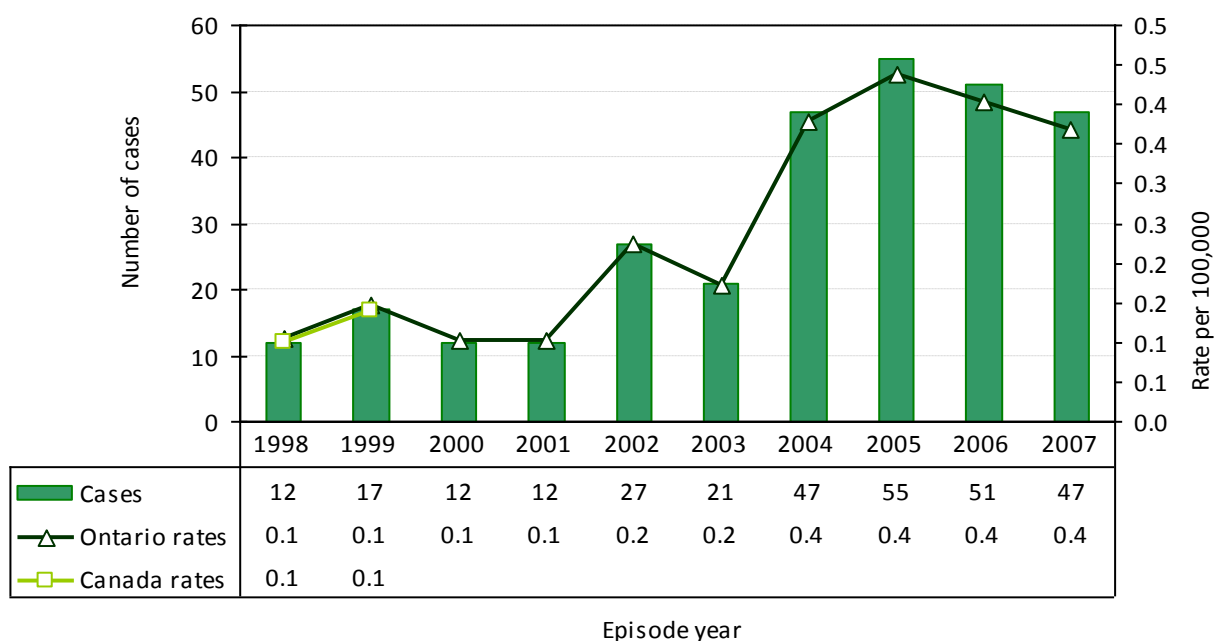
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 23% of cases; these cases were excluded

1.8 PARATYPHOID FEVER

- In 2007, Ontario reported 47 confirmed cases of paratyphoid fever, representing an incidence rate of 0.4 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the number of confirmed cases of paratyphoid fever doubled from 23 cases in 1998 (0.1 cases per 100,000 population) to 47 cases in 2007 (0.4 cases per 100,000 population).
- Between 1998 and 2003, the number of confirmed paratyphoid fever cases remained relatively stable with an average of approximately 17 cases per year. Since 2004, the incidence of paratyphoid fever has increased sharply with an average of 50 reported cases per year (Figure 1.8.1).
- There is no clear seasonal trend in the incidence of paratyphoid fever in Ontario because the disease is not endemic in Canada. In 2007, September (9 cases), June (8 cases) and August (7 cases) accounted for the highest number of cases of paratyphoid fever (Figure 1.8.2).
- Males and females in Ontario experienced the same overall sex-specific incidence rate for paratyphoid fever in 2007 at 0.4 cases per 100,000. The age-specific incidence was highest among the 20-29 age group, with 11 cases, and an incidence rate of 0.6 cases per 100,000 population (Figure 1.8.3, Table 1.8.1).
- Peel Region accounted for approximately half of paratyphoid fever cases in Ontario in 2007, with 22 cases or 1.7 cases per 100,000 population. Toronto reported the second highest incidence with 15 cases or 0.6 per 100,000 population (Map 1.8.1, Table 1.8.2).
- Of paratyphoid fever cases reporting an exposure setting in 2007 (42 out of 47 cases), 86% reported traveling outside of Ontario or having had close contact with a household member who travelled outside of Ontario; exposures were unknown for the remaining 14% of cases (Figure 1.8.4).

Figure 1.8.1: Incidence of Paratyphoid Fever in Ontario and Canada: 1998-2007

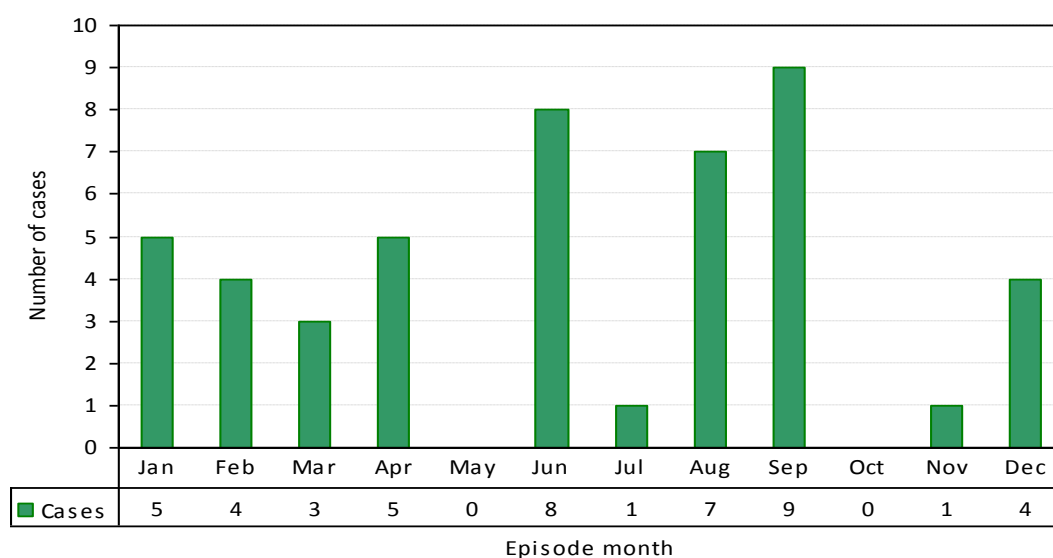


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]. Paratyphoid fever was removed from the national notifiable diseases list in 1999.

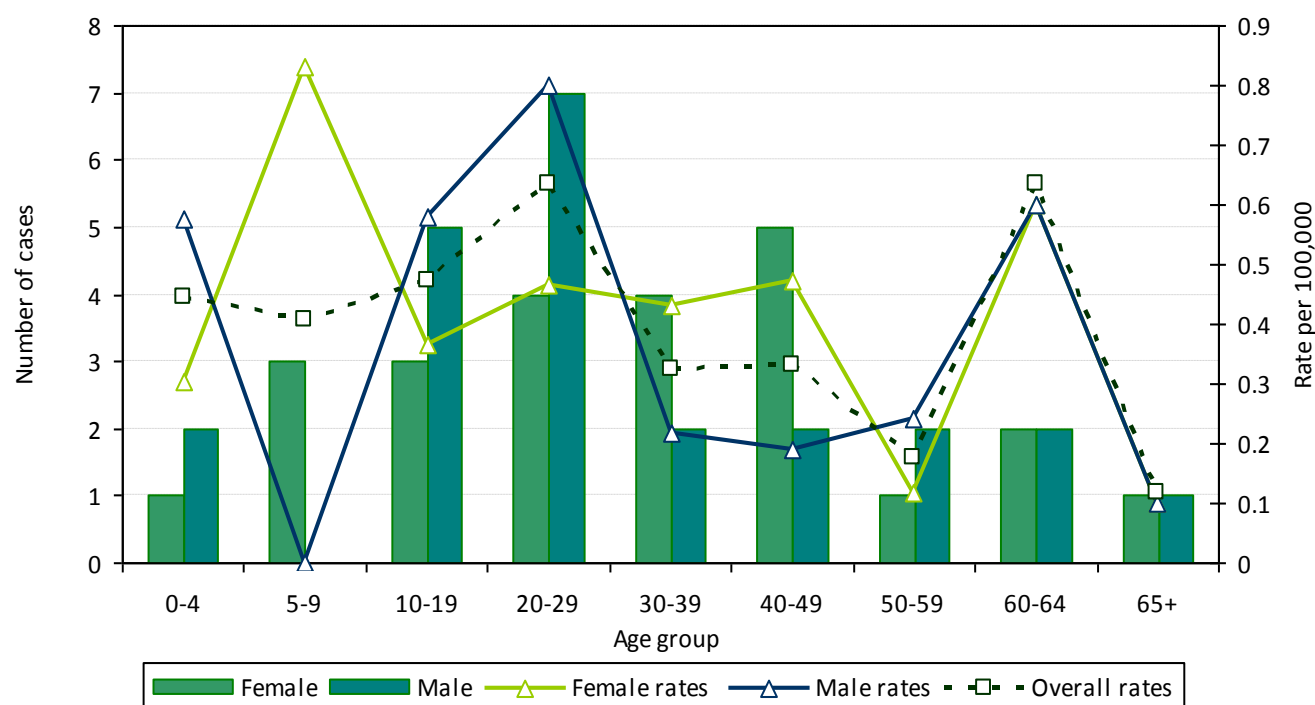
Figure 1.8.2: Incidence of Paratyphoid Fever by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.8.3: Incidence of Paratyphoid Fever by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

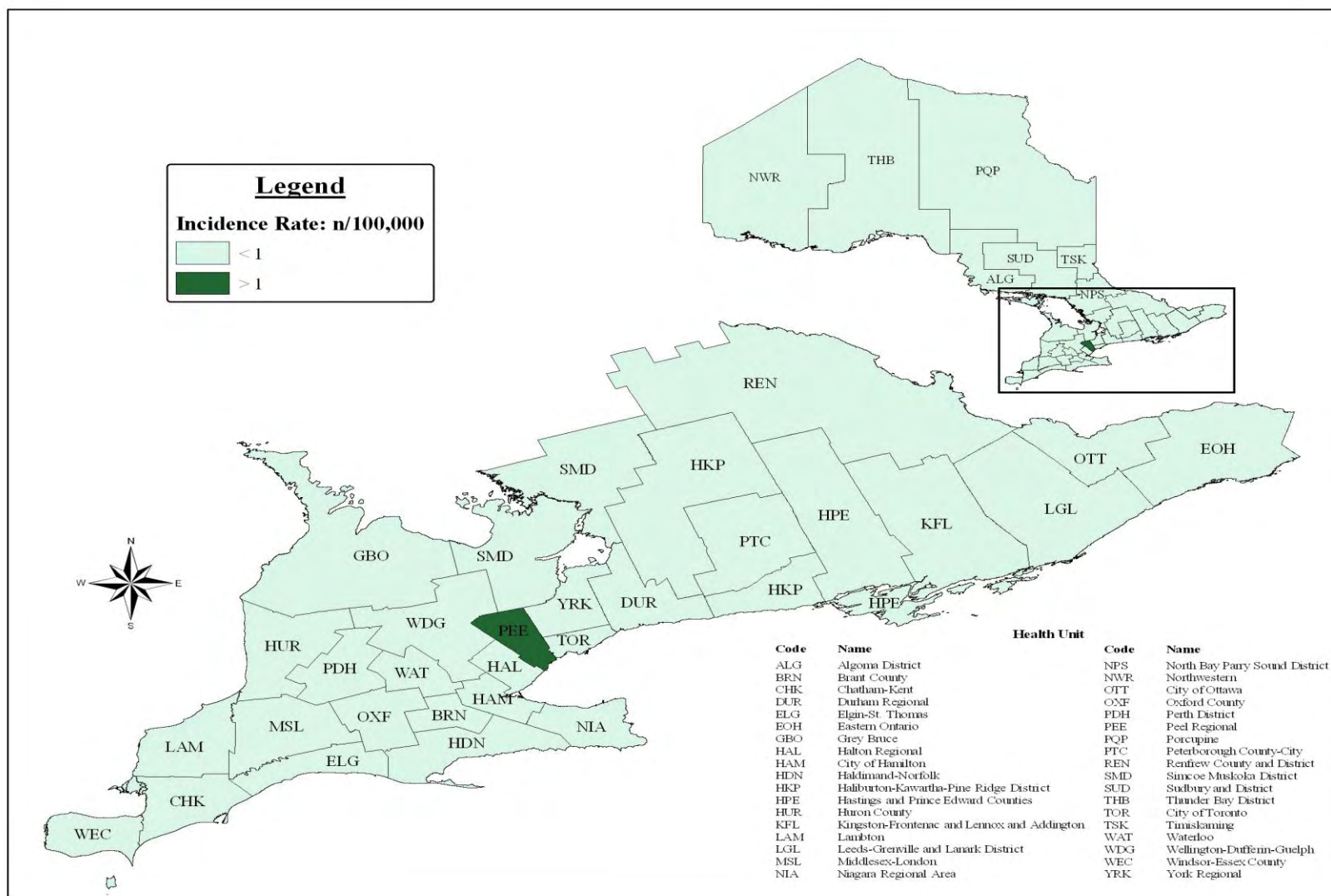
Table 1.8.1: Incidence of Paratyphoid Fever by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	1	0.3	2	0.6	3	0.4
5-9	3	0.8	0	0.0	3	0.4
10-19	3	0.4	5	0.6	8	0.5
20-29	4	0.5	7	0.8	11	0.6
30-39	4	0.4	2	0.2	6	0.3
40-49	5	0.5	2	0.2	7	0.3
50-59	1	0.1	2	0.2	3	0.2
60-64	2	0.6	2	0.6	4	0.6
65+	1	0.1	1	0.1	2	0.1
Total	24	0.4	23	0.4	47	0.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Map 1.8.1: Incidence Rates of Paratyphoid Fever by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.8.2: Incidence of Paratyphoid Fever by Public Health Unit: Ontario, 2007

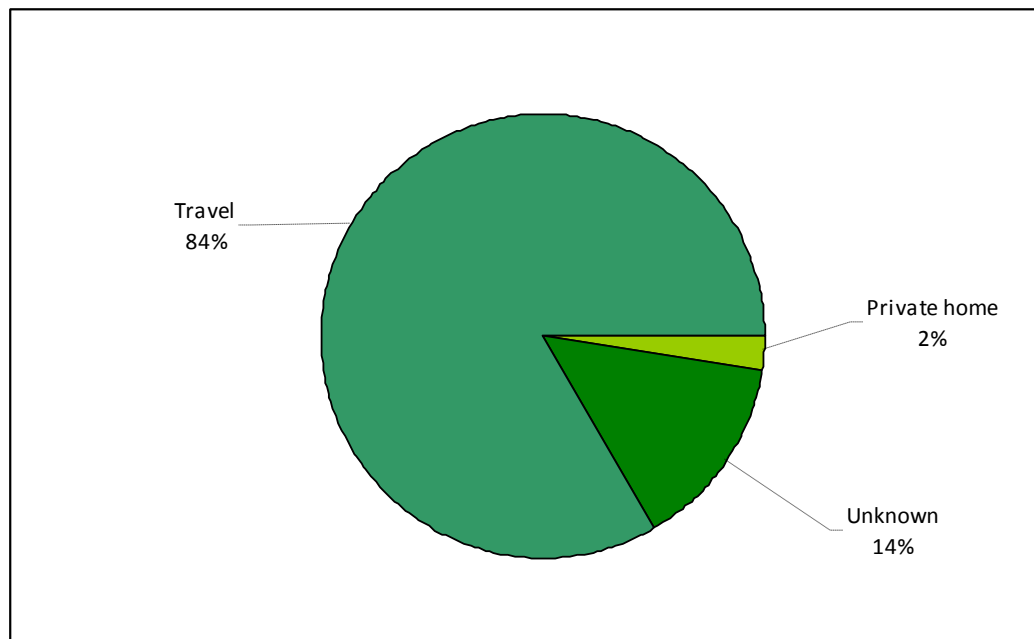
Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	22	1.7
Halton Region	3	0.6
Toronto	15	0.6
Waterloo Region	2	0.4
York Region	3	0.3
Middlesex-London	1	0.2
Ottawa, City of	1	0.1
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Durham Region	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0
Hamilton, City of	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Kingston-Frontenac and Lennox and Addington	0	0.0
Lambton County	0	0.0
Leeds-Grenville and Lanark District	0	0.0
Niagara Region	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Peterborough County	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Sudbury and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Windsor-Essex County	0	0.0
Ontario	47	0.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.8.4: Most Likely Exposures for Paratyphoid Fever: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

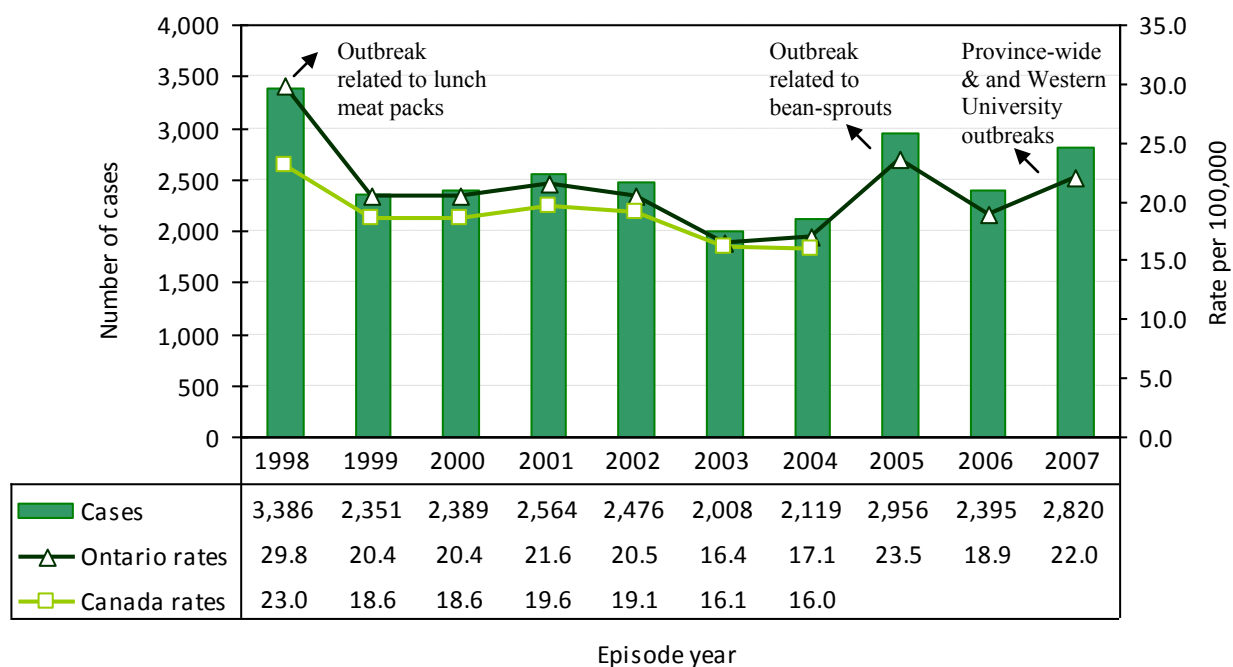
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 11% of cases; these cases were excluded

1.9 SALMONELLOSIS

- Salmonellosis is second to campylobacteriosis as a leading cause of enteric disease in Ontario, accounting for 26% of enteric diseases reported in 2007. Ontario reported 2,820 confirmed cases of salmonellosis in 2007, representing an incidence rate of 22 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence of salmonellosis declined by 25% from 30 cases per 100,000 population in 1998 to 22 cases per 100,000 population in 2007. Despite the overall decline, 2005 and 2007 experienced increases. A provincial outbreak of *Salmonella* Enteritidis caused by mung bean sprouts contributed to the 2005 increase. The higher number of cases in 2007 was attributed to a province-wide increase in *S. Typhimurium* that culminated in a large point-source outbreak involving ninety cases at the University of Western Ontario in London, Ontario (Figure 1.9.1).
- The warmer months of June to September accounted for 46% of salmonellosis cases reported in 2007. The *S. Typhimurium* outbreak at the University of Western Ontario in London, Ontario accounted for the increase in November (Figure 1.9.2).
- The sex-specific incidence rates of salmonellosis in 2007 were similar for males and females at 22.2 and 21.7 cases per 100,000 population respectively. The incidence rates of salmonellosis decreased sharply with increasing age for both males and females before stabilizing after age 29 (Figure 1.9.3, Table 1.9.1).
- Huron County reported the highest incidence rate of salmonellosis in Ontario in 2007, with 42.4 cases per 100,000. Toronto reported the highest number of confirmed cases (684), accounting for 24% of salmonellosis cases in 2007 (Map 1.9.1, Table 1.9.2).
- In 2007, *S. Typhimurium* (22%) continued to be the leading cause of salmonellosis in Ontario, followed by *S. Enteritidis* (19%), *S. Heidelberg* (6%) and *S. Thompson* (3%). Other *Salmonella* serovars each accounted for less than 3% of reported cases (Table 1.9.3).
- Of salmonellosis cases reporting a place of exposure in 2007, 17% reported travel outside of Ontario, 13% reported exposures within their homes, 10% reported being exposed at a food premise, 5% reported on-farm exposures and 2% reported exposures in other settings; 53% of cases did not know their place of exposure (Figure 1.9.4).
- Of salmonellosis cases that did not report travel outside of Ontario as an exposure in 2007, consumption of poultry and poultry products (9%), consumption of meats (4%), and contact with animals (4%), fecal matter (2%) and other sources (3%) were the most commonly reported sources of exposure (Figure 1.9.5).
- Foodborne (26%), animal-to-person (4%), fecal-oral (4%) and waterborne (1%) transmissions were the most common modes of transmission for non-travel related salmonellosis cases that reported an exposure in 2007 (Figure 1.9.6).

Figure 1.9.1: Incidence of Salmonellosis in Ontario and Canada: 1998-2007



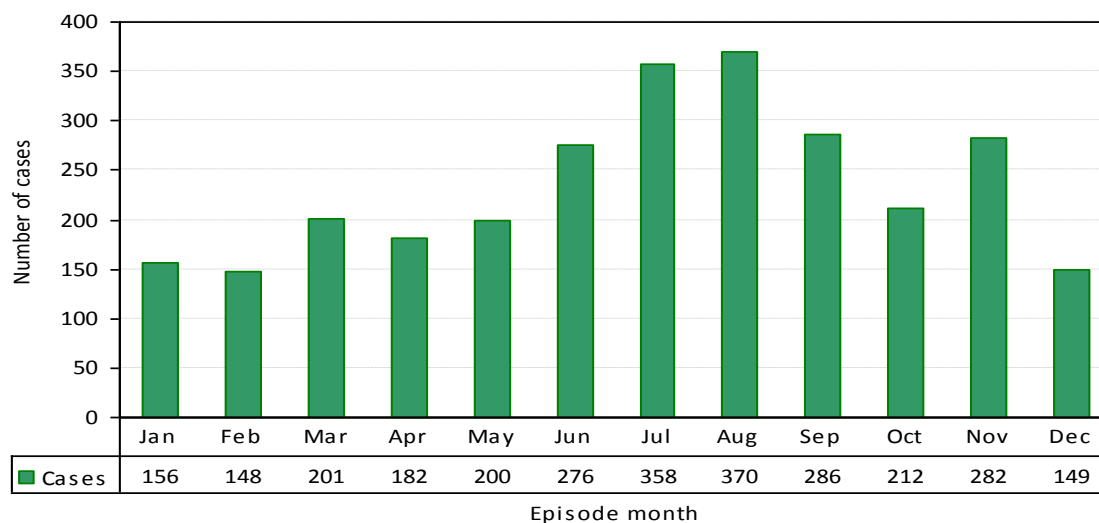
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

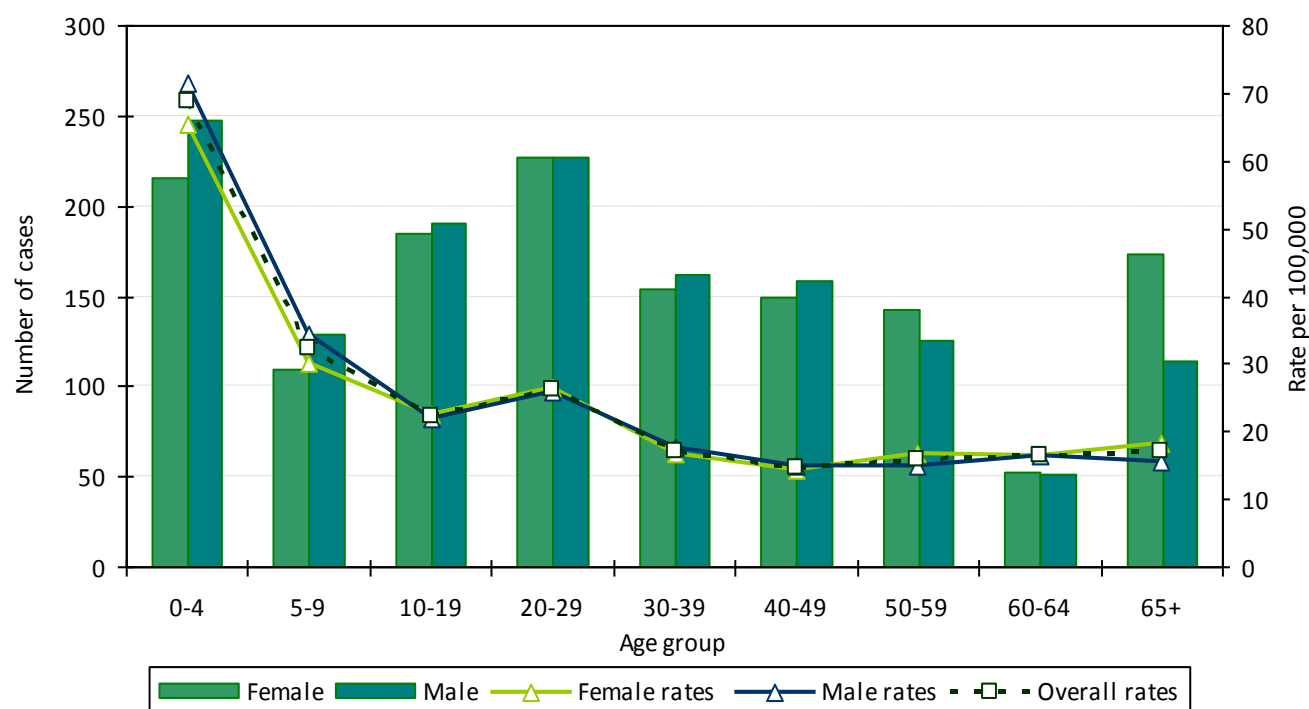
Figure 1.9.2: Incidence of Salmonellosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.9.3: Incidence of Salmonellosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 6 cases for which age and/or sex were unknown.

Table 1.9.1: Incidence of Salmonellosis by Age and Sex: Ontario, 2007

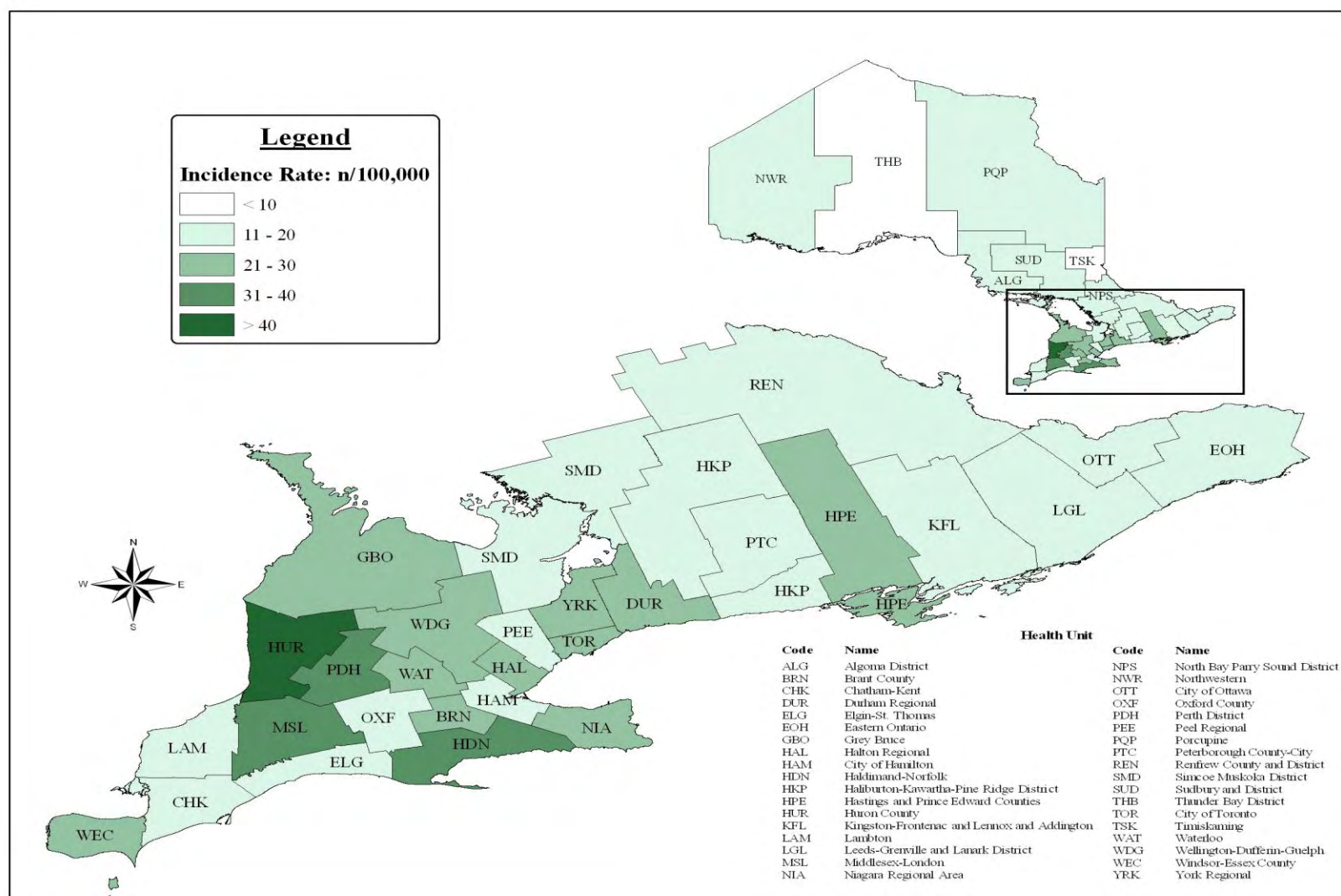
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	216	65.5	248	71.5	464	68.6
5-9	109	30.2	129	34.4	238	32.4
10-19	185	22.5	190	22.0	375	22.2
20-29	227	26.3	227	26.0	454	26.2
30-39	154	16.6	162	17.6	316	17.1
40-49	150	14.2	158	15.0	308	14.6
50-59	143	16.6	125	15.0	268	15.8
60-64	53	16.5	51	16.5	104	16.5
65+	173	18.3	114	15.4	287	17.0
Total	1,410	21.7	1,404	22.2	2,814	22.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 6 cases for which age and/or sex were unknown.

Map 1.9.1: Incidence Rates of Salmonellosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.9.2: Incidence of Salmonellosis by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Huron County	26	42.4
Middlesex-London	154	35.1
Perth District	27	35.0
Haldimand-Norfolk	39	34.9
Grey-Bruce	49	30.3
Toronto	684	25.8
Waterloo Region	128	25.8
Durham Region	150	25.2
York Region	242	24.8
Halton Region	114	24.3
Niagara Region	102	23.5
Hastings Prince Edward Counties	38	23.3
Wellington-Dufferin-Guelph	60	22.6
Windsor-Essex County	88	21.8
Brant County	29	21.2
Peel Region	262	20.2
Ottawa, City of	152	18.0
Simcoe Muskoka District	89	18.0
Leeds-Grenville and Lanark District	30	17.6
Hamilton, City of	87	16.7
Peterborough County	22	16.5
Oxford County	17	16.0
Elgin-St. Thomas	14	15.4
Kingston-Frontenac and Lennox and Addington	28	14.9
Porcupine	13	14.9
Sudbury and District	29	14.6
Eastern Ontario	28	14.1
Chatham-Kent	15	13.7
Northwestern	11	13.7
Lambton County	18	13.6
Algoma District	16	13.4
North Bay Parry Sound District	16	12.8
Haliburton-Kawartha-Pine Ridge District	21	12.0
Renfrew County and District	11	10.9
Thunder Bay District	10	6.4
Timiskaming	1	2.9
Ontario	2,820	22.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.9.3: Salmonellosis Cases by Salmonella Serovars: Ontario, 2007

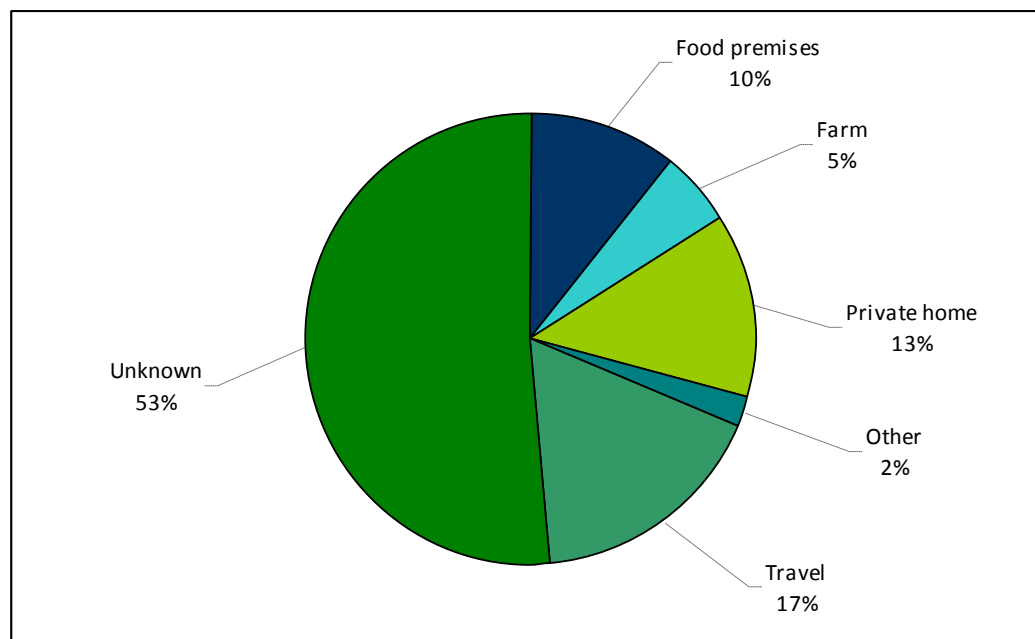
<i>Salmonella</i> Serovars	Cases	
	Number	Percent
<i>S. Typhimurium</i>	629	22.3
<i>S. Enteritidis</i>	548	19.4
<i>S. Heidelberg</i>	160	5.7
<i>S. Thompson</i>	87	3.1
<i>S. Oranieburg</i>	77	2.7
<i>S. Infantis</i>	67	2.4
<i>S. Newport</i>	56	2.0
Unspecified <i>Salmonella</i> serovar ¹	593	21.0
Other <i>Salmonella</i> serovars ²	555	19.7
Total	2820	100.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: Unspecified *Salmonella* refers to Salmonellosis cases for which no serovars were reported .

Note 2: Other *Salmonella* serovars represents serovars that accounted for < 2% of 2007 salmonellosis cases. Includes non- groupable/typable *Salmonella* cases.

Figure 1.9.4: Most Likely Exposures for Salmonellosis Cases: Ontario, 2007

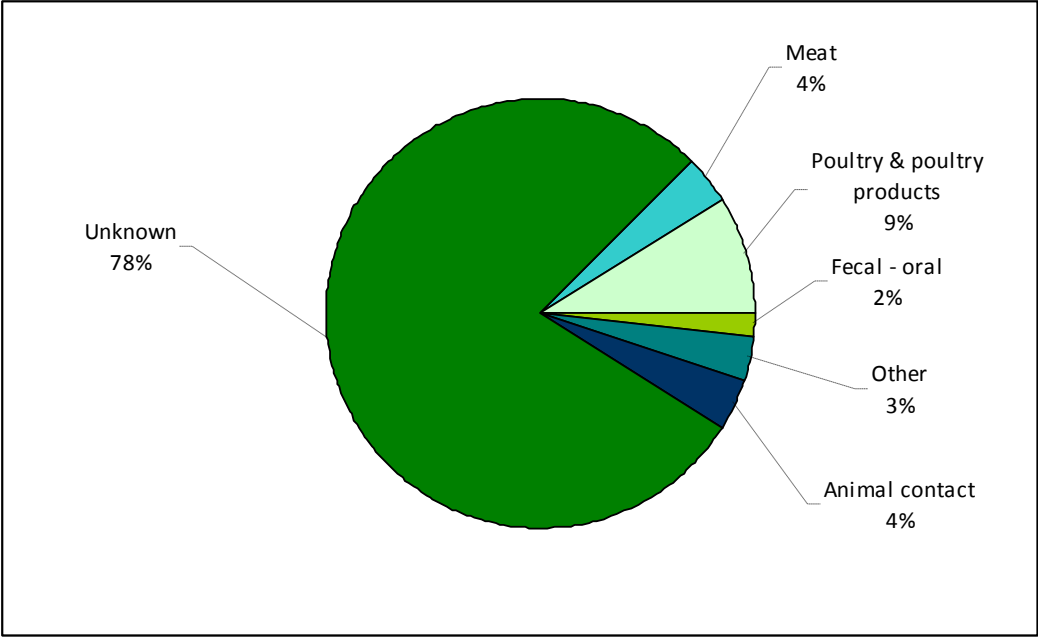


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 23% of cases; these cases were excluded

Figure 1.9.5: Most Likely Sources of Illness for Salmonellosis Cases: Ontario, 2007

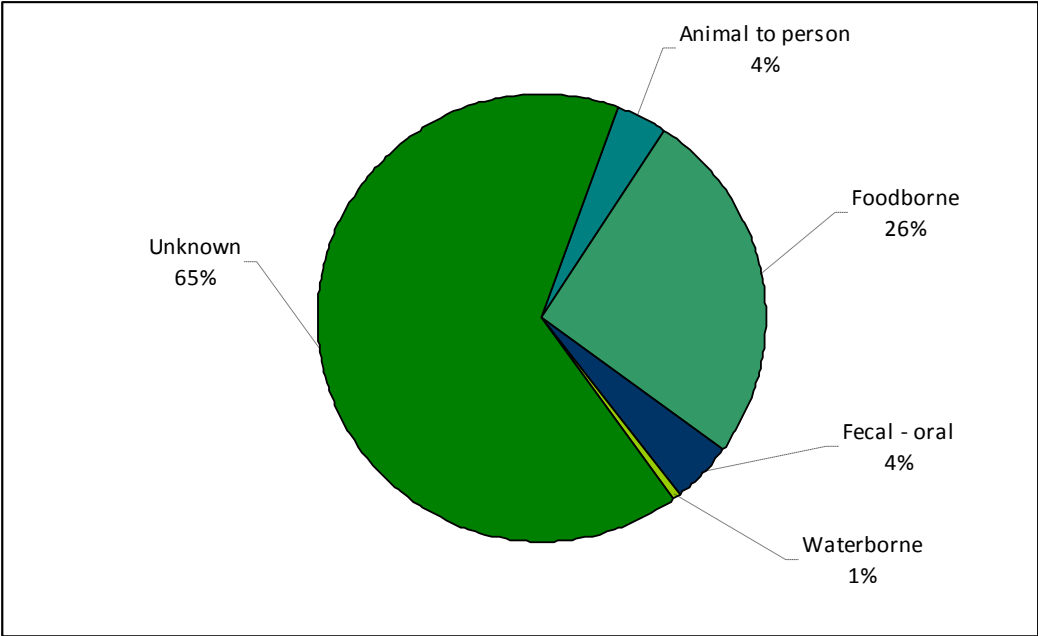


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 23% of cases; these cases were excluded. Excludes travel-related cases

Figure 1.9.6: Most Likely Modes of Transmission for Salmonellosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

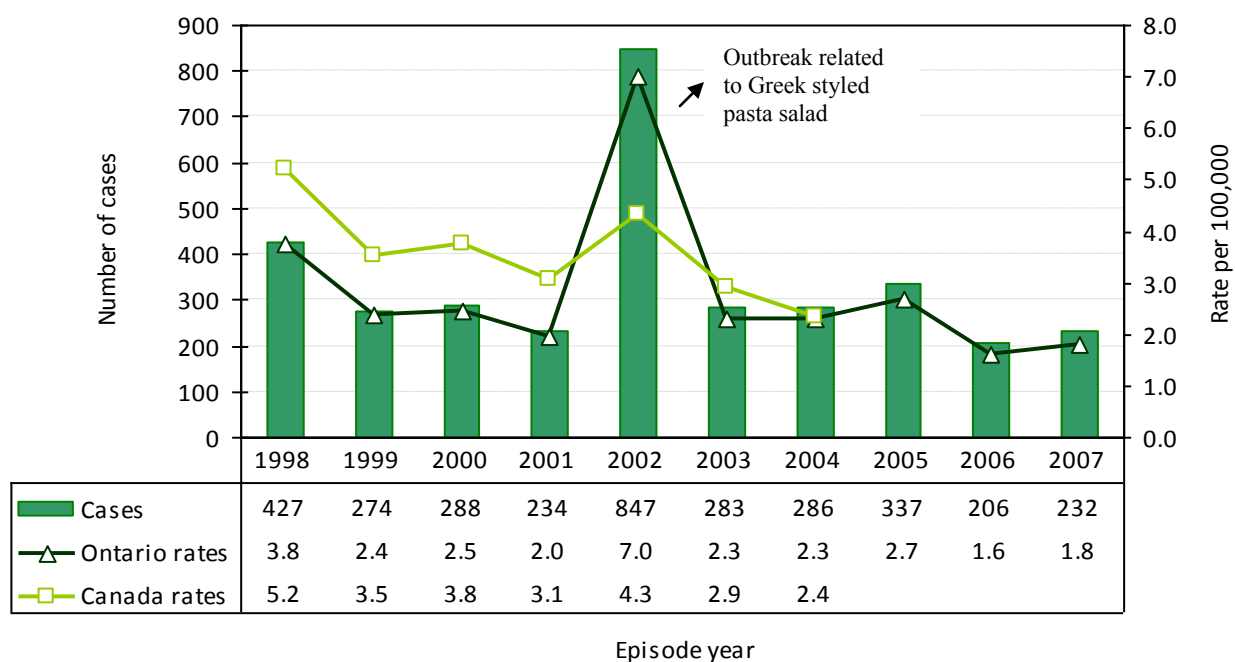
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 23% of cases; these cases were excluded. Excludes travel-related cases†

1.10 SHIGELLOSIS

- In 2007, Ontario reported 232 confirmed cases of shigellosis, representing an incidence rate of 1.8 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence of shigellosis in Ontario decreased by 53% from 3.8 cases per 100,000 population in 1998 to 1.8 cases per 100,000 population in 2007. With the exception of 2002, Ontario's incidence of shigellosis remained below the Canadian rate from 1998 to 2004. The provincial increase in 2002 was attributed to the consumption of Greek pasta salad contaminated by *Shigella sonnei* bacteria (Figure 1.10.1).
- The incidence of shigellosis did not exhibit a clear seasonal pattern in 2007. January (25 cases), May (26 cases) and July (30 cases) accounted for the highest number of cases (Figure 1.10.2).
- In 2007, the sex-specific incidence rates of shigellosis were similar for females and males at 1.9 and 1.7 cases per 100,000 population, respectively (Figure 1.10.3, Table 1.10.1).
- The incidence of shigellosis was lowest among older cases and highest among children under the age of 10 years. The highest rates occurred among children ages 0-4 years (4.7 cases per 100,000 population) and 5-9 years (3.3 cases per 100,000 population) (Figure 1.10.3, Table 1.10.1).
- One third (12/36) of health units did not report any cases of shigellosis in 2007. Kingston Frontenac Lennox and Addington reported the highest incidence rates of shigellosis at 3.2 cases per 100,000 despite accounting for less than 3% of reported cases. Toronto reported the highest incidence in Ontario and accounted for 32% of shigellosis cases in 2007 (Map 1.10.1, Table 1.10.2).
- *S. sonnei* (57%), *S. flexneri* (26%), *S. boydii* (5%) and *S. dysenteriae* (1%) accounted for 89% of all reported cases of shigellosis in Ontario in 2007. The remaining 11% of shigellosis cases had an unspecified serogroup.
- Among shigellosis cases reporting an exposure setting in 2007, 43% reported travel outside of Ontario and 13% reported exposures in private residences and other settings. The exposure setting was unknown for the remaining 44% of cases (Figure 1.10.4).
- Person-to-person transmission (23%) was the most likely mode of transmission for shigellosis cases that reported an exposure not related to travel outside of Ontario (Figure 1.10.5).

Figure 1.10.1: Incidence of Shigellosis in Ontario and Canada: 1998-2007



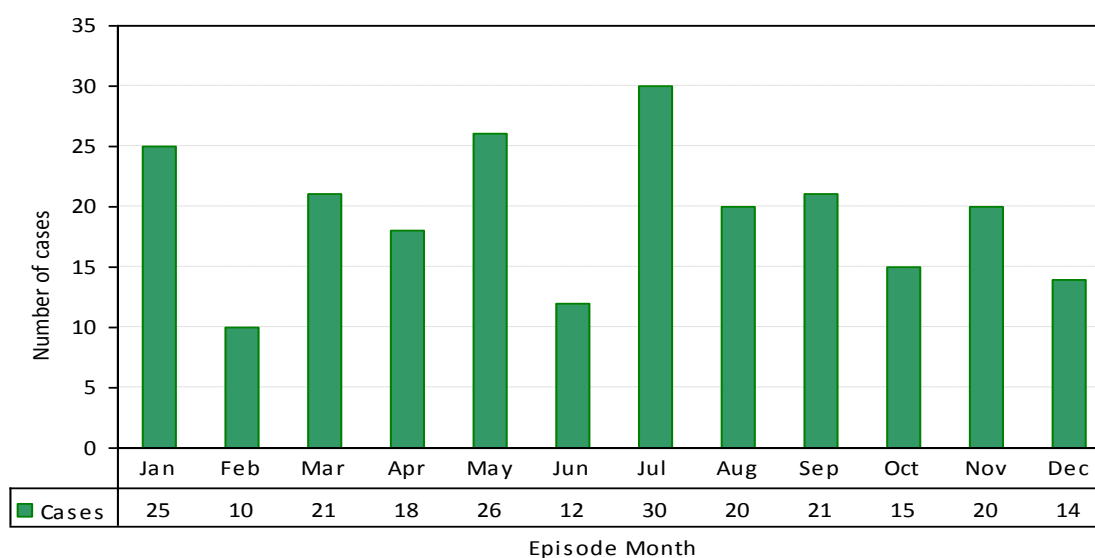
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

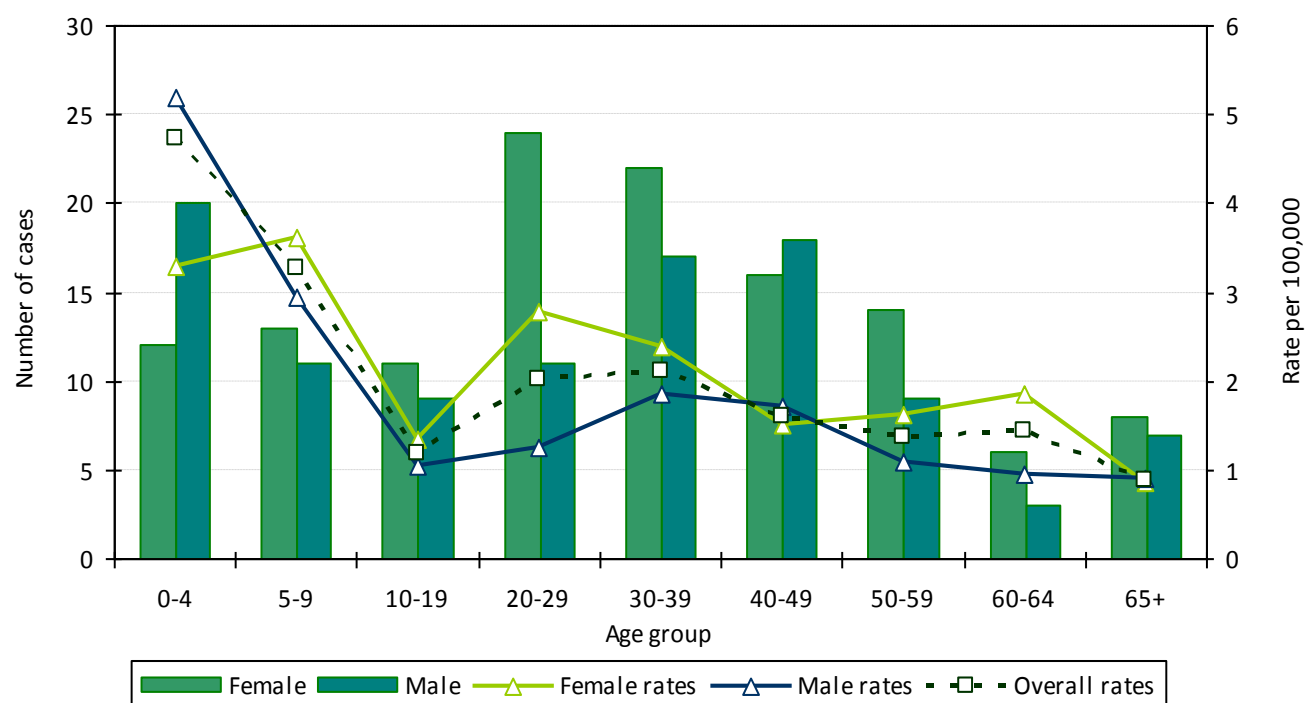
Figure 1.10.2: Incidence of Shigellosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.10.3: Incidence of Shigellosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 cases for which age and/or sex were unknown

Table 1.10.1: Incidence of Shigellosis by Age and Sex: Ontario, 2007

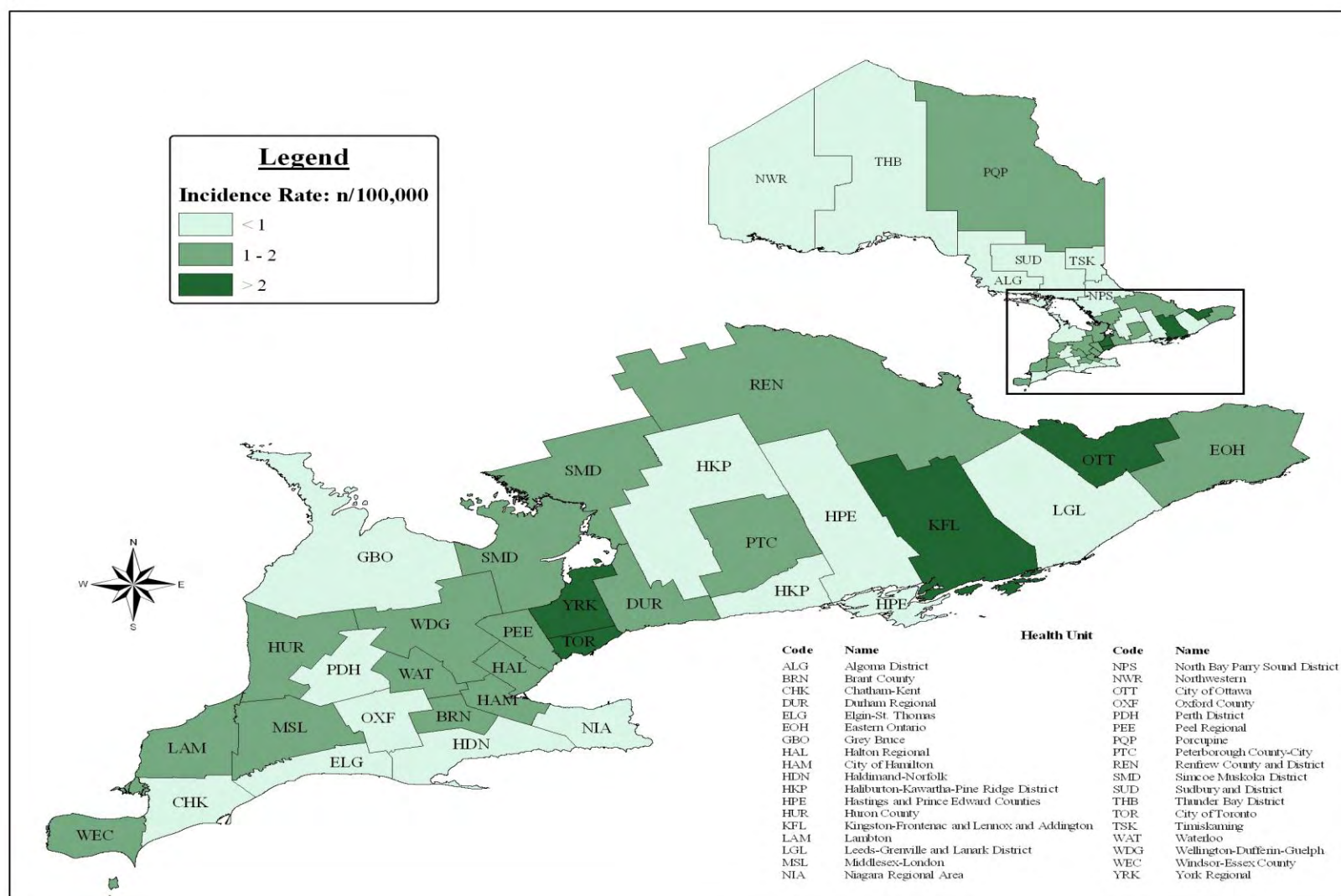
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	12	3.6	20	5.8	32	4.7
5-9	13	3.6	11	2.9	24	3.3
10-19	11	1.3	9	1.0	20	1.2
20-29	24	2.8	11	1.3	35	2.0
30-39	22	2.4	17	1.9	39	2.1
40-49	16	1.5	18	1.7	34	1.6
50-59	14	1.6	9	1.1	23	1.4
60-64	6	1.9	3	1.0	9	1.4
65+	8	0.8	7	0.9	15	0.9
Total	126	1.9	105	1.7	231	1.8

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 cases for which age and/or sex were unknown

Map 1.10.1: Incidence Rates of Shigellosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.10.2: Incidence of Shigellosis by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Kingston Frontenac Lennox & Addington	6	3.2
Ottawa, City of	25	3.0
Toronto	74	2.8
York Region	25	2.6
Durham Region	12	2.0
Renfrew County and District	2	2.0
Waterloo Region	10	2.0
Windsor-Essex County	8	2.0
Halton Region	9	1.9
Wellington-Dufferin-Guelph	5	1.9
Peel Region	23	1.8
Huron County	1	1.6
Brant County	2	1.5
Lambton County	2	1.5
Peterborough County-City	2	1.5
Middlesex-London	6	1.4
Hamilton, City of	6	1.2
Porcupine	1	1.1
Eastern Ontario	2	1.0
Simcoe Muskoka District	5	1.0
Chatham-Kent	1	0.9
Niagara Region	3	0.7
Haliburton Kawartha Pine Ridge District	1	0.6
Thunder Bay District	1	0.6
Algoma District	0	0.0
Elgin-St Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Hastings Prince Edward Counties	0	0.0
Leeds-Grenville & Lanark District	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Ontario	232	1.8

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

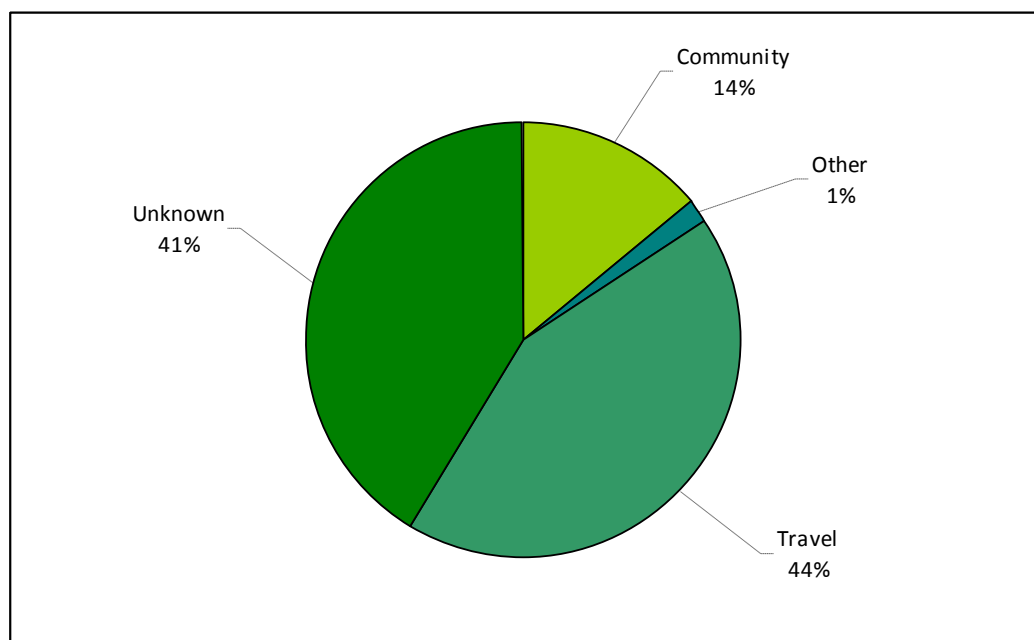
Table 1.10.3: Shigellosis Cases by *Shigella* Serogroup: Ontario, 2007

<i>Shigella</i> Serogroup	Cases	
	Number	Percent
<i>S. sonnei</i>	132	57
<i>S. flexneri</i>	60	26
<i>S. boydii</i>	12	5
<i>S. dysenteriae</i>	3	1
<i>Shigella</i> , unspecified	25	11
Total	232	100.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: Unspecified *Shigella* refers to shigellosis cases for which no serogroup were reported

Figure 1.10.4: Most Likely Exposure Settings for Shigellosis Cases: Ontario, 2007

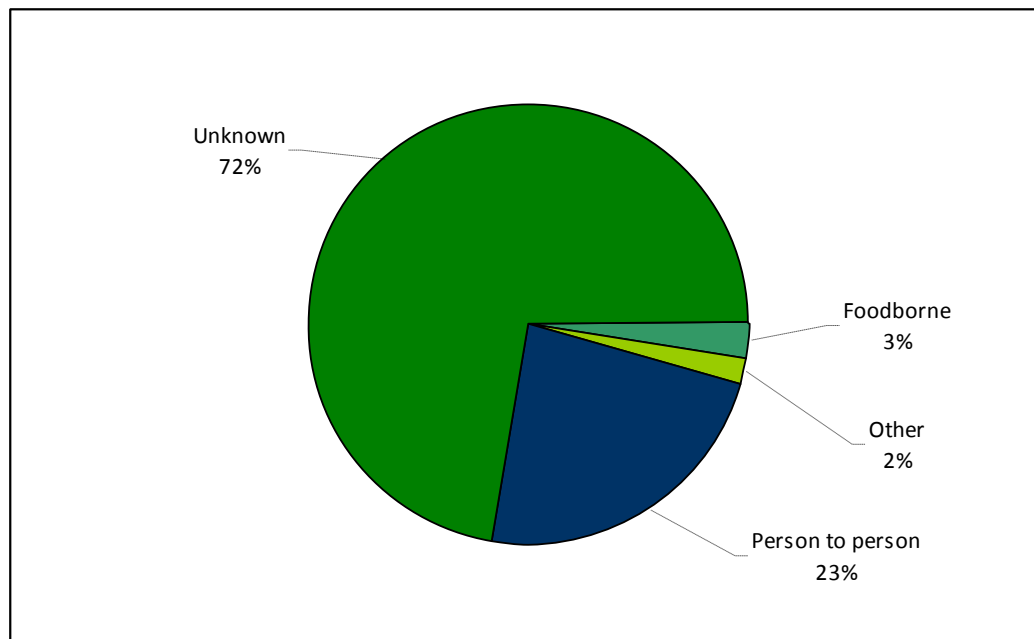


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 13% of cases; these cases were excluded

Figure 1.10.5: Most Likely Modes of Transmission for Shigellosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

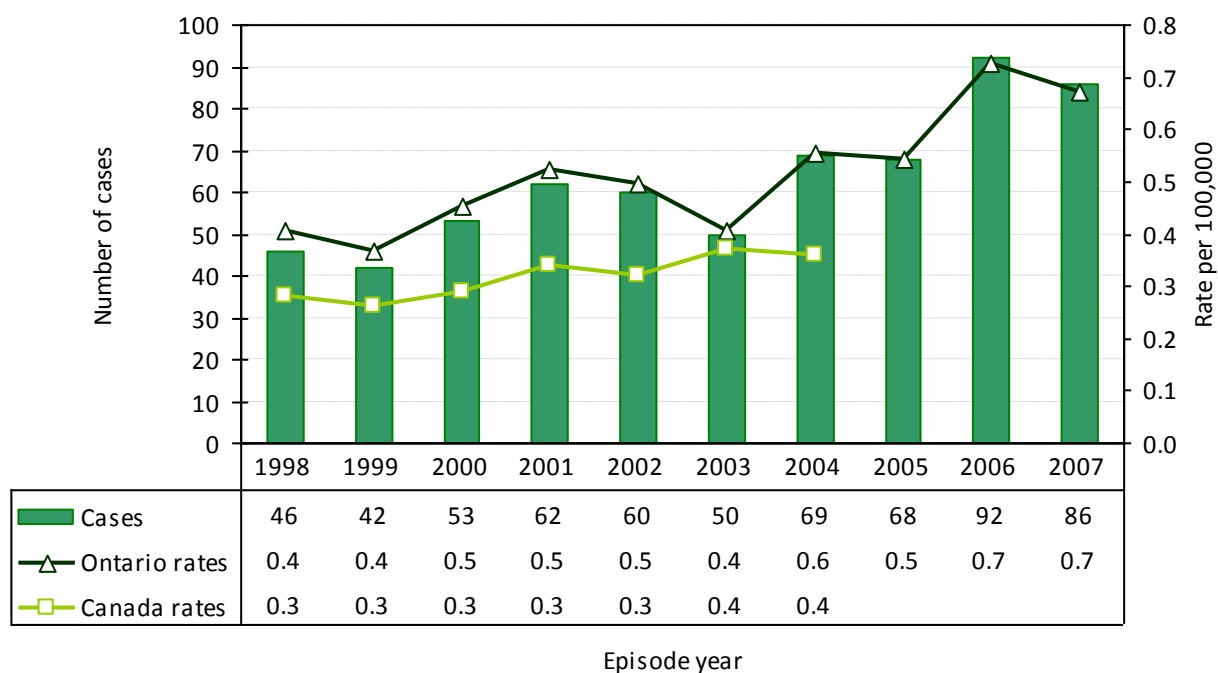
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 13% of cases; these cases were excluded; excludes travel-related cases

1.11 TYPHOID FEVER

- Ontario reported 86 confirmed cases of typhoid fever in 2007, representing an incidence rate of 0.7 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence of typhoid fever in Ontario increased by 75% from 0.4 cases per 100,000 population in 1998 to 0.7 cases per 100,000 population in 2007.
- Between 1998 and 2004, the incidence rate of typhoid fever in Canada remained relatively stable at an average of 0.3 cases per 100,000 population compared to 0.5 cases per 100,000 population in Ontario for the same time period (Figure 1.11.1).
- There is no clear seasonal trend in the incidence of typhoid fever in Ontario because the disease is not endemic in Canada. In 2007, March (10 cases) July (10 cases) and August (11 cases) accounted for the highest number of cases (Figure 1.11.2).
- In 2007, the sex-specific incidence rates for males and females were the same at 0.7 cases per 100,000 population. Generally, the incidence rates of typhoid fever decreased with increasing age for both males and females (Figure 1.11.3, Table 1.11.1).
- Peel reported the highest incidence rate of typhoid fever at 2.8 cases per 100,000 population, four times the provincial rate in 2007. Toronto reported the second highest incidence rate at 1.2 cases per 100,000 population (Map 1.11.1, Table 1.11.2).
- Among confirmed cases of typhoid fever in 2007 reporting an exposure, 85% identified travel outside of Ontario as their most likely exposure setting, two percent reported exposures in private residences, while the remaining 13% was unknown (Figure 1.11.4).

Figure 1.11.1: Incidence of Typhoid Fever in Ontario and Canada: 1998-2007



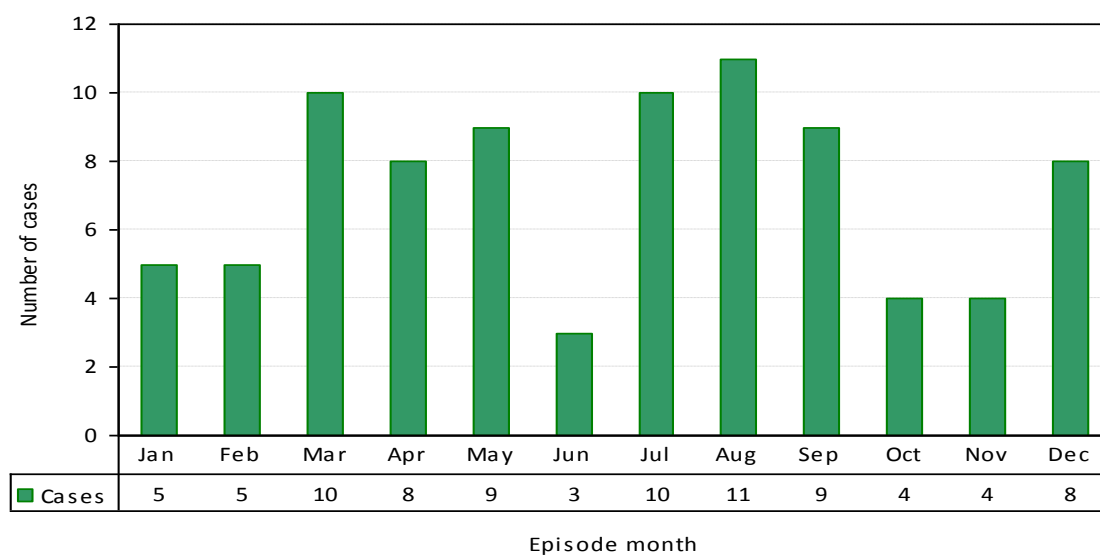
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

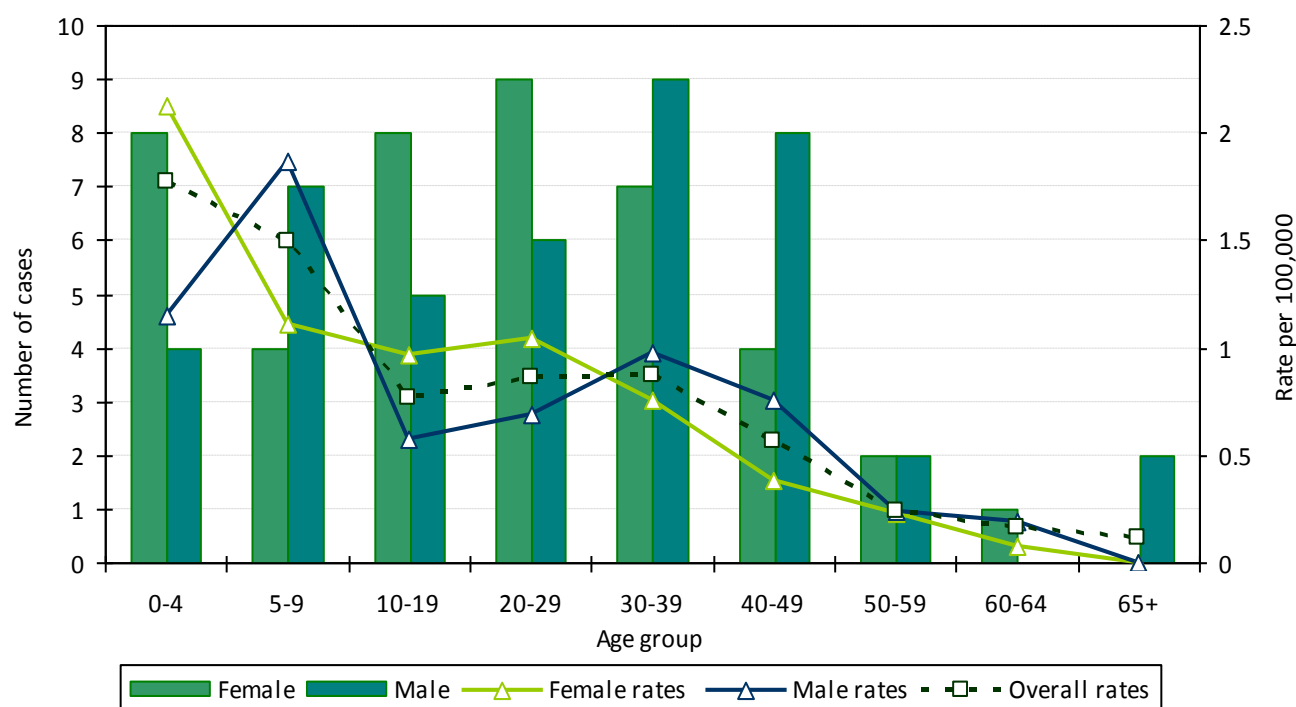
Figure 1.11.2: Incidence of Typhoid Fever by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.11.3: Incidence of Typhoid Fever by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

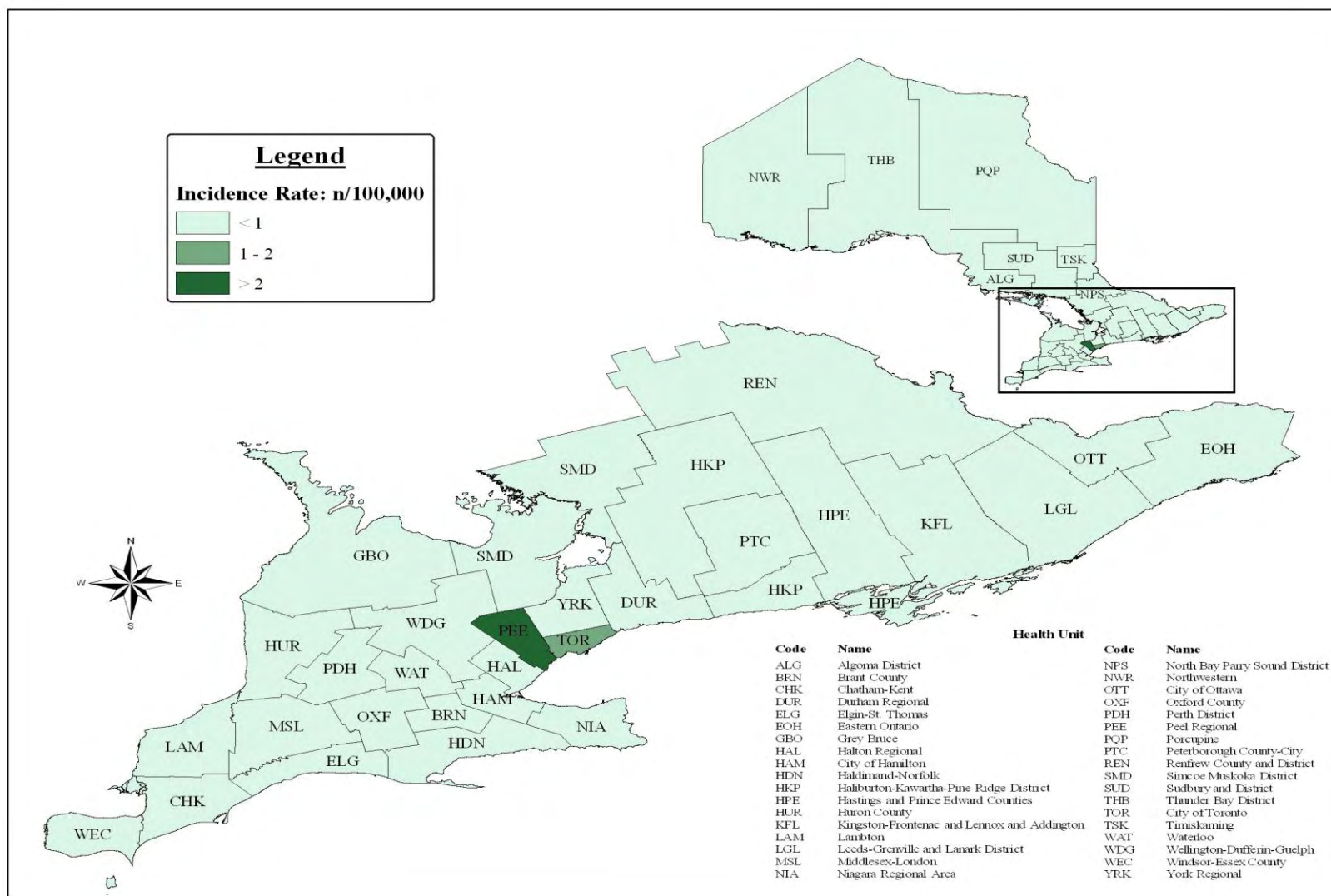
Table 1.11.1: Incidence of Typhoid Fever by Age and Sex: Ontario, 2007

Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	8	2.4	4	1.2	12	1.8
5-9	4	1.1	7	1.9	11	1.5
10-19	8	1.0	5	0.6	13	0.8
20-29	9	1.0	6	0.7	15	0.9
30-39	7	0.8	9	1.0	16	0.9
40-49	4	0.4	8	0.8	12	0.6
50-59	2	0.2	2	0.2	4	0.2
60-64	1	0.3	0	0.0	1	0.2
65+	0	0.0	2	0.3	2	0.1
Total	43	0.7	43	0.7	86	0.7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 1.11.1: Incidence Rate of Typhoid Fever by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.11.2: Incidence of Typhoid Fever by Public Health Unit: Ontario, 2007

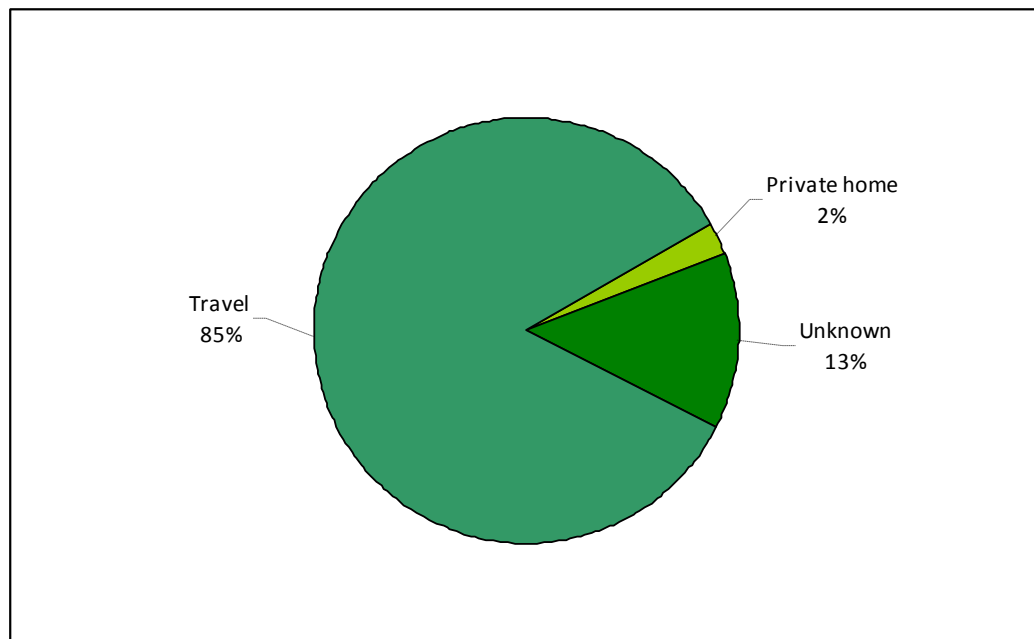
Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	36	2.8
Toronto	31	1.2
Halton Region	3	0.6
Eastern Ontario	1	0.5
Ottawa, City of	4	0.5
York Region	5	0.5
Wellington-Dufferin-Guelph	1	0.4
Durham Region	2	0.3
Middlesex-London	1	0.2
Waterloo Region	1	0.2
Windsor-Essex County	1	0.2
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Elgin-St Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton Kawartha Pine Ridge District	0	0.0
Hamilton, City of	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Kingston-Frontenac Lennox & Addington	0	0.0
Lambton County	0	0.0
Leeds-Grenville & Lanark District	0	0.0
Niagara Region	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth County	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Sudbury and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Ontario	86	0.7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.11.4: Most Likely Exposure Settings for Typhoid Fever: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

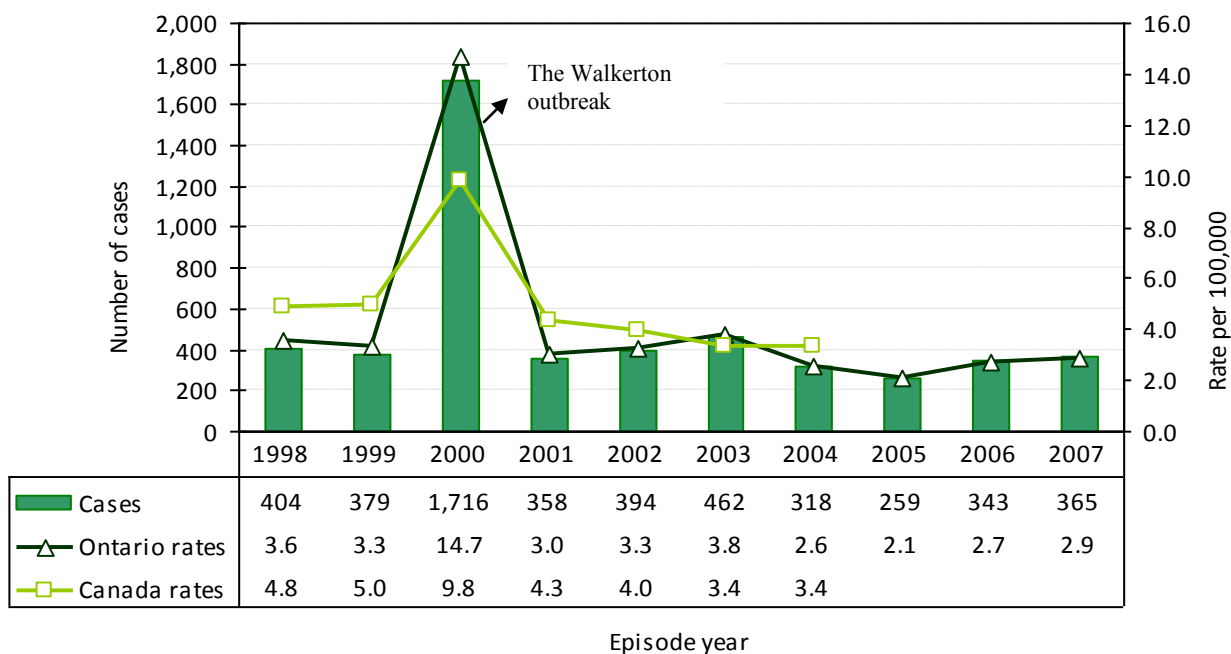
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 5% of cases; these cases were excluded

1.12 VEROTOXIN PRODUCING *E. COLI* (VTEC)

- In 2007, Ontario reported 356 cases of verotoxin producing *E. coli* (VTEC), representing an incidence of 2.9 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence of VTEC in Ontario declined by 19% from 3.6 cases per 100,000 population in 1998 to 2.9 cases per 100,000 population in 2007. Excluding 2000, Ontario reported an average of 365 cases of verotoxin producing *E. coli* (VTEC) per year from 1998 to 2007 (Figure 1.12.1).
- In 2000, an outbreak associated with a municipal drinking water supply occurred in Walkerton, Ontario. The incidence of VTEC in that year was 14.7 cases per 100,000, approximately five times higher than the provincial incidence rate of 2.9 cases per 100,000 population in 2007.
- Confirmed cases of VTEC in Ontario demonstrated a seasonal peak with the warmer months of June (82), July (87) and August (64) accounting for 65% of reported cases (Figure 1.12.2).
- In 2007, the sex-specific incidence rate was similar for females and males at 2.9 and 2.8 cases per 100,000 population, respectively (Figure 1.12.3, Table 1.12.1).
- The incidence rates of VTEC decreased with increasing age for both males and females; the highest incidence rates occurred among children in the 0-4 (10.3 cases per 100,000 population) and 5-9 (5.4 cases per 100,000 population) age groups (Figure 1.12.3, Table 1.12.1).
- Niagara Region (15.4 cases per 100,000), Huron County (13.0 cases per 100,000 population) and Grey Bruce (17.3 cases per 100,000 population) reported the highest incidence rates of VTEC in Ontario in 2007 (Map 1.12.1, Table 1.12.2).
- Compared to other enteric diseases, travel accounted for a smaller proportion of VTEC cases (5%) in 2007. Exposures occurring in food premises (25%), private homes (18%) and at private events (10%) accounted for more than half of VTEC cases who identified an exposure (Figure 1.12.4).
- Meat products, including ground beef, accounted for more than a quarter (28%) of VTEC cases who reported an exposure (Figure 1.12.5).
- Foodborne transmission (48%), secondary transmission via the fecal-oral route (9%) and animal-to-person transmission (6%) were the most frequently reported modes of transmission for VTEC in 2007 (Figure 1.12.6).

Figure 1.12.1: Incidence of VTEC in Ontario and Canada: 1998-2007



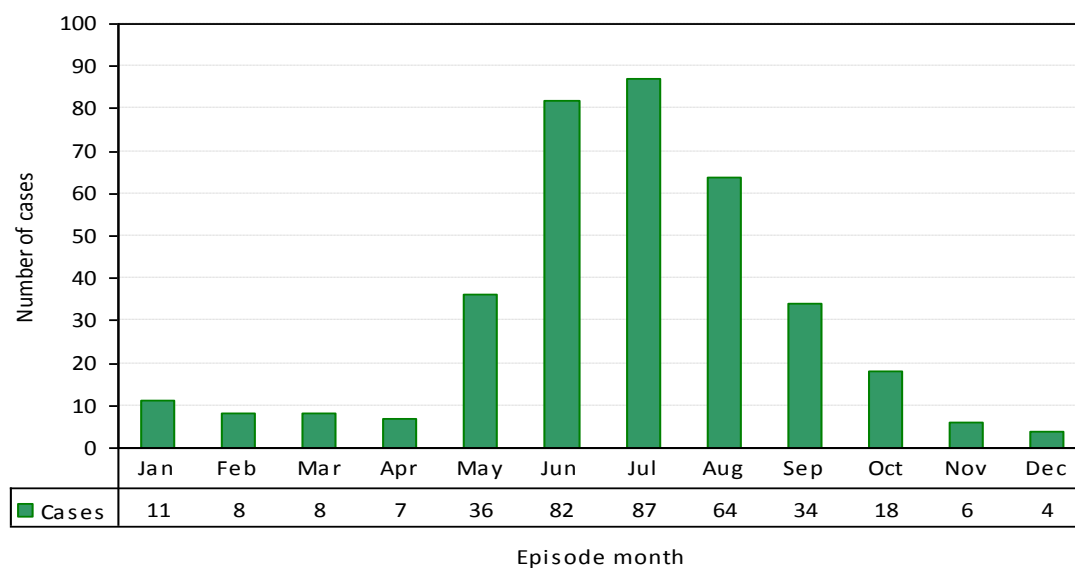
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

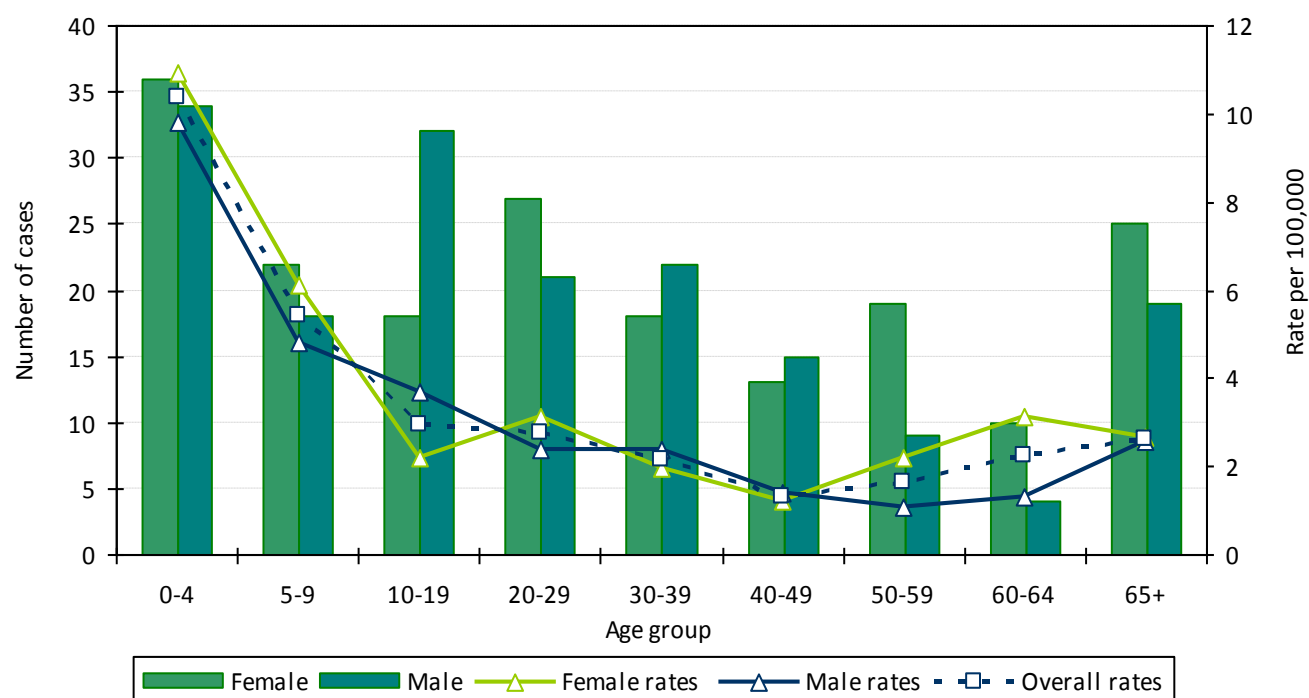
Figure 1.12.2: Incidence of VTEC by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.12.3: Incidence of VTEC by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 3 cases for which age and/or sex were unknown

Table 1.12.1: Incidence of VTEC by Age and Sex: Ontario, 2007

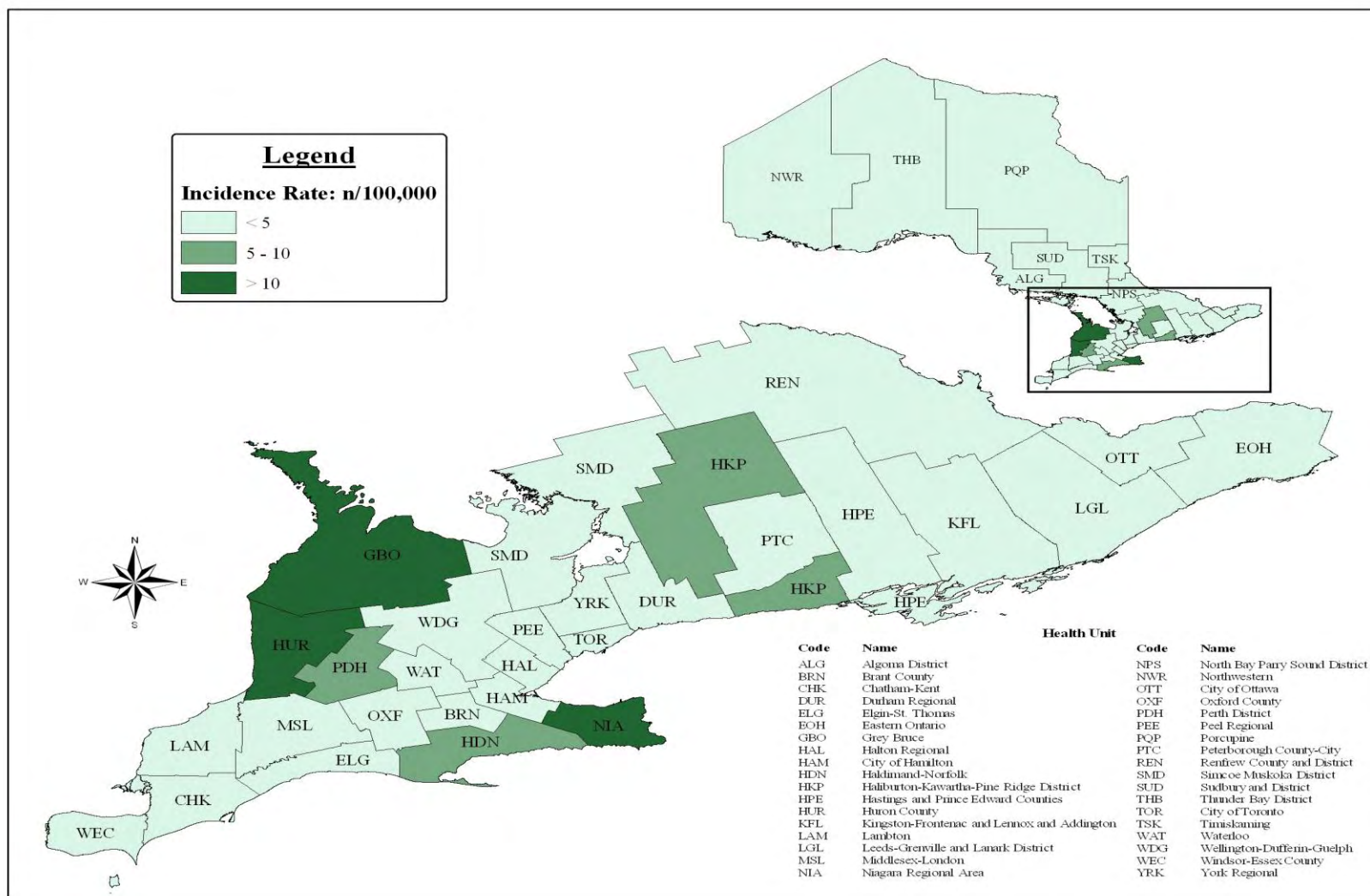
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	36	10.9	34	9.8	70	10.3
5-9	22	6.1	18	4.8	40	5.4
10-19	18	2.2	32	3.7	50	3.0
20-29	27	3.1	21	2.4	48	2.8
30-39	18	1.9	22	2.4	40	2.2
40-49	13	1.2	15	1.4	28	1.3
50-59	19	2.2	9	1.1	28	1.7
60-64	10	3.1	4	1.3	14	2.2
65+	25	2.6	19	2.6	44	2.6
Total	188	2.9	174	2.8	362	2.8

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Does not include 3 cases for which age and/or sex were unknown

Map 1.12.1: Incidence Rate of VTEC by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.12.2: Incidence of VTEC by Public Health Unit: Ontario, 2007

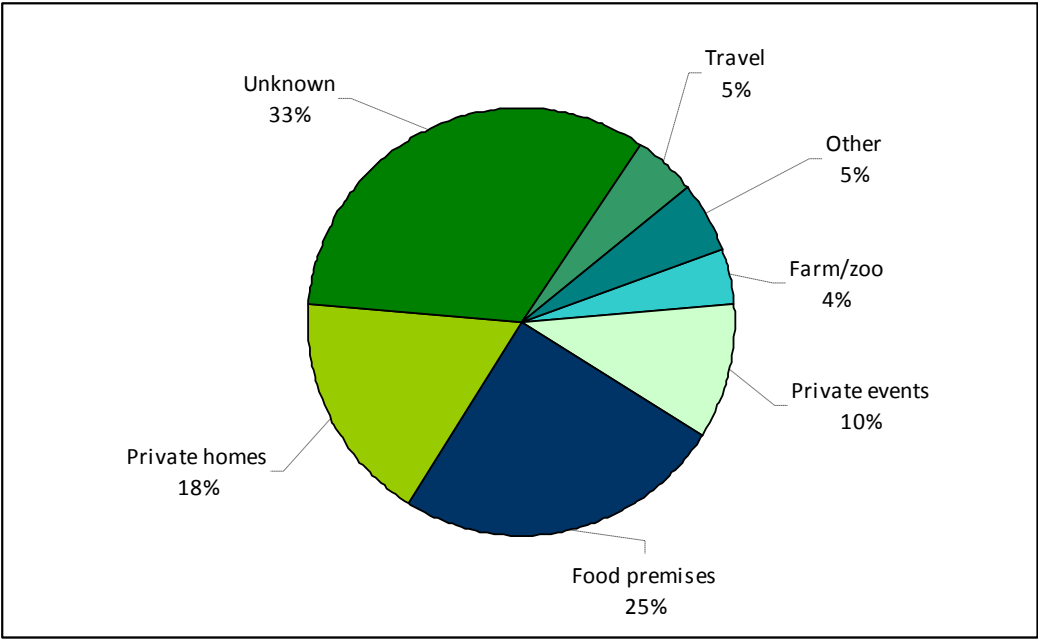
Public Health Unit	Number of cases	Rate/100,000 population
Grey-Bruce	28	17.3
Niagara Region	67	15.4
Huron County	8	13.0
Haldimand-Norfolk	7	6.3
Perth District	4	5.2
Haliburton Kawartha Pine Ridge District	9	5.1
Wellington-Dufferin-Guelph	11	4.1
Waterloo Region	18	3.6
Eastern Ontario	6	3.0
Lambton	4	3.0
Middlesex-London	13	3.0
Peterborough County-City	4	3.0
Renfrew	3	3.0
Timiskaming	1	2.9
Ottawa, City of	23	2.7
Hastings Prince Edward Counties	4	2.5
Hamilton, City of	12	2.3
Durham Region	13	2.2
Toronto	54	2.0
Windsor-Essex County	8	2.0
Halton Region	9	1.9
Algoma District	2	1.7
York Region	17	1.7
Kingston Frontenac L & A	3	1.6
Peel Region	21	1.6
Thunder Bay District	2	1.3
Leeds-Grenville & Lanark District	2	1.2
Northwestern	1	1.2
Simcoe Muskoka District	6	1.2
Elgin-St Thomas	1	1.1
Sudbury and District	2	1.0
Chatham-Kent	1	0.9
North Bay Parry Sound District	1	0.8
Brant County	0	0.0
Oxford County	0	0.0
Porcupine	0	0.0
Ontario	365	2.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.12.4: Most Likely Exposure Settings for VTEC Cases: Ontario, 2007

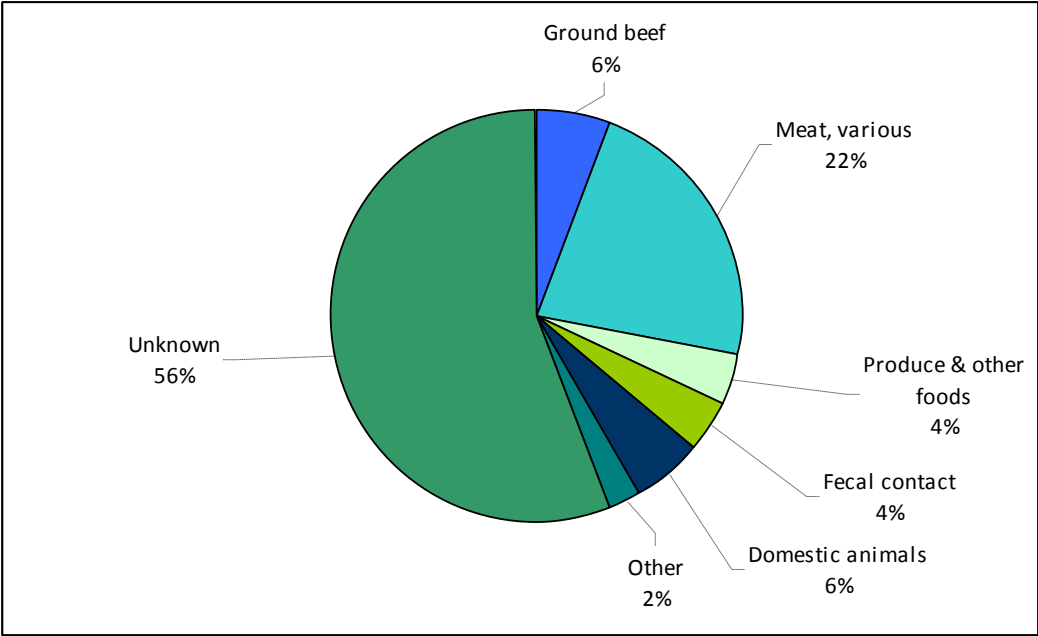


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 17% of cases; these cases were excluded

Figure 1.12.5: Most Likely Sources of Illness for VTEC Cases: Ontario, 2007

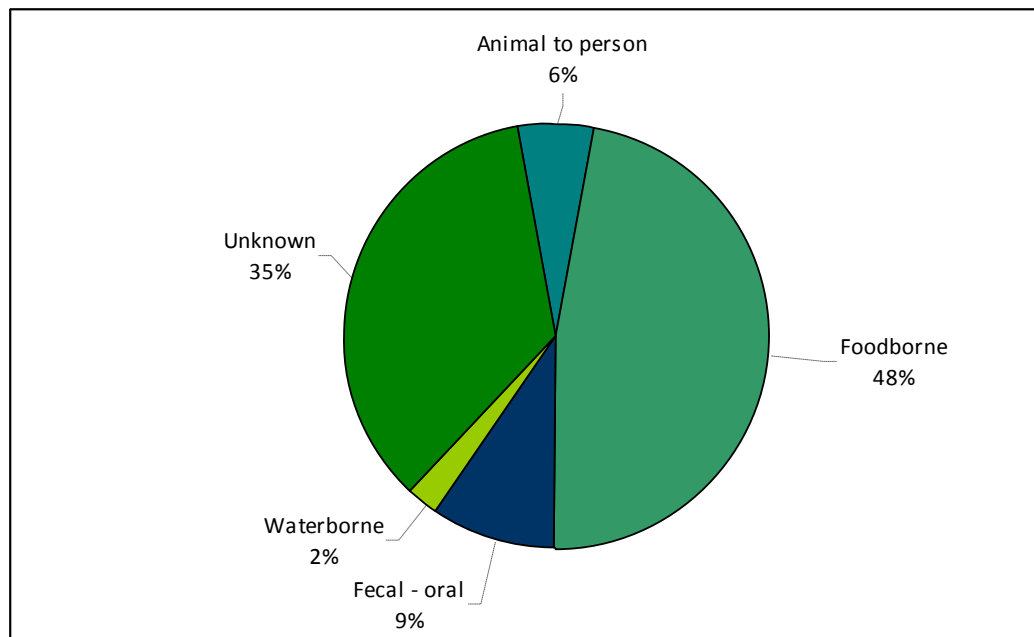


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 17% of cases; these cases were excluded; excludes travel-related cases

Figure 1.12.6: Most Likely Modes of Transmission for VTEC Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

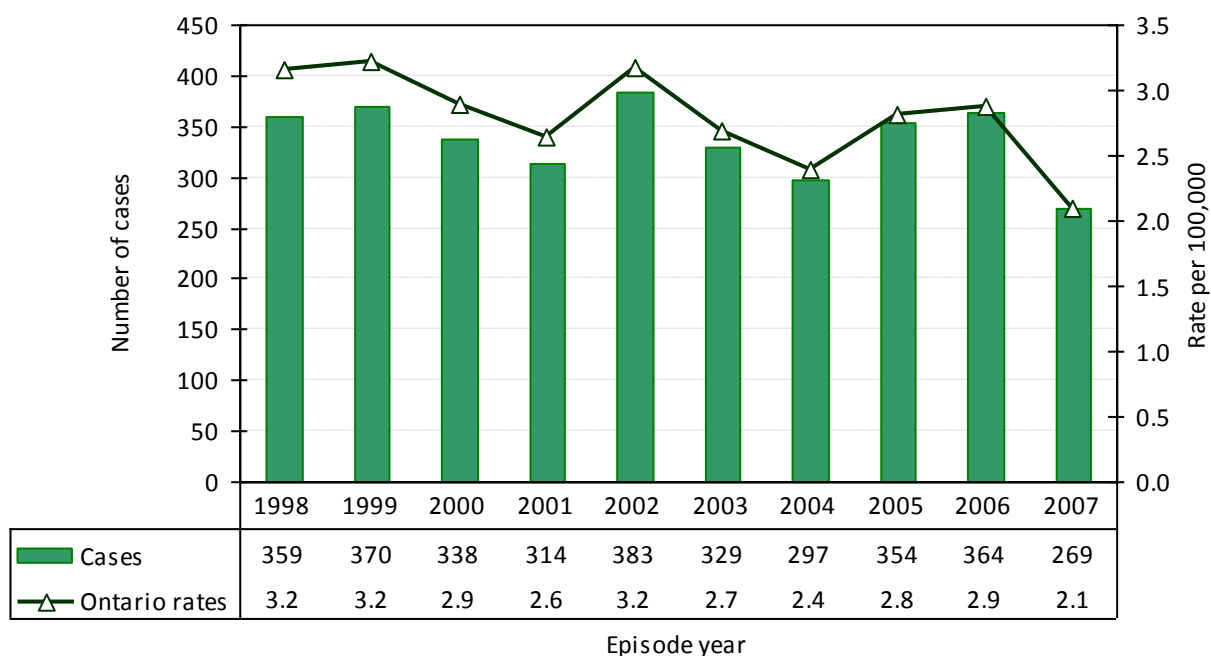
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 17% of cases; these cases were excluded; excludes travel-related cases

1.13 YERSINIOSIS

- In 2007, Ontario reported 269 confirmed cases of yersiniosis, representing an incidence rate of 2.1 cases per 100,000 population (Table 1.1).
- During the period 1998-2007, the incidence of yersiniosis in Ontario declined by 34% from 3.2 cases per 100,000 population in 1998 to 2.1 cases per 100,000 population in 2007 (Figure 1.13.1).
- There was no clear seasonal trend among yersiniosis cases in 2007. March (36 cases), June (30 cases), May (28 cases) and October (36 cases) accounted for the highest number of cases (Figure 1.13.2).
- In 2007, males (52%) accounted for slightly more cases of yersiniosis. Males also had a 10% higher sex-specific incidence rate than females, 2.2 cases per 100,000 population versus 2.0 cases per 100,000 population (Figure 1.13.3, Table 1.13.1).
- The incidence of yersiniosis decreased with increasing age; the highest incidence rate occurred among children aged 0-4 years (14.5 cases per 100,000 population). This rate is approximately seven times higher than the provincial incidence rate of 2.1 cases per 100,000 population.
- York Region reported the highest incidence rate of yersiniosis in 2007 at 4.9 cases per 100,000 population; Waterloo Region ranked second with 3.6 cases per 100,000 population. Toronto observed the highest number of cases (86), representing 32% of yersiniosis cases reported in Ontario (Map 1.13.1, Table 1.13.2).
- Among cases reporting an exposure in 2007, travel outside of Ontario (12%) and exposures in private homes (12%) were the most frequently reported exposure settings. Exposures at food premises (3%) and other settings (3%) accounted for 6% of cases (Figure 1.13.4).

Figure 1.13.1: Incidence of Yersiniosis in Ontario and Canada: 1998-2007



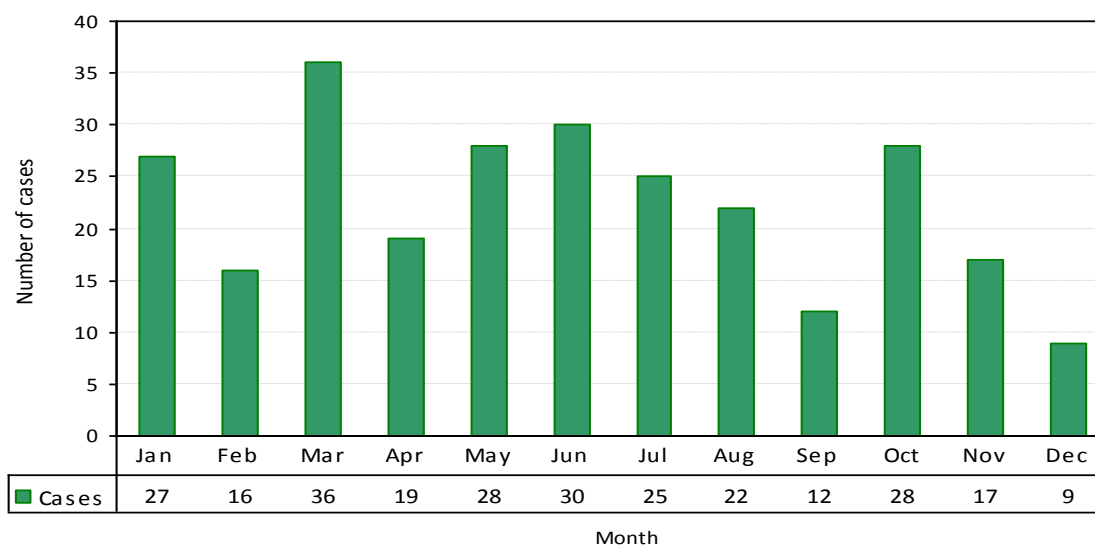
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

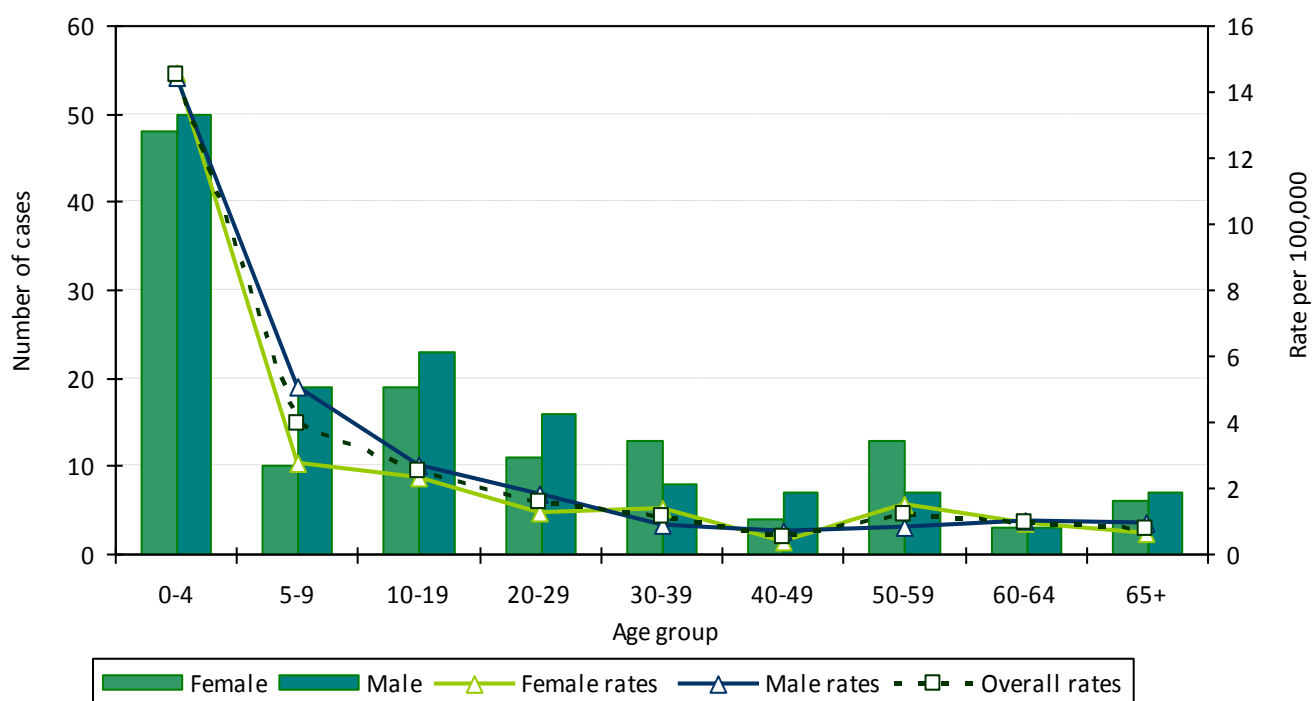
Figure 1.13.2: Incidence of Yersiniosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 1.13.3: Incidence of Yersiniosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 2 cases for which age and/or sex were unknown

Table 1.13.1: Incidence of Yersiniosis by Age and Sex: Ontario, 2007

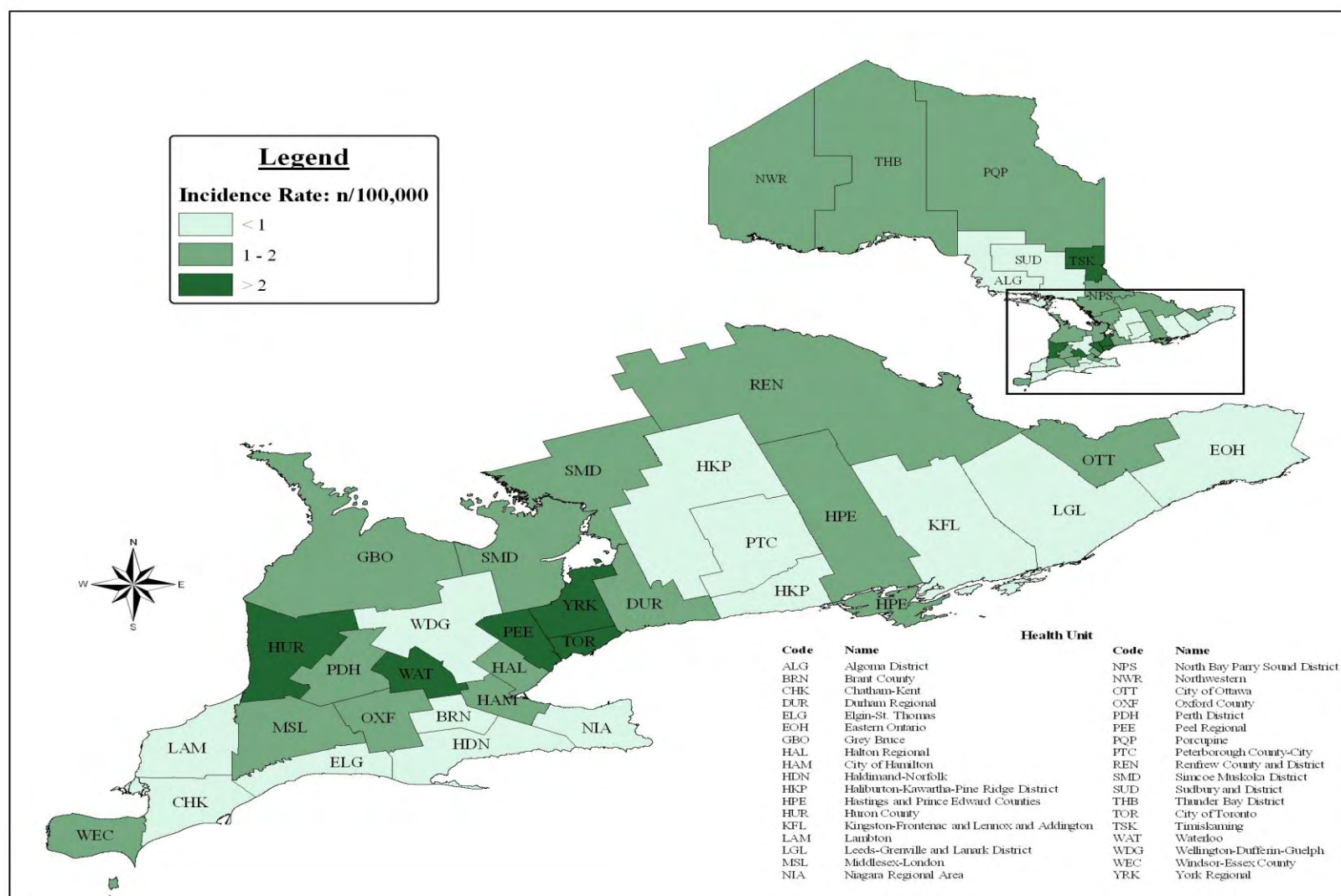
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	48	14.6	50	14.4	98	14.5
5-9	10	2.8	19	5.1	29	3.9
10-19	19	2.3	23	2.7	42	2.5
20-29	11	1.3	16	1.8	27	1.6
30-39	13	1.4	8	0.9	21	1.1
40-49	4	0.4	7	0.7	11	0.5
50-59	13	1.5	7	0.8	20	1.2
60-64	3	0.9	3	1.0	6	1.0
65+	6	0.6	7	0.9	13	0.8
Total	127	2.0	140	2.2	267	2.1

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Does not include 2 cases for which age and/or sex were unknown

Map 1.13.1: Incidence Rates of Yersiniosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 1.13.2: Incidence of Yersiniosis by Public Health Unit: Ontario, 2007

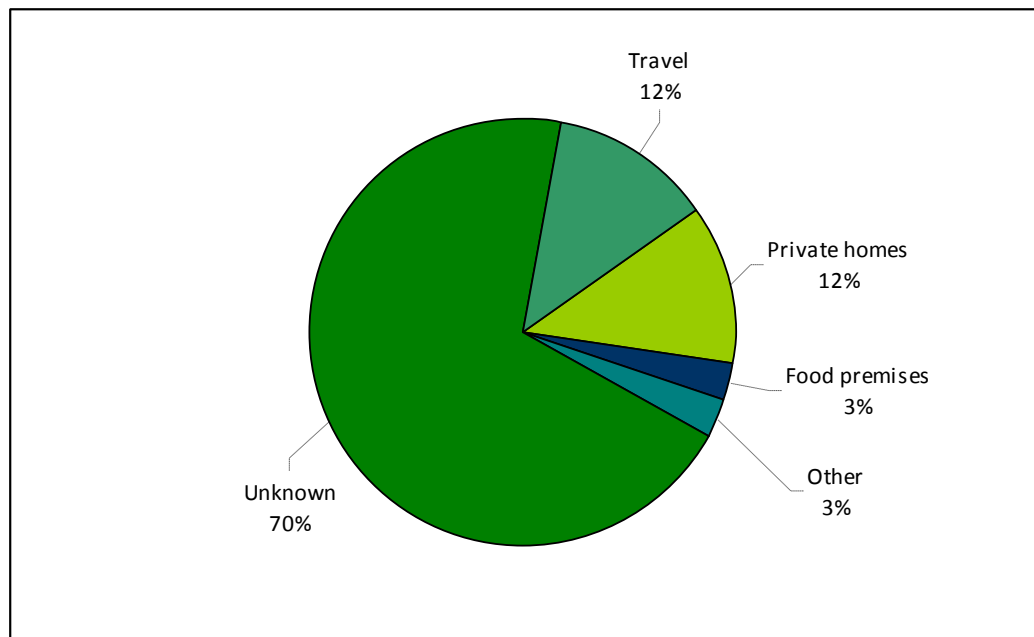
Public Health Unit	Number of cases	Rate/100,000 population
York Region	48	4.9
Waterloo Region	18	3.6
Huron County	2	3.3
Toronto	86	3.2
Timiskaming	1	2.9
Peel Region	36	2.8
Halton Region	11	2.3
Renfrew	2	2.0
Grey-Bruce	3	1.9
Oxford County	2	1.9
Thunder Bay District	3	1.9
Ottawa, City of	14	1.7
North Bay Parry Sound District	2	1.6
Hamilton, City of	8	1.5
Simcoe Muskoka District	7	1.4
Perth District	1	1.3
Durham Region	7	1.2
Hastings Prince Edward Counties	2	1.2
Northwestern	1	1.2
Middlesex-London	5	1.1
Porcupine	1	1.1
Windsor-Essex County	4	1.0
Lambton County	1	0.8
Brant County	1	0.7
Haliburton Kawartha Pine Ridge District	1	0.6
Wellington-Dufferin-Guelph	1	0.4
Niagara Region	1	0.2
Algoma District	0	0.0
Elgin-St Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Chatham-Kent	0	0.0
Kingston-Frontenac Lennox & Addington	0	0.0
Leeds-Grenville & Lanark District	0	0.0
Peterborough County-City	0	0.0
Eastern Ontario	0	0.0
Sudbury and District	0	0.0
Ontario	269	2.1

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 1.13.4: Most Likely Exposure Settings for Yersiniosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 20% of cases; these cases were excluded

Chapter 2: VACCINE PREVENTABLE DISEASES

- In 2007, *Streptococcus pneumoniae* (*S. pneumoniae*), pertussis, invasive meningococcal disease (IMD) and mumps were the most common vaccine preventable diseases reported in Ontario.
- In 2007, age-specific incidence rates for invasive meningococcal disease and pertussis were highest among infants under the age of 1 year and children ages 1-4 years. For *S. Pneumoniae*, age-specific incidence rates were highest among the same age groups and among adults aged 60 years and older.
- Since 2002, the incidence rate of invasive meningococcal disease (IMD) has declined to a yearly average of 0.5 cases per 100,000 population (Figure 2.1.1).
- Meningococcal serogroup B accounted for almost half of IMD cases reported in Ontario in 2007.
- The incidence of mumps has declined since 2000, however, the number of reported cases spiked in 2007 due to importation of mumps from Nova Scotia and New Brunswick (Figure 2.2.1).
- Persons aged 20-29 accounted for more than half of mumps cases reported in 2007, reflecting the demographic makeup of cases linked to the mumps outbreak imported from Atlantic Canada (Figure 2.2.3 and Table 2.2.1).
- The incidence rate for pertussis in Ontario declined from a high of 16.5 cases per 100,000 population in 1998 to 2.9 cases per 100,000 population in 2003. However, since 2004, the incidence rate for pertussis has increased peaking at 10.0 cases per 100,000 population in 2006 (Figure 2.3.1). The increase since 2004 is due in part to the switch to more sensitive laboratory testing in 2005.
- Over the years 2005 to 2007, the incidence of *S. pneumoniae* stabilized to a yearly average of 935 cases or 7.4 cases per 100,000 population (Figure 2.5.1).

Table 2.1: Incidence of Vaccine Preventable Diseases; Ontario, 1998-2007

Vaccine Preventable Diseases ^{2, 4}	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
Diphtheria	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Haemophilus Influenzae B	7	0.1	4	0.0	11	0.1	7	0.1	7	0.1	9	0.1	9	0.1	8	0.1	12	0.1	6	0.0
Measles	9	0.1	2	0.0	9	0.1	6	0.1	1	0.0	11	0.1	6	0.0	4	0.0	5	0.0	0	0.0
Meningococcal disease	52	0.5	80	0.7	82	0.7	106	0.9	59	0.5	58	0.5	55	0.4	43	0.3	67	0.5	62	0.5
Mumps	34	0.3	43	0.4	33	0.3	18	0.2	14	0.1	13	0.1	23	0.2	17	0.1	10	0.1	53	0.4
Pertussis	1881	16.5	1218	10.6	716	6.1	463	3.9	532	4.4	353	2.9	633	5.1	646	5.1	1265	10.0	933	7.3
Rubella	0	0.0	4	0.0	9	0.0	17	0.0	2	0.0	9	0.0	5	0.0	313 ⁶	0.0	5	0.0	2	0.0
Rubella, congenital	0	0.0	0	0.0	1	0.0	0	0.0	1	0.0	1	0.0	2	0.0	0	0.0	0	0.0	0	0.0
S. pneumoniae ³	26.0	0.2	26.0	0.2	21.0	0.2	128	1.1	649	5.4	1016	8.3	1057	8.5	930	7.4	945	7.4	940	7.3
Tetanus	2	0.0	1	0.0	1	0.0	3	0.0	2	0.0	0	0.0	0	0.0	1	0.0	1	0.0	1	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note 1: Incidence rate per 100,000 population

Note 2: No cases were reported for the following vaccine preventable diseases in Ontario during the period 1998-2007: poliomyelitis and small pox

Note 3: Interpret S. pneumoniae trend before 2003 with caution: Invasive S. pneumoniae became reportable in Ontario in 2001. Consistency in reporting was not achieved until 2003.

Note 4: Excludes diseases for which aggregate case counts rather than individual case counts are reported to the MOHLTC

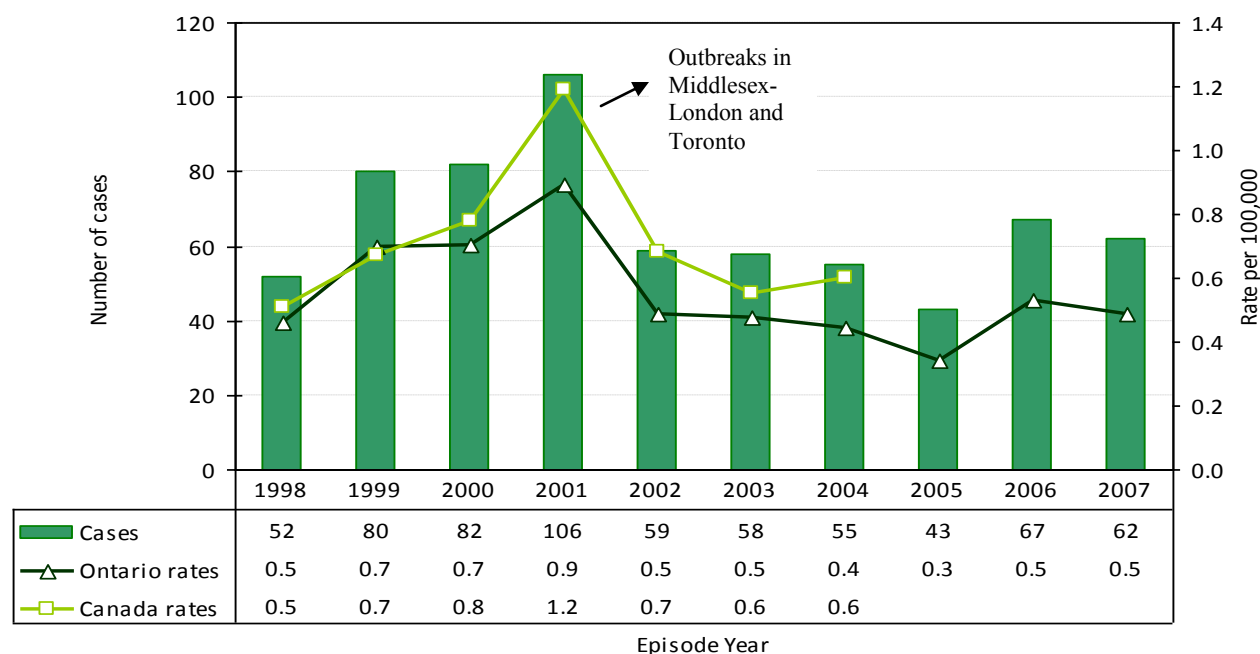
Note 5: Publicly funded Meningococcal vaccine (serogroup C) introduced in September 2004 for one year olds and in January 2005 for grade 7 students, youths aged 15 to 19 and high-risk people of all ages. Two dose schedule for measles vaccine with a catch-up program for students aged 4-18 years introduced in 1996. Publicly funded tetanus, diphtheria and acellular vaccine (Tdap) for adolescents aged 14-16 years introduced in late 2003- replaced the Td-IPV adolescent booster dose. Publicly funded Pneumococcal conjugate vaccine introduced in September 2003 for high risk children under the age of 2 years. Expanded in July 2004 to include high risk children under the age of 5 years and in January 2005 to include all children under the age of 2 years.

Note 6: Rubella outbreak in Oxford County in 2005

2.1 MENINGOCOCCAL DISEASE, INVASIVE (IMD)

- In 2007, Ontario reported 62 confirmed cases of invasive meningococcal disease (IMD), representing an incidence rate of 0.5 cases per 100,000 population (Figure 2.1.1).
- A total of six deaths were reported among cases with IMD in 2007, which corresponds to a mortality rate of 0.05 cases per 100,000 population. In contrast, the general case fatality rate for IMD is 8-15%.
- The incidence of IMD in Ontario increased between 1998 and 2001, with the highest reported incidence rate occurring in 2001 (0.9 cases per 100,000 population). An outbreak of IMD serogroup C, linked to Quebec, resulted in the increase in 2001. Since 2002, the incidence of IMD has declined to a yearly average of 0.5 cases per 100,000 population.
- The overall trend in the incidence of IMD in Canada from 1998 to 2004 was comparable to that of Ontario, although national rates were higher in most years for which data are available (Figure 2.1.1).
- Most cases of IMD in 2007 occurred in the first four months of the year. The months of January through to April accounted for 53% of cases reported in 2007 (Figure 2.1.2).
- The incidence rate of IMD in 2007 was 50% higher among males at 0.6 cases per 100,000 population compared to 0.4 cases per 100,000 population among females (Figure 2.1.3, Table 2.1.1).
- Children <1 years old and children in the 1-4 age groups experienced the highest burden of IMD with incidence rates of 5.2 and 1.3 cases per 100,000 population, respectively. The incidence rate for males in the 20-29 age group was five times higher than that of females at 1.0 case per 100,000 compared to 0.2 cases per 100,000 population (Figure 2.1.3, Table 2.1.1).
- Lambton County Health Unit (2.3 cases per 100,000 population), Eastern Health Unit (1.5 cases per 100,000 population) and Perth District Health Unit (1.3 cases per 100,000 population) experienced the highest incidence rates of IMD. Forty-four percent of health units reported no cases of IMD in 2007 (Map 2.1.1, Table 2.1.2).
- The most frequently identified meningococcal serogroups in 2007 were Group B (48%), Group Y (24%), Group C (18%) and Group W135 (5%); the remaining cases were ungroupable (5%) (Figure 2.1.4).

Figure 2.1.1: Incidence of Invasive Meningococcal Disease in Ontario and Canada: 1998-2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

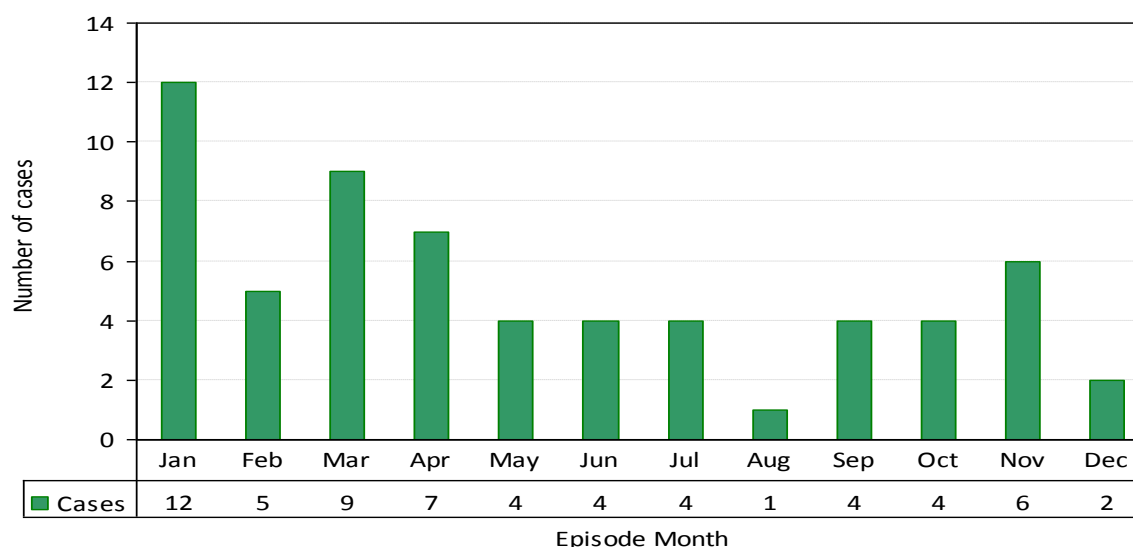
Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note 1: Canadian rates available up to 2004.

Note 2: Publicly funded Meningococcal vaccine (serogroup C) introduced in September 2004 for one year olds and in January 2005 for grade 7 students, youths aged 15 to 19 and high-risk people of all ages.

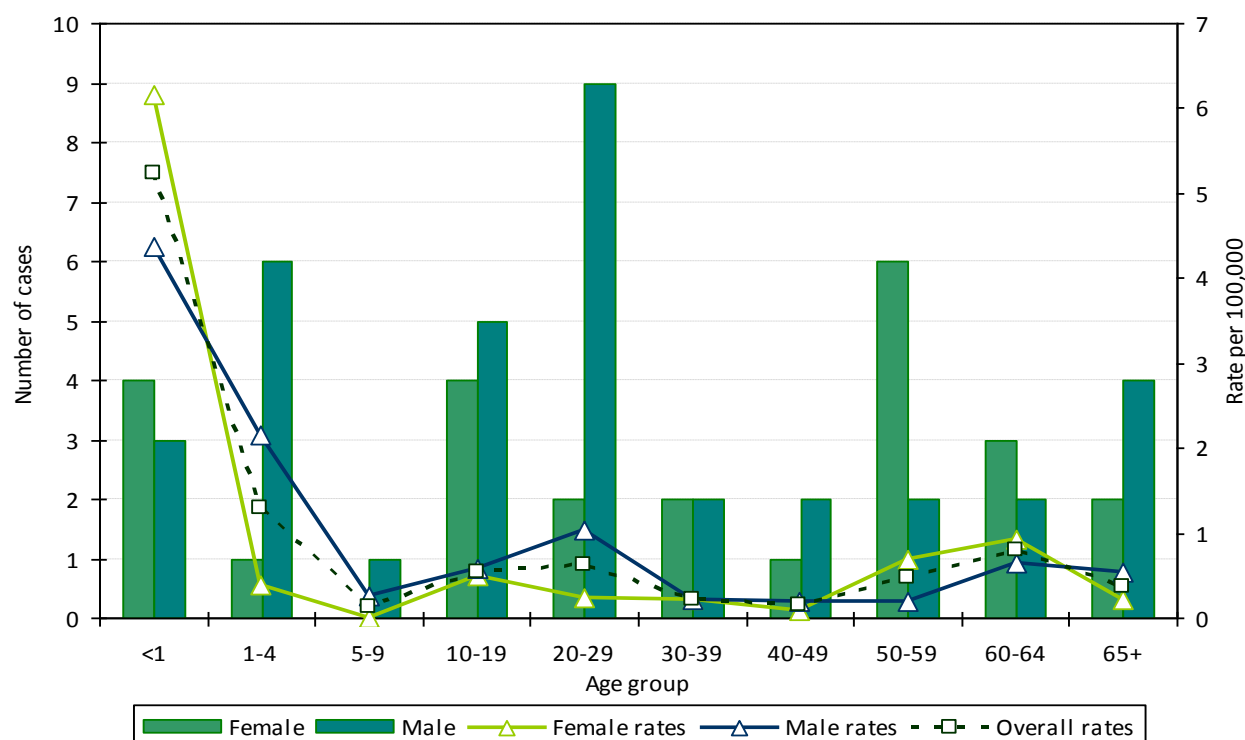
Figure 2.1.2: Incidence of Invasive Meningococcal Disease by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 2.1.3: Incidence of Invasive Meningococcal Disease by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 1 case for which sex and/or age were unknown

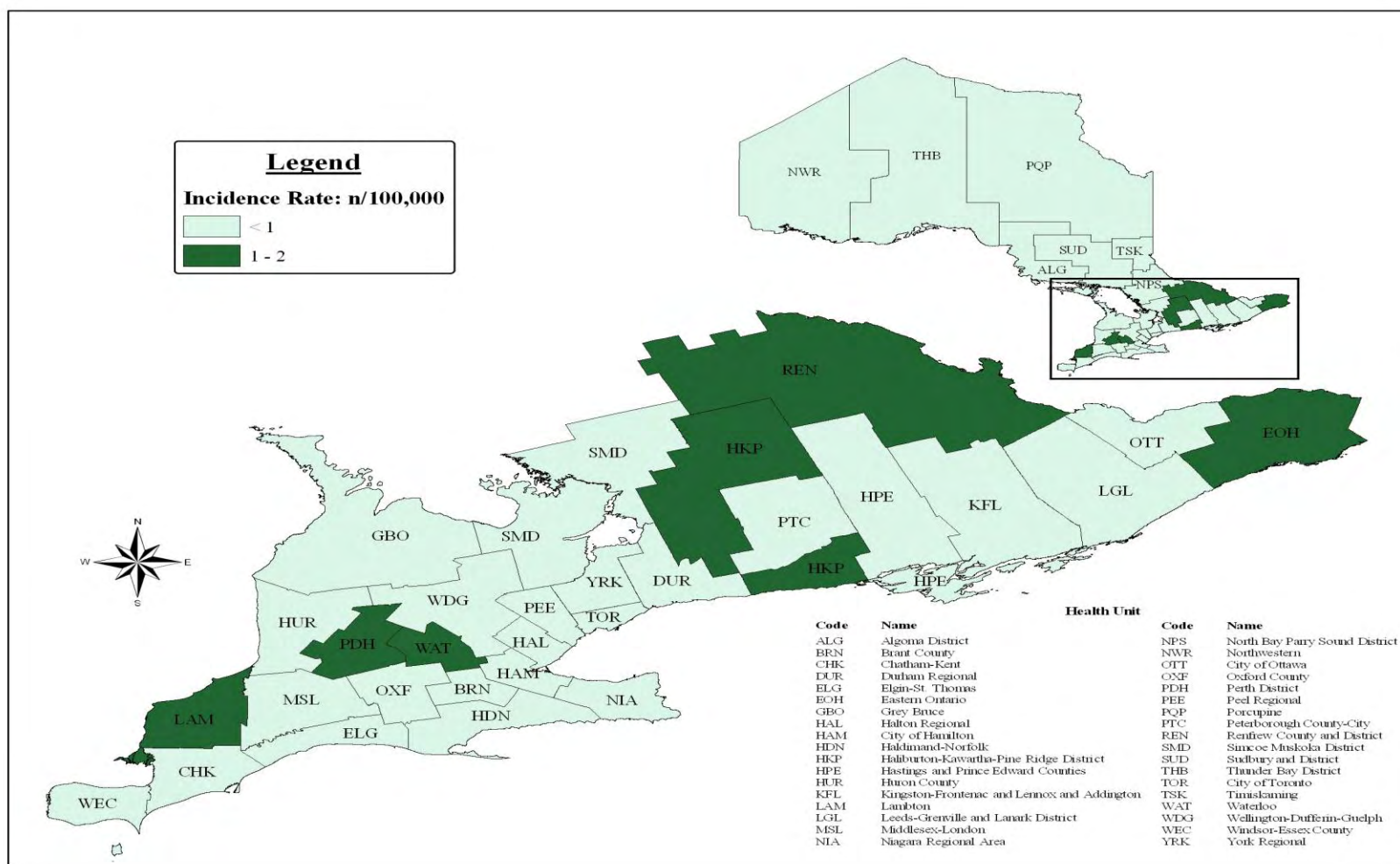
Table 2.1.1: Incidence of Invasive Meningococcal Disease by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
<1	4	6.2	3	4.4	7	5.2
1-4	1	0.4	6	2.2	7	1.3
5-9	0	0.0	1	0.3	1	0.1
10-19	4	0.5	5	0.6	9	0.5
20-29	2	0.2	9	1.0	11	0.6
30-39	2	0.2	2	0.2	4	0.2
40-49	1	0.1	2	0.2	3	0.1
50-59	6	0.7	2	0.2	8	0.5
60-64	3	0.9	2	0.6	5	0.8
65+	2	0.2	4	0.5	6	0.4
Total	25	0.4	36	0.6	61	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Excludes 1 case for which sex and/or age were unknown

Map 2.1.1: Incidence Rates of Invasive Meningococcal Disease by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 2.1.2: Incidence of Invasive Meningococcal Disease by Public Health Unit: Ontario, 2007

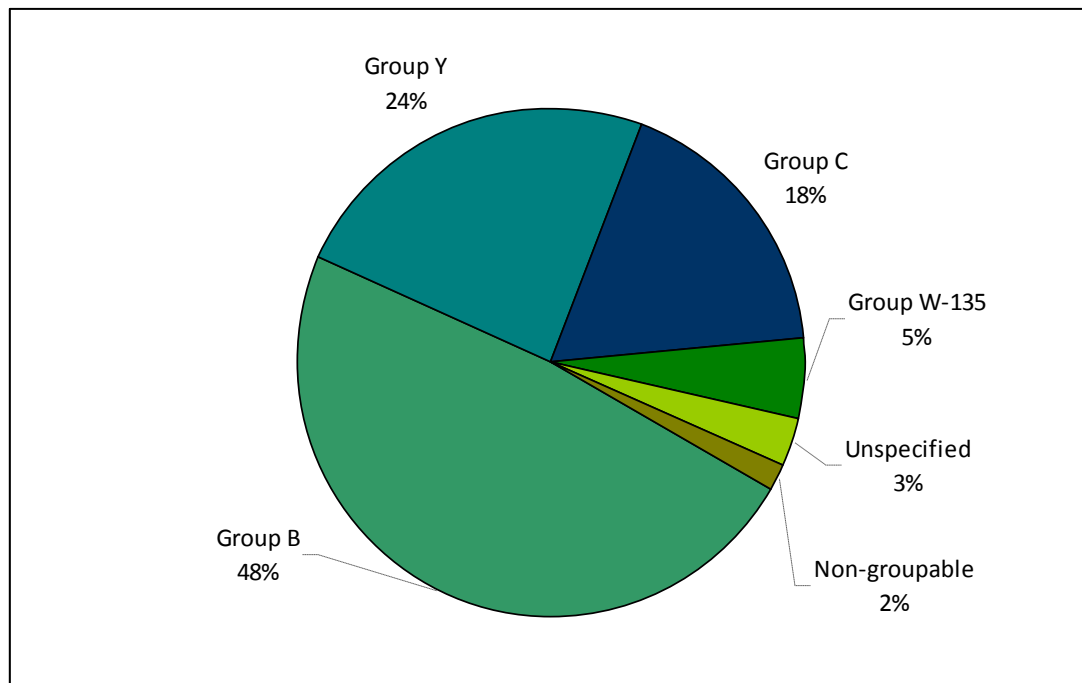
Public Health Unit	Number of cases	Rate/100,000 population
Lambton County	3	2.3
Eastern Ontario	3	1.5
Perth District	1	1.3
Haliburton-Kawartha-Pine Ridge District	2	1.1
Renfrew County and District	1	1.0
Waterloo Region	5	1.0
Halton Region	4	0.9
Oxford County	1	0.9
Durham Region	4	0.7
Middlesex-London	3	0.7
Peterborough County	1	0.7
York Region	7	0.7
Hastings Prince Edward Counties	1	0.6
Thunder Bay District	1	0.6
Peel Region	6	0.5
Toronto	12	0.5
Windsor-Essex County	2	0.5
Simcoe Muskoka District	2	0.4
Niagara Region	1	0.2
Ottawa, City of	2	0.2
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Hamilton, City of	0	0.0
Huron County	0	0.0
Kingston-Frontenac and Lennox and Addington	0	0.0
Leeds-Grenville and Lanark District	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Porcupine	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Ontario	62	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 2.1.4: Incidence of Invasive Meningococcal Disease by Sero-group: Ontario, 2007

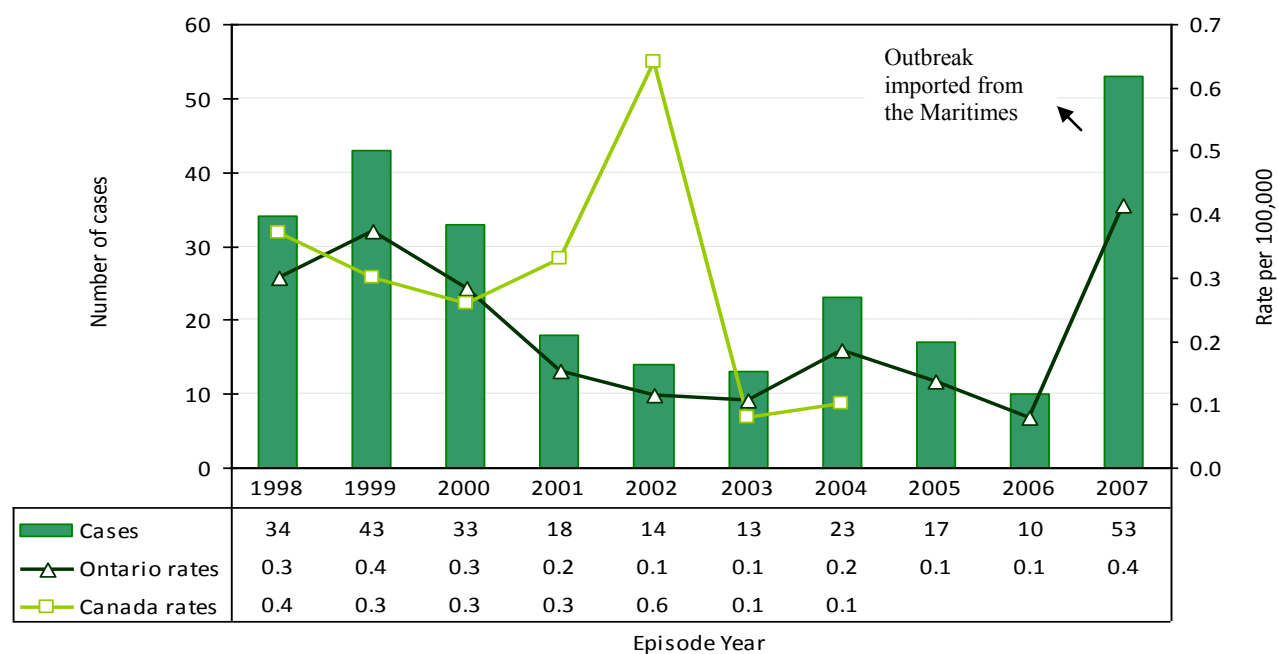


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

2.2 MUMPS

- In 2007, Ontario reported 53 confirmed cases of mumps, representing an incidence rate of 0.4 cases per 100,000 population (Figure 2.2.1).
- The incidence of mumps in Ontario has declined since 2000, however, the number of reported cases spiked in 2007 due to importation of mumps from Nova Scotia and New Brunswick. In Canada from 1998-2004, incidence rates have similarly declined, with the exception of 2002 when the national incidence rate peaked at 0.6 per 100,000 population (Figure 2.2.1).
- Confirmed cases of mumps in 2007 peaked from April to October which coincides with the importation of mumps cases from the Maritimes. There were no other peaks in mumps cases reported for the remainder of the year. (Figure 2.2.2).
- In 2007, males accounted for 60% of mumps cases and females accounted for 40%, with incidence rates of 0.5 and 0.3 cases per 100,000 population, respectively (Figure 2.2.3, Table 2.2.1).
- Persons aged 20-29 accounted for more than half (54%) of mumps cases reported in 2007, reflecting the demographic makeup of cases linked to the mumps outbreak imported from Atlantic Canada. In addition, 71% of cases in this age group were males (Figure 2.2.3, Table 2.2.1).
- Oxford County reported the highest incidence rate of mumps in 2007 with 6.6 cases per 100,000 population or seven cases. Toronto reported the most cases at 16 and an incidence rate of 0.6 cases per 100,000 population (Map 2.2.1, Table 2.2.2).
- Among mumps cases reporting an exposure in 2007, 50% were residents of Ontario returning from Nova Scotia (17) or international destinations (4) (Figure 2.2.4).

Figure 2.2.1: Incidence of Mumps in Ontario and Canada: 1998-2007



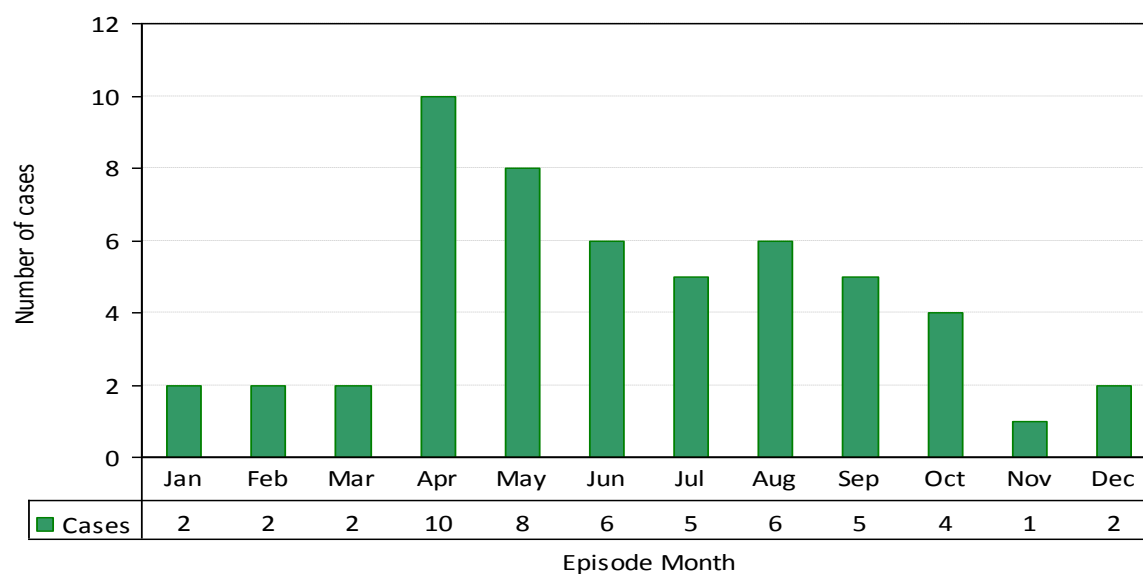
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Canadian rates available up to 2004.

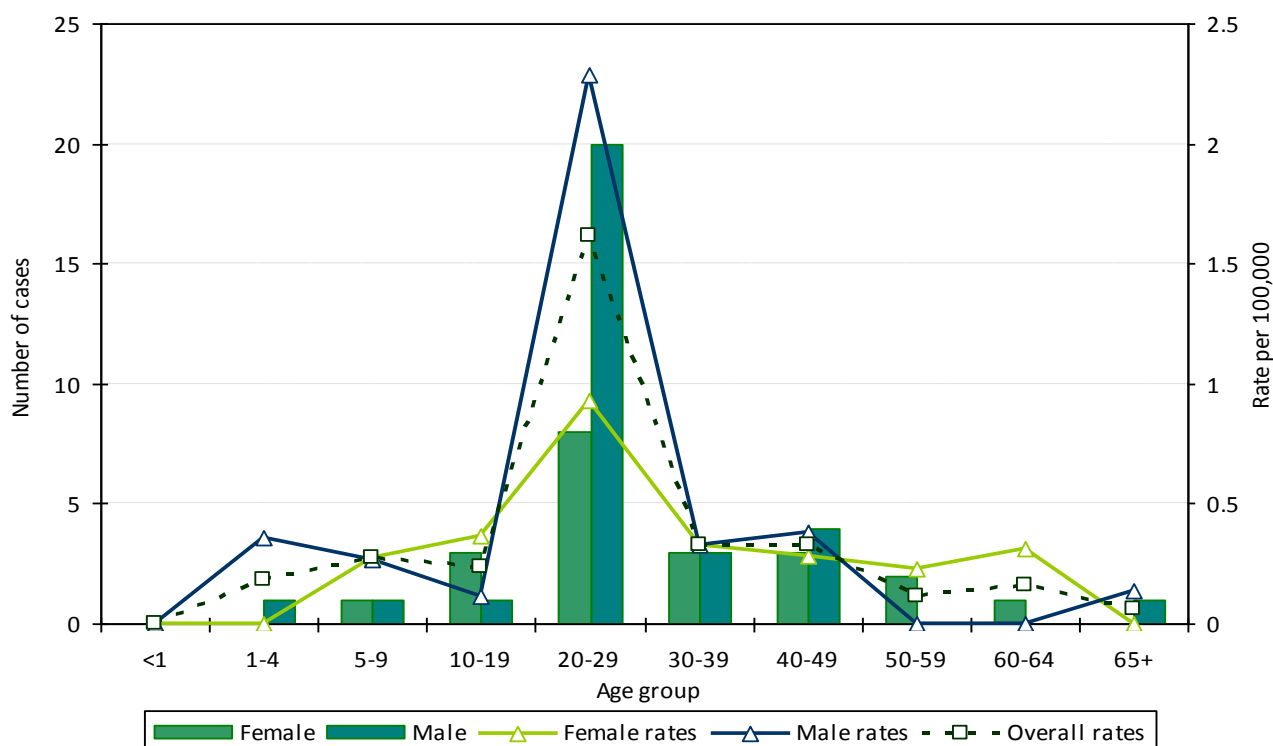
Figure 2.2.2: Incidence of Mumps by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 2.2.3: Incidence of Mumps by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 1 case for which sex and/or age were unknown

Table 2.2.1: Incidence of Mumps by Age and Sex: Ontario, 2007

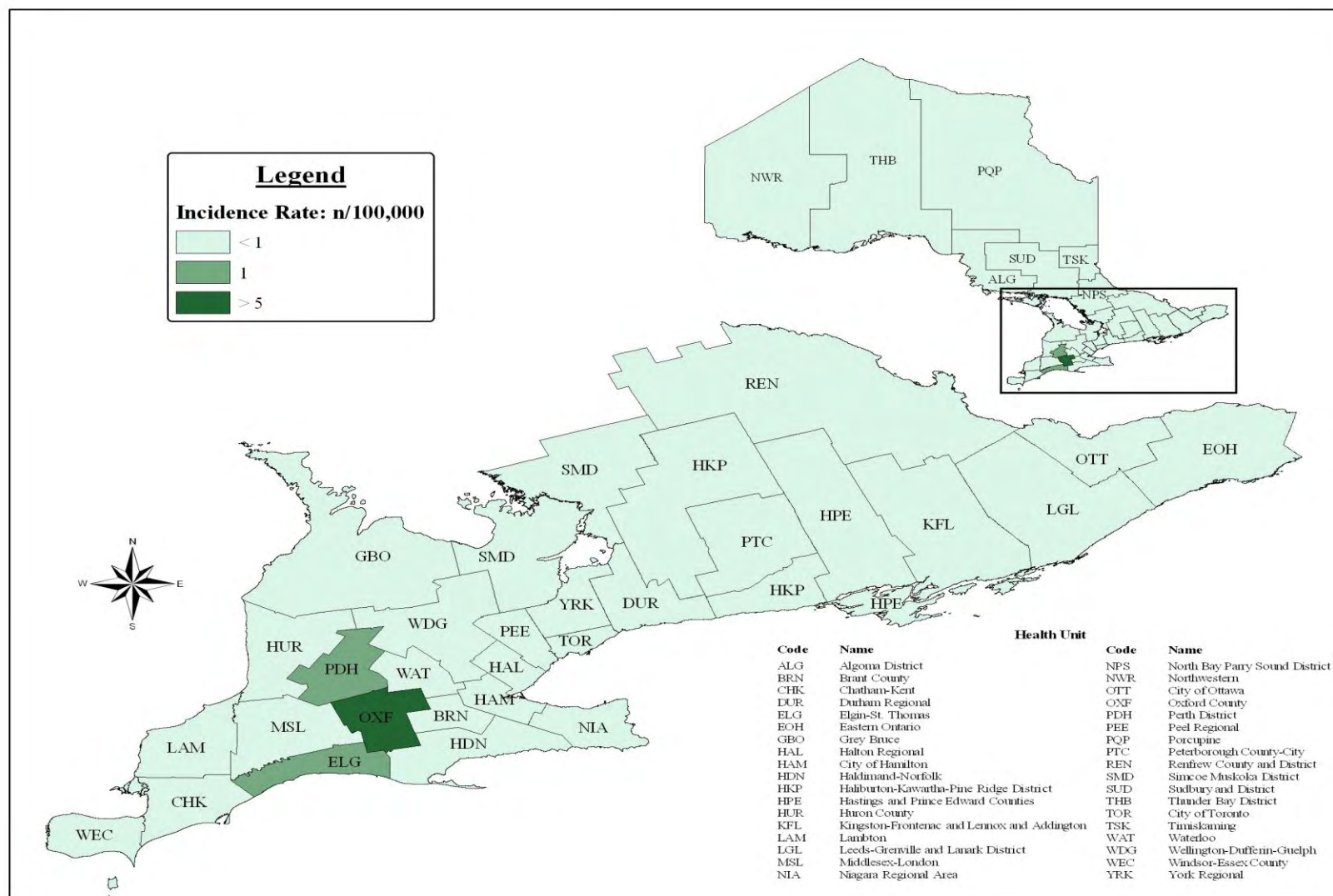
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
<1	0	0.0	0	0.0	0	0.0
1-4	0	0.0	1	0.4	1	0.2
5-9	1	0.3	1	0.3	2	0.3
10-19	3	0.4	1	0.1	4	0.2
20-29	8	0.9	20	2.3	28	1.6
30-39	3	0.3	3	0.3	6	0.3
40-49	3	0.3	4	0.4	7	0.3
50-59	2	0.2	0	0.0	2	0.1
60-64	1	0.3	0	0.0	1	0.2
65+	0	0.0	1	0.1	1	0.1
Total	21	0.3	31	0.5	52	0.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 1 case for which sex and/or age were unknown

Map 2.2.1: Incidence Rates of Mumps by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 2.2.2: Incidence of Mumps by Public Health Unit: Ontario, 2007

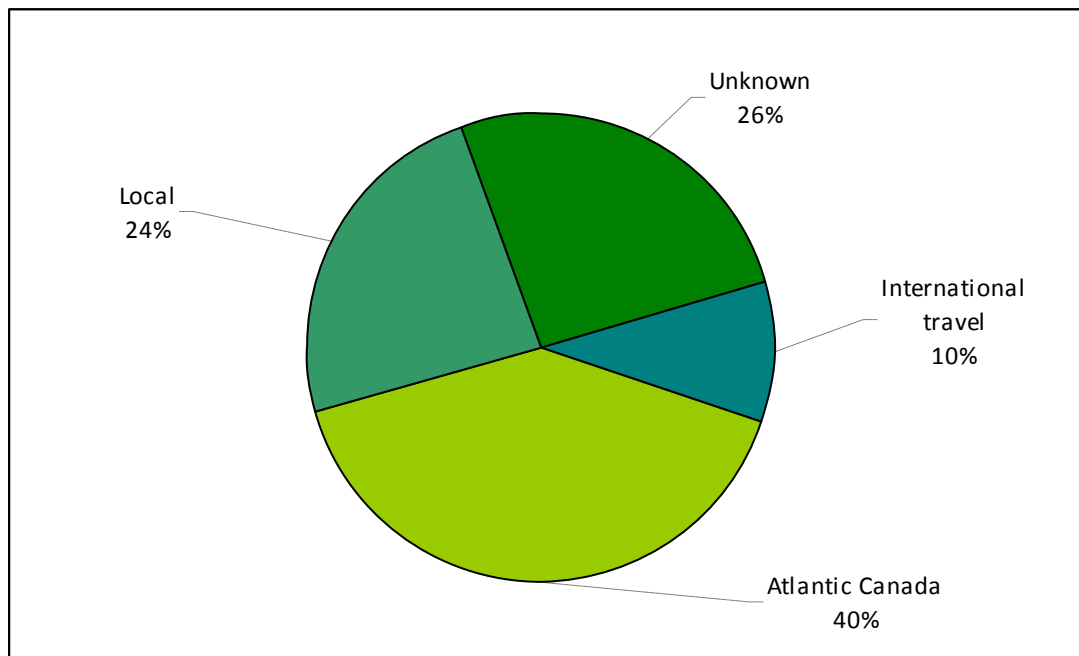
Public Health Unit	Number of cases	Rate/100,000 population
Oxford County	7	6.6
Perth District	1	1.3
Elgin-St. Thomas	1	1.1
Chatham-Kent	1	0.9
Lambton County	1	0.8
North Bay Parry Sound District	1	0.8
Waterloo Region	4	0.8
Halton Region	3	0.6
Leeds-Grenville and Lanark District	1	0.6
Simcoe Muskoka District	3	0.6
Toronto	16	0.6
York Region	6	0.6
Kingston-Frontenac and Lennox and Addington	1	0.5
Middlesex-London	2	0.5
Niagara Region	2	0.5
Peel Region	3	0.2
Algoma District	0	0.0
Brant County	0	0.0
Durham Region	0	0.0
Eastern Ontario	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0
Hamilton, City of	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Northwestern	0	0.0
Ottawa, City of	0	0.0
Peterborough County	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Sudbury and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Windsor-Essex County	0	0.0
Ontario	53	0.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 2.2.4: Frequency Distribution of the Most Likely Exposure Settings for Mumps Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

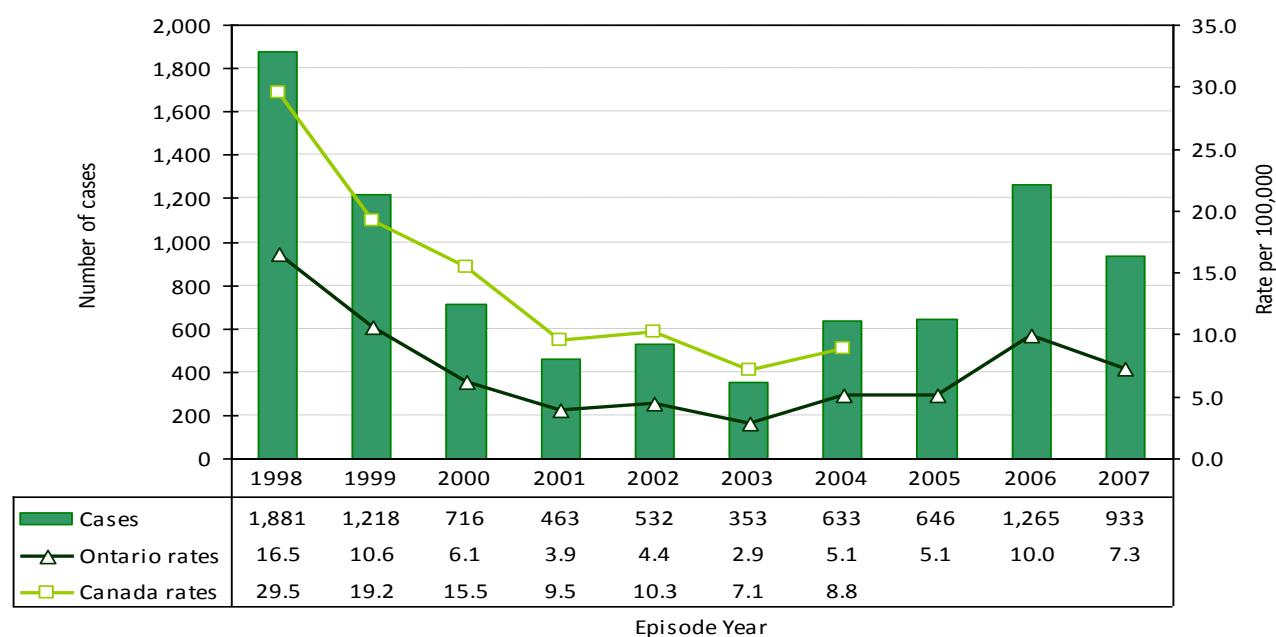
Note 1: The most likely exposure was selected for cases reporting more than 1 exposure

Note 2: Exposure details were not reported for 21% of cases; these cases were excluded

2.3 PERTUSSIS (WHOOPING COUGH)

- In 2007, Ontario reported 933 confirmed cases of pertussis, representing an incidence rate of 7.3 cases per 100,000 population (Figure 2.3.1).
- The incidence rate of pertussis in Ontario declined almost six fold from 16.5 cases per 100,000 population in 1998 to 2.9 cases per 100, 000 population in 2003. In subsequent years (2004-2007), the incidence of pertussis increased, peaking at 10.0 cases per 100,000 population in 2006. The increase since 2004 is due in part to the switch to more sensitive laboratory testing in 2005, which may have resulted in a higher rate of false positive cases (Figure 2.3.1).
- Confirmed cases of pertussis peaked during the months of January, November and December and were lowest during August, which is indicative of a seasonal increase during the winter period (Figure 2.3.2).
- In 2007, the incidence rates for males and females were similar, at 7.1 and 7.4 cases per 100,000 population, respectively (Figure 2.3.3, Table 2.3.1).
- The incidence of pertussis in Ontario declined with increasing age with children under the age of 5 years accounting for more than half (56%) of the cases in 2007 (Figure 2.3.3, Table 2.3.1).
- Compared to other age groups, children under the age of one had the highest incidence rate at 156 cases per 100,000 population. Children in this age group are most susceptible to pertussis since they may not have completed the three primary doses of the vaccine required to confer immunity against pertussis (Figure 2.3.3 and Table 2.3.1).
- Toronto and York Region reported the highest incidence rates of pertussis at 18.9 and 18.6 cases per 100,000 population, respectively. Eleven health units reported zero cases of pertussis in 2007 (Map 2.3.1, Table 2.3.2).
- Among pertussis cases that reported an exposure setting in 2007, exposures occurred in school settings (9%), private homes (8%), child-care facilities (4%), outside of Ontario (<1%) and in other (6%) or unknown (73%) settings. (Figure 2.3.4).

Figure 2.3.1: Incidence of Pertussis in Ontario and Canada: 1998-2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

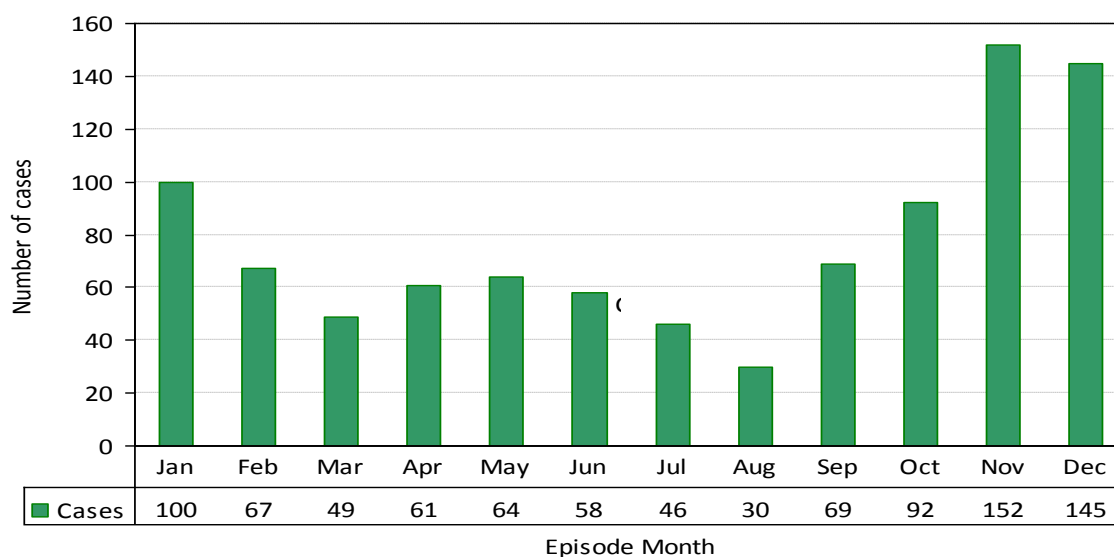
Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note 1: Canadian rates available up to 2004.

Note 2: Publicly funded tetanus, diphtheria and acellular pertussis vaccine (Adacel [Tdap]) for adolescents aged 14-16 years introduced in late 2003 - replaced the Td-IPV adolescent booster dose.

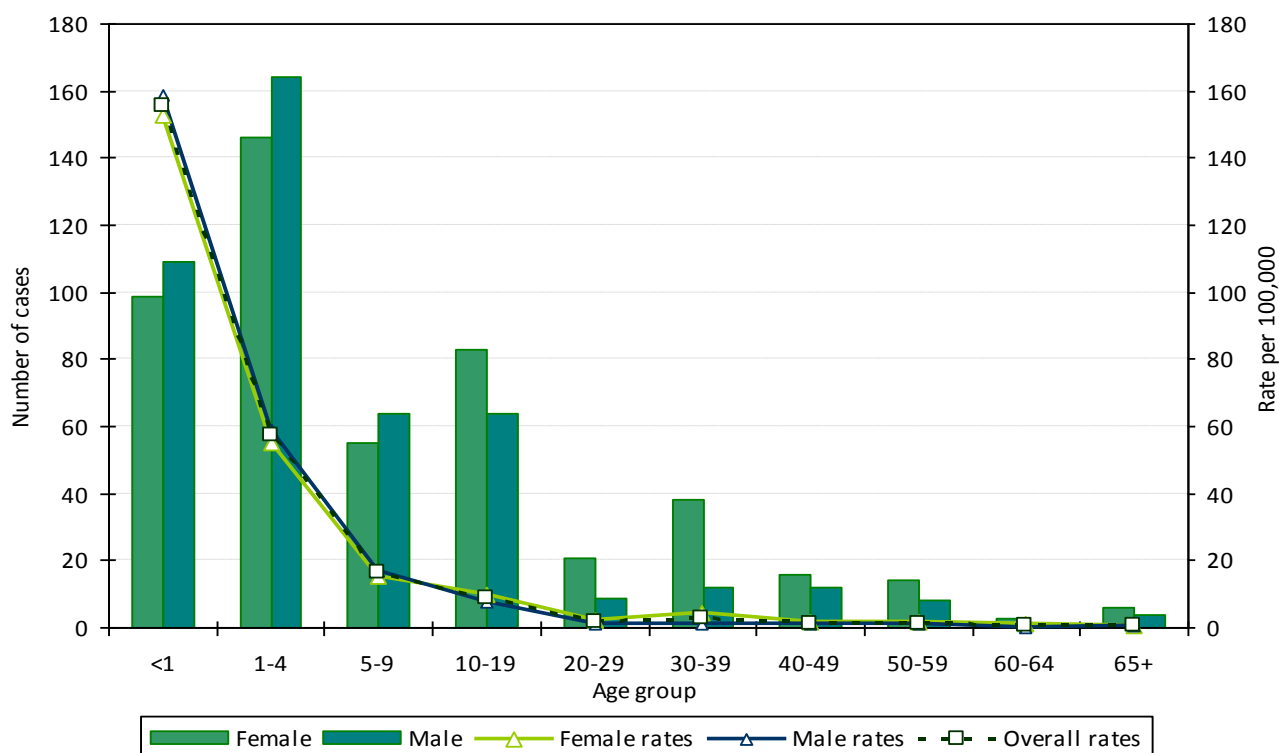
Figure 2.3.2: Incidence of Pertussis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 2.3.3: Incidence of Pertussis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 6 cases for which sex and/or age were unknown

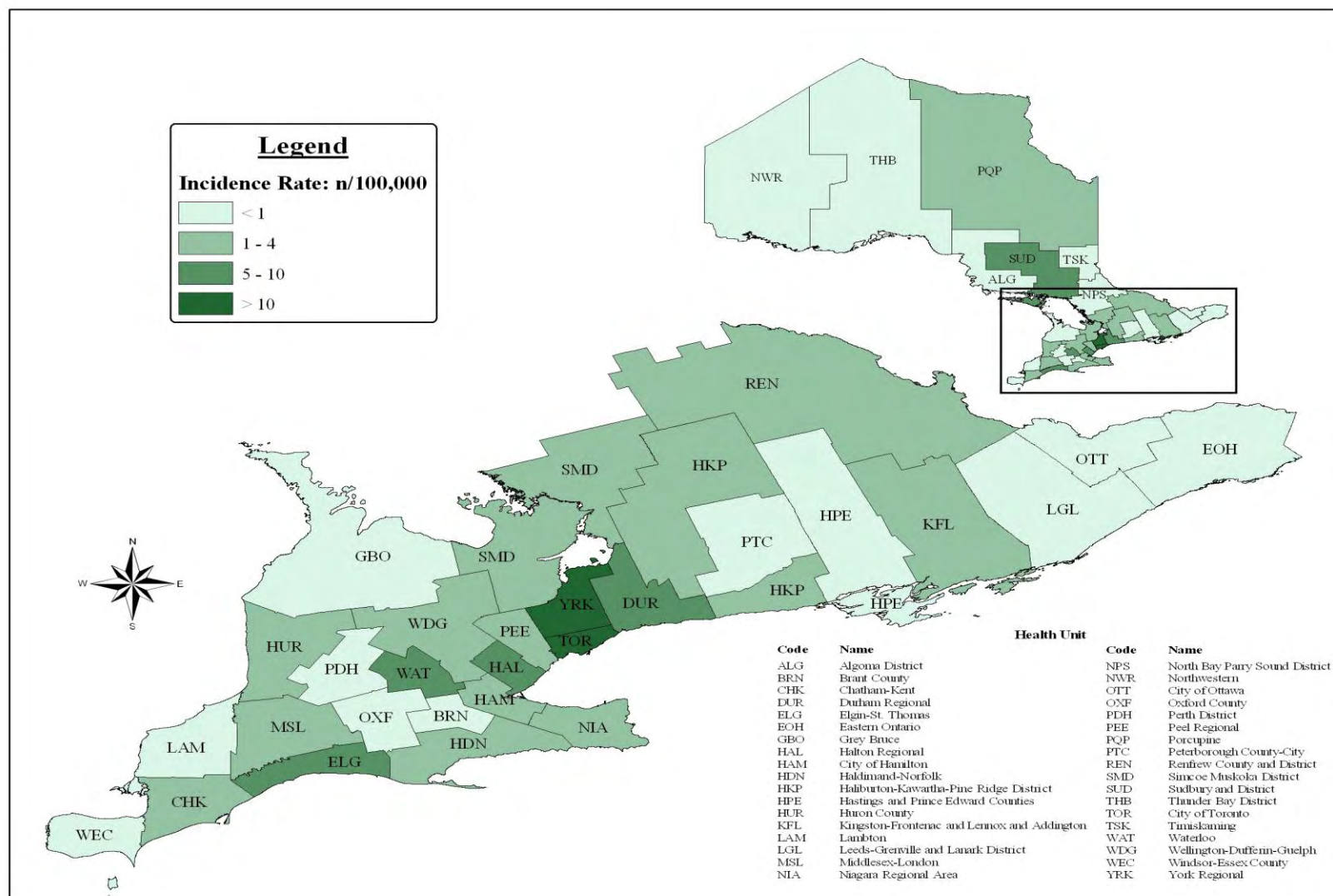
Table 2.3.1: Incidence of Pertussis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
<1	99	152.5	109	158.8	208	155.7
1-4	146	55.2	164	59.0	310	57.1
5-9	55	15.2	64	17.1	119	16.2
10-19	83	10.1	64	7.4	147	8.7
20-29	21	2.4	9	1.0	30	1.7
30-39	38	4.1	12	1.3	50	2.7
40-49	16	1.5	12	1.1	28	1.3
50-59	14	1.6	8	1.0	22	1.3
60-64	3	0.9	0	0.0	3	0.5
65+	6	0.6	4	0.5	10	0.6
Total	481	7.4	446	7.1	927	7.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Excludes 6 cases for which sex and/or age were unknown

Map 2.3.1: Incidence Rates of Pertussis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 2.3.2: Incidence of Pertussis by Public Health Unit: Ontario, 2007

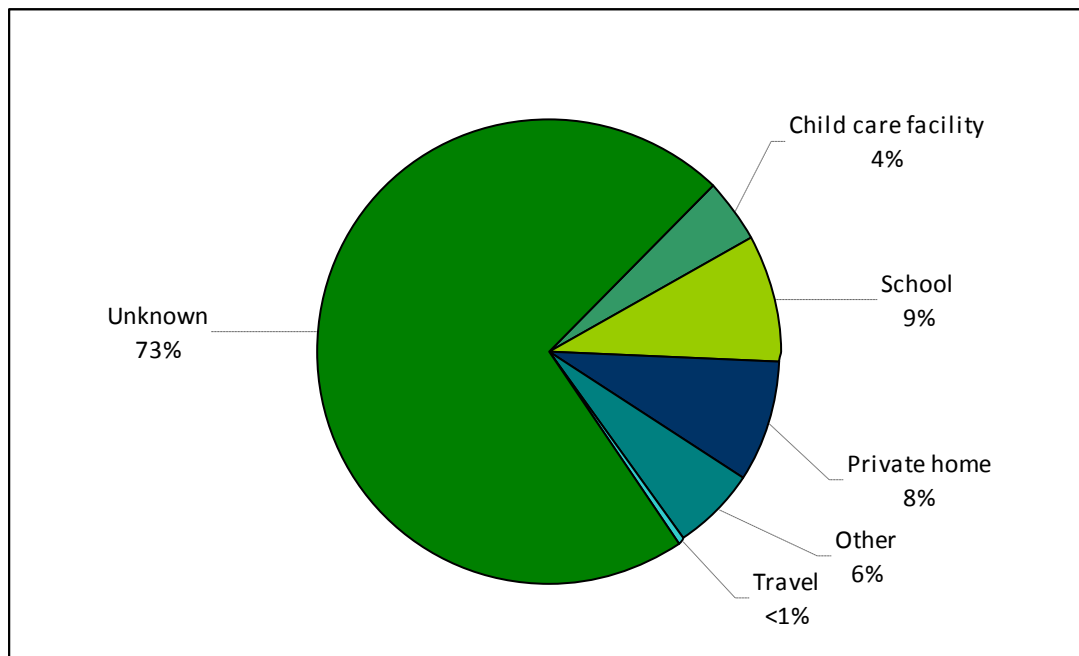
Public Health Unit	Number of cases	Rate/100,000 population
Toronto	501	18.9
York Region	182	18.6
Sudbury and District	20	10.1
Durham Region	51	8.6
Halton Region	33	7.0
Elgin-St. Thomas	5	5.5
Waterloo Region	25	5.0
Peel Region	49	3.8
Haldimand-Norfolk	4	3.6
Wellington-Dufferin-Guelph	8	3.0
Haliburton-Kawartha-Pine Ridge District	4	2.3
Simcoe Muskoka District	10	2.0
Chatham-Kent	2	1.8
Middlesex-London	8	1.8
Hamilton, City of	9	1.7
Huron County	1	1.6
Niagara Region	7	1.6
Kingston-Frontenac and Lennox and Addington	2	1.1
Porcupine	1	1.1
Renfrew County and District	1	1.0
Ottawa, City of	6	0.7
Peterborough County	1	0.7
Grey-Bruce	1	0.6
Leeds-Grenville and Lanark District	1	0.6
Eastern Ontario	1	0.5
Algoma District	0	0.0
Brant County	0	0.0
Hastings Prince Edward Counties	0	0.0
Lambton County	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	933	7.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Figure 2.3.4: Frequency Distribution of the Most Likely Exposure Setting for Pertussis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

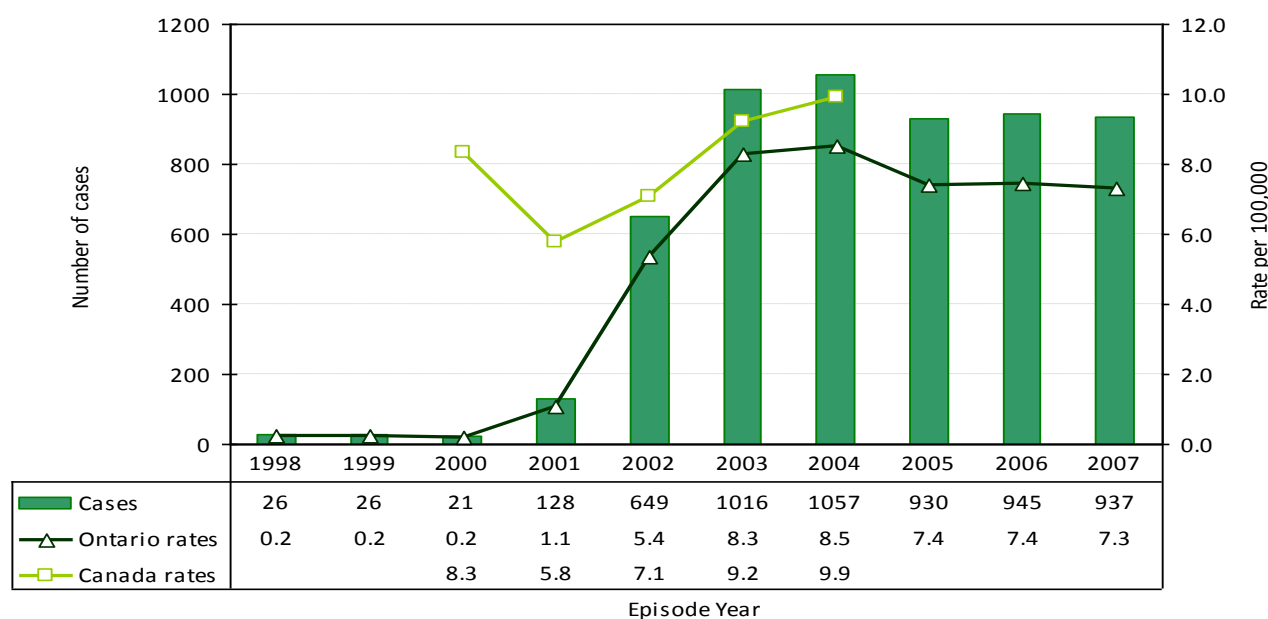
Note 1: The most likely exposure was selected for cases reporting more than 1 exposure

Note 2: Exposure details were not reported for 31% of cases; these cases were excluded

2.4 STREPTOCOCCUS PNEUMONIAE, INVASIVE

- In 2007, Ontario reported 937 confirmed cases of invasive *S. pneumoniae*, which represents an incidence rate of 7.3 cases per 100,000 population (Figure 2.4.1).
- During the five year period from 2003 to 2007, the incidence rate of invasive *S. pneumoniae* decreased by 12%. It became relatively stable in the latter three years with a yearly average of 935 cases or 7.4 cases per 100,000 population. In 2003 and 2004, the Canadian incidence rates for *S. pneumoniae* were 10%-14% higher than those of Ontario (Figure 2.4.1).
- Confirmed cases of invasive *S. pneumoniae* followed a seasonal trend in 2007; the majority of cases occurred in the cooler months of January to May and November to December. Case counts were lowest in the warmer months from June to October (Figure 2.4.2).
- In 2007, the incidence rate of invasive *S. pneumoniae* was higher among males at 7.6 cases per 100,000 population than females at 7.0 per 100,000 (Figure 2.4.3, Table 2.4.1).
- While persons aged 65 years and older accounted for the greatest number of confirmed cases, the highest incidence rates occurred among persons at both ends of the age spectrum. Cases under the age of one had the highest incidence rate at 24 cases per 100,000 population and cases aged 65 years and older had the second highest incidence rate at 23 cases per 100,000 population (Figure 2.4.3, Table 2.4.1).
- The incidence rate varied across the province with the three highest rates occurring in Perth District (15.6 cases per 100,000 population), Kingston-Frontenac and Lennox and Addington (13.3 per 100,000), and Chatham-Kent (12.8 per 100,000) (Map 2.4.1 and Table 2.4.2).

Figure 2.4.1: Incidence of Invasive Streptococcus Pneumoniae in Ontario and Canada: 1998-2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

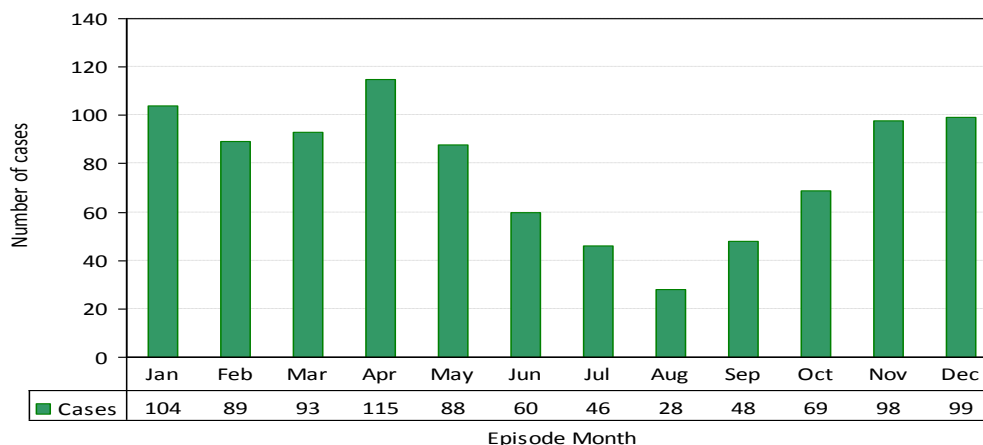
Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note 1: Invasive *S. pneumoniae* became nationally reportable in 2000; data are available up to 2004.

Note 2: Invasive *S. pneumoniae* became reportable in Ontario in 2001. Interpret Ontario trend before 2003 with caution: Consistency in reporting was not achieved until 2003.

Note 3: Publicly funded Pneumococcal conjugate vaccine introduced in September 2003 for high risk children under the age of 2 years. Expanded in July 2004 to include high risk children under the age of 5 years and in January 2005 to include all children under the age of 2 years.

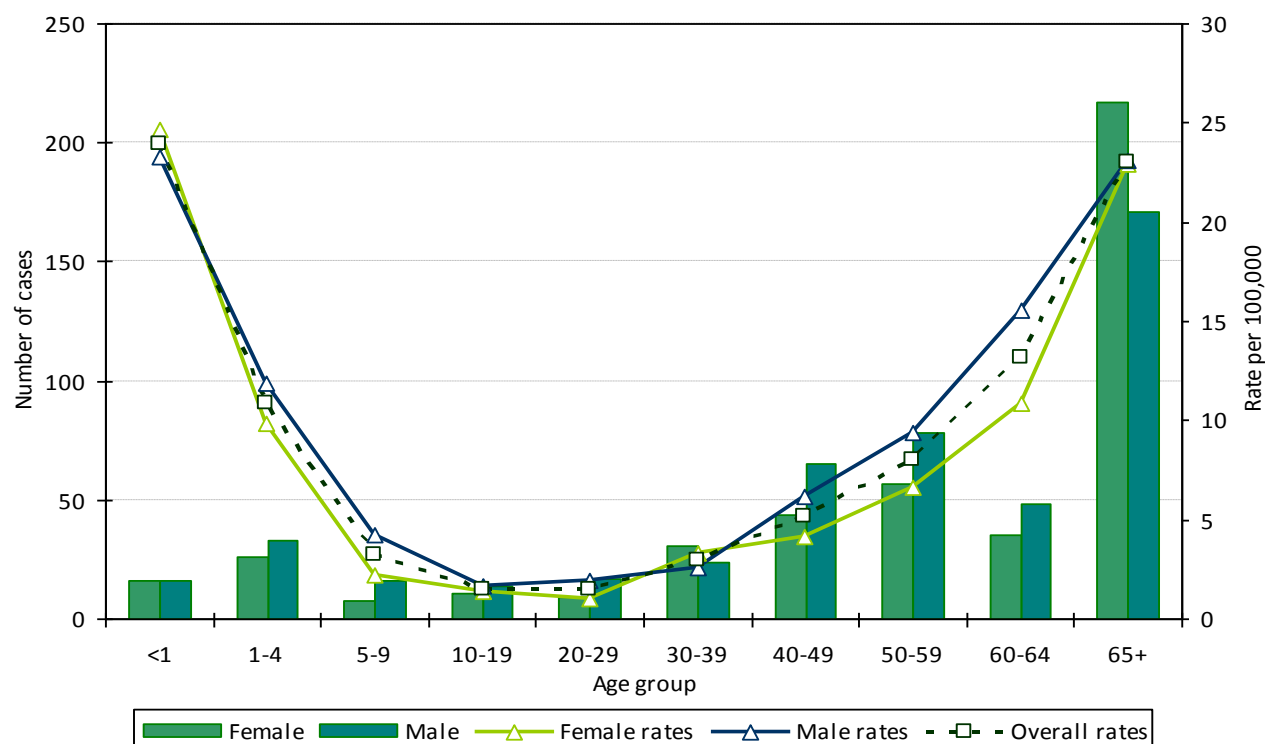
Figure 2.4.2: Incidence of Invasive Streptococcus Pneumoniae by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 2.4.3: Incidence of Streptococcus Pneumoniae by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 1 case for which sex and/or age were unknown

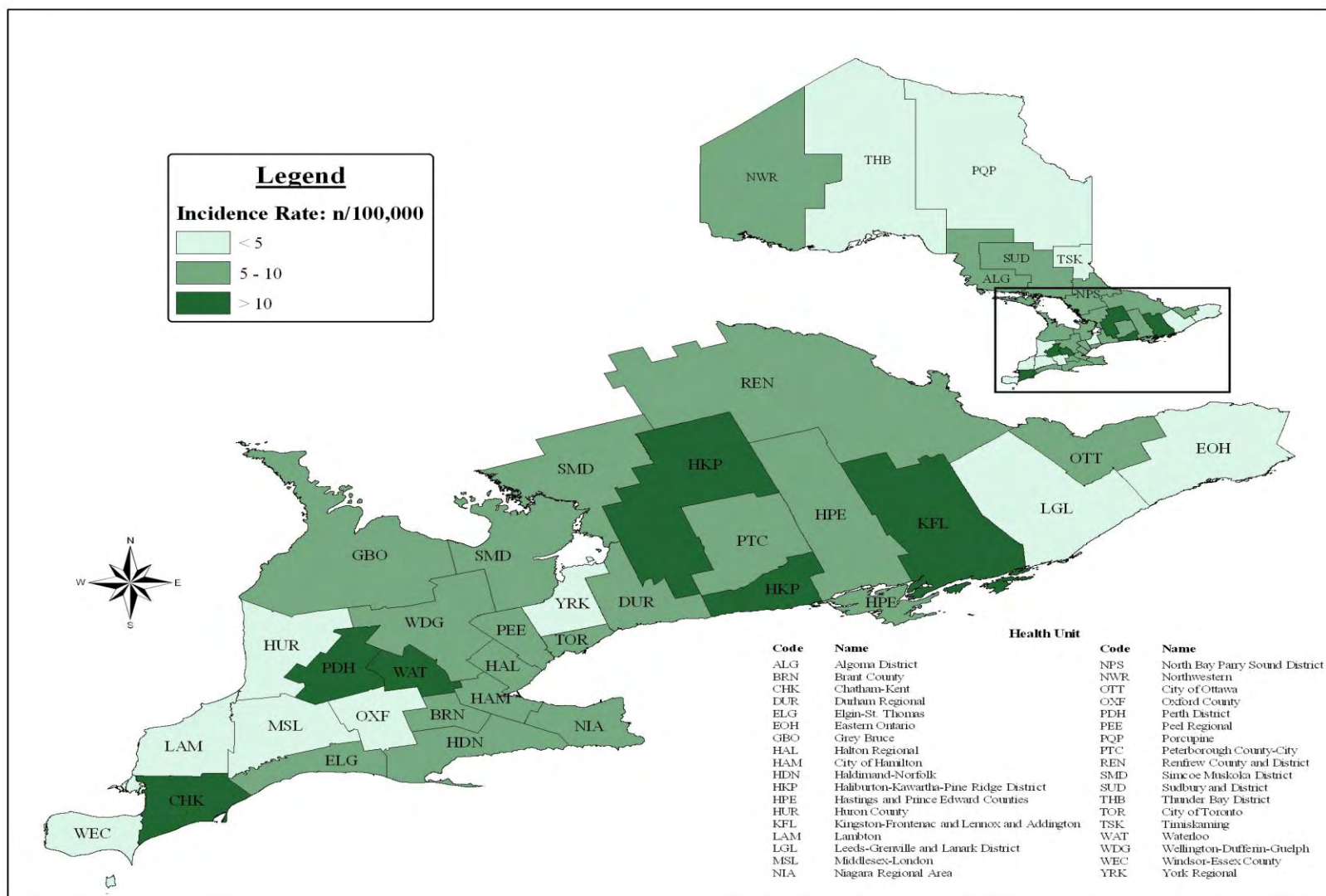
Table 2.4.1: Incidence of Streptococcus Pneumoniae by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
<1	16	24.6	16	23.3	32	24.0
1-4	26	9.8	33	11.9	59	10.9
5-9	8	2.2	16	4.3	24	3.3
10-19	11	1.3	14	1.6	25	1.5
20-29	9	1.0	17	1.9	26	1.5
30-39	31	3.3	24	2.6	55	3.0
40-49	44	4.2	65	6.2	109	5.2
50-59	57	6.6	78	9.4	135	8.0
60-64	35	10.9	48	15.6	83	13.2
65+	217	23.0	171	23.1	388	23.0
Total	454	7.0	482	7.6	936	7.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Excludes 1 case for which sex and/or age were unknown

Map 2.4.1: Incidence Rates of Streptococcus Pneumoniae by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 2.4.2: Incidence of Streptococcus Pneumoniae by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Perth District	12	15.6
Kingston-Frontenac and Lennox and Addington	25	13.3
Chatham-Kent	14	12.8
Haliburton-Kawartha-Pine Ridge District	22	12.6
Waterloo Region	56	11.3
Hastings Prince Edward Counties	17	10.4
Niagara Region	44	10.1
Peterborough County	13	9.7
Renfrew County and District	9	9.0
Elgin-St. Thomas	8	8.8
Simcoe Muskoka District	43	8.7
Toronto	232	8.7
Ottawa, City of	71	8.4
Halton Region	38	8.1
Hamilton, City of	42	8.1
Brant County	11	8.0
Grey-Bruce	13	8.0
Durham Region	46	7.7
Algoma District	9	7.6
Sudbury and District	15	7.6
Wellington-Dufferin-Guelph	19	7.2
Haldimand-Norfolk	7	6.3
Northwestern	5	6.2
Peel Region	74	5.7
North Bay Parry Sound District	7	5.6
Leeds-Grenville and Lanark District	8	4.7
Lambton County	6	4.5
Windsor-Essex County	17	4.2
Thunder Bay District	6	3.9
Oxford County	4	3.8
York Region	35	3.6
Eastern Ontario	4	2.0
Huron County	1	1.6
Middlesex-London	4	0.9
Porcupine	0	0.0
Timiskaming	0	0.0
Ontario	937	7.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Chapter 3: SEXUALLY TRANSMITTED AND BLOODBORNE INFECTIONS

- Chlamydia was the most frequently reported sexually transmitted infection (STI) (and reportable disease) in Ontario in 2007 with 23,275 confirmed cases. Gonorrhea and syphilis were the second and third most commonly reported STIs with 3,954 and 401 confirmed cases, respectively (Table 3.1).
- The incidence rate of chlamydia and gonorrhea increased gradually over the past 10 years (1998-2007) in Ontario; chlamydia increased by 62% and gonorrhea by 51% over this period (Figure 3.1.1.).
- The number of confirmed cases of syphilis increased from a yearly average of 50 cases in the years 1998-2001 to a high of almost 500 cases in 2004, representing an increase of approximately 900%. From 2005 to 2007, the incidence of syphilis has remained high, but stable with an average of 375 confirmed cases per year (Figure 3.7.1).
- Rates of chlamydia and gonorrhea were highest among persons aged 20-24 years and among women (Table 3.1.1 and 3.2.1). Northwestern Health Unit had the highest incidence rates for both chlamydia and gonorrhea (Tables 3.1.2 and 3.2.2).
- The main risk factor for acquiring both chlamydia and gonorrhea was lack of condom use during sex (Tables 3.1.3 and 3.2.3).
- Toronto and Ottawa reported the most confirmed cases syphilis and diagnoses for HIV in 2007 (Table 3.6.3 and 3.7.2). Rates were highest among men between the ages of 24 and 45 years (Tables 3.6.1 and 3.7.1). Men having sex with men (MSM) was the most frequently reported risk factor for acquiring both diseases (Tables 3.6.3 and 3.7.3).
- The rate of HIV in Ontario has remained relatively stable and comparable to the national rate from 2003 to 2007 (Figure 3.6.1). Over this period, the rate of AIDS continued to decline, although this decline has been faster in Ontario than in Canada (Figure 3.6.2).
- The rate of hepatitis C (HCV) declined over the past 10 years (Figure 3.5.1). The top three risk factors were intravenous and intranasal drug use; tattoo, piercing, electrolysis and acupuncture; and exposures outside of Canada (Table 3.5.3).
- The incidence of hepatitis B has remained relatively stable over the past 10 years, with an average annual incidence rate of 1.3 cases per 100,000 population (160 cases) (Figure 3.4.1). The most commonly reported risk factors were exposures that occurred out of Canada and sexual transmission (Table 3.4.3).
- In 2007, 76 infants acquired STIs or blood-borne infections from their mothers during pregnancy or delivery. Infections included 43 cases of neonatal Group B streptococcus disease, four cases of chlamydia, two cases of HIV and 27 cases of HCV.

Table 3.1: Incidence of Sexually Transmitted and Bloodborne Infections; Ontario, 1998-2007

Sexually Transmitted and Bloodborne Infections ²	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
AIDS	245	2.2	216	1.9	172	1.5	204	1.7	186	1.5	213	1.7	189	1.5	196	1.6	131	1.0	129	1.0
Chlamydia	12720	111.9	13513	117.4	14805	126.7	16360	137.5	18363	151.7	19478	158.8	20801	167.5	21931	174.6	22542	177.7	23275	181.8
Gonorrhea	2322	20.4	2271	19.7	2858	24	2954	24.8	3085	25.5	3360	27.4	3513	28.3	3325	26.5	3860	30.4	3954	30.9
Group B Streptococcus	31	0.3	47	0.4	53	0.5	64	0.5	69	0.6	65	0.5	55	0.4	52	0.4	55	0.4	46	0.3
Hepatitis B	149	1.3	143	1.2	148	1.3	123	1.0	152	1.3	172	1.4	168	1.4	161	1.3	187	1.5	182	1.4
Hepatitis C	7487	65.9	6811	59.2	6009	51.4	5572	46.8	5479	45.3	5491	44.8	5418	43.6	4616	36.8	3999	31.5	4512	35.4
HIV ³	747	6.6	750	6.5	773	6.6	857	7.2	982	8.1	943	7.7	990	8.0	901	7.2	983	7.7	946	7.4
Syphilis	45	0.4	54	0.5	49	0.4	52	0.4	241	2.0	427	3.5	496	4.0	360	2.9	366	2.9	401	3.1
Cytomegalovirus, congenital	5	0.0	11	0.1	8	0.1	4	0.0	6	0.0	8	0.1	7	0.1	7	0.1	8	0.1	4	0.0
Hepatitis D	5	0.0	7	0.1	10	0.1	8	0.1	9	0.1	2	0.0	2	0.0	9	0.1	4	0.0	2	0.0
Herpes, neonatal	3	0.0	10	0.1	1	0.0	4	0.0	5	0.0	2	0.0	11	0.1	5	0.0	5	0.0	3	0.0
Ophthalmia neonatorum	7	0.1	7	0.1	11	0.1	7	0.1	3	0.0	4	0.0	6	0.0	6	0.0	3	0.0	3	0.0

Case Count (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note 1: Incidence rate per 100,000 population

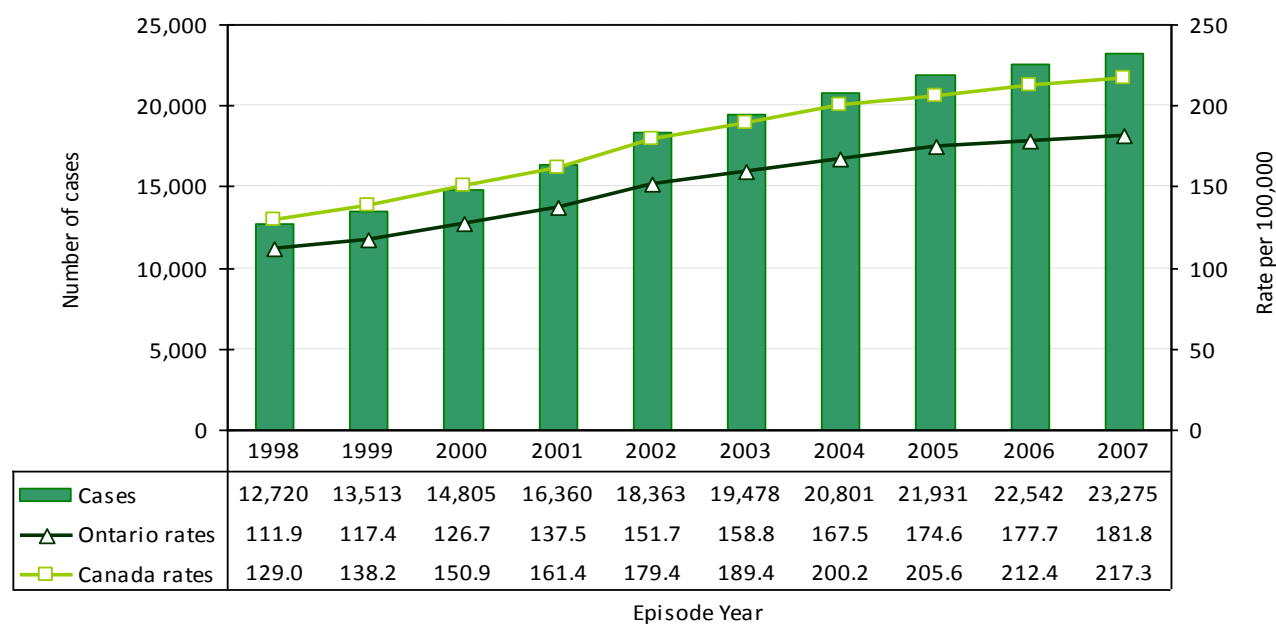
Note 2: No cases were reported for the following sexually transmitted and bloodborne infections in Ontario during the period 1998-2007: hemorrhagic fevers and chancroid

Note 3: HIV became reportable in 2002 pursuant to the Ontario Health Protection and Promotion Act, O. Reg. 749/91, s. 1. Previously, only AIDS was reportable. This may explain the increase in HIV incidence in 2002.

3.1 CHLAMYDIA

- In 2007, chlamydia was the most frequently reported sexually transmitted infection in Ontario with 23,275 confirmed cases (Table 3.1).
- Over the last ten years, Ontario's incidence rate of chlamydia increased steadily from 112 cases per 100,000 population in 1998 to 182 cases per 100,000 population in 2007, an increase of 62%. During this period, Canada reported a comparable trend that grew at a faster rate, 10 cases per year per 100,000 population compared to 8 cases per year per 100,000 population for Ontario (Figure 3.1.1).
- In 2007, the incidence rate of chlamydia among females was almost 70% higher than their male counterparts (227 cases compared to 135 cases per 100,000 population, respectively) (Table 3.1.1). This may be explained in part by the higher likelihood of chlamydia screening during routine medical care for females.
- The incidence rate of chlamydia was highest among persons aged 20-24 years at 1,011 cases per 100,000 population. Sex-specific incidence rates for this age group were also the highest at 1,314 and 717 cases per 100,000 population for females and males, respectively (Figure 3.1.2).
- Northwestern Health Unit (565 cases per 100,000 population) and Thunder Bay District Health Unit (330 cases per 100,000 population) in northern Ontario reported the highest incidence rates of chlamydia in 2007. Toronto Public Health reported the third highest incidence rate at 265 cases per 100,000 population while Huron County Health Unit had the lowest incidence rate at 60 cases per 100,000 population (Map 3.1.1, Table 3.1.2).
- The most common risk factors for acquiring chlamydia, among cases reporting at least one risk factor, were lack of condom use (86%), having a new partner in the last two months (16%), and having multiple sex partners in the last six months (15%) (Table 3.1.3).
- Among women with chlamydia reporting at least one risk factor, 279 reported being pregnant, resulting in maternal transmission to four infants in 2007.
- Of the 23,275 confirmed cases of chlamydia reported in 2007, 1,142 (5%) reported a simultaneous infection (co-infection) with gonorrhea.
- Individuals with single episodes of chlamydia accounted for 96% (22,327) of chlamydia cases reported in 2007. The remaining 4% (948) were re-infections, attributed to 465 individuals. Among these individuals, 449 had two episodes of chlamydia, 14 had three episodes and 2 had four episodes.

Figure 3.1.1: Incidence of Chlamydia in Ontario and Canada: 1998-2007

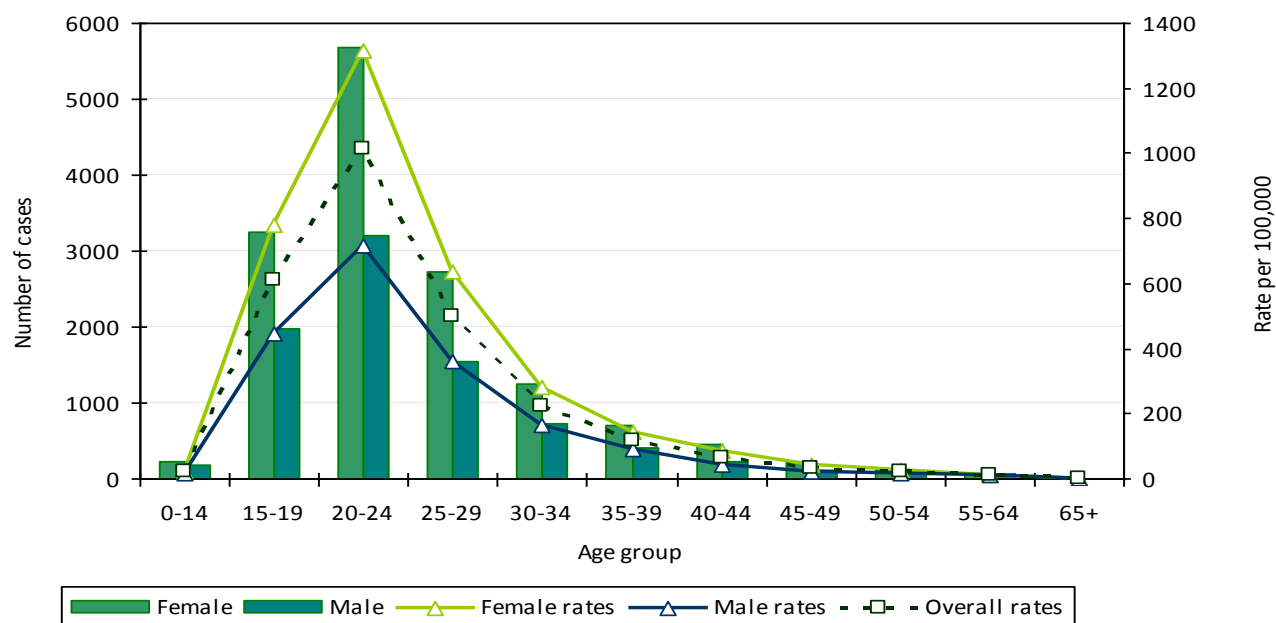


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. STI Data Tables. Downloaded March 6, 2009: http://www.phac-aspc.gc.ca/std-mts/sti-its_tab/index-eng.php.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.1.2: Incidence of Chlamydia by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 19 cases for which sex and/or age were unknown

Table 3.1.1: Incidence of Chlamydia by Age and Sex: Ontario, 2007

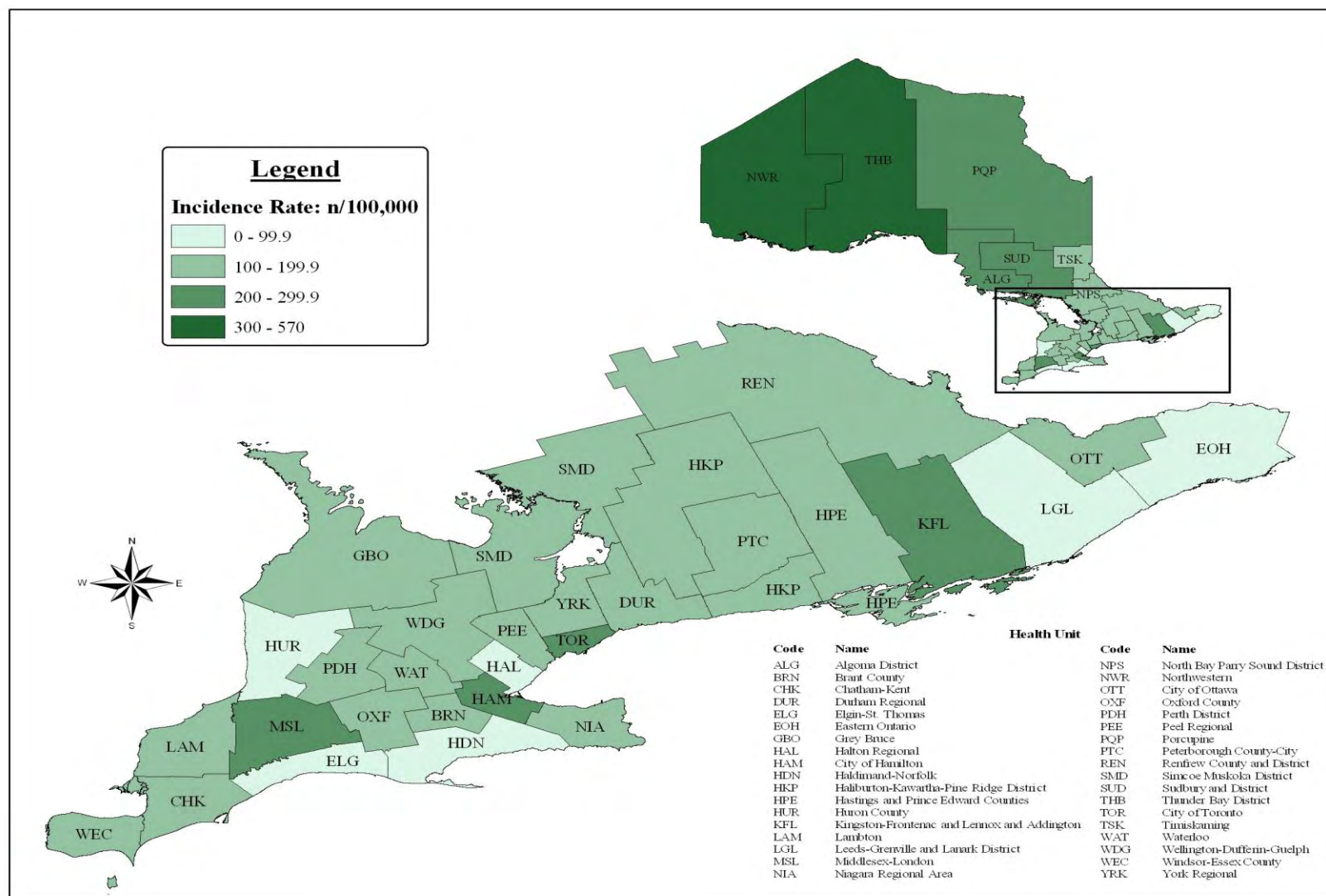
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14	234	21.4	185	16.1	419	19.7
15-19	3,258	777.3	1,975	447.6	5,233	608.3
20-24	5,679	1,313.9	3,205	717.1	8,884	1010.5
25-29	2,734	636.1	1,545	361.9	4,279	499.4
30-34	1,247	280.8	719	163.1	1,966	222.2
35-39	699	145.2	419	87.8	1,118	116.6
40-44	451	84.8	228	42.8	679	63.8
45-49	221	42.1	120	22.9	341	32.5
50-54	111	24.0	62	13.8	173	19.0
55-64	71	9.8	70	10.1	141	10.0
65+	13	1.4	10	1.4	23	1.4
Total	14,718	226.8	8,538	135.2	23,256	181.6

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 19 cases for which sex and/or age were unknown

Map 3.1.1: Incidence Rates of Chlamydia by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.1.2: Incidence of Chlamydia by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Northwestern	452	564.7
Thunder Bay District	511	329.5
Toronto	7,013	264.5
Porcupine	224	256.6
Sudbury and District	471	237.6
Middlesex-London	1,008	229.9
Kingston-Frontenac and Lennox and Addington	424	225.7
Algoma District	250	209.9
Hamilton, City of	1,060	203.9
Peterborough County	259	193.9
Ottawa, City of	1,583	187.1
North Bay Parry Sound District	224	178.7
Waterloo Region	860	173.3
Durham Region	1,017	170.8
Peel Region	2,180	168.1
Brant County	217	158.6
Niagara Region	655	150.9
Timiskaming	48	138.9
Wellington-Dufferin-Guelph	365	137.6
Hastings Prince Edward Counties	221	135.5
Simcoe Muskoka District	654	132.4
Lambton County	174	131.6
Windsor-Essex County	525	130.0
Perth District	93	120.5
Chatham-Kent	131	119.5
York Region	1,135	116.3
Grey-Bruce	187	115.5
Renfrew County and District	115	114.5
Haliburton-Kawartha-Pine Ridge District	199	113.6
Oxford County	111	104.2
Leeds-Grenville and Lanark District	152	89.3
Halton Region	401	85.5
Elgin-St. Thomas	75	82.6
Haldimand-Norfolk	91	81.5
Eastern Ontario	153	76.8
Huron County	37	60.3
Ontario	23,275	181.8

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.1.3: Risk Factors and Risk Settings for Chlamydia Cases: Ontario, 2007

Risk Factors and Settings	Cases (n=10,368)	Percent (%)
No condom used	9,129	86
New partner in past 2 months	1,675	16
Multiple sex partners in past 2 months	1,616	15
Condom failure	599	6
Partner with multiple sex partners	427	4
Judgment impaired by alcohol/drugs	334	3
Other ¹	151	1.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

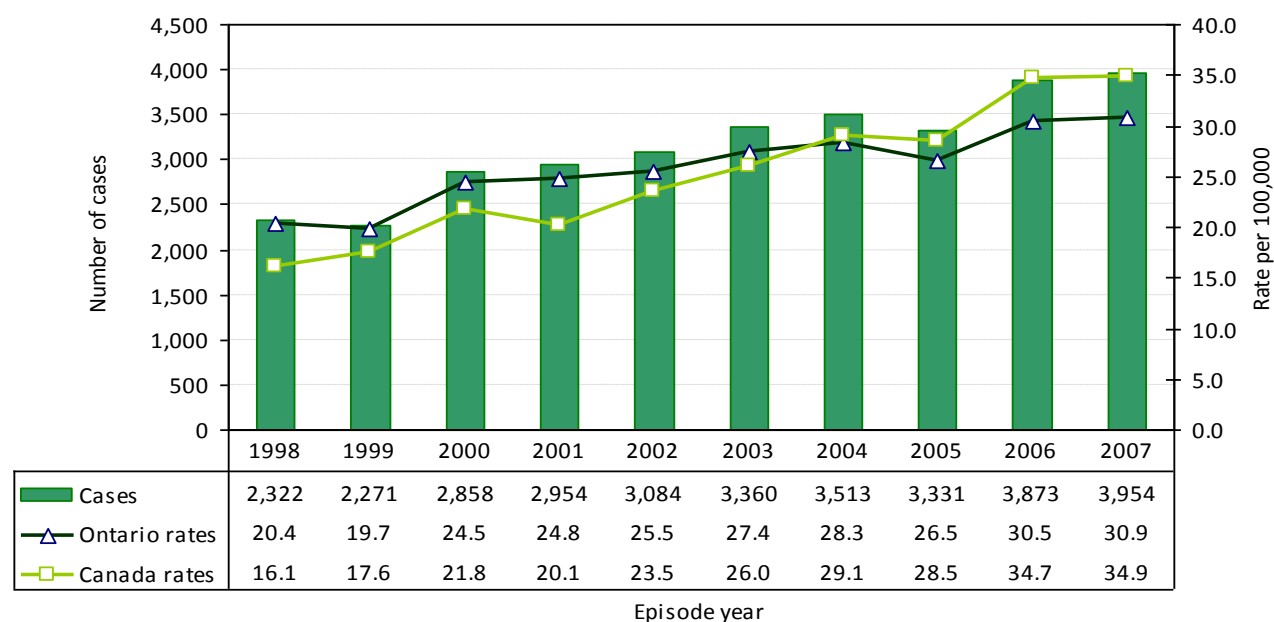
Note 1: Other includes the following risk factors: casual encounters, sex with same sex, sex with sex trade worker, sex trade worker, shared sex toys, born to an infected mother and being homeless

Note 2: Cases may report more than 1 risk factor; Risk factors were reported by < 50% of reported cases in 2007

3.2 GONORRHEA

- Gonorrhea is the second most frequently reported sexually transmitted infection in Ontario with a total of 3,954 confirmed cases in 2007 (Table 3.1.).
- Over the last ten years, the incidence rate of gonorrhea in Ontario increased steadily from 20 cases per 100,000 population in 1998 to 31 cases per 100,000 population in 2007, an increase of 51%. During this period, the incidence rate of gonorrhea in Canada more than doubled from 16 cases per 100,000 population in 1998 to 35 cases per 100,000 population in 2007 (Figure 3.2.1).
- Overall, the incidence rate of gonorrhea in Ontario in 2007 was higher among males (37 cases per 100,000 population) compared to females (25 cases per 100,000 population). However, females under the age of 20 years reported higher incidence rates than their male counterparts (Table 3.2.1).
- The incidence of gonorrhea was highest among persons aged 20-24 years regardless of sex (Figure 3.2.2).
- Similar to chlamydia, the incidence rate of gonorrhea was highest in Northwestern Health Unit (141 cases per 100,000 population), Toronto Public Health (68 cases per 100,000 population) and Thunder Bay District Health Unit (52 cases per 100,000 population). Timiskaming had the lowest incidence rate of gonorrhea at 0 cases per 100,000 population (Map 3.2.1, Table 3.2.2).
- The most frequently reported risk factors among gonorrhea cases reporting at least one risk factor were: failure to use a condom (81%), having multiple sex partners in the last 6 months (26%), and having a new partner in the last 2 months (21%) (Table 3.2.3).
- Thirty-four women reported being pregnant, but these pregnancies did not result in any mother to child transmission of gonorrhea.
- Of the 3,954 confirmed cases of gonorrhea reported in 2007, 1,142 (29%) reported having a co-infection (simultaneous infection) with chlamydia.
- Individuals with single episodes of gonorrhea accounted for 82% (3,259) of cases reported in 2007. The remaining 18% (695) were re-infections, attributed to 341 individuals. Among these individuals, 329 had two episodes of gonorrhea and 12 had three or more.

Figure 3.2.1: Incidence of Gonorrhea in Ontario and Canada: 1998-2007

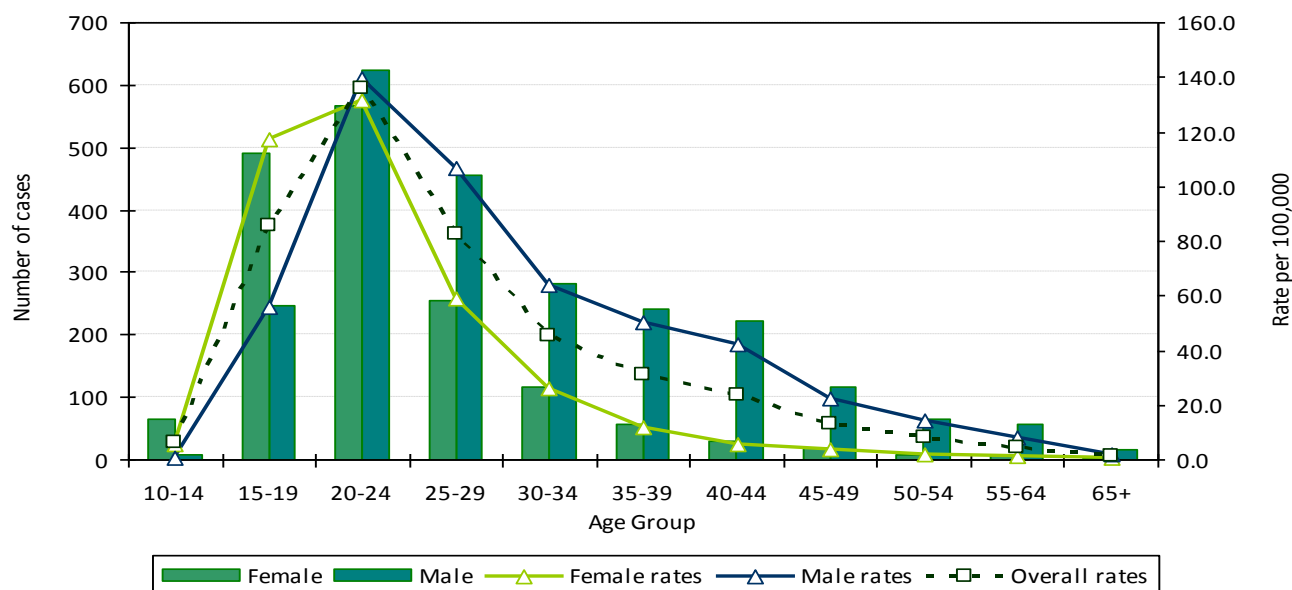


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. STI Data Tables. Downloaded March 6, 2009: http://www.phac-aspc.gc.ca/std-mts/sti-its_tab/index-eng.php.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.2.2: Incidence of Gonorrhea by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 4 cases for which sex and/or age were unknown

Table 3.2.1: Incidence of Gonorrhea by Age and Sex: Ontario, 2007

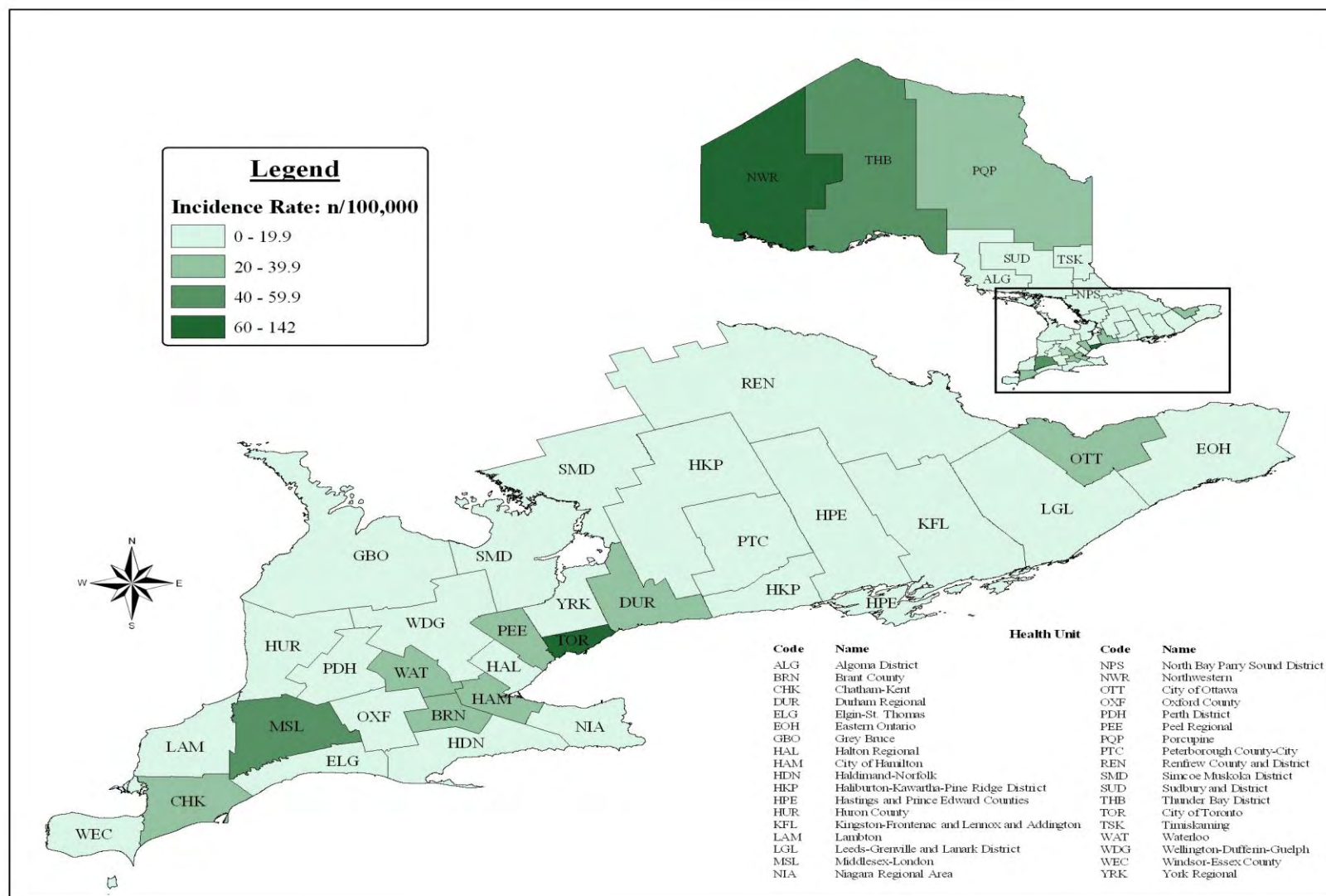
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14	64	5.8	8	0.7	72	6.3
15-19	492	117.4	246	55.8	738	85.8
20-24	568	131.4	624	139.6	1,192	135.6
25-29	254	59.1	455	106.6	709	82.8
30-34	116	26.1	282	64.0	398	45.0
35-39	57	11.8	241	50.5	298	31.1
40-44	30	5.6	223	41.9	253	23.8
45-49	18	3.4	118	22.6	136	13.0
50-54	9	1.9	64	14.3	73	8.0
55-64	7	1.0	56	8.1	63	4.5
65+	3	0.3	15	2.0	18	1.1
Total	1,618	24.9	2,332	36.9	3,950	30.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 4 cases for which sex and/or age were unknown

Map 3.2.1: Incidence Rates of Gonorrhea Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.2.2: Incidence of Gonorrhea by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Northwestern	113	141.2
Toronto	1,809	68.2
Thunder Bay District	80	51.6
Middlesex-London	189	43.1
Hamilton, City of	197	37.9
Waterloo	150	30.2
Peel, Region	379	29.2
Durham Region	171	28.7
Porcupine	25	28.6
Ottawa, City of	219	25.9
Chatham-Kent	26	23.7
Brant County	30	21.9
Sudbury District	38	19.2
Oxford County	19	17.8
Algoma District	21	17.6
Elgin-St. Thomas	15	16.5
Windsor-Essex County	66	16.3
Peterborough County	21	15.7
Niagara Region	65	15.0
Kingston-Frontenac and Lennox and Addington	28	14.9
Lambton County	15	11.3
Halton Region	52	11.1
York Region	101	10.3
Wellington-Dufferin-Guelph	24	9.0
Haliburton-Kawartha- Pine Ridge District	13	7.4
Haldimand-Norfolk	8	7.2
North Bay Parry Sound District Health Unit	9	7.2
Grey-Bruce	10	6.2
Hastings Prince Edward Counties	10	6.1
Simcoe Muskoka District	28	5.7
Eastern Ontario	10	5.0
Renfrew County and District	4	4.0
Leeds-Grenville and Lanark District	6	3.5
Perth District	2	2.6
Huron County	1	1.6
Timiskaming	0	0.0
Ontario	3,954	30.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.2.3: Risk Factors and Risk Settings for Gonorrhea Cases: Ontario, 2007

Risk Factors & Settings	Cases (n=1,980)	Frequency (%)
No condom used	1,595	81
Multiple sex partners in past 6 months	523	26
New partner in past 2 months	417	21
Condom Failure	124	6
Partner with multiple sex partners	107	5
Judgment impaired by alcohol/drugs	82	4
Other ¹	131	7

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

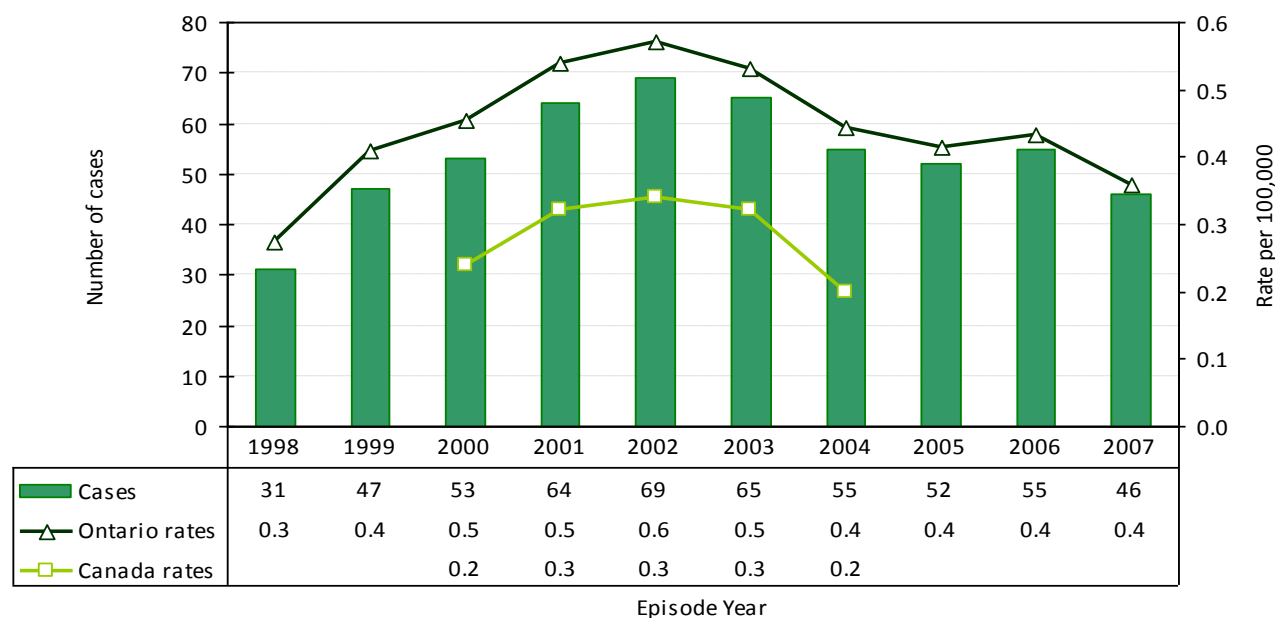
Note 1: Other includes the following risk factors: casual encounters, sex with sex trade worker, sex trade worker, shared sex toys, being homeless, had sex for drugs and born to an infected mother

Note 2: Cases may report more than 1 risk factor; Risk factors were reported by 50% of reported cases in 2007

3.3 GROUP B STREPTOCOCCUS DISEASE, NEONATAL

- Neonatal group B streptococcal disease occurs exclusively among neonates (0-1 year). In 2007, Ontario reported 46 cases of neonatal group B streptococcal disease, which represents an incidence rate of 0.4 cases per 100,000 population. This is the lowest number of reported cases since 1998 (Table 3.1).
- The incidence of neonatal group B streptococcus disease peaked in the early 2000s, but has remained relatively stable at approximately 50 cases per year since 2004 (Figure 3.3.1).
- The age-specific incidence rate of group B streptococcus diseases was 34 cases per 100,000 population. The sex-specific incidence rates were 36 and 32 cases per 100,000 population for males and females, respectively.
- Infection of newborns with group B streptococcus disease is serious and may be fatal. Ontario reported five deaths related to group B streptococcus disease between 2003 and 2007.
- Ontario's rate of neonatal group B streptococcus disease was approximately double the corresponding national rates during the years for which national data were available (2000-2004). This may no longer be the case because Ontario's rates have continued to decline (Figure 3.1.1).
- Many public health units reported zero cases of group B streptococcal disease in 2007. Elgin-St. Thomas, Chatham-Kent, Toronto and Waterloo Region reported the highest rates (Map 3.3.1, Table 3.3.2).

Figure 3.3.1: Incidence of Group B Streptococcus Disease in Ontario and Canada: 1998-2007



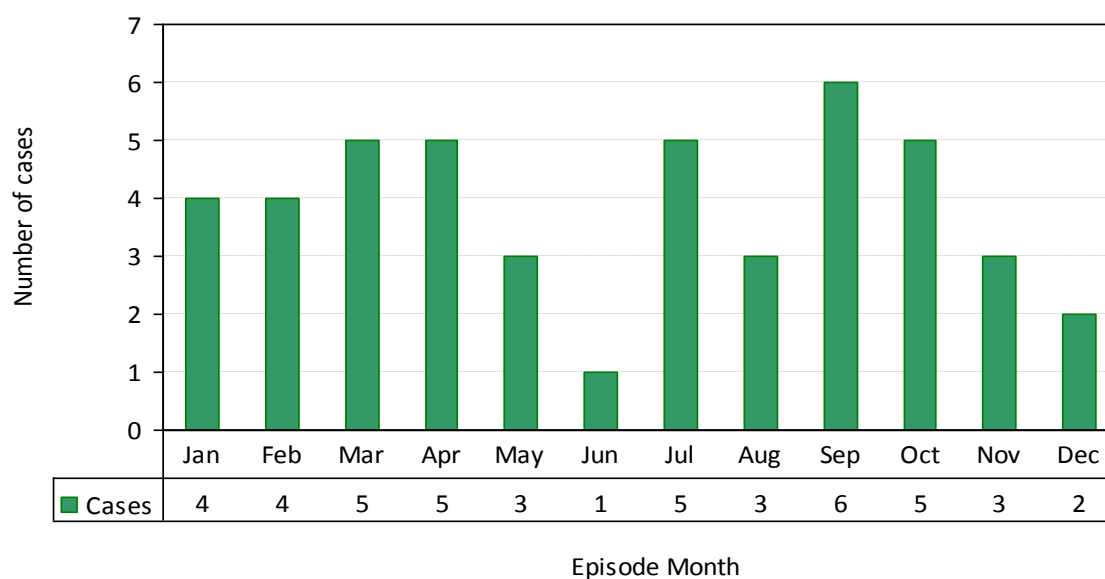
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Group B streptococcus disease became nationally reportable in 2000; Canadian statistics available up to 2004.

Figure 3.3.2: Incidence of Group B Streptococcus Disease by Episode Month: Ontario, 2007

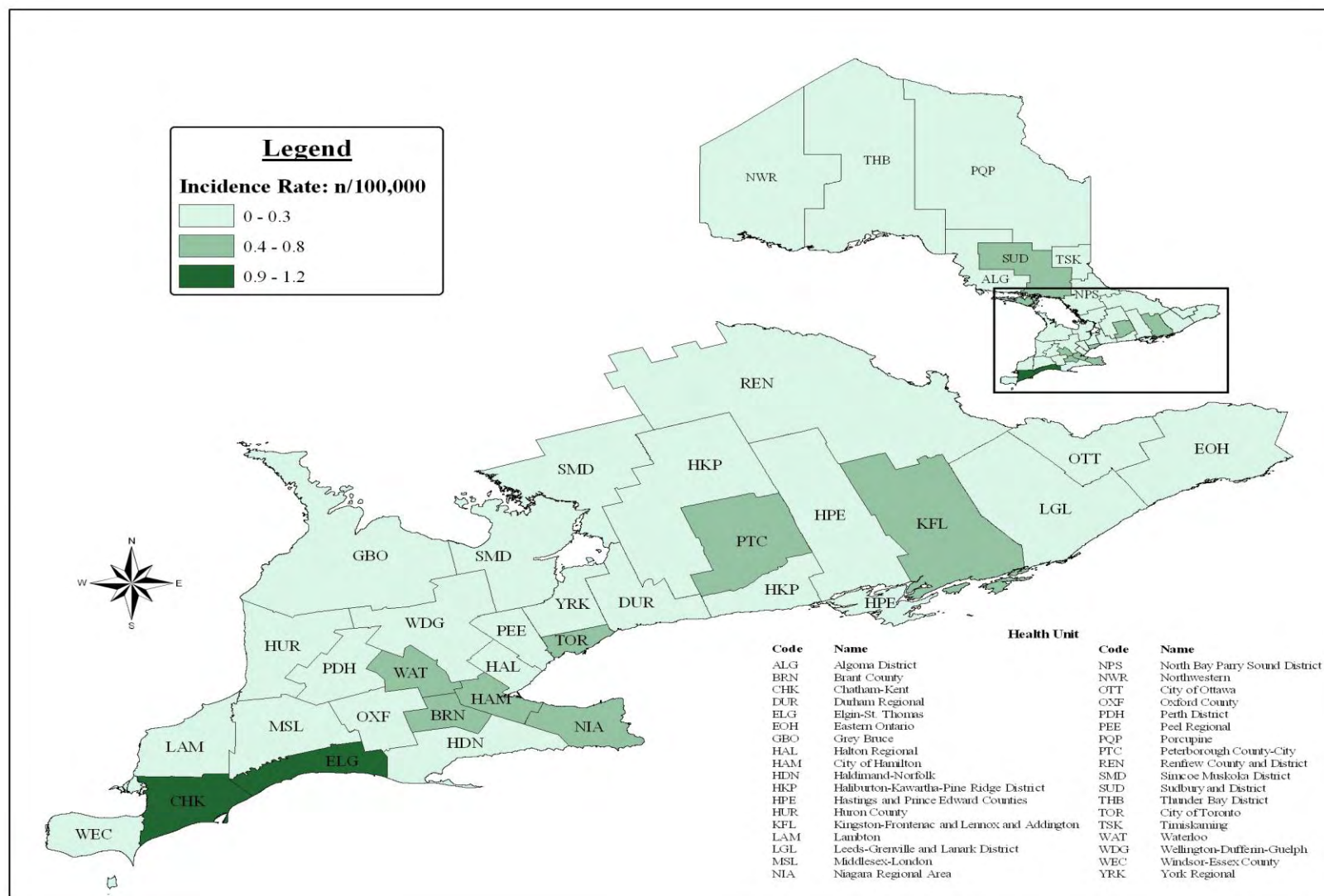


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Map 3.3.1: Group B Streptococcus Disease Cases by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification

Table 3.3.1: Incidence of Group B Streptococcus Disease by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Elgin-St. Thomas	1	1.1
Chatham-Kent	1	0.9
Toronto	21	0.8
Waterloo	4	0.8
Brant County	1	0.7
Peterborough County	1	0.7
Kingston-Frontenac and Lennox and Addington	1	0.5
Niagara Region	2	0.5
Sudbury District	1	0.5
Hamilton, City of	2	0.4
York Region	3	0.3
Halton Region	1	0.2
Middlesex-London	1	0.2
Ottawa, City of	2	0.2
Peel, Region	3	0.2
Windsor-Essex County	1	0.2
Algoma District	0	0.0
Durham Region	0	0.0
Eastern Ontario	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton-Kawartha- Pine Ridge District	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Lambton County	0	0.0
Leeds-Grenville and Lanark District	0	0.0
North Bay Parry Sound District Health Unit	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Ontario	46	0.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

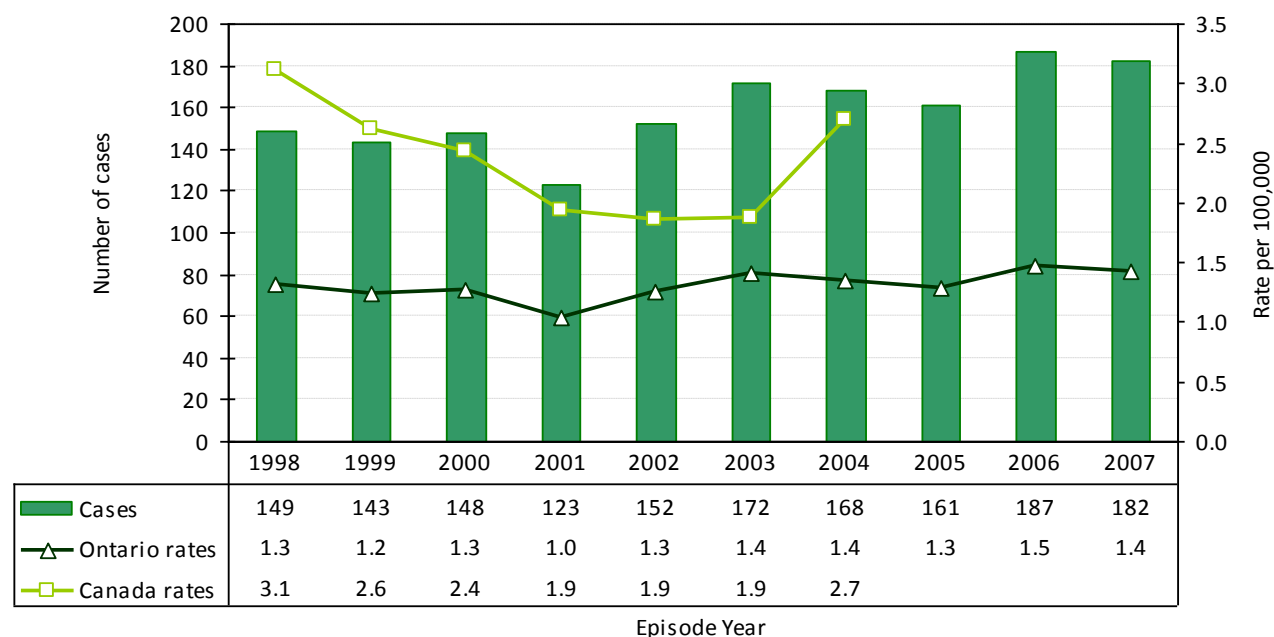
Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification

3.4 HEPATITIS B

- In 2007, Ontario reported 182 confirmed cases of hepatitis B, which represents an incidence rate of 1.4 cases per 100,000 population (Table 3.1).
- During the period 1998 to 2007, the incidence rate of hepatitis B in Ontario remained relatively stable, averaging 1.3 cases per 100,000 population per year. Overall, the national rate remained higher than Ontario's at approximately 2.4 cases per 100,000 population over the period 1998 to 2004 (Figure 3.4.1).
- Males accounted for 60% (109/182) of hepatitis B cases in Ontario in 2007 and their incidence rate was higher than their female counterparts (1.7 cases per 100,000 population compared to 1.1 cases per 100,000 population, respectively) (Table 3.4.1).
- Hepatitis B cases in 2007 had an average and median age of 42 years.
- Sudbury District (8.6 cases per 100,000 population), Thunder Bay District (6.4 cases per 100,000 population) and Wellington-Dufferin Guelph (5.3 cases per 100,000 population) reported the highest incidence rates of hepatitis B in Ontario in 2007 (Map 3.4.1, Table 3.4.2).
- Exposures outside of Canada (33%), sexual risks (29%) and person to person exposures (20%) were the most frequently reported risk factors or exposures for acquiring hepatitis B among cases reporting at least one risk factor and/or exposure in 2007 (Table 3.4.3).
- There were no reports of maternal transmission of hepatitis B in 2007.

Figure 3.4.1: Incidence of Hepatitis B in Ontario and Canada: 1998 - 2007



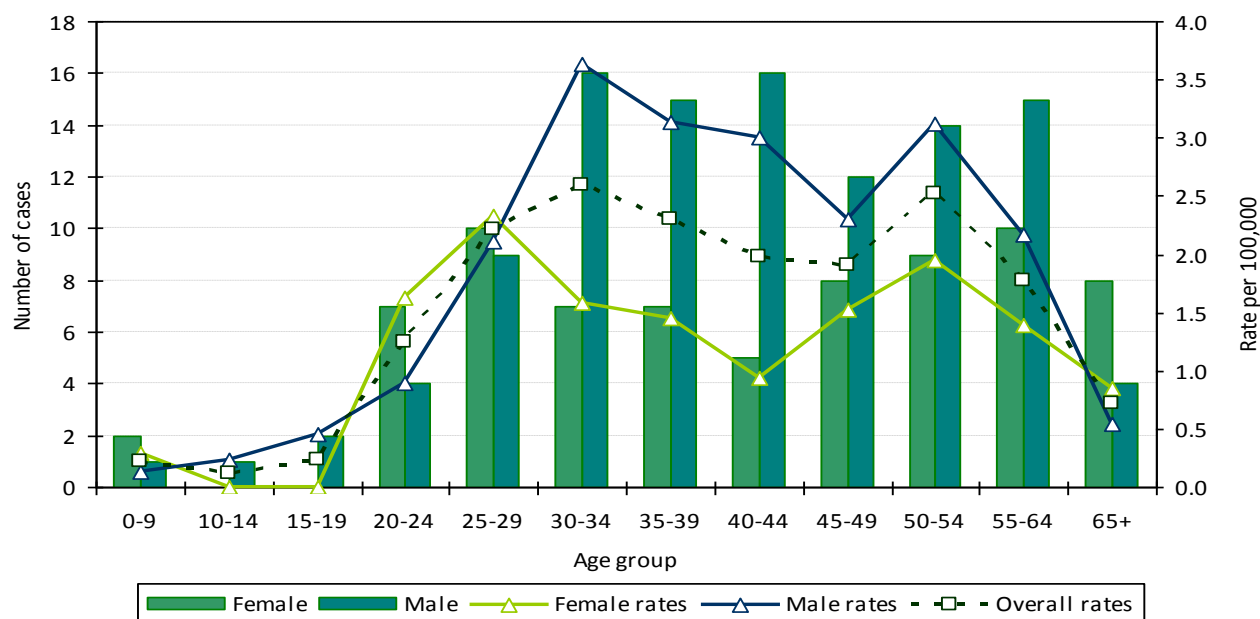
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian statistics available up to 2004.

Figure 3.4.2: Incidence of Hepatitis B by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

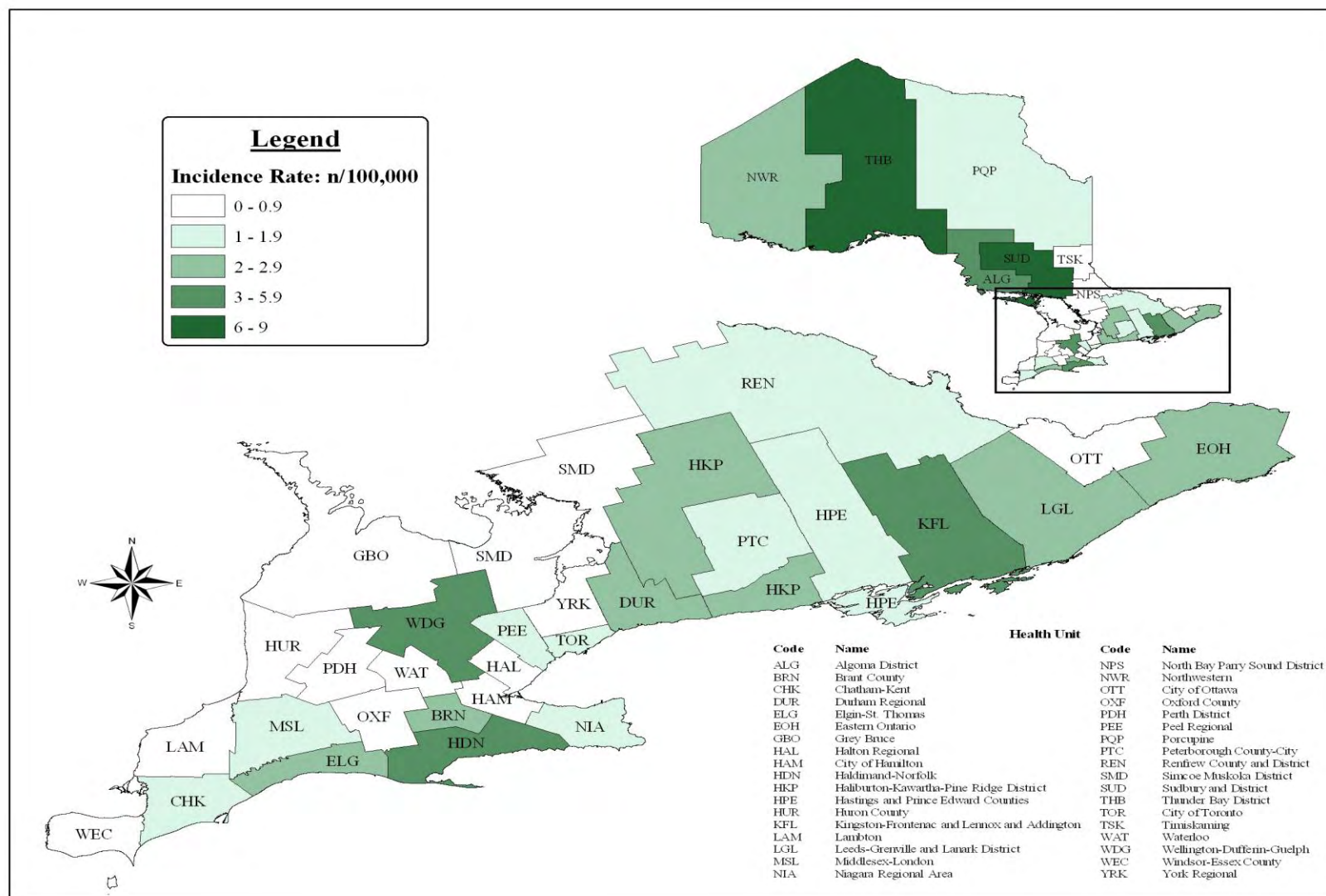
Table 3.4.1: Incidence of Hepatitis B by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-9	2	0.3	1	0.1	3	0.2
10-14	0	0.0	1	0.2	1	0.1
15-19	0	0.0	2	0.5	2	0.2
20-24	7	1.6	4	0.9	11	1.3
25-29	10	2.3	9	2.1	19	2.2
30-34	7	1.6	16	3.6	23	2.6
35-39	7	1.5	15	3.1	22	2.3
40-44	5	0.9	16	3.0	21	2.0
45-49	8	1.5	12	2.3	20	1.9
50-54	9	1.9	14	3.1	23	2.5
55-64	10	1.4	15	2.2	25	1.8
65+	8	0.8	4	0.5	12	0.7
Total	73	1.1	109	1.7	182	1.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 3.4.1: Incidence Rates of Hepatitis B by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.4.2: Incidence of Hepatitis B by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Sudbury and District	17	8.6
Thunder Bay District	10	6.4
Wellington-Dufferin-Guelph	14	5.3
Kingston-Frontenac and Lennox and Addington	9	4.8
Haldimand-Norfolk	4	3.6
Algoma District	4	3.4
Durham Region	16	2.7
Eastern Ontario	5	2.5
Northwestern	2	2.5
Leeds-Grenville and Lanark District	4	2.4
Haliburton-Kawartha-Pine Ridge District	4	2.3
Brant County	3	2.2
Elgin-St. Thomas	2	2.2
Chatham-Kent	2	1.8
Niagara Region	7	1.6
Peterborough County	2	1.5
Hastings Prince Edward Counties	2	1.2
Peel Region	15	1.2
Middlesex-London	5	1.1
Porcupine	1	1.1
Toronto	28	1.1
Renfrew County and District	1	1.0
Oxford County	1	0.9
Hamilton, City of	4	0.8
North Bay Parry Sound District	1	0.8
Waterloo Region	4	0.8
Windsor-Essex County	3	0.7
Grey-Bruce	1	0.6
Ottawa, City of	5	0.6
York Region	5	0.5
Halton Region	1	0.2
Huron County	0	0.0
Lambton County	0	0.0
Perth District	0	0.0
Simcoe Muskoka District	0	0.0
Timiskaming	0	0.0
Ontario	182	1.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Notes: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.4.3: Risk Factors and Risk Settings for Hepatitis B: Ontario, 2007

Risk Factors & Settings	Cases (n = 102)	Percent (%)
Out of Canada exposure ¹	34	33
Sexual transmission ²	30	29
Person to person risk ³	20	20
Medical/dental procedures ⁴	17	17
Intravenous or intranasal drug use	15	15
Tattoo/acupuncture/ear piercing/electrolysis	12	12
Immuno-compromised	5	5
Other ⁵	15	15
Unknown	5	5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: Out of Canada exposures include travel to, living in or receiving medical care in an endemic area

Note 2: Includes risks attributable to sexual contact and having multiple sex partners

Note 3: Includes unspecified person to person risks and household contact with hepatitis B

Note 4 Includes blood transfusions, organ/tissue transplant and invasive surgical/dental/ocular procedures

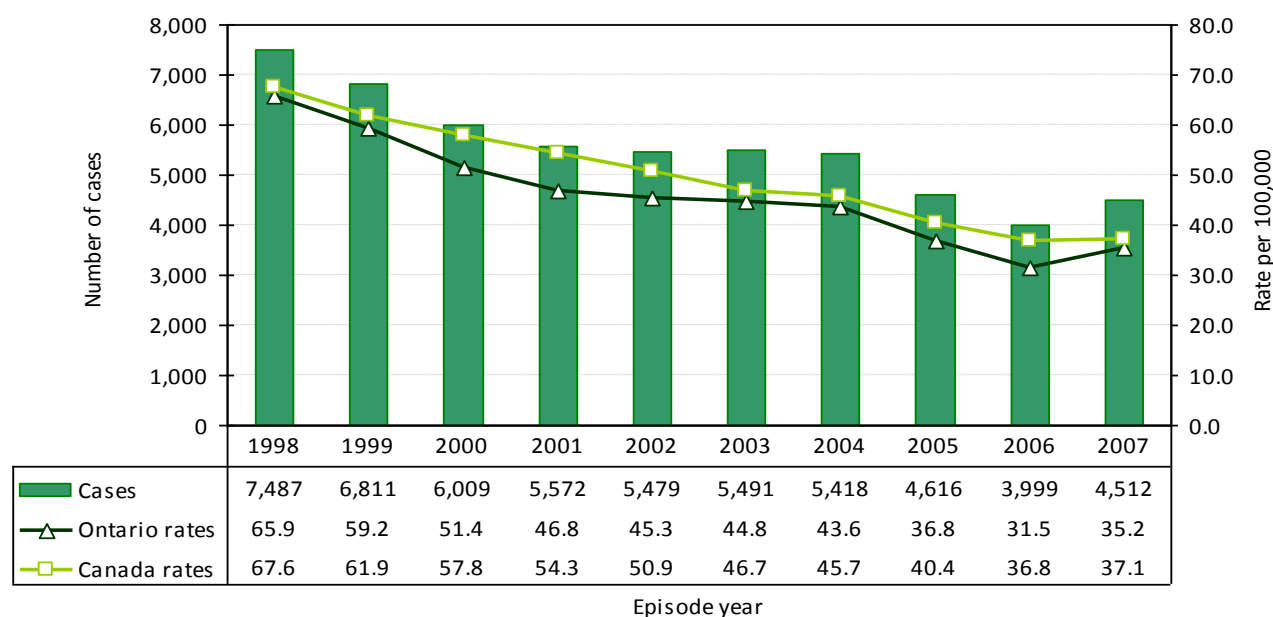
Note 5: Includes: shared personal items, occupational risks, mother to child transmission, bath-house, incarceration, homelessness and MSM

Note 6: Cases may report more than one risk factor and exposure setting; Risk factors and exposures were reported by 56% of cases reported in 2007

3.5 HEPATITIS C

- In 2007, hepatitis C was second to chlamydia as the most frequently reported sexually transmitted/bloodborne disease in Ontario (Table 3.1).
- Ontario reported 4,512 cases of hepatitis C cases in 2007, which corresponds to a rate of 35 cases per 100,000 population (Table 3.1).
- The rate of hepatitis C in Ontario decreased by 47% between 1998 and 2007 from 66 cases per 100,000 population in 1998 to 35 cases per 100,000 population in 2007 (Figure 3.5.1).
- During the period 1998 to 2007, the national rate of hepatitis C also declined. Ontario's rate remained below the national rate over the same period (Figure 3.5.1).
- Males accounted for 60% of hepatitis C cases reported in Ontario in 2007 and had higher rates for all age categories when compared to women (Figure 3.5.2, Table 3.5.1).
- In 2007, persons aged 45 to 54 years had the highest rate of hepatitis C at 76 cases per 100,000 population, which is twice the overall rate for Ontario (Figure 3.5.2, Table 3.5.1).
- In 2007, Ontario reported 27 cases of hepatitis C in infants under the age of one year.
- Kingston-Frontenac and Lennox and Addington Public Health Unit reported the highest rate of hepatitis C in 2007 at 121 cases per 100,000 population, which may be attributed to the location of high-capacity correctional facilities in that area. Thunder Bay District Health Unit reported the second highest rate of hepatitis C at 87 cases per 100,000 population (Map 3.5.1, Table 3.5.2).
- Intravenous/intranasal drug use (57%), receipt of invasive procedures by tattoo, acupuncture, piercing or electrolysis (29%), and exposures outside of Canada (16%) were the most commonly reported risk factors or exposures for acquiring hepatitis C among cases that reported risk factors and/or exposures in 2007 (Table 3.5.3).

Figure 3.5.1: Reported Cases and Rates of Hepatitis C in Ontario and Canada: 1998-2007

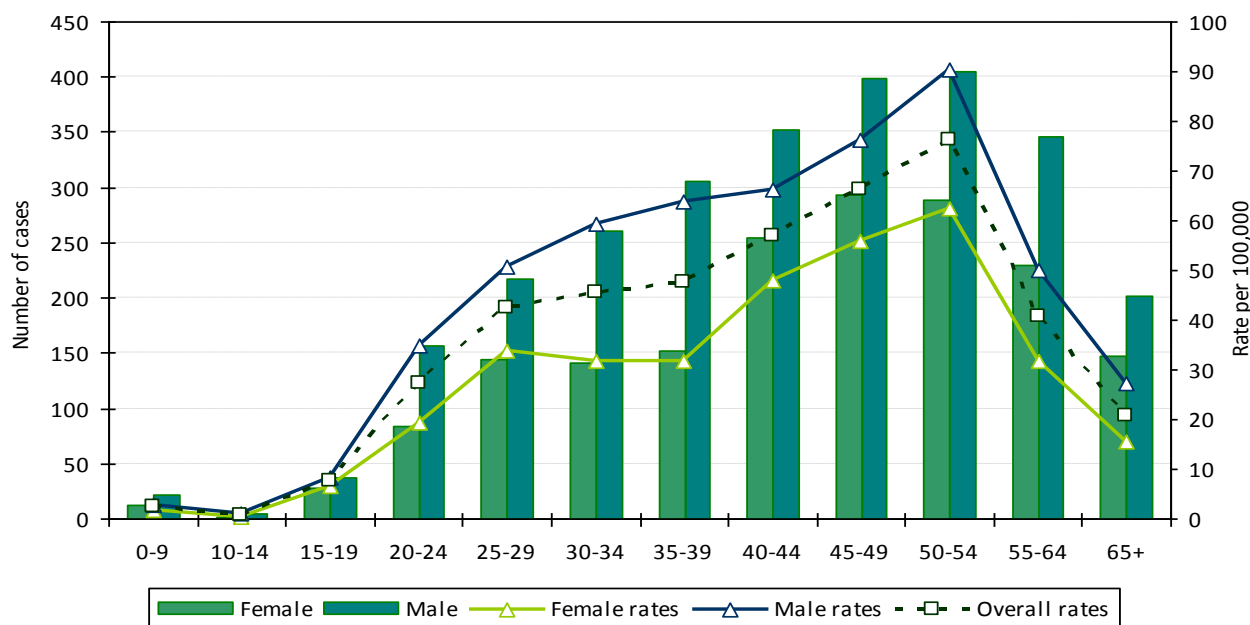


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.5.2: Reported Cases and Rates of Hepatitis C by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 29 cases for which sex and/or age were unknown

Table 3.5.1: Reported Cases and Rates of Hepatitis C by Age and Sex: Ontario, 2007

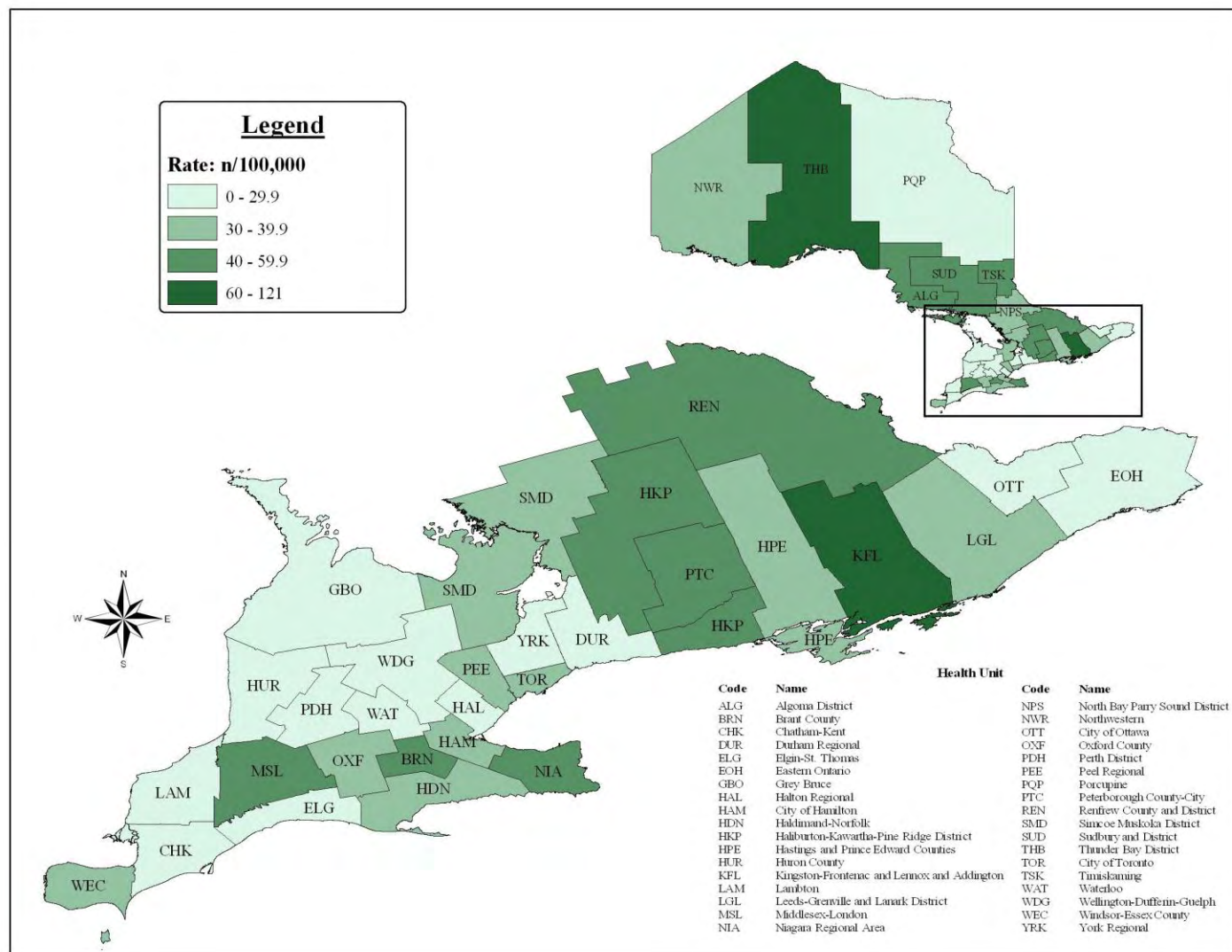
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-9	12	1.7	21	2.9	33	2.3
10-14	2	0.5	4	0.9	6	0.7
15-19	28	6.7	37	8.4	65	7.6
20-24	84	19.4	156	34.9	240	27.3
25-29	145	33.7	217	50.8	362	42.3
30-34	141	31.7	261	59.2	402	45.4
35-39	152	31.6	305	63.9	457	47.7
40-44	254	47.8	353	66.3	607	57.0
45-49	294	56.0	399	76.3	693	66.1
50-54	289	62.5	405	90.2	694	76.2
55-64	229	31.7	346	50.0	575	40.7
65+	147	15.5	202	27.3	349	20.7
Total	1,777	27.4	2,706	42.8	4,483	35.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 29 cases for which sex and/or age were unknown

Map 3.5.1: Rates of Hepatitis C by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.5.2: Reported Cases and Rates of Hepatitis C by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Kingston-Frontenac and Lennox and Addington	227	120.8
Thunder Bay District	135	87.1
Haliburton-Kawartha-Pine Ridge District	100	57.1
Niagara Region	230	53.0
Algoma District	59	49.5
Middlesex-London	208	47.4
Timiskaming	16	46.3
Sudbury and District	88	44.4
Renfrew County and District	42	41.8
Brant County	57	41.6
Peterborough County	55	41.2
Toronto	1,056	39.8
Oxford County	39	36.6
North Bay Parry Sound District	45	35.9
Haldimand-Norfolk	38	34.0
Hastings Prince Edward Counties	54	33.1
Leeds-Grenville and Lanark District	55	32.3
Simcoe Muskoka District	154	31.2
Peel Region	390	30.1
Hamilton, City of	156	30.0
Northwestern	24	30.0
Windsor-Essex County	121	30.0
Halton Region	140	29.9
Waterloo Region	146	29.4
Eastern Ontario	57	28.6
Elgin-St. Thomas	26	28.6
Durham Region	167	28.1
Ottawa, City of	235	27.8
Chatham-Kent	29	26.5
York Region	228	23.4
Grey-Bruce	37	22.9
Wellington-Dufferin-Guelph	58	21.9
Porcupine	18	20.6
Perth District	13	16.8
Huron County	9	14.7
Lambton County	0	0.0
Ontario	4,512	35.2

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.5.3: Risk Factors and Risk Settings for Hepatitis C: Ontario, 2007

Risk Factors & Settings	Cases (n = 2,645)	Percent (%)
Intravenous/intranasal drug use	1,506	57
Tattoo/acupuncture/piercing/electrolysis	778	29
Out of Canada exposure ¹	420	16
Transfusion recipient	416	16
Invasive medical/dental procedures	328	12
Sexual transmission ²	202	8
Hepatitis C positive partner	143	5
History of incarceration	82	3
Other risk or exposure	330	12
Unknown risk or exposure	78	3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note 1: Include travel to, living in or receiving medical care in an endemic area

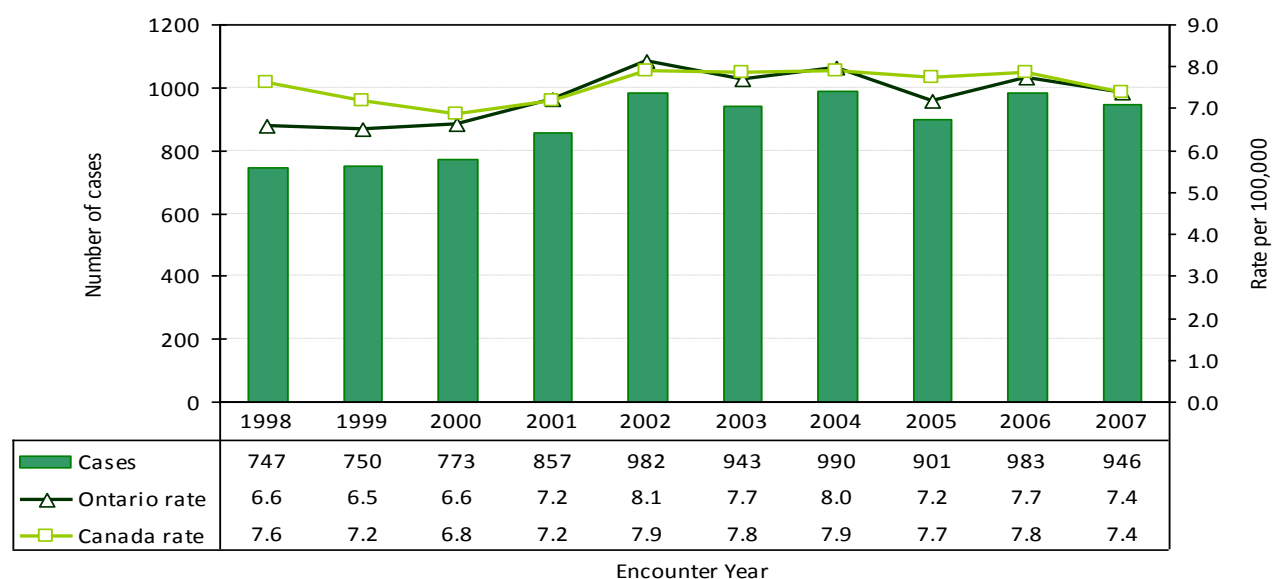
Note 2: Includes sexual transmission likely attributable to having multiple sex partners, a partner with multiple sex partners, risky sexual behaviour, MSM and sexual assault.

Note: Cases may report more than one risk factor or exposure setting; Risk factors and exposures were reported by 60% of cases reported in 2007

3.6 HIV/AIDS

- Ontario reported 946 newly diagnosed cases of HIV in 2007. This represents a rate of 7.4 cases per 100,000 population and a decrease of 4% compared to 2006 (n=983) (Table 3.1).
- The rate of HIV in Ontario was relatively stable over the past seven years with rates fluctuating between 7 to 8 HIV cases per 100,000 population (Figure 3.6.1).
- The Canadian rate of HIV in 1998 and 1999 surpassed Ontario's and produced the largest annual differences in the period 1998-2007. Since 2000, the rate of HIV in Ontario has been similar to the corresponding national rates with rates converging at 7.4 HIV cases per 100,000 population in 2007 (Figure 3.6.1).
- The rate of HIV among males in Ontario was four times higher than females; males reported 12 cases per 100,000 population compared to females with 3 cases per 100,000 population (Figure 3.6.3, Table 3.6.1).
- Females aged 25-29 and 35-39 years reported rates of HIV that were higher than the provincial rate. Males in the age groups from 20 to 54 years also reported rates that were higher than the provincial rate (Figure 3.6.3).
- The rate of HIV was highest in Ontario's three largest metropolitan census areas: Toronto at 23 cases per 100,000 population, City of Ottawa at 11 cases per 100,000 population and City of Hamilton at 6 cases per 100,000 population (Map 3.6.1, Table 3.6.3).
- The exposure categories most affected by HIV in 2007 were men who have sex with men (39%), persons from HIV endemic countries (21%) and others affected by heterosexual transmission (10%) (Table 3.6.4).
- Ontario had fewer than five instances of maternal transmission of HIV in 2007.
- Brant County (3.7 cases per 100,000 population), Toronto (2.8 cases per 100,000 population) and Northwestern Health Unit (2.5 cases per 100,000 population) reported the highest diagnosis rates for AIDS in 2007 (Map 3.6.2, Table 3.6.3).
- A total of 1,881 cases of AIDS were diagnosed in Ontario from 1998 to 2007 with the lowest number of cases reported in 2006 (131 cases) and 2007 (129 cases) (Table 3.1).
- AIDS diagnoses in Ontario decreased from 1998 to 2000 and were comparable to the corresponding national AIDS rates. Between 2001 and 2005, the number of AIDS cases in Ontario increased to an average of 200 new diagnoses per year, resulting in a noticeable increase in the gap between the Ontario and the Canadian AIDS rates (Figure 3.6.2).
- Eleven percent (100/946) of HIV cases reported in 2007 also had a concurrent AIDS diagnosis. Seventy-eight percent of AIDS cases diagnosed in 2007 had an unreported HIV status prior to their AIDS diagnosis. Absence of testing, anonymous testing, or testing outside of the province may explain why these HIV cases did not come to the attention of public health earlier.
- Three percent (32) of HIV cases diagnosed in 2007 reported a co-infection with syphilis.

Figure 3.6.1: Reported Number and Rate of HIV Diagnoses in Ontario and Canada: 1998-2007

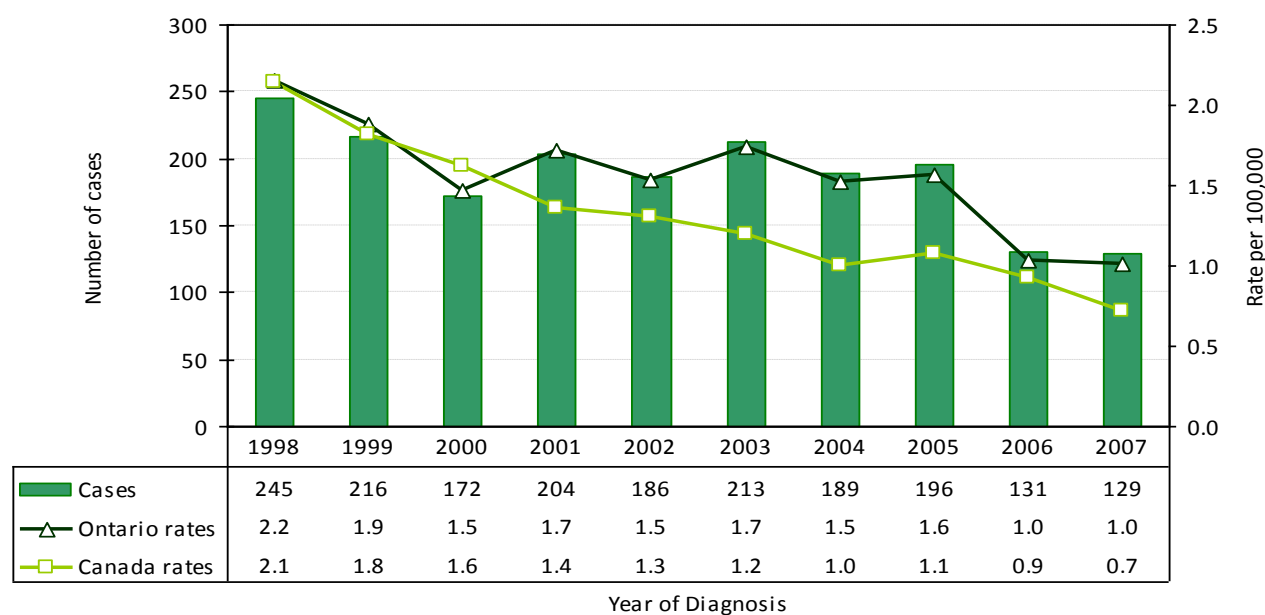


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Public Health Agency of Canada (2008). *HIV and AIDS in Canada. Surveillance Report to December 31, 2007.*

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.6.2: Reported Number and Rate of AIDS Diagnoses in Ontario and Canada: 1998-2007

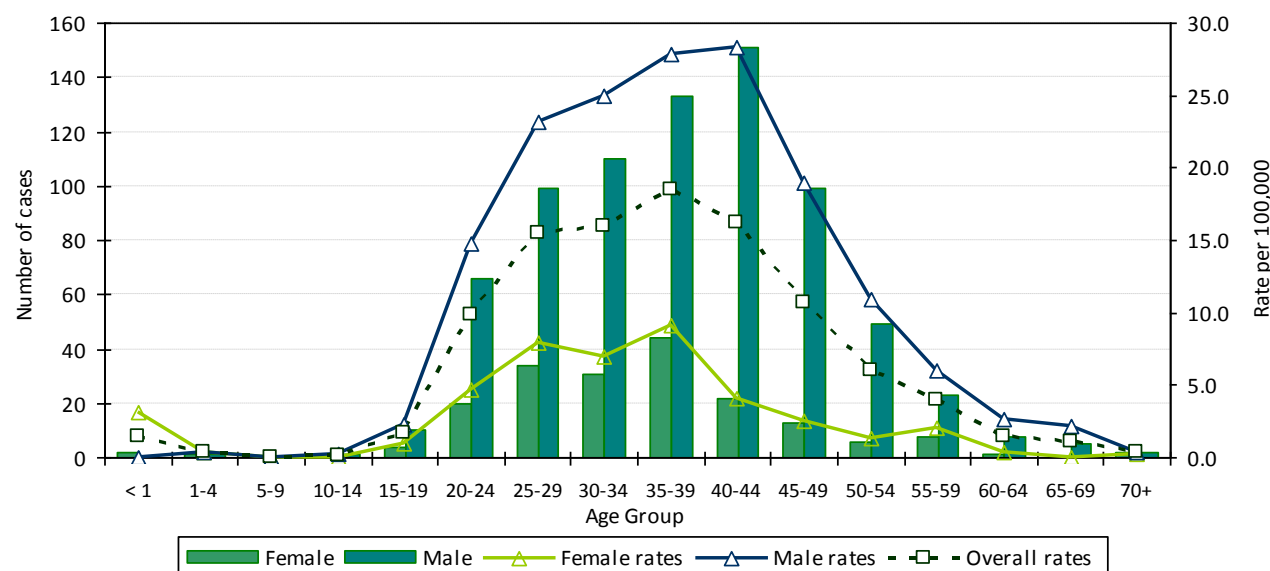


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Public Health Agency of Canada (2008). *HIV and AIDS in Canada. Surveillance Report to December 31, 2007.*

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.6.3: Reported Number and Rates of HIV Diagnoses by Age and Sex: Ontario, 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Excludes 1 case for which sex and/or age were unknown

Table 3.6.1: Reported Number and Rates of HIV Diagnoses by Age and Sex: Ontario, 2007

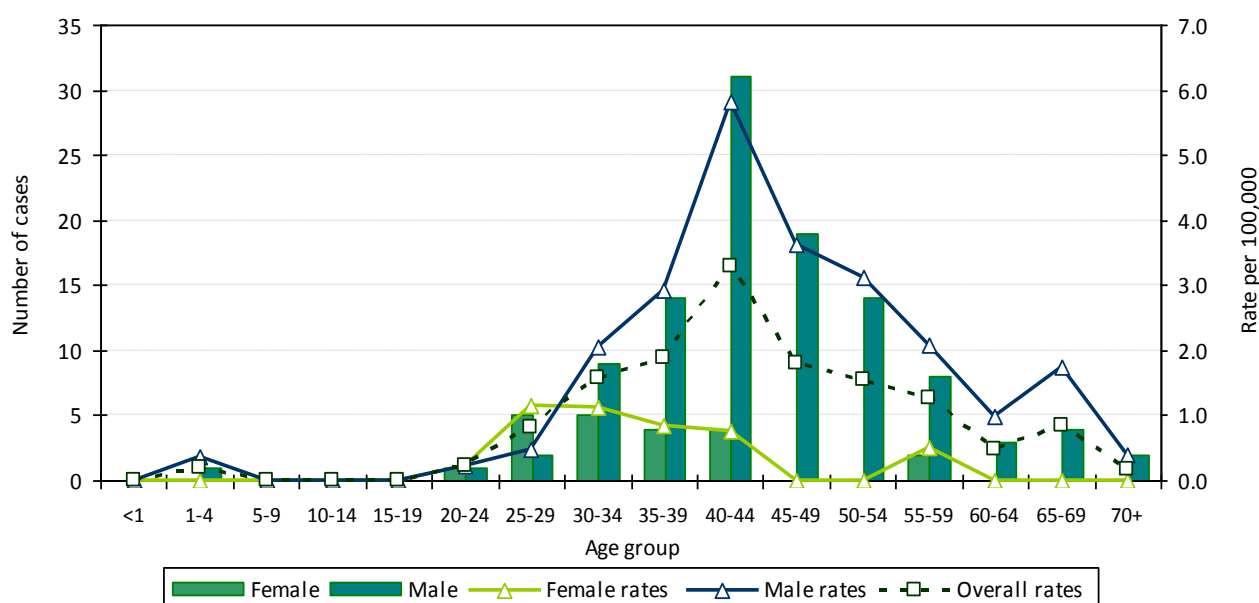
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
< 1	2	3.1	0	0.0	2	1.5
1-4	1	0.4	1	0.4	2	0.4
5-9	0	0.0	0	0.0	0	0.0
10-14	0	0.0	1	0.2	1	0.1
15-19	4	1.0	10	2.3	14	1.6
20-24	20	4.6	66	14.8	86	9.8
25-29	34	7.9	99	23.2	133	15.5
30-34	31	7.0	110	25.0	141	15.9
35-39	44	9.1	133	27.9	177	18.5
40-44	22	4.1	151	28.3	173	16.3
45-49	13	2.5	99	18.9	112	10.7
50-54	6	1.3	49	10.9	55	6.0
55-59	8	2.0	23	6.0	31	4.0
60-64	1	0.3	8	2.6	9	1.4
65-69	0	0.0	5	2.2	5	1.0
70+	2	0.3	2	0.4	4	0.3
Total	188	2.9	757	12.0	945	7.4

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Excludes 1 case for which sex and/or age were unknown

Figure 3.6.4: Reported Number and Rates of AIDS Diagnoses by Age and Sex: Ontario, 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

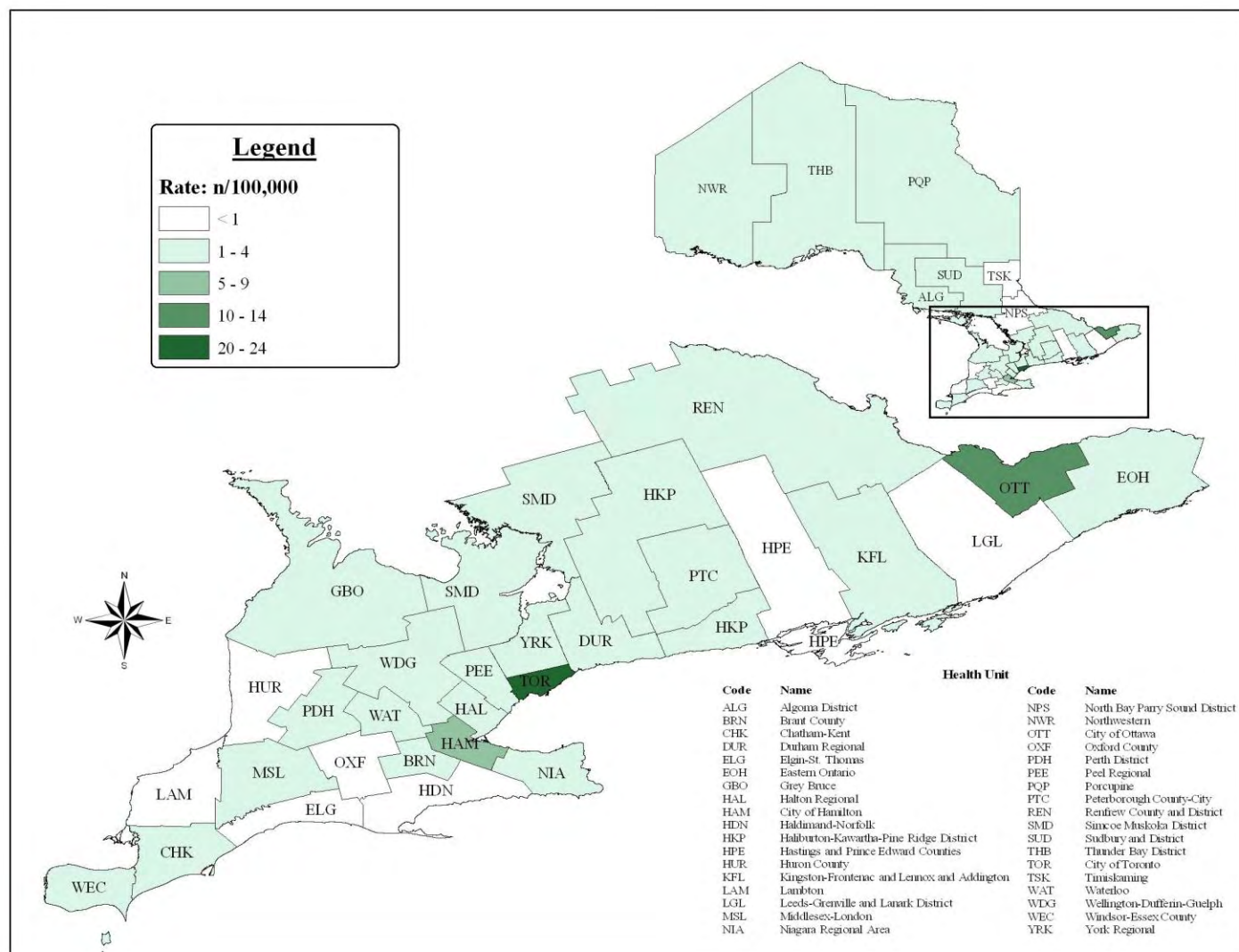
Table 3.6.2: Reported Number and Rates of AIDS Diagnoses by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
< 1	0	0.0	0	0.0	0	0.0
1-4	0	0.0	1	0.4	1	0.2
5-9	0	0.0	0	0.0	0	0.0
10-14	0	0.0	0	0.0	0	0.0
15-19	0	0.0	0	0.0	0	0.0
20-24	1	0.2	1	0.2	2	0.2
25-29	5	1.2	2	0.5	7	0.8
30-34	5	1.1	9	2.0	14	1.6
35-39	4	0.8	14	2.9	18	1.9
40-44	4	0.8	31	5.8	35	3.3
45-49	0	0.0	19	3.6	19	1.8
50-54	0	0.0	14	3.1	14	1.5
55-59	2	0.5	8	2.1	10	1.3
60-64	0	0.0	3	1.0	3	0.5
65-69	0	0.0	4	1.7	4	0.8
70+	0	0.0	2	0.4	2	0.2
Total	21	0.3	108	1.7	129	1.0

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 3.6.1: Rates of HIV Diagnoses by Public Health Unit: Ontario, 2007

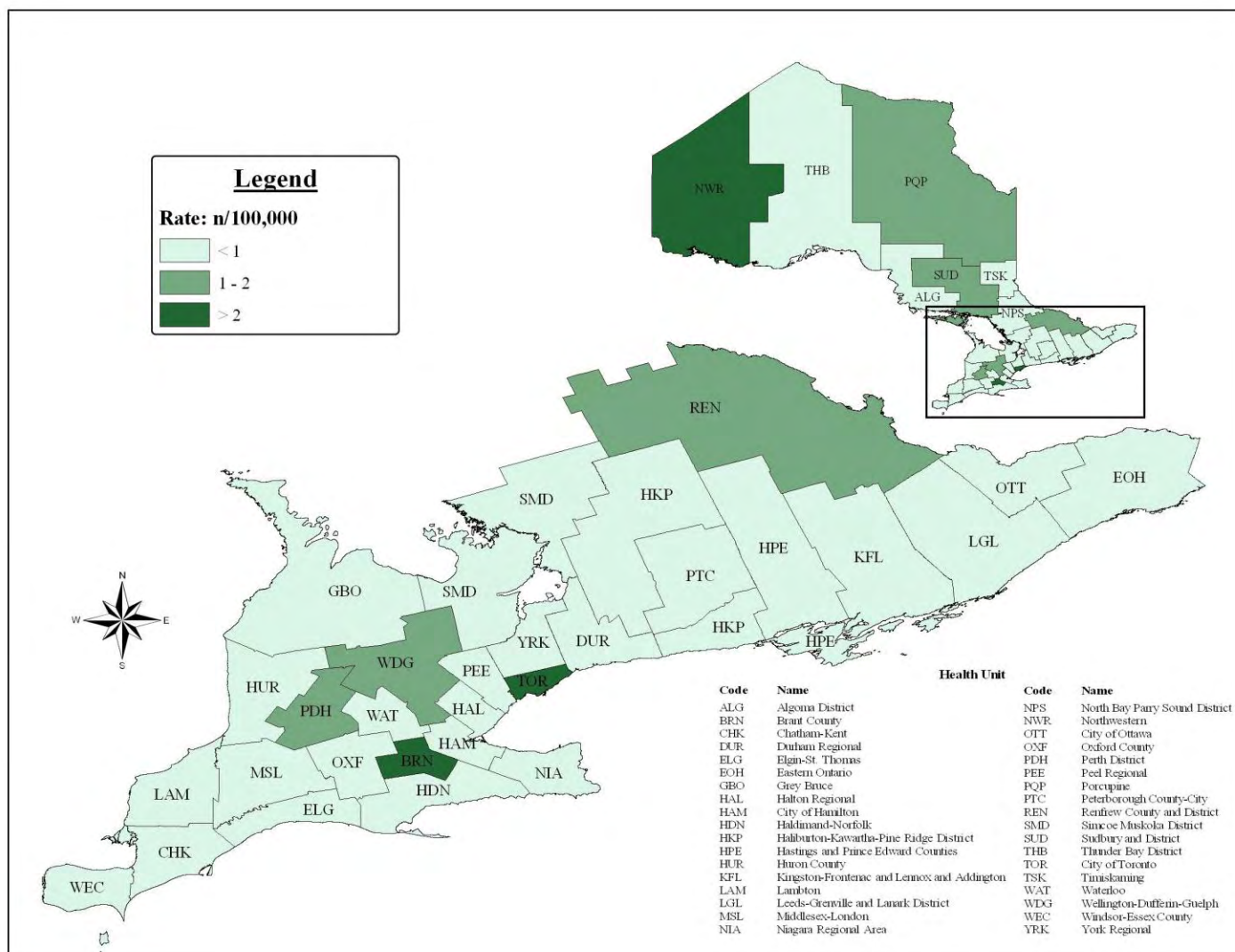


Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Notes: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Map 3.6.2: Rates of AIDS Diagnoses by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Notes: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.6.3 Reported Number and Rates of HIV and AIDS Diagnoses by Public Health Unit: Ontario, 2007

Public Health Unit	HIV		AIDS	
	Number of cases	Rate/100,000 population	Number of cases	Rate/100,000 population
Toronto	620	23.4	73	2.8
Ottawa, City of	93	11.0	7	0.8
Hamilton, City of	31	6.0	2	0.4
Brant County	5	3.7	5	3.7
Peel, Region	48	3.7	3	0.2
Halton Region	17	3.6	2	0.4
Algoma District	4	3.4	1	0.8
Middlesex-London	15	3.4	4	0.9
Waterloo	17	3.4	1	0.2
Kingston-Frontenac and Lennox and Addington	6	3.2	1	0.5
Thunder Bay District	4	2.6	0	0.0
Northwestern	2	2.5	2	2.5
Sudbury District	5	2.5	4	2.0
Wellington-Dufferin-Guelph	6	2.3	3	1.1
Durham Region	13	2.2	4	0.7
Simcoe Muskoka District	11	2.2	2	0.4
Renfrew County and District	2	2.0	1	1.0
Windsor-Essex County	8	2.0	2	0.5
Chatham-Kent	2	1.8	1	0.9
Niagara Region	8	1.8	3	0.7
Haliburton-Kawartha- Pine Ridge District	3	1.7	1	0.6
York Region	16	1.6	2	0.2
Peterborough County	2	1.5	0	0.0
Perth District	1	1.3	1	1.3
Grey-Bruce	2	1.2	0	0.0
Porcupine	1	1.1	1	1.1
Eastern Ontario	2	1.0	1	0.5
Haldimand-Norfolk	1	0.9	1	0.9
North Bay Parry Sound District Health Unit	1	0.8	0	0.0
Elgin-St. Thomas	0	0.0	0	0.0
Hastings Prince Edward Counties	0	0.0	0	0.0
Huron County	0	0.0	0	0.0
Lambton County	0	0.0	0	0.0
Leeds-Grenville and Lanark District	0	0.0	0	0.0
Oxford County	0	0.0	1	0.9
Timiskaming	0	0.0	0	0.0
Ontario	946	7.4	129	1.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.6.4: Risk Factors and Risk Settings for HIV Cases: Ontario, 2007

Risk Factors & Settings	Cases (n =946)	Percent (%)
Men who have sex with men (MSM)	371	39.2
HIV endemic country	201	21.2
Heterosexual transmission	93	9.8
Intravenous drug use (IDU)	45	4.8
Women who have sex with women (WSW)	43	4.5
MSM/IDU	21	2.2
HIV positive partner	14	1.5
Transfusion	3	0.3
Mother to child transmission	2	0.2
Occupational exposure	2	0.2
Missing/other	151	16.0

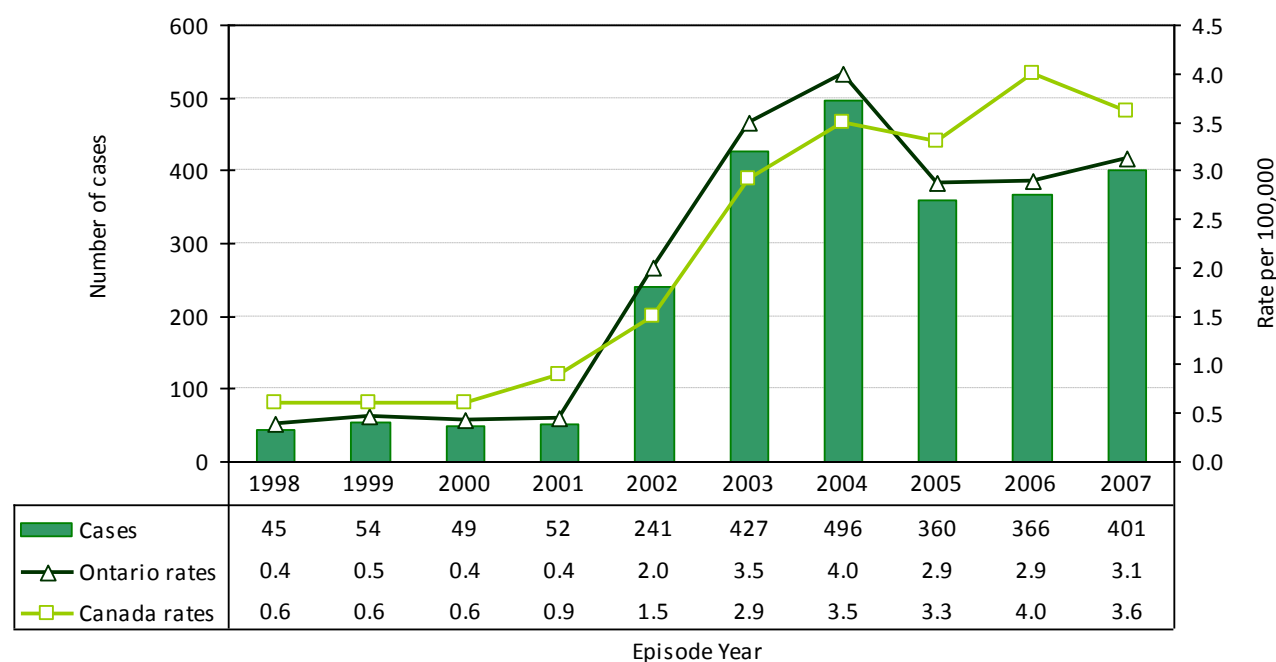
Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: The most likely risk factor or risk setting for cases reporting more than 1 risk factor or risk setting was determined using HIV incidence and prevalence in Ontario and the *Guidelines for the Surveillance of AIDS in Canada*.

3.7 INFECTIOUS SYPHILIS

- Ontario reported 401 cases of syphilis in 2007, which represents an incidence rate of 3.1 cases per 100,000 population, an increase of almost 700% from 0.4 cases per 100,000 population in 1998 (Figure 3.7.1).
- The incidence of syphilis in Ontario over the past 10 years is marked by a period of relative stability from 1998 to 2001, a rapid increase between 2002 and 2004 and a stage of continued high rates from 2005 to 2007. The increase in cases began in 2002 and has continued because of an ongoing syphilis outbreak among men who have sex with men (MSM) primarily in Toronto and Ottawa (Figure 3.7.1).
- The incidence rate of syphilis in Canada in 2007 was 16% higher than Ontario's at 3.6 cases per 100,000 population (Figure 3.7.1).
- Canada experienced a similar rapid increase in the incidence of syphilis beginning in 2001 and incidence rates remained higher than Ontario's from 2005 through to 2007 despite a decline in 2007 (Figure 3.7.1). The national trend from 2002 to 2007 was driven in part by the increase in syphilis cases in Ontario.
- In 2007, males accounted for 95% (381) of reported syphilis cases. The incidence rate of syphilis among males was 20 times higher than females at 6.0 cases per 100,000 population compared to 0.3 cases per 100,000 (Table 3.7.1).
- The provincial incidence rate of syphilis in 2007 was driven primarily by males aged 20-49 years. Incidence rates ranged from 7 cases per 100,000 population for 20-24 year olds to a high of 15 cases per 100,000 population in the 40 to 44 year old category (Figure 3.7.2).
- The cities of Toronto (70%) and Ottawa (11%) accounted for over 80% of syphilis cases reported in Ontario in 2007. Perth District Health Unit had three syphilis cases and accounted for the third highest incidence rate in Ontario. Fourteen public health units did not report any cases of syphilis in 2007 (Map 3.7.1, Table 3.7.2).
- Among syphilis cases who reported at least one risk factor, the most frequently reported in 2007 were MSM (71%), failure to use a condom (60%), having multiple sex partners in the last six months (48%) and having a new partner in the last two months (23%) (Table 3.7.3).
- Thirty-five percent (139/401) of syphilis cases reported in Ontario in 2007 had an HIV diagnosis in the last 10 years.

Figure 3.7.1: Incidence of Infectious Syphilis in Ontario and Canada: 1998-2007

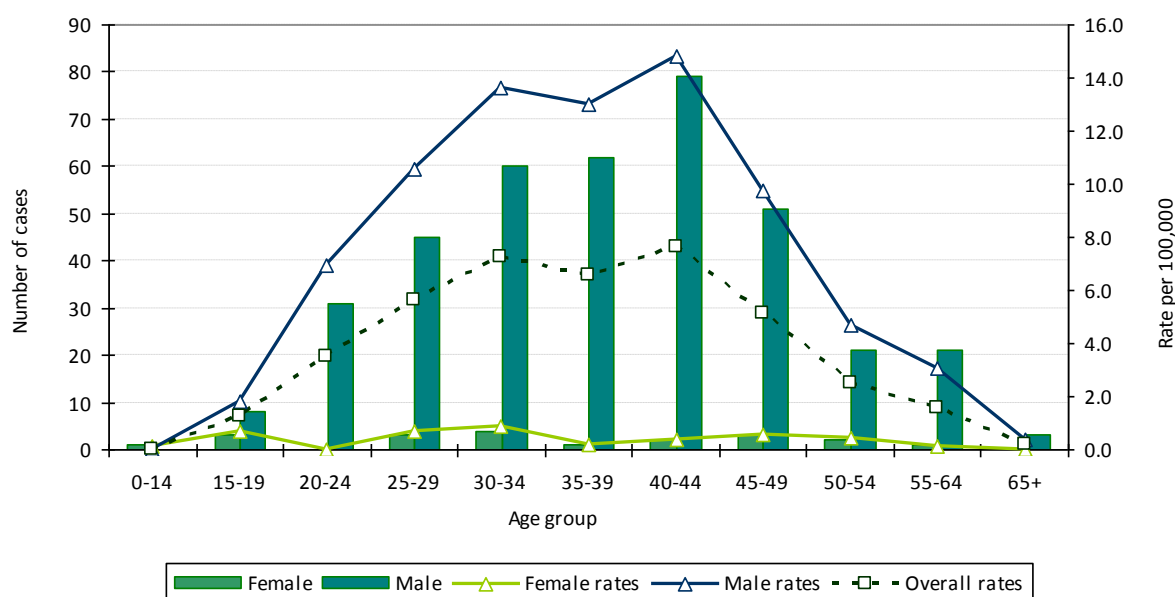


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. STI Data Tables. Downloaded March 6, 2009: http://www.phac-aspc.gc.ca/std-mts/sti-its_tab/index-eng.php.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Figure 3.7.2: Incidence of Infectious Syphilis by Age and Sex: Ontario, 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

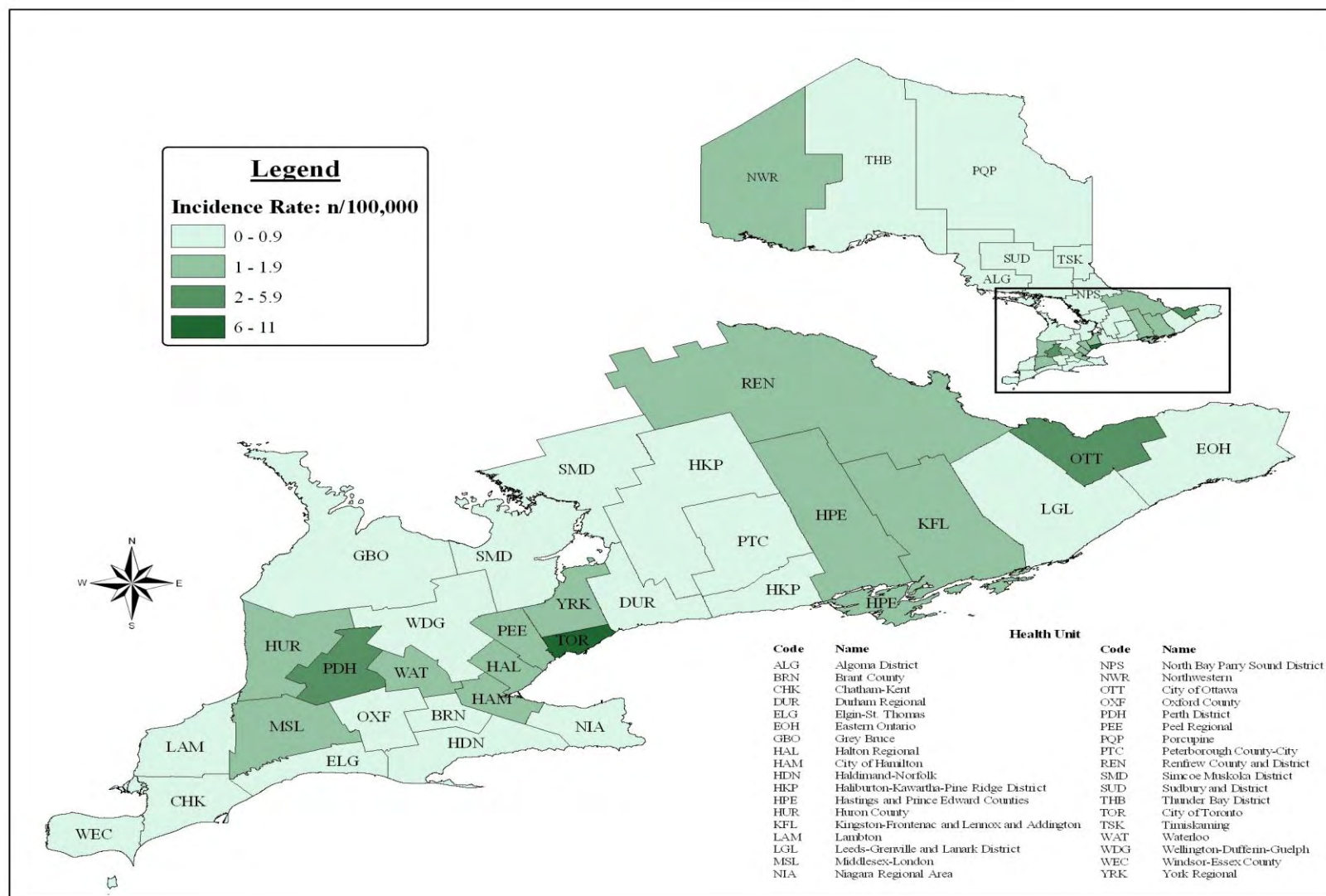
Table 3.7.1: Incidence of Infectious Syphilis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14	1	0.1	0	0.0	1	0.0
15-19	3	0.7	8	1.8	11	1.3
20-24	0	0.0	31	6.9	31	3.5
25-29	3	0.7	45	10.5	48	5.6
30-34	4	0.9	60	13.6	64	7.2
35-39	1	0.2	62	13.0	63	6.6
40-44	2	0.4	79	14.8	81	7.6
45-49	3	0.6	51	9.7	54	5.2
50-54	2	0.4	21	4.7	23	2.5
55-64	1	0.1	21	3.0	22	1.6
65+	0	0.0	3	0.4	3	0.2
Total	20	0.3	381	6.0	401	3.1

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [01/08/2009].

Map 3.7.1: Incidence of Infectious Syphilis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.7.2: Incidence of Infectious Syphilis by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Toronto	276	10.4
Ottawa, City of	44	5.2
Perth District	3	3.9
Hastings Prince Edward Counties	3	1.8
Halton Region	8	1.7
Hamilton, City of	9	1.7
Huron County	1	1.6
Peel Region	17	1.3
York Region	13	1.3
Northwestern	1	1.2
Kingston-Frontenac and Lennox and Addington	2	1.1
Middlesex-London	5	1.1
Renfrew County and District	1	1.0
Waterloo Region	5	1.0
North Bay Parry Sound District	1	0.8
Brant County	1	0.7
Durham Region	4	0.7
Niagara Region	3	0.7
Haliburton-Kawartha-Pine Ridge District	1	0.6
Eastern Ontario	1	0.5
Wellington-Dufferin-Guelph	1	0.4
Simcoe Muskoka District	1	0.2
Algoma District	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Grey-Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Lambton County	0	0.0
Leeds-Grenville and Lanark District	0	0.0
Oxford County	0	0.0
Peterborough County	0	0.0
Porcupine	0	0.0
Sudbury and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	401	3.1

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 3.7.3: Risk Factors and Risk Settings for Infectious Syphilis Cases: Ontario, 2007

Risk Factors & Settings	Cases (n=304)	Frequency (%)
MSM	217	71
No condom used	182	60
Multiple sex partners In last 6 months	146	48
New partner in past 2 months	71	23
Partner with multiple sex partners	26	9
Bath house encounter	25	8
Met partner through internet	14	5
Judgment impaired by alcohol/drugs	13	4
Other	11	4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Cases may report more than one risk factor or exposure setting

Chapter 4: DISEASES TRANSMITTED BY DIRECT CONTACT AND RESPIRATORY ROUTES

- Tuberculosis (TB), invasive group A streptococcus disease (iGAS), influenza and legionellosis are the most frequently reported diseases transmitted by direct contact and respiratory routes in Ontario.
- Between 1998 and 2007, the incidence rate of TB in Ontario decreased steadily from 6.5 to 5.3 cases per 100,000 population. During this period, Ontario's annual incidence rates for TB consistently exceeded the national average (Figure 4.4.1).
- In 2007, the incidence of iGAS increased by 74% from 2.3 cases per 100,000 population in 2004 to 3.9 cases per 100,000 population (Figure 4.1.1).
- The incidence of legionellosis declined 78% from 49 cases in 1998 to a low of 11 cases in 2004. Since 2005, the annual incidence of legionellosis has increased to over 50 cases (Figure 4.3.1).
- The incidence of influenza increased in the 2007/2008 season (5,163) following relatively low activity in the 2005/2006 (2,486) and the 2006/2007 seasons (2,930) (Figure 4.2.1).
- Influenza A caused 59% (3,055 cases) of influenza cases reported in Ontario in the 2007/2008 season compared to 41% (2,104 cases) for influenza B (Table 4.2.3).
- The incidence rates for iGAS, legionellosis and tuberculosis were highest among cases aged 65 years and older (Tables 4.1.1, 4.3.1 and 4.4.1). For influenza, the highest incidence rate occurred among cases under the age of one year (Table 4.2.1).
- While Toronto accounted for the highest proportions of iGAS, legionellosis and influenza cases in 2007, Thunder Bay (17 cases per 100,000 population), Elgin St. Thomas (2 cases per 100,000 population) and Huron County (140 cases per 100,000 population) reported the highest incidence rates. Toronto reported the highest incidence and incidence rate for tuberculosis in 2007 (Tables 4.1.2, 4.2.2, 4.3.2 and 4.4.2).
- The incidence of TB was highest among people aged 65 years and older at 11.4 cases per 100,000 population (Figure 4.4.3, Table 4.4.1).
- Three percent of TB cases reported in 2007 also reported being co-infected with HIV.
- Eighty-six percent of TB cases reported in Ontario between 1998 and 2007 were born outside Canada, 11% were born in Canada and 3% had an unknown country of origin (Figure 4.4.4).
- From 2005 to 2007, the proportion of TB cases reporting resistance to one or more drugs decreased from 11% to 9%. (Table 4.4.8).

Table 4.1: Incidence of Diseases Transmitted by Direct Contact and Respiratory Routes; Ontario, 1998-2007

Vaccine Preventable Diseases	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
Invasive Group A streptococcus	279	2.5	310	2.7	409	3.5	328	2.8	385	3.2	409	3.3	288	2.3	392	3.1	465	3.7	501	3.9
Influenza ^{2,3}	2,367	20.6	2,882	24.7	791	6.6	2,274	18.8	981	8.0	5,389	43.4	5,778	46.0	2,486	19.6	2,930	22.9	5,163	40.3
Legionellosis	49	0.4	45	0.4	41	0.4	21	0.2	24	0.2	32	0.3	11	0.1	75	0.6	69	0.5	58	0.5
Tuberculosis	742	6.5	698	6.1	700	6.0	699	5.9	716	5.9	693	5.7	661	5.3	654	5.2	691	5.4	680	5.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note 1: Incidence rate per 100,000 population

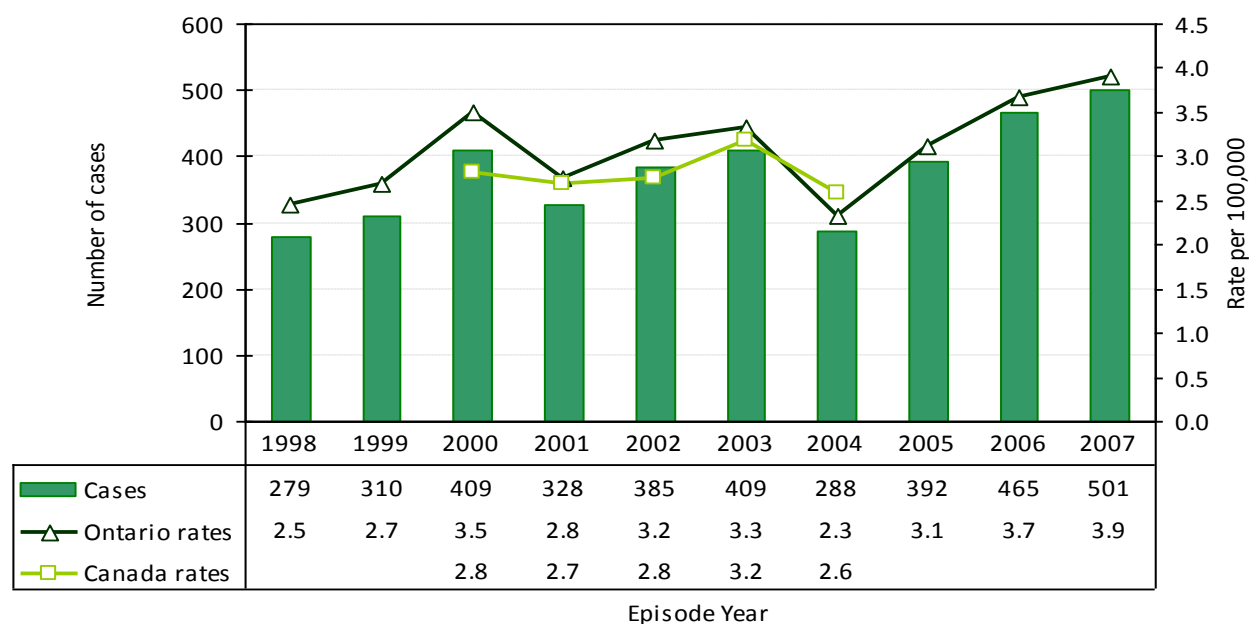
Note 2: Influenza counts and rates are based on seasons that run from September 1 to August 31 of the following year; e.g. 1998 in the table above represents the 1998/1999 influenza season

Note 3: Influenza data does not include cases reported in aggregate

4.1 INVASIVE GROUP A STREPTOCOCCUS DISEASE

- In 2007, Ontario reported 501 confirmed cases of invasive group A streptococcus disease (iGAS), representing an incidence rate of 3.9 cases per 100,000 population (Table 4.1).
- The incidence of iGAS increased by 70% from 2.3 cases per 100,000 population in 2004 to 3.9 cases per 100,000 population in 2007 (Figure 4.1.1).
- Confirmed iGAS cases occurred throughout the year, but a disproportionate number of cases occurred during the first half of the year and in December (Figure 4.1.2).
- In 2007, males accounted for 52% (262) of iGAS cases and had an incidence rate 11% higher than females (4.1 cases per 100,000 population compared to 3.7 cases per 100,000 population, respectively) (Figure 4.1.3, Table 4.1.1).
- The incidence rate of iGAS in 2007 was highest in the 65 and older age group (6.9 cases per 100,000 for females and 11.3 cases per 100,000 for males). Persons in the 30-39 and 50 and older age groups had higher incidence rates than the total population (Figure 4.1.3, Table 4.1.1).
- In 2007, the North West Region, comprised of Thunder Bay District Health Unit (16.8 cases per 100,000) and Northwestern Health Unit (13.7 cases per 100,000), reported higher than expected incidence rates for iGAS. In Thunder Bay, a local outbreak contributed to the increased incidence of iGAS (Map 4.1.1 and Table 4.1.2).

Figure 4.1.1: Incidence of Invasive Group A Streptococcal Disease in Ontario and Canada: 1998-2007



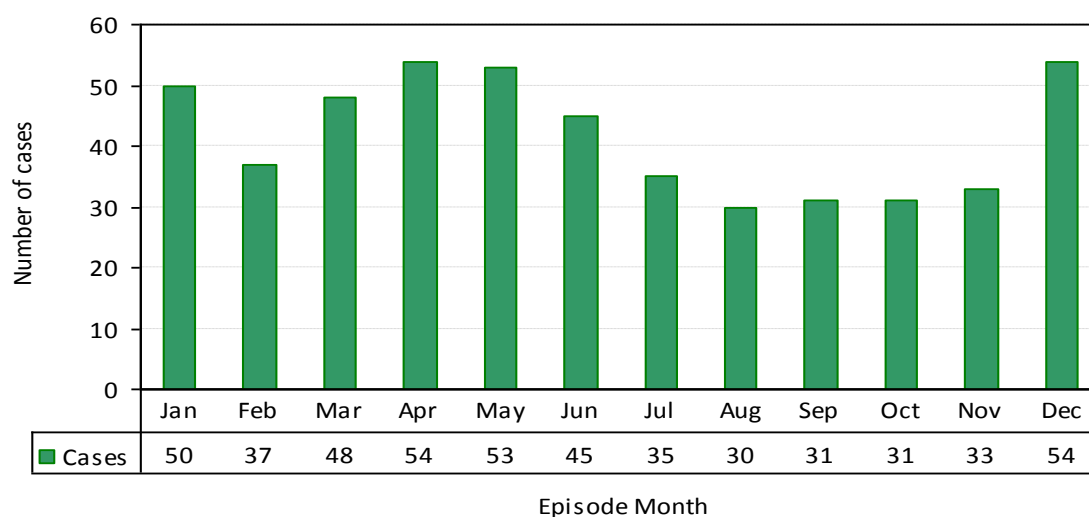
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Note: Invasive group A streptococcus became nationally reportable in 2000 Canadian rates available up to 2004.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

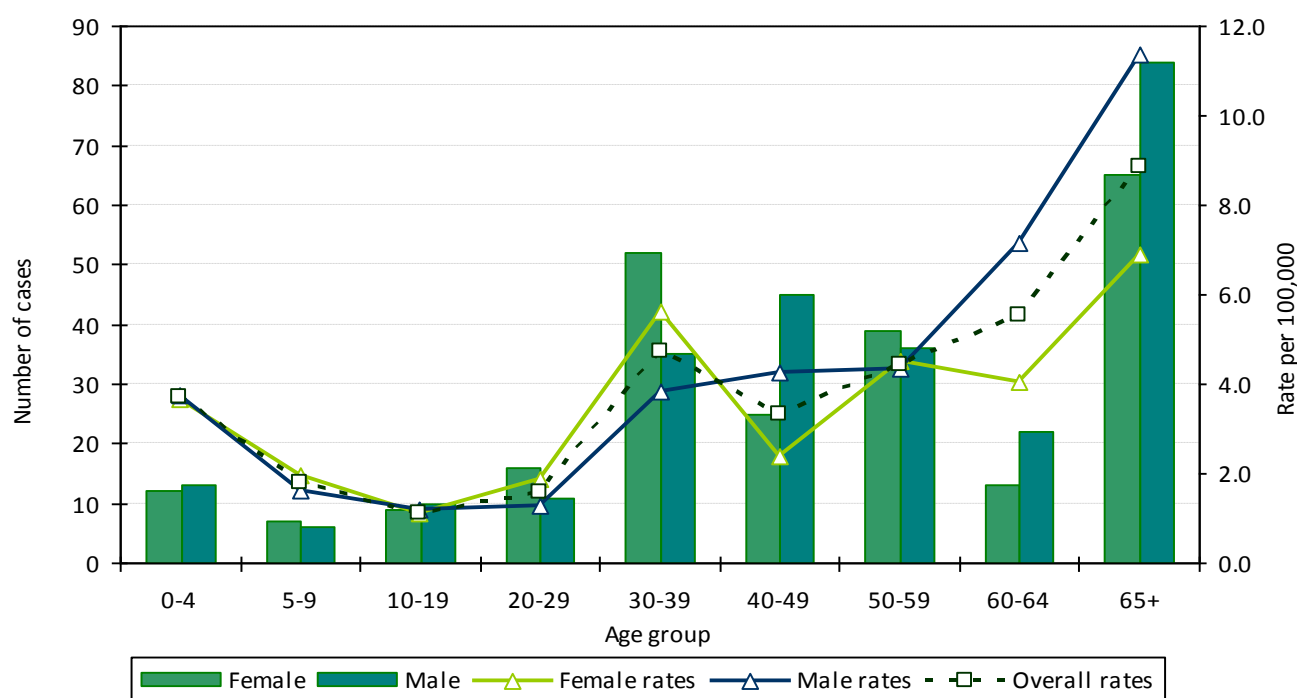
Figure 4.1.2: Incidence of Invasive Group A Streptococcal Disease by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 4.1.3: Incidence of Invasive Group A Streptococcal Disease by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 case for which sex and/or age was unknown

Table 4.1.1: Incidence of Invasive Group A Streptococcal Disease by Age and Sex: Ontario, 2007

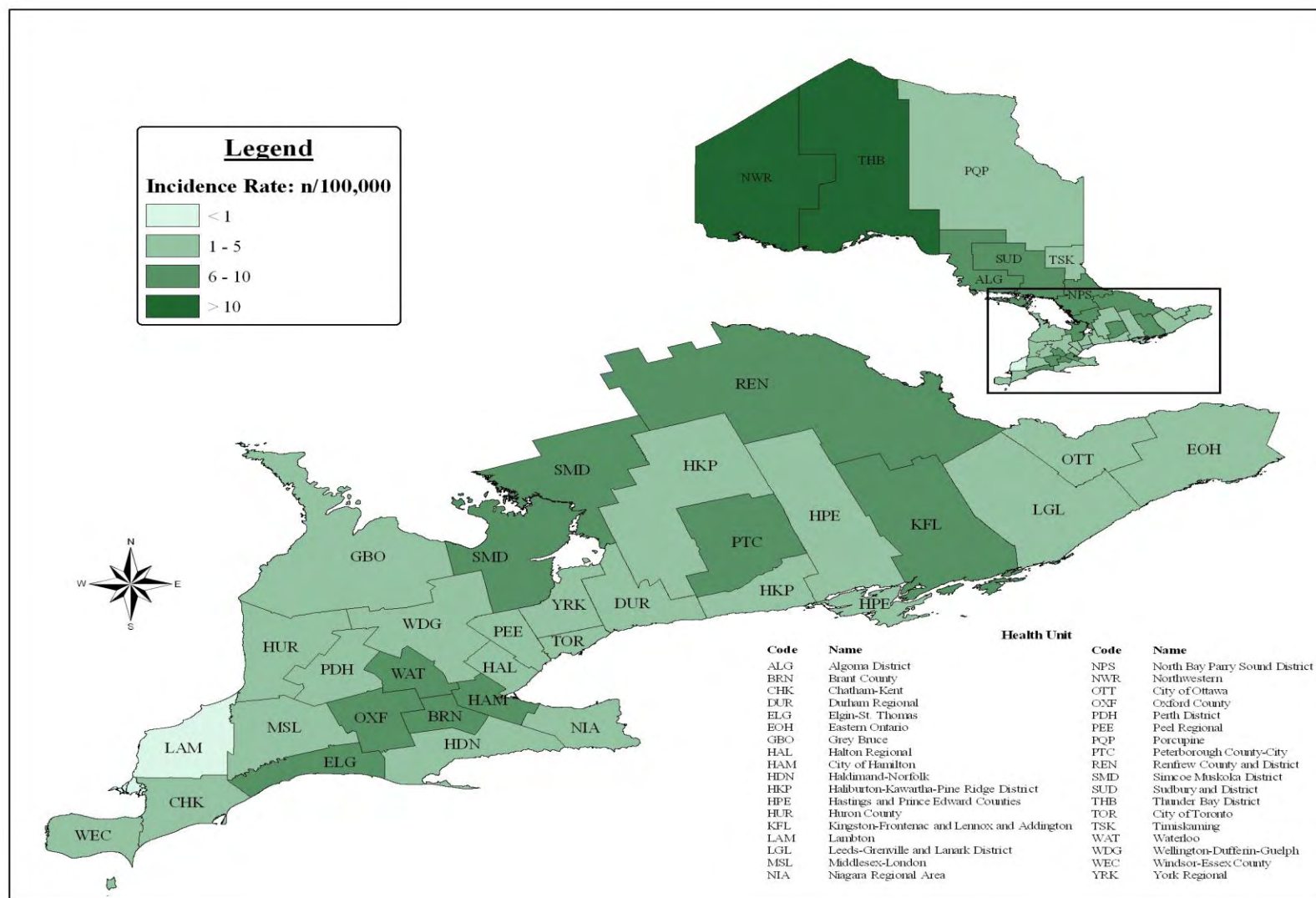
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	12	3.6	13	3.7	25	3.7
5-9	7	1.9	6	1.6	13	1.8
10-19	9	1.1	10	1.2	19	1.1
20-29	16	1.9	11	1.3	27	1.6
30-39	52	5.6	35	3.8	87	4.7
40-49	25	2.4	45	4.3	70	3.3
50-59	39	4.5	36	4.3	75	4.4
60-64	13	4.0	22	7.1	35	5.6
65+	65	6.9	84	11.3	149	8.8
Total	238	3.7	262	4.1	500	3.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 1 case for which sex and/or age was unknown

Map 4.1.1: Incidence of Invasive Group A Streptococcal Disease by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases

Table 4.1.2: Incidence of Invasive Group A Streptococcal Disease by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Thunder Bay District	26	16.8
Northwestern	11	13.7
Brant County	11	8.0
Elgin-St. Thomas	7	7.7
Hamilton, City of	40	7.7
Algoma District	9	7.6
Renfrew County and District	7	7.0
Oxford County	7	6.6
Peterborough County-City	8	6.0
Kingston-Frontenac and Lennox and Addington	11	5.9
Waterloo Region	29	5.8
North Bay Parry Sound District	7	5.6
Simcoe Muskoka District	27	5.5
Sudbury District	11	5.5
Perth District	4	5.2
Wellington-Dufferin-Guelph	12	4.5
Hastings Prince Edward Counties	7	4.3
Leeds-Grenville and Lanark District	7	4.1
Grey-Bruce	6	3.7
Haldimand-Norfolk	4	3.6
Toronto	96	3.6
Niagara Region	15	3.5
Huron County	2	3.3
Ottawa, City of	26	3.1
Eastern Ontario	6	3.0
Haliburton-Kawartha- Pine Ridge District	5	2.9
Timiskaming	1	2.9
Halton Region	13	2.8
Peel Region	35	2.7
Durham Region	15	2.5
Middlesex-London	11	2.5
Chatham-Kent	2	1.8
Windsor-Essex County	7	1.7
York Region	15	1.5
Porcupine	1	1.1
Lambton County	0	0.0
Ontario	501	3.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

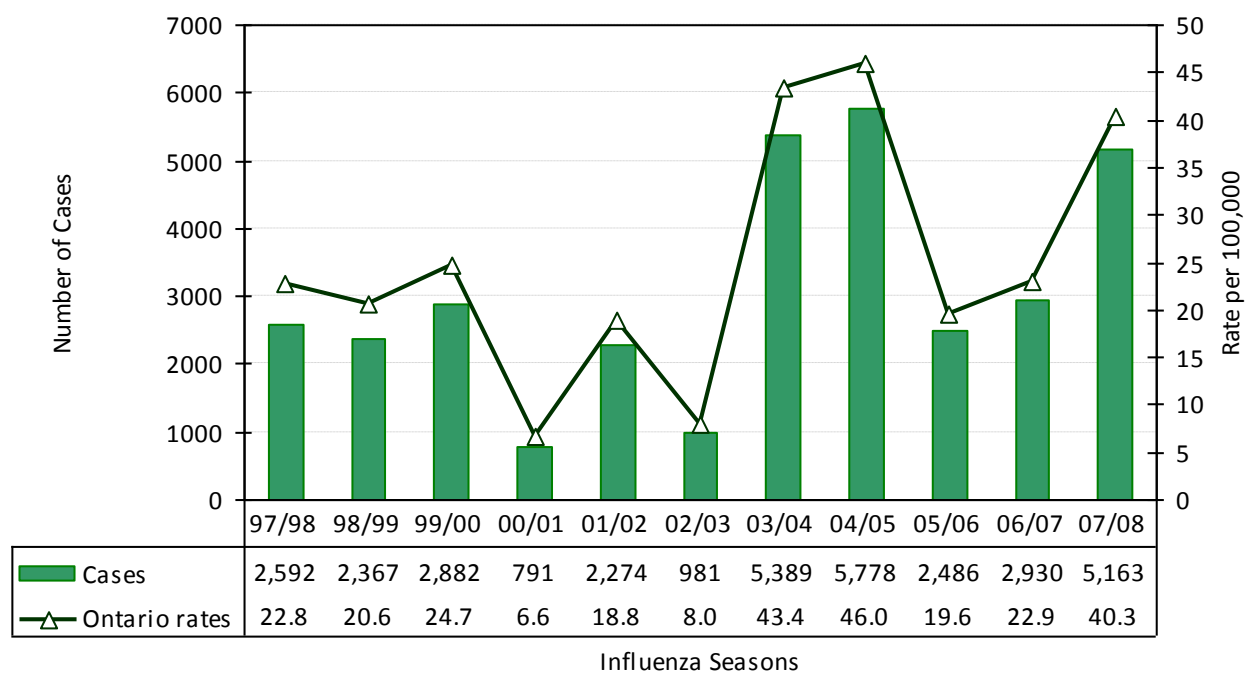
Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases

4.2 INFLUENZA

- Ontario reported 5,163 confirmed cases of influenza during the 2007/2008 influenza season (September 1, 2007 to August 31, 2008), which represents an incidence rate of 40 cases per 100,000 population.
- Influenza activity in the 2007/2008 season was higher than both the 2006/2007 (2,930 cases) and 2005/2006 (2,486) seasons.
- The average incidence rate for influenza over the past ten surveillance seasons was 25 cases per 100,000. In Ontario, the highest incidence rate for influenza to date in a single season was 46 cases per 100,000 population during the 2004/2005 influenza season. The circulation of the A/California strain contributed to this increase because the seasonal influenza vaccine did not provide protection against it.
- Influenza activity during the 2007/2008 season peaked in March 2008 with 1,789 confirmed cases, which accounted for 35% of reported cases.
- During the 2007/2008 season, the incidence of influenza was highest among children under the age of one (258 cases per 100,000 population) and among children aged 1-4 years (106 cases per 100,000 population). Adults aged 65 and older reported the third highest incidence rate at 98 cases per 100,000 population (Figure 4.2.3 and Table 4.2.1).
- Slightly more than one third (13 out of 36) of Ontario health units reported incidence rates for influenza that were higher than the overall provincial incidence rate of 40 cases per 100,000 population (Table 4.2.2).
- Influenza A accounted for the largest proportion of influenza cases reported in Ontario during the 2007/2008 season. Fifty-nine percent (3,055) of reported cases were influenza A, 41% (2,104) were influenza B and less than 1% (4) were unspecified (influenza A/B). During the 2006/2007 season, Influenza A accounted for 93% of reported influenza cases while influenza B accounted for less than 7% (Table 4.2.3).

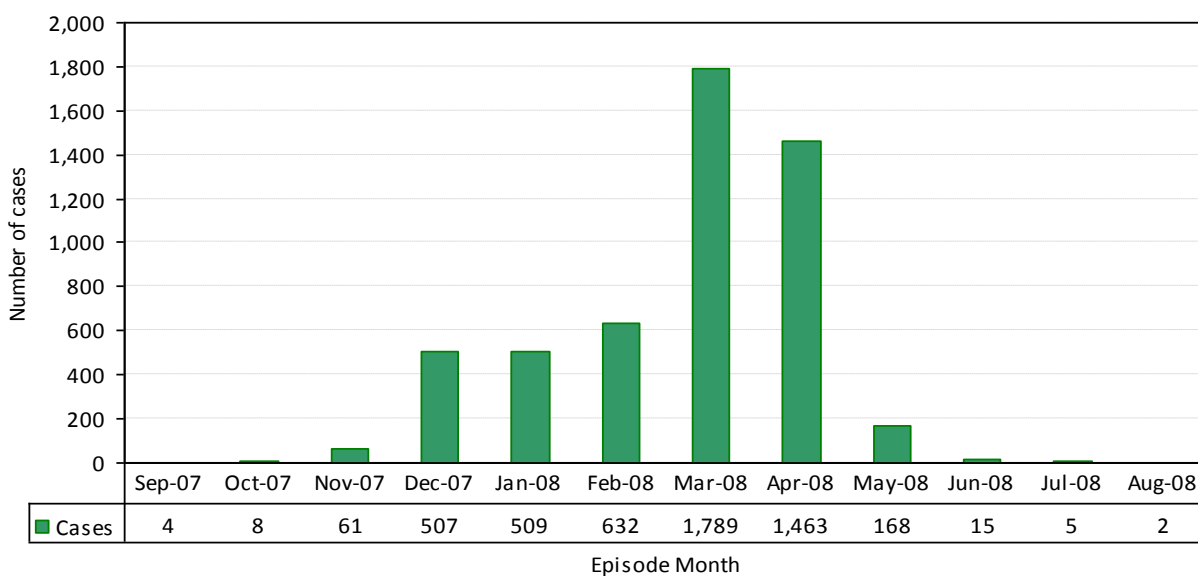
Figure 4.2.1: Incidence of Influenza in Ontario: 1998/1999 - 2007/2008



Data Source (Ontario rates): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/05/2010].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

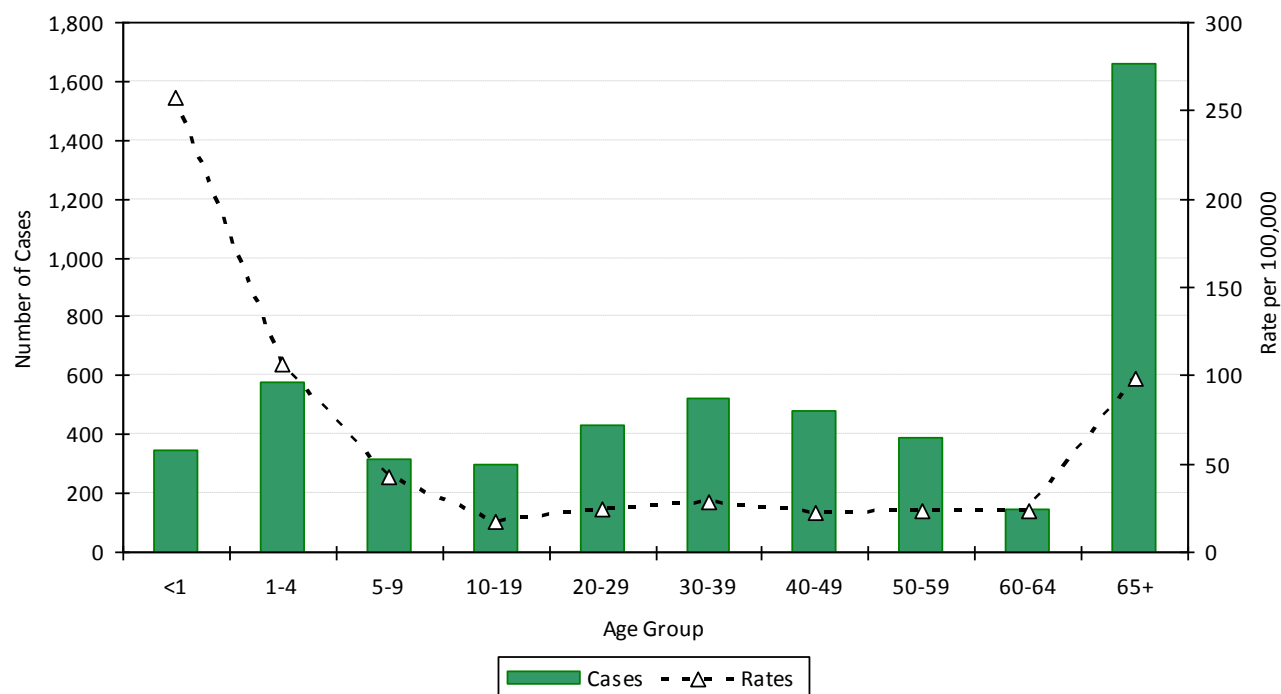
Figure 4.2.2: Incidence of Influenza by Episode Month: Ontario, 2007/2008



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/05/2010].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 4.2.3: Incidence of Influenza by Age: Ontario, 2007/2008



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [10/24/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Total excludes seven cases for which age is unknown

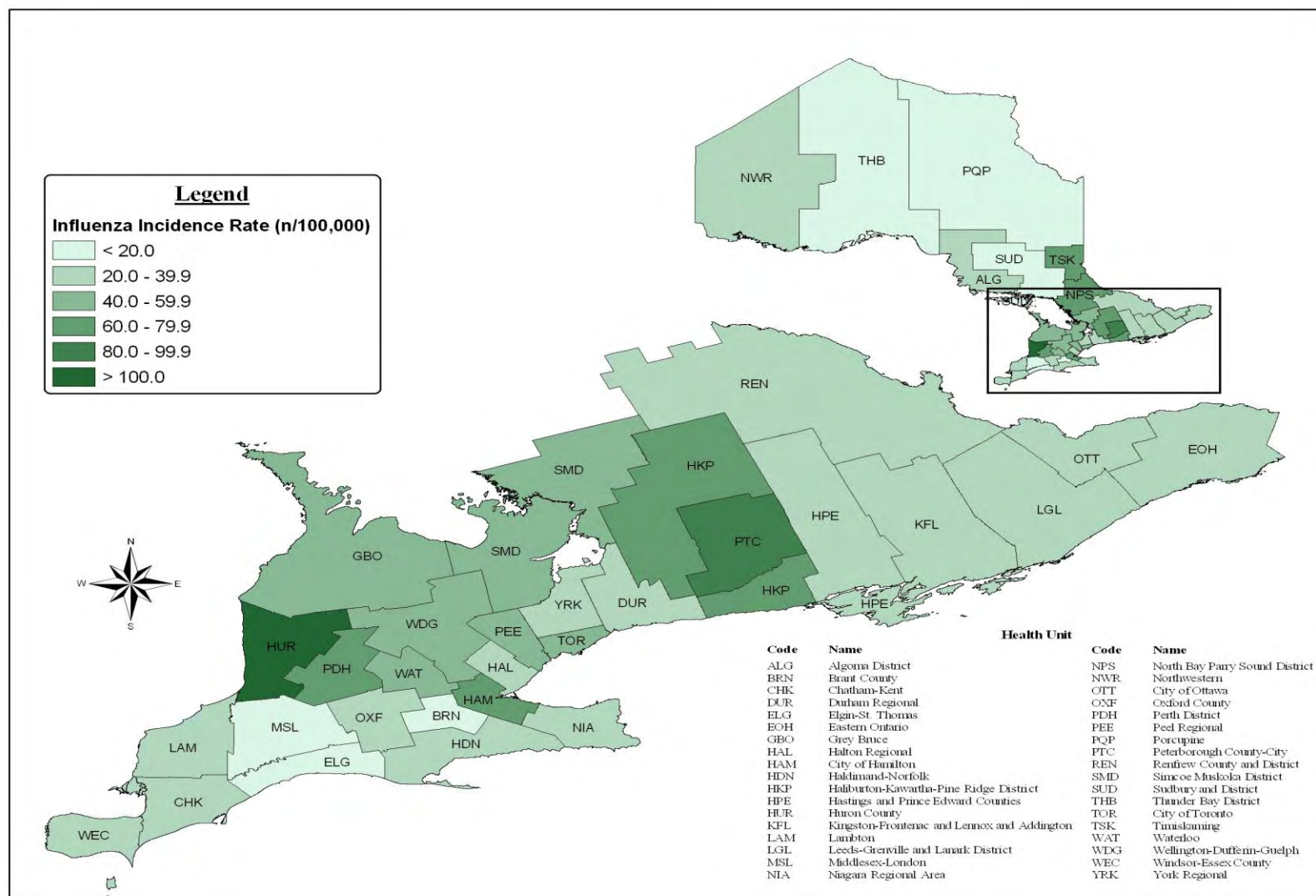
Table 4.2.1: Incidence of Influenza by Age Group: Ontario, 2007/2008

Age group (years)	Number of cases	Rate/100,000 population
<1	344	258
1-4	576	106
5-9	314	43
10-19	296	18
20-29	431	25
30-39	521	28
40-49	479	23
50-59	390	23
60-64	147	23
65+	1,658	98
Total	5,156	40.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/05/2010].

Note: Total excludes seven cases for which age is unknown

Map 4.2.1: Incidence of Influenza by Public Health Unit: Ontario, 2007/2008



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes one case that is not a resident of Ontario; Includes travel-related cases

Table 4.2.2: Incidence of Influenza by Public Health Unit: Ontario, 2007/2008

Public Health Unit	Number of cases	Rate/100,000 population
Huron County	86	140.1
Peterborough County-City	127	95.1
Haliburton-Kawartha- Pine Ridge District	136	77.6
Perth District	56	72.6
Timiskaming	25	72.3
North Bay Parry Sound District	86	68.6
Hamilton, City of	346	66.6
Toronto	1,475	55.6
Simcoe Muskoka District	269	54.4
Wellington-Dufferin-Guelph	124	46.7
Waterloo Region	224	45.1
Grey-Bruce	69	42.6
Peel Region	537	41.4
Halton Region	184	39.2
Northwestern	30	37.5
Algoma District	43	36.1
Kingston-Frontenac and Lennox and Addington	64	34.1
Hastings Prince Edward Counties	48	29.4
Ottawa, City of	244	28.8
Haldimand-Norfolk	32	28.7
Oxford County	29	27.2
Renfrew County and District	27	26.9
Niagara Region	111	25.6
Durham Region	151	25.4
Lambton County	33	25.0
Eastern Ontario	49	24.6
York Region	231	23.7
Leeds-Grenville and Lanark District	38	22.3
Chatham-Kent	23	21.0
Windsor-Essex County	84	20.8
Thunder Bay District	30	19.3
Sudbury District	37	18.7
Elgin-St. Thomas	15	16.5
Brant County	21	15.3
Porcupine	13	14.9
Middlesex-London	65	14.8
Ontario	5,163	40.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

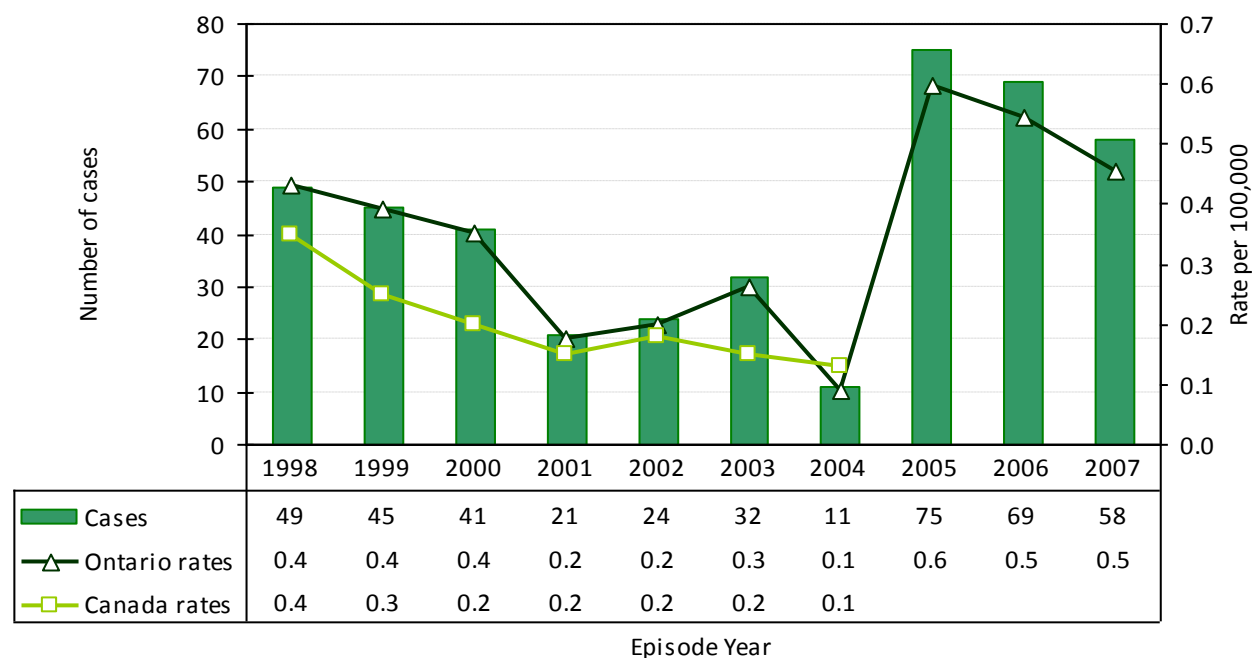
Note 1: Health unit refers the health unit where the case resided at the time of disease identification.

Note 2: Includes travel-related cases. Total includes one case that is not a resident of Ontario.

4.3 LEGIONELLOSIS

- In 2007, Ontario reported 58 confirmed cases of legionellosis, representing an incidence rate of 0.5 cases per 100,000 population (Table 4.1).
- Between 1998 and 2004, the incidence of legionellosis in Ontario declined by 78% to a low of 11 cases in 2004. In 2005, legionellosis peaked at 75 cases due mainly to a large outbreak in Toronto. Since 2005, the incidence of legionellosis has remained relatively high despite a 23% decrease in 2007 (Figure 4.3.1).
- During the period 1998 to 2004, a comparable decline in the incidence rate for legionellosis also occurred at the national level with a 75% decrease in incidence from 0.4 cases per 100,000 population in 1998 to 0.1 case per 100,000 population in 1998 (Figure 4.3.1).
- In Ontario, legionellosis typically demonstrates a seasonal pattern, most cases occur in late summer and early fall. In 2007, 38% of cases occurred in September and October (Figure 4.3.2).
- In 2007, the incidence rate of legionellosis was highest among those aged 65 years and older for both genders. The ratio of confirmed cases among females and males was approximately 1:3 (Figure 4.3.3, Table 4.3.1).
- In 2007, Elgin St. Thomas reported the highest incidence rate (2.2 cases per 100,000 population), and Toronto reported the highest number of legionellosis cases (14 cases). Almost half (16/36) of Ontario health units reported no cases of legionellosis in 2007 and exactly a third (12/36) reported incidence rates higher than the overall provincial incidence rate of 0.5 cases per 100,00 population.
- Among legionellosis cases reporting an exposure setting in 2007, 60% reported an unknown setting, 12 % reported travel outside of Ontario, 23% reported exposures within their homes and 5% reported exposure in long-term care settings (Figure 4.3.4).

Figure 4.3.1: Incidence of Legionellosis in Ontario and Canada: 1998-2007

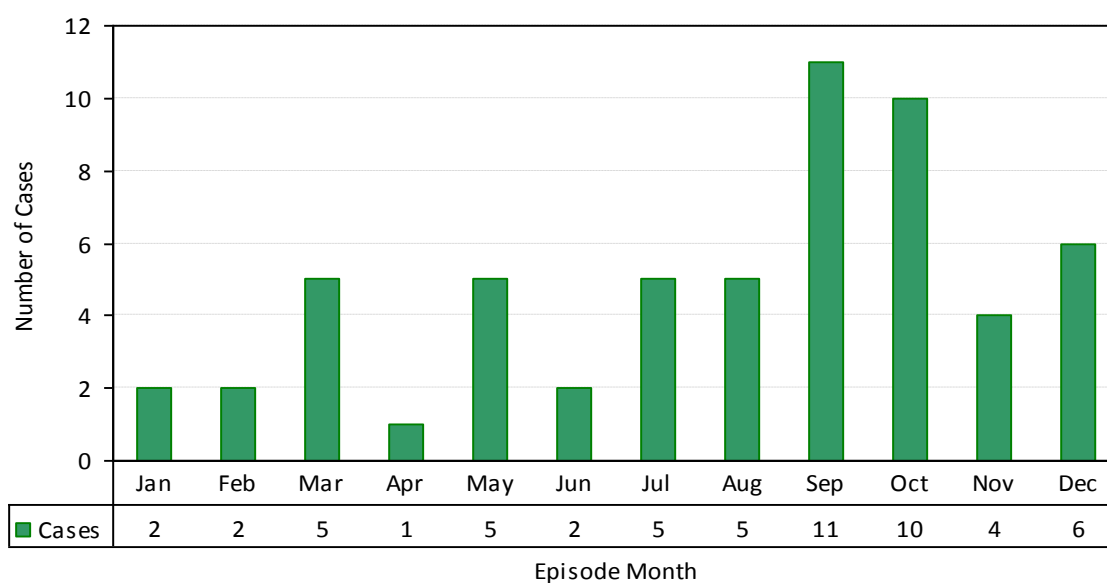


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [01/08/2009].

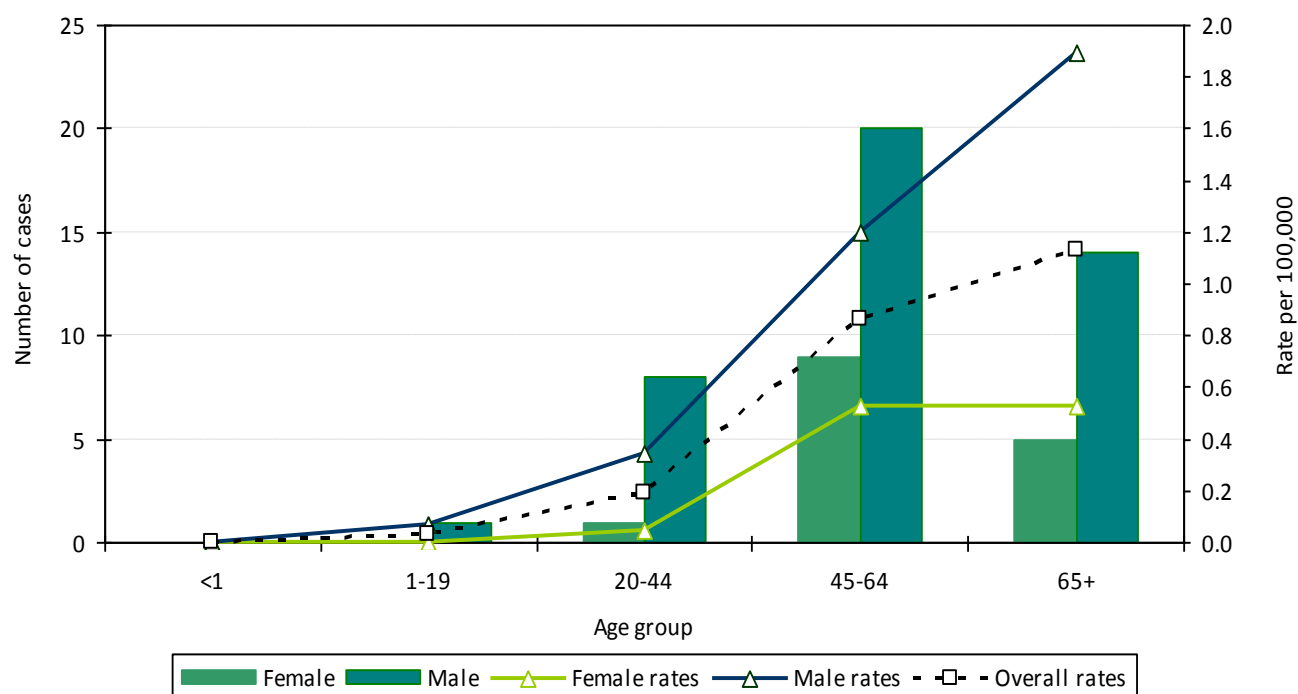
Figure 4.3.2: Incidence of Legionellosis by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 4.3.3: Incidence of Legionellosis by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

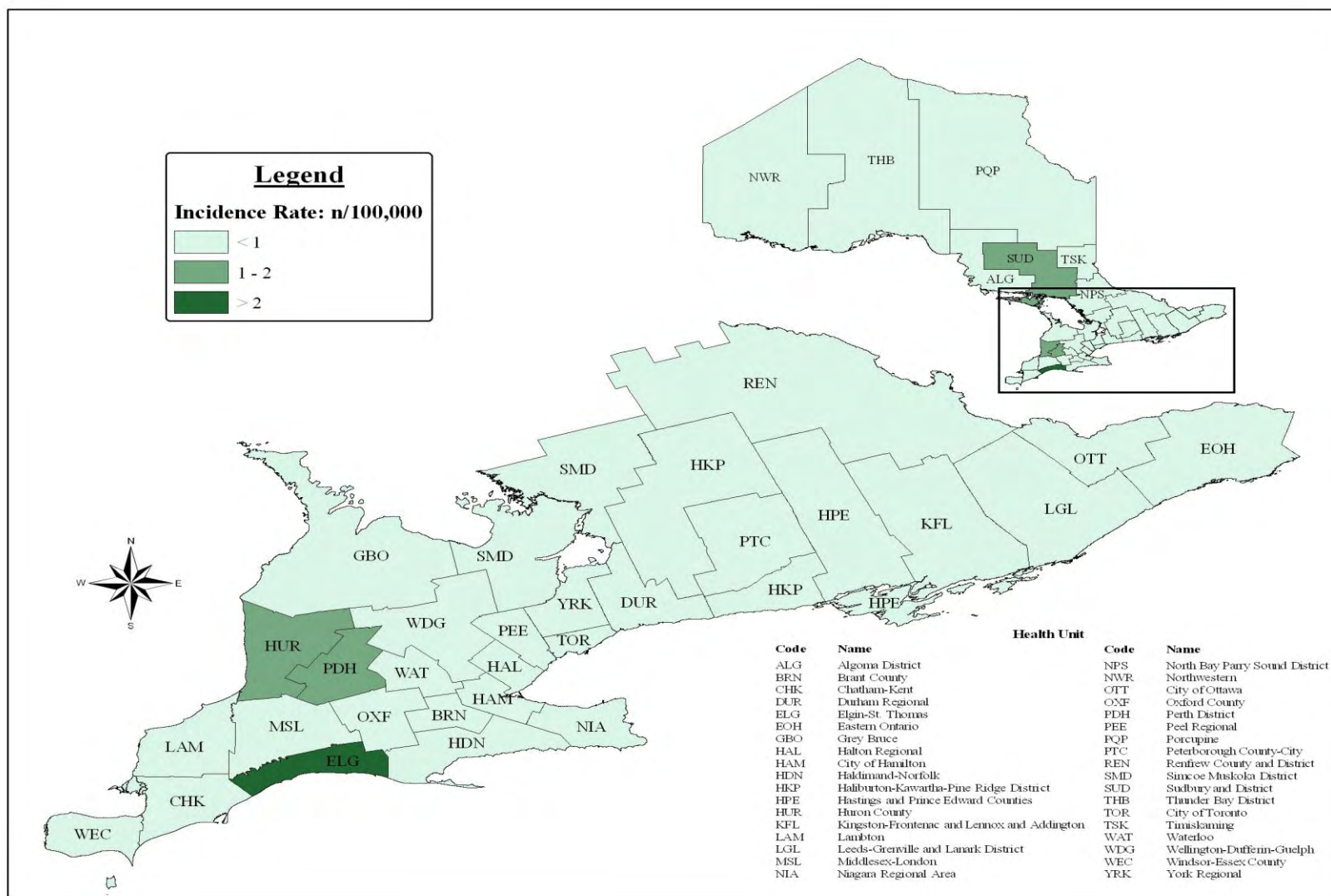
Table 4.3.1: Incidence of Legionellosis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
<1	0	0.0	0	0.0	0	0.0
1-19	0	0.0	1	0.1	1	0.0
20-44	1	0.0	8	0.3	9	0.2
45-64	9	0.5	20	1.2	29	0.9
65+	5	0.5	14	1.9	19	1.1
Total	15	0.2	43	0.7	58	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 4.3.1: Incidence of Legionellosis by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases

Table 4.3.2: Incidence of Legionellosis by Public Health Unit: Ontario, 2007

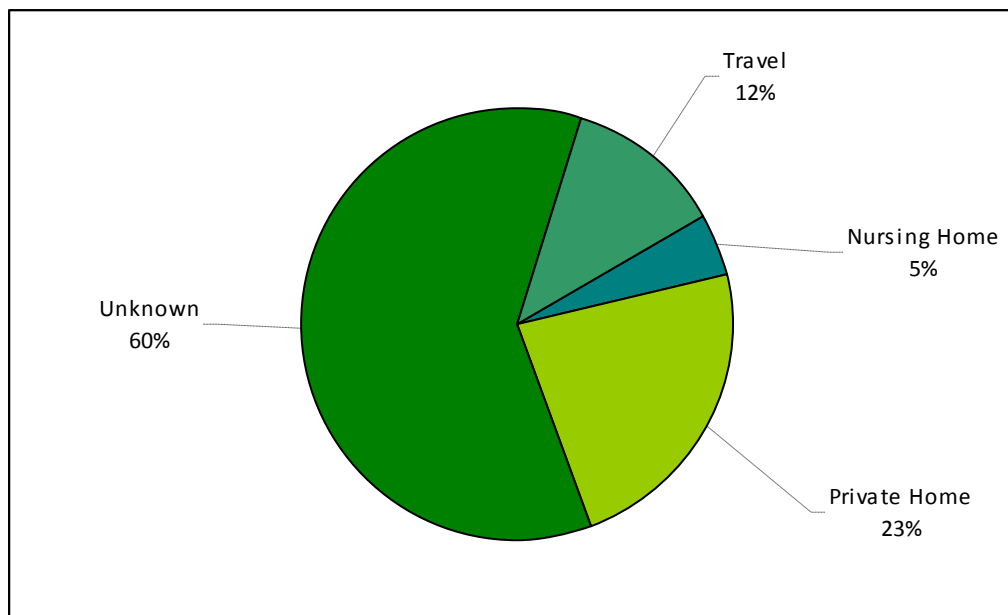
Public Health Unit	Number of cases	Rate/100,000 population
Elgin-St. Thomas	2	2.2
Huron County	1	1.6
Sudbury District	3	1.5
Perth District	1	1.3
Halton Region	4	0.9
Peel Region	12	0.9
Algoma District	1	0.8
Brant County	1	0.7
Middlesex-London	3	0.7
Windsor-Essex County	3	0.7
Grey-Bruce	1	0.6
Hamilton, City of	3	0.6
Kingston-Frontenac and Lennox and Addington	1	0.5
Toronto	14	0.5
Wellington-Dufferin-Guelph	1	0.4
Durham Region	2	0.3
Niagara Region	1	0.2
Waterloo Region	1	0.2
York Region	2	0.2
Ottawa, City of	1	0.1
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton-Kawartha- Pine Ridge District	0	0.0
Hastings Prince Edward Counties	0	0.0
Lambton County	0	0.0
Leeds-Grenville and Lanark District	0	0.0
North Bay Parry Sound District Health Unit	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Ontario	58	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases

Figure 4.3.4: Most Likely Exposure Setting for Legionellosis Cases: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

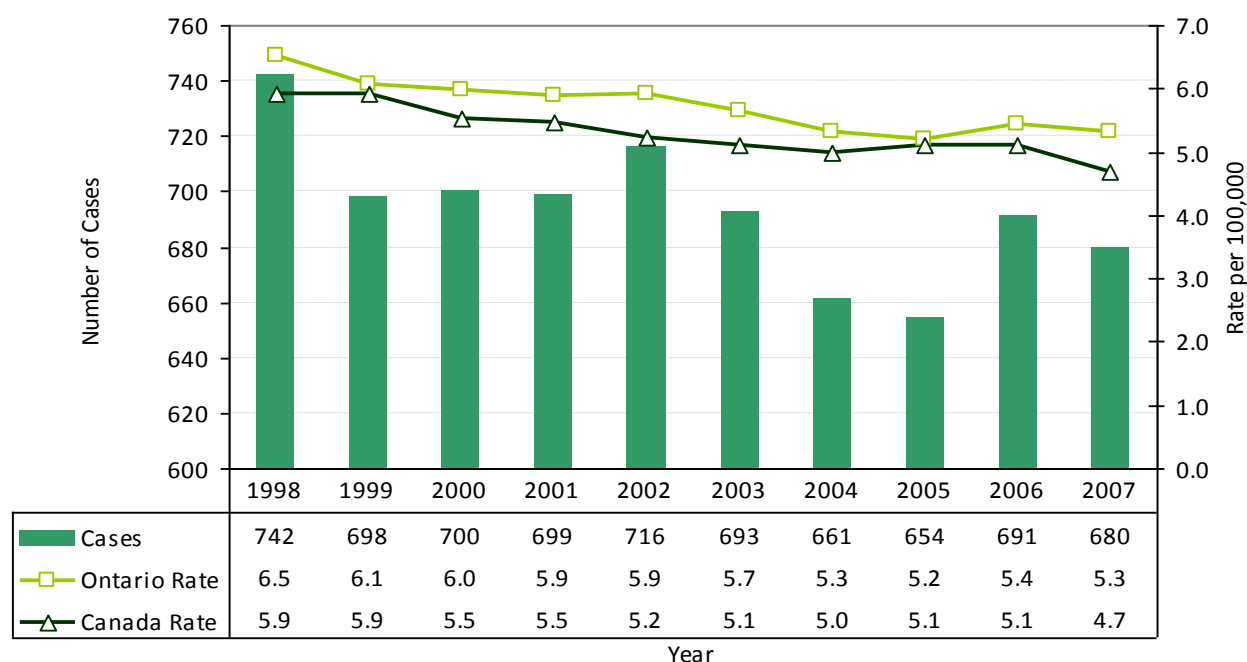
Note 1: The most likely exposure was selected for cases reporting more than one exposure

Note 2: Exposure details were not reported for 26% of cases; these cases were excluded

4.4 TUBERCULOSIS (Active)

- Ontario reported 680 confirmed cases of tuberculosis (TB) in 2007, which represents an incidence rate of 5.3 cases per 100,000 population (Figure 4.4.1).
- Between 1998 and 2007, the incidence rate of TB in Ontario decreased steadily from 6.5 to 5.3 cases per 100,000 population. During this period, Ontario's annual incidence rates for TB consistently exceeded the national average (Figure 4.4.1).
- In 2007, the overall incidence rate for TB was similar for males and females at 5.5 and 5.1 cases per 100,000 population, respectively. However, age-specific rates varied among males and females (Figure 4.4.3, Table 4.4.1).
- The incidence of TB was highest among people aged 65 years and older at 11.4 cases per 100,000 population (Figure 4.4.3, Table 4.4.1).
- Toronto and Peel Region reported the highest incidence rates of TB at 12.5 and 9.7 cases per 100,000 population, respectively. Northwestern reported the third highest incidence rate at 8.7 cases per 100,000 population (Table 4.4.2).
- Among cases reporting at least one risk factor in 2007, being a close contact of an existing case of TB was the most common behavioural/social risk factor for acquiring TB (34%). Having lived in (66%), or travelled to (12%) an endemic area were the most commonly reported exposure settings for acquiring TB. Self-reported HIV/AIDS (43%) and other chronic medical conditions (18%) were the most common medical risk factors reported by TB cases in 2007 (Table 4.4.3).
- In 2007, 3% (22) of TB cases tested positive for HIV.
- 6,934 individuals developed active TB between 1998 and 2007; 5,918 (85%) were born outside Canada, and 772 (11%) were born within Canada. Country of birth was unknown or missing for the remaining 4% of cases (Figure 4.4.4).
- Among TB cases with active infections and who were born outside of Canada between 1998 and 2007, the top four countries of birth were India (17%), the Philippines (11%), China (11%), and Vietnam (8%) (Table 4.4.4).
- TB was classified as an underlying cause of death for 20% of active TB cases, a contributing cause for 41%, and unrelated for 29% of active TB cases who died in 2007 (n=56) (Table 4.4.6).
- From 2005 to 2007, the proportion of TB cases reporting resistance to one or more drugs decreased from 11% to 9%. The proportion of cases exhibiting multi-drug resistant (MDR) TB decreased from 2% to 1% (Table 4.4.8).

Figure 4.4.1: Incidence of Active Tuberculosis in Ontario and Canada: 1998-2007

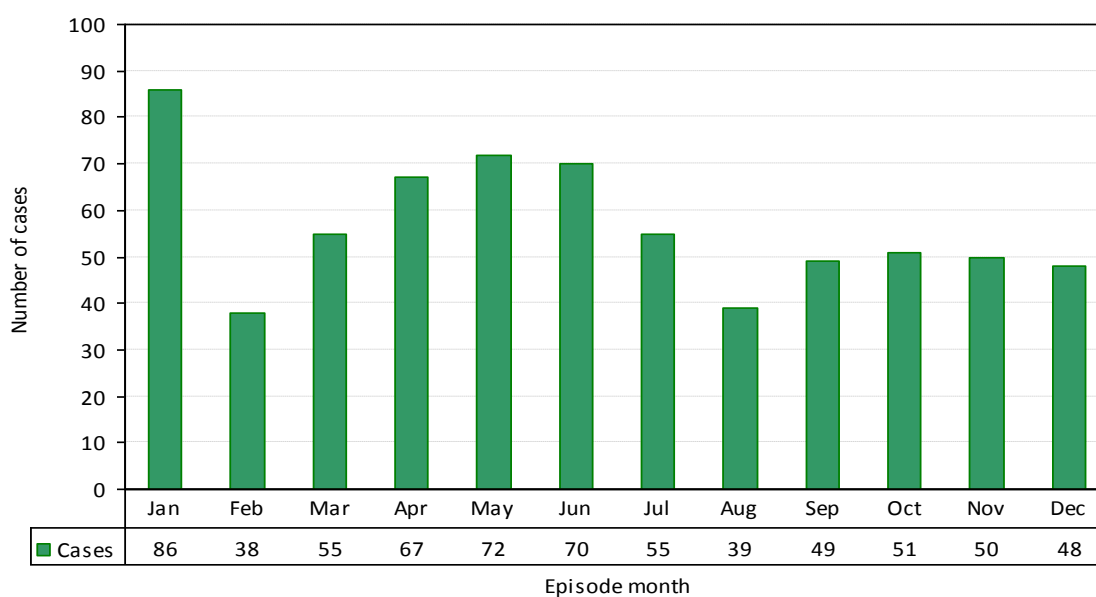


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Data Source (Canada rates): Public Health Agency of Canada. Tuberculosis in Canada 2007. Ottawa (Canada): Minister of Public Works and Government Services Canada; 2009. Available online: <http://www.publichealth.gc.ca/tuberculosis>.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

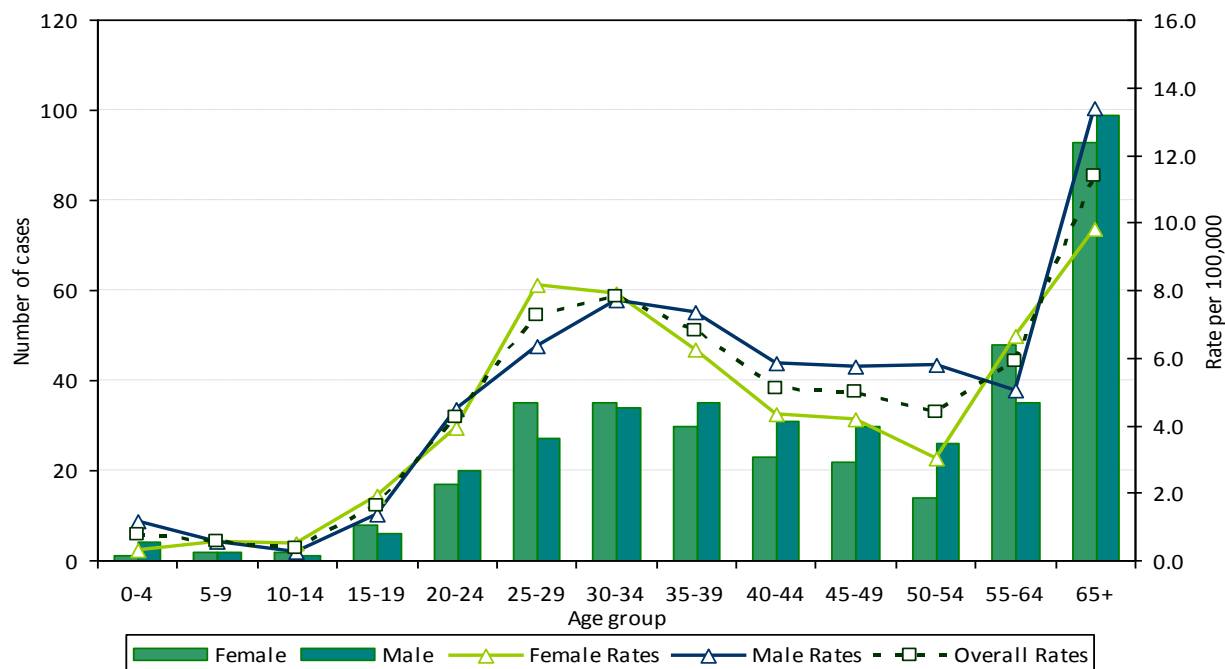
Figure 4.4.2: Number of reported cases of Active Tuberculosis by month, Ontario 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note: Episode onset month refers to the best estimate of the onset of illness month.

Figure 4.4.3: Incidence of Active Tuberculosis by Age and Sex: Ontario, 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

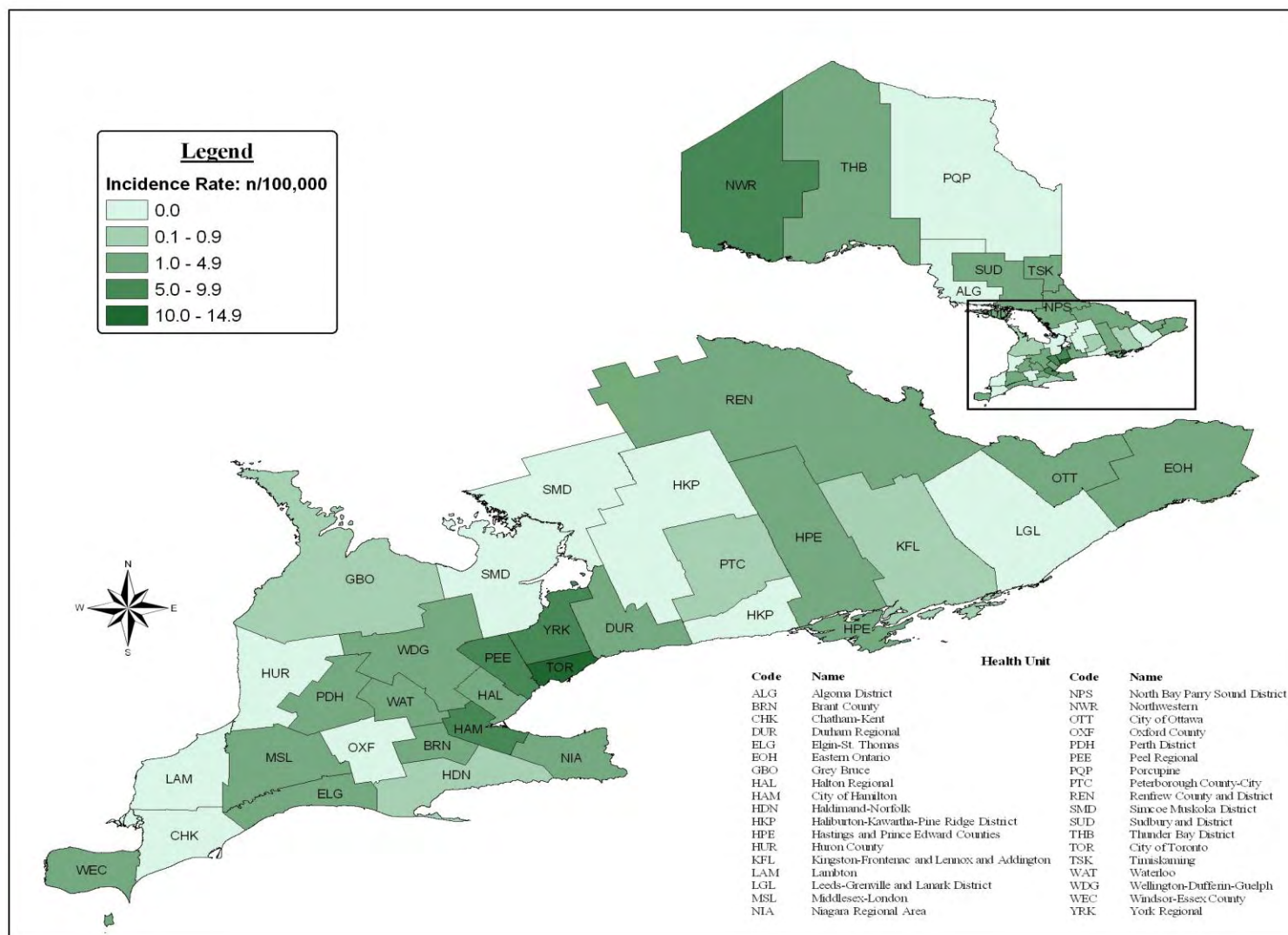
Table 4.4.1: Incidence of Active Tuberculosis by Age and Sex: Ontario, 2007

Age group (years)	Females		Males		Total	
	Number of Cases	Rate/ 100,000 population	Number of Cases	Rate/ 100,000 population	Number of Cases	Rate/ 100,000 population
0-4	1	0.3	4	1.2	5	0.7
5-9	2	0.6	2	0.5	4	0.5
10-14	2	0.5	1	0.2	3	0.4
15-19	8	1.9	6	1.4	14	1.6
20-24	17	3.9	20	4.5	37	4.2
25-29	35	8.1	27	6.3	62	7.2
30-34	35	7.9	34	7.7	69	7.8
35-39	30	6.2	35	7.3	65	6.8
40-44	23	4.3	31	5.8	54	5.1
45-49	22	4.2	30	5.7	52	5.0
50-54	14	3.0	26	5.8	40	4.4
55-64	48	6.6	35	5.1	83	5.9
65+	93	9.8	99	13.4	192	11.4
Total	330	5.1	350	5.5	680	5.3

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Map 4.4.1: Incidence Rate of Active Tuberculosis by Public Health Unit: Ontario, 2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification.

Table 4.4.2: Incidence of Active Tuberculosis by Diagnosing Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Toronto	332	12.5
Peel Region	126	9.7
Northwestern	7	8.7
York Region	63	6.5
Hamilton	28	5.4
Ottawa	35	4.1
Waterloo Region	17	3.4
Elgin-St. Thomas	3	3.3
Timiskaming	1	2.9
Durham Region	14	2.4
North Bay Parry Sound District	3	2.4
Halton Region	11	2.3
Brant County	3	2.2
Middlesex-London	9	2.1
Sudbury and District	3	1.5
Perth District	1	1.3
Thunder Bay District	2	1.3
Hastings & Prince Edward Counties	2	1.2
Niagara Region	5	1.2
Windsor-Essex County	5	1.2
Wellington-Dufferin-Guelph	3	1.1
Eastern Ontario	2	1.0
Renfrew County and District	1	1.0
Haldimand-Norfolk	1	0.9
Peterborough County-City	1	0.7
Grey Bruce	1	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Algoma District	0	0.0
Chatham-Kent	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Huron County	0	0.0
Lambton County	0	0.0
Leeds, Grenville and Lanark District	0	0.0
Oxford County	0	0.0
Porcupine	0	0.0
Simcoe Muskoka District	0	0.0
Ontario	680	5.3

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification.

Table 4.4.3: Exposure Settings and Risk Factors for Tuberculosis, Ontario: 2007

Risk Factors and Exposure Setting ¹		Cases Reporting the Risk Factor/ Exposure Setting (n =680)	Percentage
Social/ Behavioural Risk Factors	Close contact of a case	38	34
	Substance abuse	23	21
	Other ²	6	5
	Low income	5	4
	No social/behavioural risk factor reported	40	36
	Total	112	100
Exposure Settings	Lived in an endemic area	190	66
	Travelled to an endemic area	35	12
	Institution	22	8
	Other ³	19	7
	Under-housed	16	6
	Unknown	7	2
	Total	289	100
Medical Risk Factors ⁶	Self-reported HIV/AIDS ⁴	108	43
	Other underlying medical conditions	46	18
	Diabetes mellitus	24	9
	Past TB infection	19	8
	Immuno-compromised	15	6
	Other ⁵	12	5
	No medical risk factors reported	29	11
	Total	253	100

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010]

Note 1: TB cases may report more than one risk factor or exposure setting.

Note 2: Includes "stress" and "unknown"

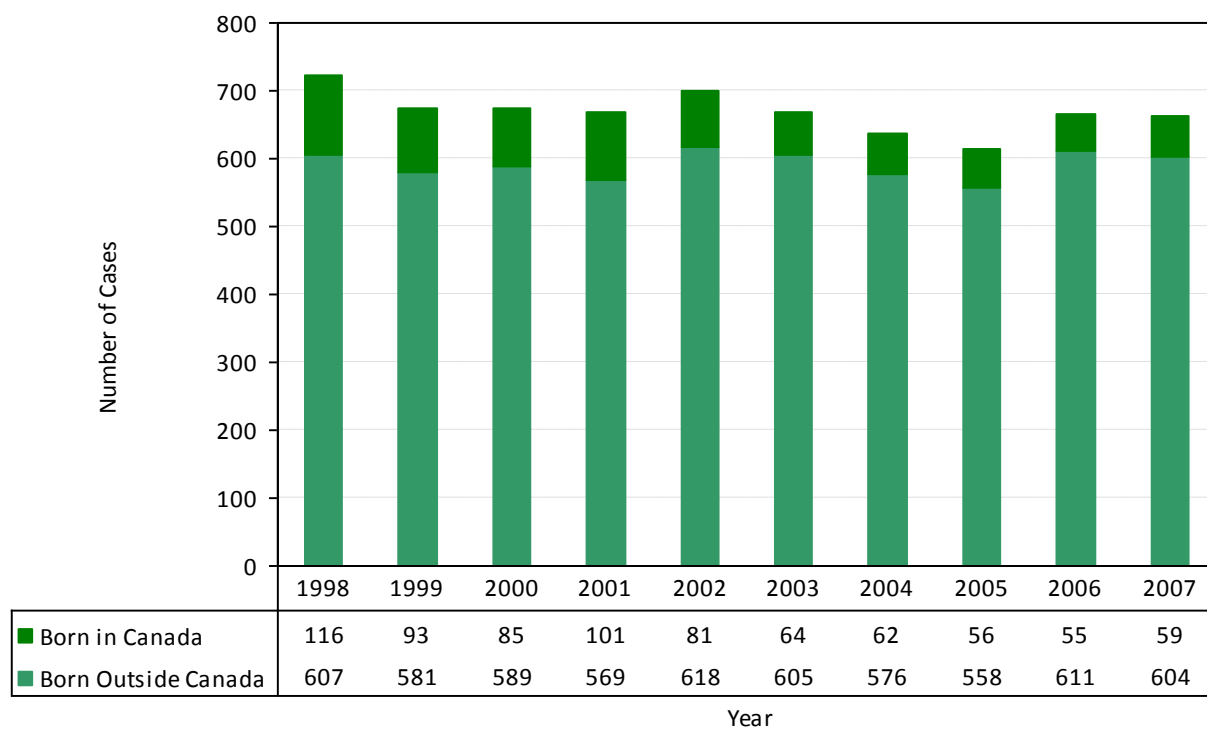
Note 3: Includes "refugee camp", "prisoner of war camp", and "drop-in centre"

Note 4: The number of cases reporting HIV/AIDS as a medical risk factor was substantially greater than the number of reported co-infections of HIV/AIDS and TB as reported in the TB chapter overview. This might be attributed to the fact that the TB/HIV co-infections rate is based on laboratory confirmed cases that were officially reported to the Ministry of Health and Long-Term Care whereas medical risk factors were self-reported.

Note 5: Includes "lifestyle", "prolonged steroid therapy", and "unknown"

Note 6: Excludes medical risk factors reported as "abnormal chest x-ray" and age when infected <=5 years

Figure 4.4.4: Active Tuberculosis Cases by Country of Origin: Ontario, 1998-2007



Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: Excludes 244 cases where country of origin is unknown, unspecified, or missing.

Table 4.4.4: Active Tuberculosis by Country of Origin: Ontario, 1998-2007

Country of Origin	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Born Outside Canada											
India	80	69	86	95	101	115	115	115	127	105	1,008
Philippines	63	63	70	58	69	73	67	56	83	72	674
China	82	62	66	56	72	63	52	67	69	80	669
Vietnam	53	69	47	44	53	48	56	37	34	33	474
Somalia	38	37	38	21	26	27	22	27	22	22	280
Pakistan	20	25	26	36	30	25	29	21	40	40	292
Hong Kong	34	36	40	24	27	27	12	9	16	18	243
Ethiopia	28	22	16	13	16	25	18	20	22	12	192
Sri Lanka	16	19	18	18	14	23	21	26	26	27	208
South Korea	0	0	0	0	0	0	0	8	11	13	32
Other	193	179	182	204	210	179	184	172	161	182	1,846
Sub-Total	607	581	589	569	618	605	576	558	611	604	5,918
Born in Canada											
Inuit	0	0	0	0	1	0	0	1	0	1	3
Non-Aboriginal	100	79	73	83	67	56	45	49	46	48	646
Registered/ Status Indian	16	14	12	18	13	8	17	6	9	10	123
Sub-Total	116	93	85	101	81	64	62	56	55	59	772
Unknown	19	24	26	29	17	24	23	40	25	17	244
TOTAL	742	698	700	699	716	693	661	654	691	680	6,934

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Table 4.4.5: Active Tuberculosis Cases by Method of Detection: Ontario, 2007

Method of Detection	Number of cases	Percentage of Total (n=680)
Symptoms	537	79%
Immigration Screening	43	6%
Routine Screening	27	4%
Contact Tracing	19	3%
Targeted Screening	9	1%
Other ¹	29	4%
Unknown	16	2%
Total	680	100%

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: Other includes post-mortem and detection during medical treatment for another condition.

Note 2: Method of detection refers to the means through which the case of Tuberculosis was initially identified.

Table 4.4.6: Cause of Death among Active Tuberculosis Cases: Ontario, 2007

Cause of Death	Number of cases	Percentage of Total (n=56)
Contributing Cause of Death	23	41%
Unrelated to Cause of Death	16	29%
Underlying Cause of Death	11	20%
Unknown	6	11%
Total	56	100%

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note: Includes only TB cases for which a date of death in 2007 was reported.

Table 4.4.7: Active Tuberculosis Cases by Diagnostic Site: Ontario, 2007

Diagnostic Site ¹	Number of cases	Percentage of Total (n=680)
Respiratory System	448	66%
Lymphatic System	117	17%
Pleurisy	38	6%
Gastrointestinal System	31	5%
Nervous System	23	3%
Genitourinary System	17	3%
Bones and Joints System	16	2%
Integumentary System	14	2%
Biliary	9	1%
Other ²	17	2%
Total	730	n/a

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: TB cases may have more than one disease site. In all, 730 disease sites were identified among 680 cases.

Note 2: Other includes Ileocecal TB, TB adenitis, sample from brain tumour, psoas abscess, TB of pericardium, disseminated TB (lymphadenitis, pulmonary, hepatosplenic, pancreatic, abdomen).

Table 4.4.8: Drug Resistance among Active Tuberculosis Cases: Ontario, 2005- 2007

Level of Resistance	2005		2006		2007	
	Number of cases	Percentage of Total	Number of cases	Percentage of Total	Number of cases	Percentage of Total
Any Drug Resistance	75	11%	53	8%	62	9%
MDR ¹	14	2%	8	1%	8	1%
XDR ¹	0	0%	0	0%	1	0%
XXDR ¹	0	0%	0	0%	0	0%
Total Cases	654	100%	691	100%	680	100%

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: Multiple drug resistant (MDR), extensively drug resistant (XDR), extremely drug resistant (XXDR); see the Technical Notes for full definitions.

Table 4.4.9: Compliance with Prescribed Treatment Regimens among Active Tuberculosis Cases: Ontario, 2005-2007

Year	Number of cases	At Least 80% Compliance Level Achieved (n) ¹	At Least 80% Compliance Level Achieved (%) ¹
2005	654	489	75%
2006	691	571	83%
2007	680	539	79%

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: Compliance is an estimate of the amount of medication taken by a case over their treatment period.

Table 4.4.10: Modes of Treatment and Overall Compliance for Active Tuberculosis Cases: Ontario, 2007

Mode of Treatment	Compliance Level ¹						Number of cases
	100%	80-99%	50-79%	<50%	0%	Unknown	
Daily- Self Administered	14	26	3	0	3	11	57
Directly observed therapy (DOT)	79	238	20	6	2	31	376
Self-Administered	31	122	14	1	1	24	193
Other	12	17	1	1	3	2	36
Unknown	0	0	0	0	1	17	18
Total	136	403	38	8	10	85	680

Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Note 1: Compliance is an estimate of the amount of medication taken by a case over their treatment period.

Chapter 5: VECTOR-BORNE DISEASES

- The most frequently reported vector-borne diseases in Ontario are Malaria, Lyme disease and West Nile Virus illness (WNV). Both Lyme disease and WNV illness are endemic to Ontario; malaria is not.
- Between 1998 and 2007, the incidence of Lyme disease increased steadily from 20 reported cases in 1998 to 69 cases in 2007.
- Since 2005, the incidence of non-travel related Lyme disease cases has increased from less than 0.1 cases per 100,000 population in 2005 to 0.2 cases per 100,000 population in 2007.
- Since its first report in 2002, WNV illness has declined sharply in Ontario. In 2002, there were 394 confirmed and probable cases of WNV illness. The lowest number of cases was reported in Ontario in 2004 (14).
- In 2007, Ontario reported 17 cases of West Nile Virus illness, representing an incidence rate of 0.1 cases per 100,000 population.
- The incidence of malaria in Ontario has remained stable over the past 10 years, with an average of 170 cases per year.
- Malaria is not endemic in Ontario and its incidence reflects travel to malaria- endemic countries or recent immigration from those countries. During the period 1998 to 2007, there were no exposures to malaria in Ontario.

Table 5.1: Incidence of Vector-borne Diseases; Ontario, 1998-2007

Vector-borne Diseases	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
Lyme Disease	20	0.2	23	0.2	46	0.4	24	0.2	28	0.2	26	0.2	33	0.3	41	0.3	48	0.4	69	0.5
Malaria	161	1.4	166	1.4	184	1.6	162	1.4	154	1.3	167	1.4	181	1.5	187	1.5	188	1.5	176	1.4
West Nile Virus (WNV)	nr	nr	nr	nr	nr	nr	nr	nr	394	3.3	89	0.7	14	0.1	101	0.8	42	0.3	17	0.1

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note 1: Incidence rate per 100,000 population

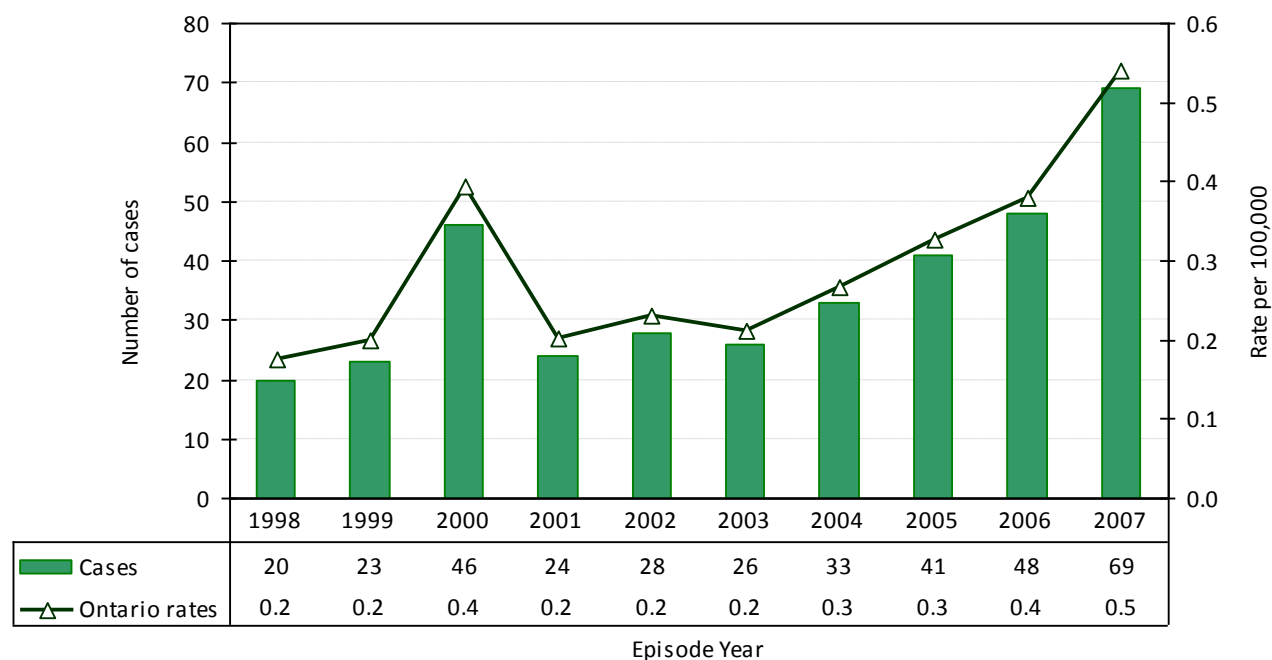
Note 2: No cases were reported for the following vector-borne diseases in Ontario during the period 1998-2007: yellow fever

Note 3: Nr - not reportable. WNV illness became a reportable disease in Ontario in 2002

5.1 LYME DISEASE

- Ontario reported 69 confirmed cases of Lyme disease in 2007, representing an incidence rate of 0.5 cases per 100,000 population (Figure 5.1.1).
- Between 1998 and 2007, the incidence of Lyme disease increased steadily from 20 reported cases in 1998 to 69 cases in 2007 (Figure 5.1.1).
- The incidence rate of non-travel related Lyme disease cases increased from less than 0.1 cases per 100,000 population in 2005 to 0.2 cases per 100,000 population in 2007 (23 cases). Non-travel related Lyme disease refers to Lyme disease cases who did not report travel outside of Ontario during the 30 days before the onset of symptoms.
- The incidence of Lyme disease peaked in June, July and August which accounted for 61% of all cases (Figure 5.1.2). Non-travel related cases peaked in the month of July, accounting for 56% of cases reported during that month.
- In 2007, the number of reported cases of Lyme disease was substantially higher among females (40 cases or 0.6 case per 100,000 population) compared to males (29 cases or 0.5 cases per 100,000 population). There was a similar trend in the incidence rate of non-travel related cases in 2007 (Figure 5.1.3 and Table 5.1.1).
- Of the 31 cases who reported travel outside of Ontario, 28 cases (90%) reported travel to locations endemic for Lyme disease in the United States, Europe and the former Soviet Union.
- Exposure locations for Lyme disease cases in 2007 indicated an increase in the range of locations for the acquisition of Lyme disease in Ontario. These locations include jurisdictions in south-eastern and south-western Ontario, where the Lyme disease carrying tick has established populations (Haldimand-Norfolk, Chatham-Kent, Kingston-Frontenac-Lennox and Addington and Leeds-Grenville and Lanark) and other un-established areas as far north as Thunder Bay (Map 5.1.1).

Figure 5.1.1: Incidence of Lyme Disease in Ontario: 1998-2007

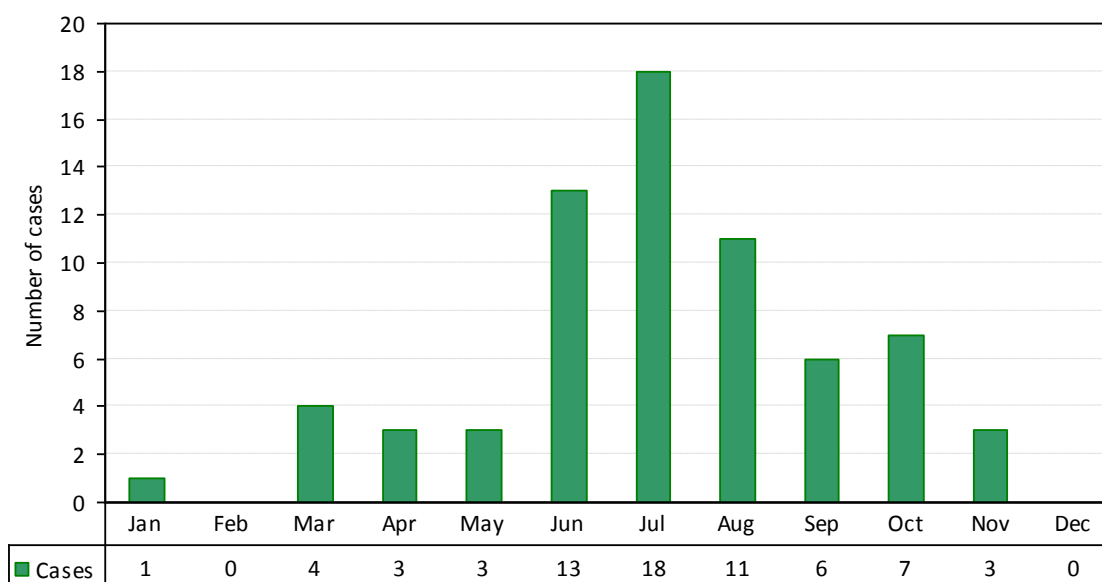


Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Lyme disease is not a nationally reportable disease.

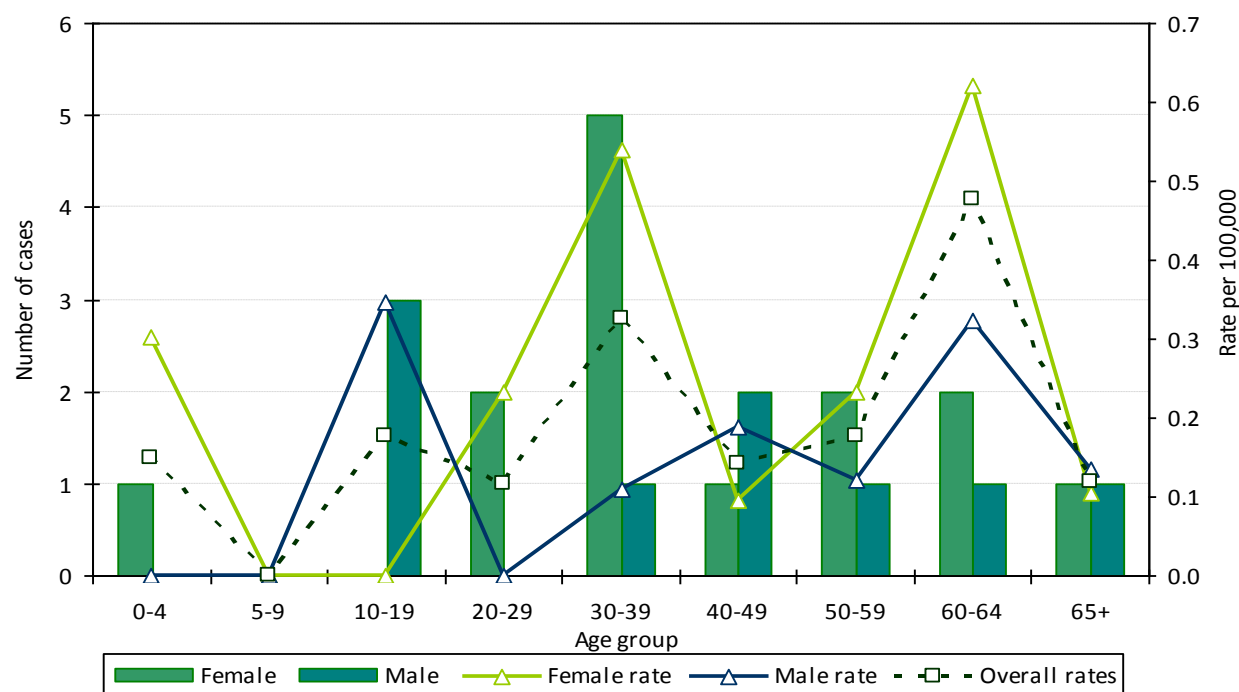
Figure 5.1.2: Incidence of Lyme Disease by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode month refers to the best estimate of the month of onset of illness.

Figure 5.1.3: Incidence of Lyme Disease by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Includes all case of Lyme disease reported in 2007, including travel related cases

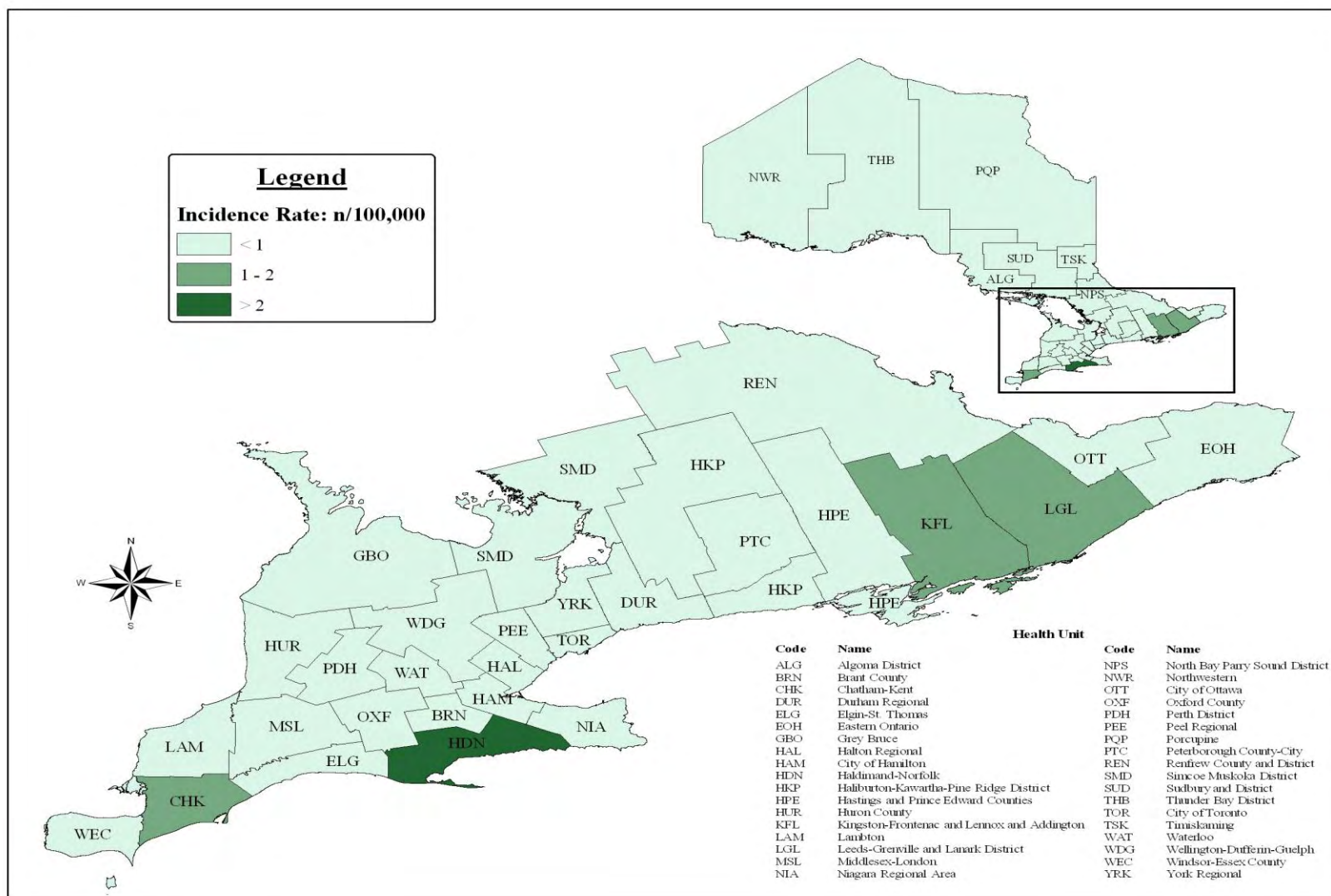
Table 5.1.1: Incidence of Lyme Disease by Age and Sex: Ontario, 2007

Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	1	0.3	1	0.3	2	0.3
5-9	1	0.3	1	0.3	2	0.3
10-19	5	0.6	4	0.5	9	0.5
20-29	4	0.5	1	0.1	5	0.3
30-39	8	0.9	4	0.4	12	0.7
40-49	3	0.3	6	0.6	9	0.4
50-59	9	1.0	6	0.7	15	0.9
60-64	4	1.2	1	0.3	5	0.8
65+	5	0.5	5	0.7	10	0.6
Total	40	0.6	29	0.5	69	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Includes all case of Lyme disease reported in 2007, including travel related cases

Map 5.1.1: Incidence of Non-travel Related Lyme Disease by Public Health Unit of Most Likely Exposure: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009]

Note: Includes only non-travel related cases that did not report any travel outside of Ontario in the 30 days before the onset of symptoms

Table 5.1.2: Incidence of Lyme Disease by Public Health Unit of Residence: Ontario, 2007

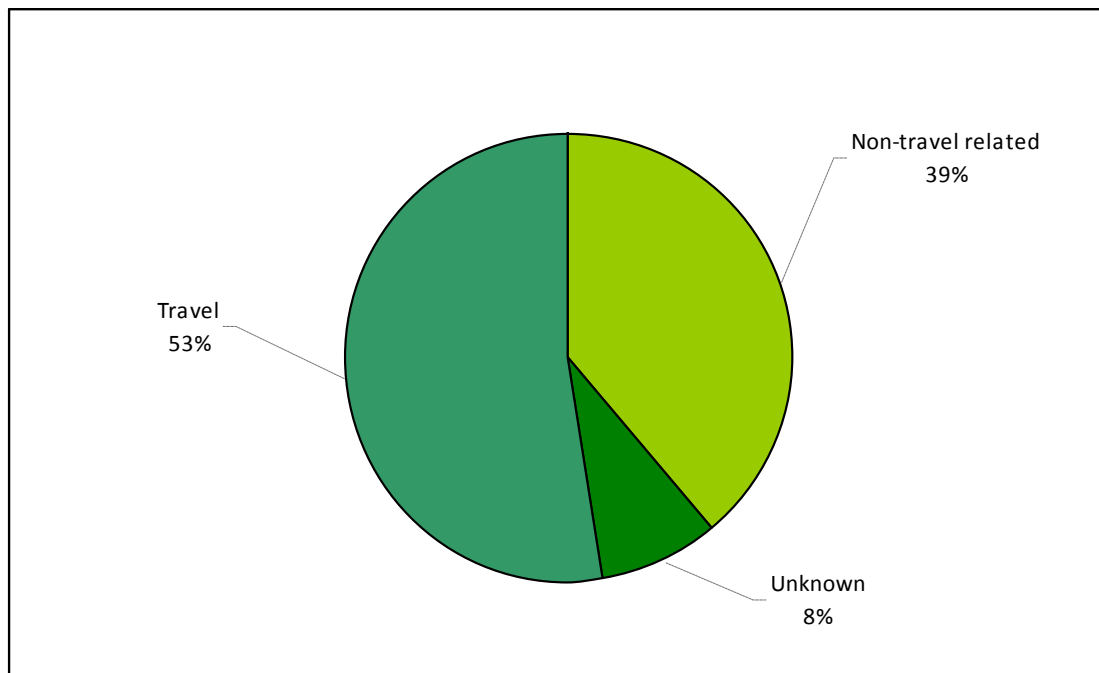
Public Health Unit	Number of cases	Rate/100,000 population
Durham Region	6	6.6
Timiskaming	1	2.9
Niagara Region	3	2.4
Renfrew County And District	2	2.0
Thunder Bay District	3	1.9
Halton Region	3	1.8
Hastings & Prince Edward Counties	1	1.6
Kingston, Frontenac, Lennox & Addington	2	1.5
Eastern Ontario	2	1.2
Lambton County	2	1.2
Ottawa, City of	2	1.0
Waterloo Region	5	1.0
Elgin-St. Thomas	1	0.9
Oxford County	1	0.9
Leeds Grenville	3	0.7
Toronto	15	0.6
Peel Region	6	0.5
Haliburton, Kawartha, Pine Ridge	2	0.4
Simcoe Muskoka	2	0.4
York Region	4	0.4
Hamilton, City of	1	0.2
Haldimand-Norfolk	1	0.2
Northwestern	1	0.1
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Grey Bruce	0	0.0
Huron County	0	0.0
Middlesex-London	0	0.0
North Bay Parry Sound District	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Sudbury And District	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Windsor-Essex	0	0.0
Ontario	69	0.5

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Includes all case of Lyme disease reported in 2007, including travel related cases

Figure 5.1.4: Most Likely Exposure Settings for Cases of Lyme Disease: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

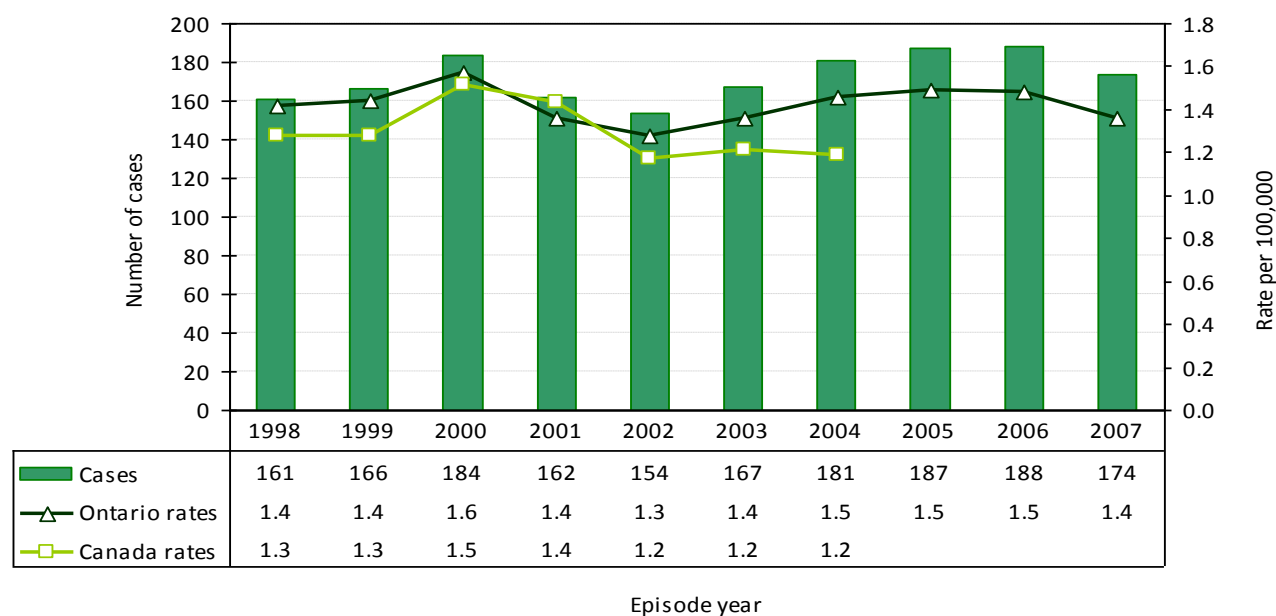
Note 1: The most likely exposure was selected for cases reporting more than 1 exposure

Note 2: Exposure details were not reported for 14% of cases; these cases were excluded

5.2 MALARIA

- In 2007, Ontario reported 174 confirmed cases of malaria, representing an incidence of 1.4 cases per 100,000 population.
- Malaria is not endemic in Ontario and its incidence reflects travel to malaria endemic countries or recent immigration from these countries.
- Between 1998-2007, the incidence of malaria in Ontario remained stable with an average of 170 cases or 1.4 cases per 100,000 population. However, the number of cases in 2007 was slightly lower than the annual case counts of the previous three years.
- Between 1998 and 2004, the incidence of malaria remained relatively stable in Canada with an average incidence of 1.3 cases per 100,000 population.
- Unlike endemic vector-borne diseases such as WNV illness and Lyme disease, malaria does not demonstrate any seasonal clustering. The months of June (16%), September (13%) and December (9%) accounted for the highest number of cases; this pattern may correlate to an increase in travel to malaria-endemic countries during these months.
- In 2007, males accounted for over half (58%) of confirmed cases of malaria with an incidence rate of 1.6 cases per 100,000 population, while females accounted for 42% of cases with an incidence rate of 1.1 cases per 100,000 population.
- For males, the highest number of cases occurred among those aged 20-24 years (15 cases or 3.4 cases per 100,000 population), while the highest number of cases among females occurred among the 40-44 age group (11 cases or 2.1 cases per 100,000 population).
- In 2007, Peel Region and Toronto reported the highest incidence rates of malaria at 3.5 and 3.2 cases per 100,000 population, respectively.
- Travel to or recent immigration from malaria endemic countries in Africa and the Indian sub-continent accounted for 89% of all known exposures reported by malaria cases. Travel to the Caribbean and Latin-American region (8%) and South-East Asia (3%) accounted for the remaining exposures.
- In 2007, *Plasmodium falciparum* was the etiologic agent for more than half (57%) of reported cases of malaria for which the etiologic agent was specified. Other etiologic agents, *P. vivax* (39%), *P. ovale* (3%) and *P. malariae* (2%), accounted for the remaining cases.
- *P. falciparum* (54%), *P. malariae* (100%) and *P. ovale* (100%) were most frequently associated with travel to Africa, while *P. vivax* (64%) was most frequently associated with travel to South Asia.

Figure 5.2.1: Incidence of Malaria in Ontario and Canada: 1998-2007



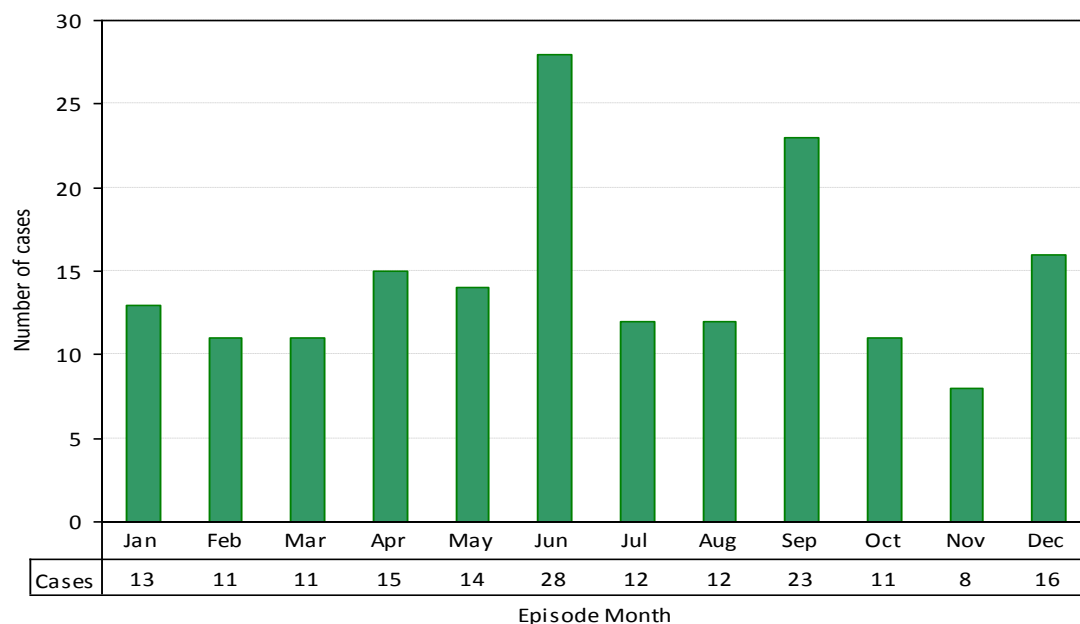
Data Source (Ontario data): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Data Source (Canadian data): Public Health Agency of Canada. Notifiable Diseases On-line. Downloaded March 6, 2009: http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/index_e.html.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Canadian rates available up to 2004.

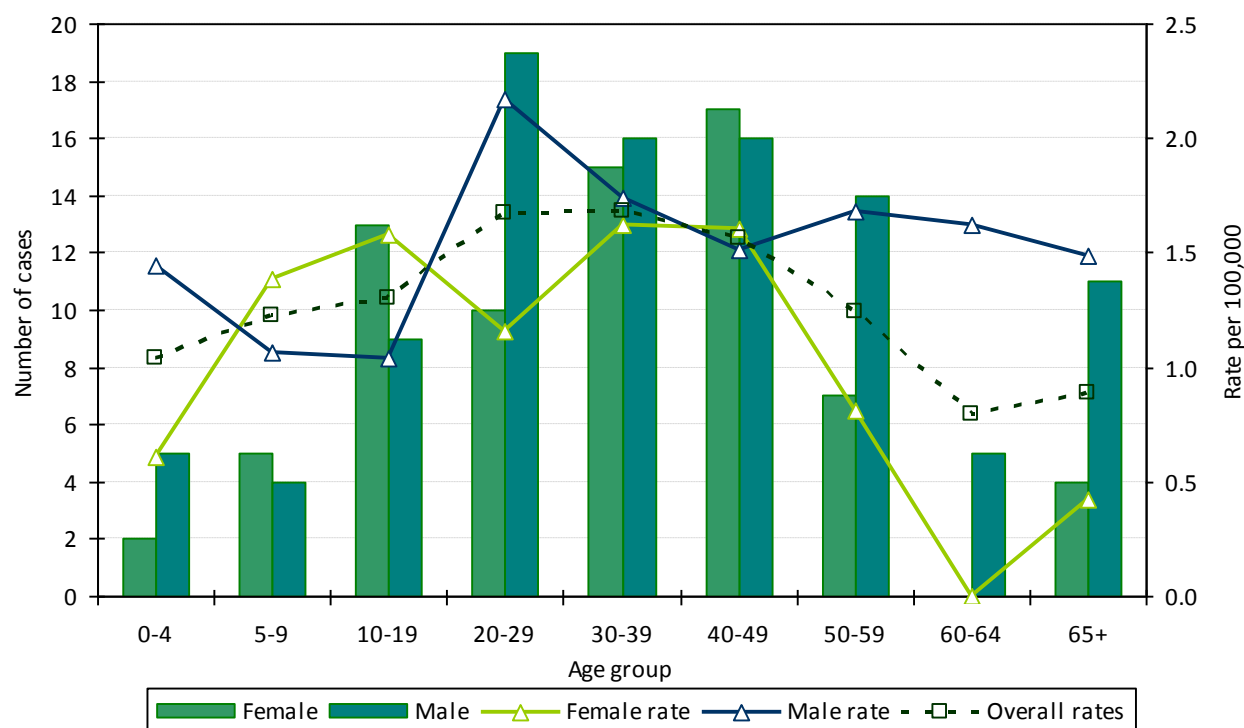
Figure 5.2.2: Incidence of Malaria by Episode Month: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Note: Episode onset month refers to the best estimate of the month of onset of illness.

Figure 5.2.3: Incidence of Malaria by Age and Sex: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 2 cases for which age and/or sex were unknown

Table 5.2.1: Incidence of Malaria by Age and Sex: Ontario, 2007

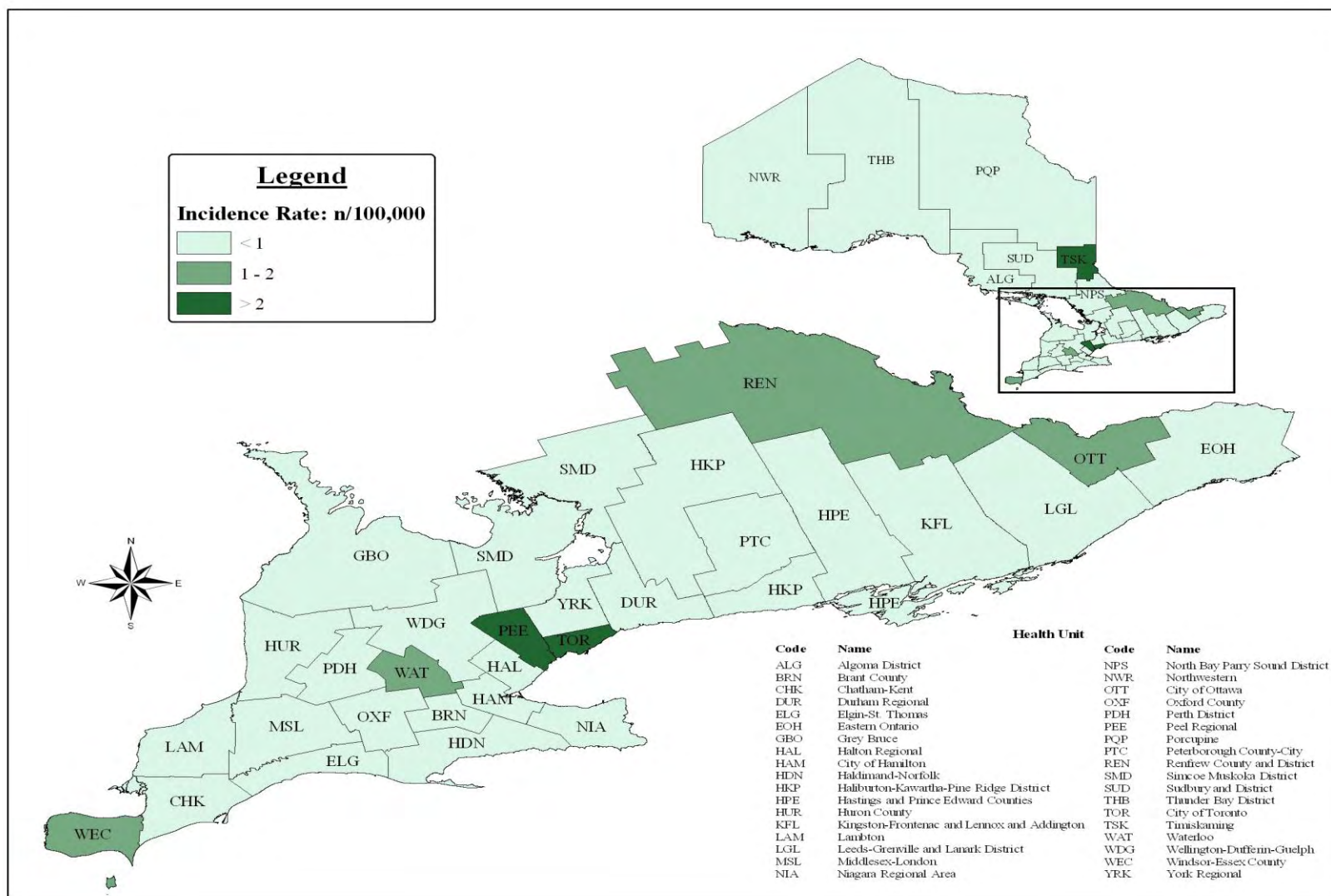
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	2	0.6	5	1.4	7	1.0
5-9	5	1.4	4	1.1	9	1.2
10-19	13	1.6	9	1.0	22	1.3
20-29	10	1.2	19	2.2	29	1.7
30-39	15	1.6	16	1.7	31	1.7
40-49	17	1.6	16	1.5	33	1.6
50-59	7	0.8	14	1.7	21	1.2
60-64	0	0.0	5	1.6	5	0.8
65+	4	0.4	11	1.5	15	0.9
Total	73	1.1	99	1.6	172	1.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Does not include 2 cases for which age and/or sex were unknown

Map 5.2.1: Incidence Rates of Malaria by Public Health Unit: Ontario, 2007



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 5.2.2: Incidence of Malaria by Public Health Unit: Ontario, 2007

Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	45	3.5
Toronto	85	3.2
Timiskaming	1	2.9
Ottawa, City of	10	1.2
Renfrew County and District	1	1.0
Waterloo Region	5	1.0
Windsor-Essex County	4	1.0
Chatham-Kent	1	0.9
Oxford County	1	0.9
North Bay Parry Sound District	1	0.8
York Region	8	0.8
Middlesex-London	3	0.7
Grey-Bruce	1	0.6
Halton Region	3	0.6
Simcoe Muskoka District	2	0.4
Wellington-Dufferin-Guelph	1	0.4
Durham Region	1	0.2
Hamilton, City of	1	0.2
Algoma District	0	0.0
Brant County	0	0.0
Elgin-St Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton Kawartha Pine Ridge District	0	0.0
Hastings Prince Edward Counties	0	0.0
Huron County	0	0.0
Kingston-Frontenac Lennox & Addington	0	0.0
Lambton County	0	0.0
Leeds-Grenville & Lanark District	0	0.0
Niagara Region	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Eastern Ontario	0	0.0
Sudbury and District	0	0.0
Thunder Bay District	0	0.0
Northwestern	0	0
Ontario	174	1.4

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification; Includes travel-related cases

Table 5.2.3: Incidence of Malaria by Region of Travel and Aetiologic Agent: Ontario, 2007

Region of Travel	<i>Plasmodium</i> species					Total	
	<i>Falciparum</i>	<i>Malariae</i>	<i>Ovale</i>	<i>Vivax</i>	Unspecified	Cases (n)	Percent (%)
Africa	46	3	2	4	2	57	33%
Caribbean/L. America	3	0	0	3	1	7	4%
S.E. Asia	1	0	0	2	0	3	2%
South Asia	4	0	0	16	0	20	12%
Unknown Region	31	0	2	33	21	87	50%
Total (cases)	85	3	4	58	24	174	100 %
Total (percent)	49%	2%	2%	33%	14%	100%	100%

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

APPENDICES

Appendix 1: TECHNICAL NOTES

There are some limitations inherent in the data presented in this report and any interpretation or extrapolation should take these into account. Despite these limitations, it is possible to describe trends and estimate where the main burden of infectious diseases lies in Ontario.

Data Sources

Ontario Disease data

The sole source for infectious diseases data in this report is the integrated Public Health Information System (iPHIS), the electronic reporting system for reportable diseases in Ontario. Data in iPHIS are collected by thirty-six public health units in Ontario and reported centrally to the province. iPHIS was implemented in phases throughout 2005, with full implementation in all health units by the end of the year. Except where noted, data for this report were extracted from iPHIS between January and April, 2009. Discrepancies in disease counts and rates provided in this report and previously published data may exist due to:

- enhanced data cleaning prior to analysis
- late reporting
- local data clean up
- differences in data extraction dates.

Where such variability exists, the data provided in the most current Annual Epidemiology Report are definitive.

Population data

Population data for Ontario were extracted from the Public Health Planning Database (PHPDB) in January, 2009. The PHPDB has since been renamed IntelliHEALTH Ontario. Population data were used as denominators to calculate overall, age-, sex- and geographic-specific crude incidence rates. Identified differences in rates and counts from one public health unit to another, and between Ontario and Canada, are absolute and do not imply statistical significance.

The crude incidence rate is based on the following formula:

$$\left\{ \begin{array}{l} \text{Crude incidence rate} = \\ \frac{\text{Number of cases in specified time period \& population}}{\text{Total number of people in that population}} \times 100,000 \end{array} \right\}$$

Throughout the report, the term “incidence rate” signifies a rate or the number of cases observed for every 100,000 Ontarians in a given time, while “incidence” refers to the absolute number of cases reported in a given period. In general, incidence refers to new cases of disease regardless of previous history of the same disease in the same period. HIV and Hepatitis C are exceptions. These diseases often remain undiagnosed for extended periods and their detection by public health is generally not indicative of the actual time of acquisition. Therefore, in the current report, some cases of HIV and hepatitis C that are reported occurred in individuals who likely acquired their infections in earlier years.

Comparator data

Comparative data (incidence rates) for Canada are provided in the report whenever available. These data were obtained from several reports and data tables available publicly on the Public Health Agency of Canada's website: [Notifiable Diseases On-Line](#), [STI Data Table](#), [HIV and AIDS in Canada Surveillance Report](#) and [Tuberculosis in Canada, 2007](#).

Data Limitations and Management

Reference Period

The information in this report reflects the number of incident cases of reportable infectious diseases reported in Ontario through iPHIS in 2007. Trend data cover the period from 1998 to 2007.

With the exception of HIV and AIDS, the number of incident cases in this report is based on episode dates within the reference period. The episode date is an estimate of the onset date of disease for each case. The episode date was determined using the following hierarchy:

- Symptom onset date
- Specimen collection date
- Lab test date
- Reported date

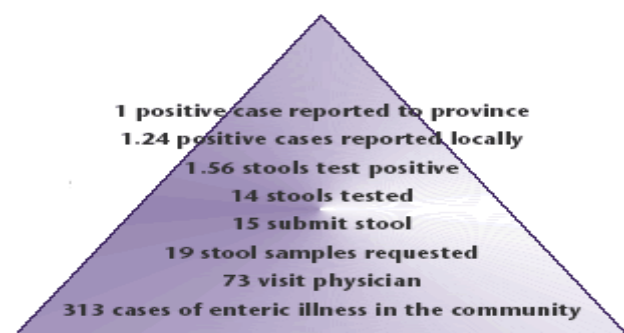
The earliest date available at each stage in the hierarchy was selected as the episode date. If an Onset Date exists, it was selected with priority instead of the specimen collection date and so on.

HIV incident case count is based on the encounter date, which is the date a case became known to public health.

AIDS incident case count is based on the diagnosis date, which is the date of a case's AIDS diagnosis.

Under-reporting

Passive surveillance systems such as iPHIS that rely on physician and laboratory reports of illness are characterized by under-reporting of the true burden of illness. For example, Majowicz et al estimated that only one in every 313 actual cases of enteric illnesses in the community is reported to public health¹. The disease reporting pyramid below depicts the infectious disease reporting chain and how each tier contributes to under-reporting.



Source: Majowicz, S.E., et al, 2005

¹ Majowicz, S.E., et al. 2005. Estimating under-reporting for infectious gastrointestinal illness in Ontario. Canadian Journal of Public Health. 96(3): 178-181.

Case Ascertainment Criteria

This report includes all reports of infectious disease made through iPHIS with an episode date in 2007, with the following exceptions:

1. Cases who were not residents of Ontario at the time of diagnosis;
2. Cases who did not meet the provincial surveillance confirmed case definition;
3. Diseases for which aggregate case counts rather than individual case reports are reported, e.g. chickenpox and institutional outbreaks of gastroenteritis and influenza;
4. Cases reported as encephalitis and meningitis with the following aetiologies: viral, bacterial, vaccine-related and unspecified;
5. Cases of food poisoning with etiologies other than those specified as the causative agent of other reportable enteric diseases; and
6. Cases associated with institutional outbreaks that have not been reported as sporadic incident cases

Re-infections – For several reportable diseases, immunity is not conferred following infection, resulting in continued susceptibility and potential for re-infection. Data in this report do not account for re-infections except where indicated. Thus a single person with more than one episode of the same disease in a single year contributes at least two cases of that disease to the total provincial count for that year.

Exposure determination

The most likely exposure was selected for cases who reported more than one exposure. Selection of the most likely exposure was based on the following hierarchy:

1. Travel-associated exposure - at least one travel destination reported for the case. The determination of travel-associated exposures was based on exposure information entered into iPHIS and is calculated using the “exposure setting”, “exposure setting type”, “exposure name”, “exposure location” and “exposure comments” fields.
2. A known exposure source - at least one exposure is reported for the case that is not travel-related or “unknown”. The following factors influence the selection of the most likely exposure source when multiple known exposures are reported: the exposure has been previously associated with illness or outbreaks, plausibility of the recorded mode of transmission, and consistency within the reported exposure fields. For example, a case with a foodborne mode of transmission cannot report person-person contact as the source of exposure.
3. Unknown exposure - an “unknown” exposure is the only exposure reported for the case
4. Missing - no exposure information is reported for the case

Exposure determination-HIV

Exposure or risk factor categories for HIV cases were determined using a mutually exclusive hierarchy that assigned HIV cases to a single exposure category that best represents the true source of infection for the case when more than one risk factor or exposure was reported. Detailed information about

the exposure hierarchy is available in appendices C1-3 of the Guidelines for the Surveillance of AIDS in Canada.²

Risk Factor Determination

The report includes risk factors for sexually transmitted and bloodborne infections. Cases of STI may report more than one risk factor and therefore the total number of risk factors reported may be greater than the total number of cases reported in a year.

Drug resistance determination-TB

TB cases that are resistant to any anti-TB medication are called drug resistant TB.³

1. Multi-drug resistant TB (MDR) refers to TB cases that are resistant to INH and rifampin, with or without resistance to other first or second line drugs
2. Extensively drug resistant TB (XDR) refers to TB cases that are resistant to at least INH and rifampin from among the first line drugs (i.e. MDR) and resistance to any fluoroquinolone and to at least one of the three injectable second line drugs (capreomycin, kanamycin and amikacin)
3. Extremely drug resistant TB (XXDR) refers to TB cases that are resistant to all first and second line anti-tuberculosis medications⁴

Duplicates – the possibility of duplicates exist because duplicate sets were not identified and excluded unless they were resolved prior to data extraction either at the local or provincial level.

Handling of missing data – A high proportion of missing or incomplete data may result in conclusions or interpretations that are not representative of disease trends. In this report, missing data are handled in three ways:

1. Reporting the proportion or number of cases with missing data to provide perspective (e.g. age, sex, exposures, risk factors)
2. Suppressing the data altogether if a significantly larger proportion of data are missing (e.g. no data are reported on hospitalizations and deaths).
3. Diseases for which fewer than five cases are reported in a year are suppressed and indicated as “<5” - less than five cases.

Definitions

Travel-associated cases - Travel-associated cases were defined as having an incubation period contained partially or entirely within the period in which travel outside of Ontario occurred. This report includes all travel-associated cases and only excludes them from analyses that attempt to enumerate exposure sources or transmissions that occurred within Ontario.

² Remis RS. (1995). Guidelines to the Surveillance of AIDS in Canada. Division of HIV/AIDS Epidemiology, Bureau of Communicable Disease Epidemiology, Laboratory Centre for Disease Control, Health Protection Branch, Health Canada. Ottawa

³ Long R, Avendano, M & Whitehead L. (2007). *Drug Resistant Tuberculosis* in Long R & Ellis E. (Eds.), Canadian Tuberculosis Standards, 6th ed. (pp. 146-181). Ottawa: Public Health Agency of Canada. Available online: <http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbstand07-eng.php>

⁴ Migliori GB, Loddenkemper R, Blasi F, Raviglione MC. (2007) 125 years after Robert Koch's discovery of the tubercle bacillus: the new XDR-TB threat: is “science” enough to tackle the epidemic? *Eur Respir J*, 29: 423-7.

Diagnosing health units refers to the health unit where the case resided when they became known to public health for the suspect/confirmed reportable disease episode.

Case definitions for all diseases in this report are based on laboratory confirmation and/or epidemiological links to a laboratory confirmed case. The iPHIS Manual (version 04/11/2005) outlines the provincial case definitions in effect at the time of surveillance. Cases that did not meet the provincial case definitions were not included in this report.

Appendix 2: DISEASES REPORTABLE IN ONTARIO

Reportable Diseases are specified under Ontario Regulations 559/91 and amendments under the Health Protection and Promotion Act. Diseases not reported on in this report are marked with an asterisk (*).

Acquired immunodeficiency syndrome (HIV/AIDS)	Lassa fever
Amebiasis	Legionellosis
Anthrax	Leprosy
Botulism	Listeriosis
Brucellosis	Lyme disease
Campylobacter enteritis	Malaria
Chancroid	Measles
* Chickenpox (Varicella)	* Meningitis, acute
Chlamydia	• Bacterial
Cholera	• Viral
* Clostridium difficile associated disease	• Other
Cryptosporidiosis	Meningococcal disease, invasive
Cyclosporiasis	Mumps
Cytomegalovirus infection, congenital	Ophthalmia neonatorum
Diphtheria	Paratyphoid fever
* Encephalitis, including:	Pertussis (whooping cough)
• Primary, viral	Plague
• Post-infectious	Pneumococcal disease, invasive
• Vaccine-related	* Poliomyelitis, acute
• Subacute sclerosing panencephalitis	Psittacosis/ornithosis
• Unspecified	Q Fever
* Food poisoning, all causes	* Rabies
* Gastroenteritis, institutional outbreaks	Respiratory infection outbreaks in institutions
Giardiasis	Rubella
Gonorrhea	Rubella, congenital syndrome
Group A Streptococcal infections, invasive	Salmonellosis
Group B Streptococcal infections, neonatal	* Severe acute respiratory syndrome (SARS)
Haemophilus influenzae b disease, invasive	Shigellosis
Hantavirus pulmonary syndrome	* Smallpox
Hemorrhagic fevers	Syphilis
• Ebola virus disease	Tetanus
• Marburg virus disease	Transmissible spongiform encephalopathy
• Other viral causes	• Creutzfeldt-Jakob disease, all types
Hepatitis A	• Gerstmann-Sträussler-Scheinker syndrome
Hepatitis B	• Fatal Familial Insomnia
Hepatitis C	• Kuru
Hepatitis D (Delta hepatitis)	Trichinosis
Herpes, neonatal	Tuberculosis
Influenza	Tularemia

Typhoid fever
Verotoxin-producing *E. coli* including
Hemolytic
Uremic Syndrome
West Nile virus illness
Yellow fever
Yersiniosis

Appendix 3: ONTARIO PUBLIC HEALTH UNITS AND REGIONS

Region	Ontario Public Health Units
North West	Northwestern
	Thunder Bay District
North East	Algoma
	North Bay Parry Sound District
	Porcupine
	Sudbury & District
	Timiskaming
Eastern	City of Ottawa
	Eastern Ontario
	Hastings & Prince Edward Counties
	Kingston, Frontenac, Lennox & Addington
	Leeds, Grenville And Lanark District
	Renfrew County And District
Central East	Durham Region
	Haliburton, Kawartha, Pine Ridge
	Peel Region
	Peterborough County-City
	Simcoe Muskoka District
	York Region
Toronto	Toronto
South West	Chatham-Kent
	Elgin-St. Thomas
	Grey Bruce
	Huron County
	Lambton County
	Middlesex-London
	Oxford County
	Perth District
	Windsor-Essex County
Central West	Brant County
	City Of Hamilton
	Haldimand-Norfolk
	Halton Region
	Niagara Region
	Waterloo Region
	Wellington-Dufferin-Guelph

Appendix 4: DATA TABLES

Data Table 1: Incidence of Infectious Diseases in Ontario, 1998-2007

Disease Categories	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
Enteric and Zoonotic Diseases	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
Amebiasis	839	7.4	769	6.7	925	7.9	851	7.2	825	6.8	771	6.3	678	5.5	772	6.1	659	5.2	815	6.4
Campylobacteriosis	5449	47.9	4192	36.4	5061	43.3	5033	42.3	4612	38.1	4127	33.7	3991	32.1	3796	30.2	3870	30.5	3873	30.2
Cryptosporidiosis	187	1.6	210	1.8	235	2.0	250	2.1	231	1.9	277	2.3	303	2.4	266	2.1	402	3.2	405	3.2
Cyclosporiasis	96	0.8	21	0.2	9	0.1	23	0.2	52	0.4	39	0.3	95	0.8	132	1.1	92	0.7	94	0.7
Giardiasis	2146	18.9	1990	17.3	2007	17.2	2060	17.3	1921	15.9	1633	13.3	1592	12.8	1626	12.9	1582	12.5	1623	12.7
Hepatitis A	321	2.8	261	2.3	157	1.3	175	1.5	151	1.2	143	1.2	185	1.5	150	1.2	206	1.6	121	0.9
Listeriosis	52	0.5	31	0.3	37	0.3	37	0.3	43	0.4	43	0.4	42	0.3	37	0.3	42	0.3	40	0.3
Paratyphoid Fever	12	0.1	17	0.1	12	0.1	12	0.1	27	0.2	21	0.2	47	0.4	55	0.4	51	0.4	47	0.4
Salmonellosis	3386	29.8	2351	20.4	2389	20.4	2564	21.6	2476	20.5	2008	16.4	2119	17.1	2956	23.5	2395	18.9	2820	22.0
Shigellosis	427	3.8	274	2.4	288	2.5	234	2.0	847	7.0	283	2.3	286	2.3	337	2.7	206	1.6	232	1.8
Typhoid Fever	46	0.4	42	0.4	53	0.5	62	0.5	60	0.5	50	0.4	69	0.6	68	0.5	92	0.7	86	0.7
E. coli, verotoxin producing	404	3.6	379	3.3	1746	14.7	358	3.0	394	3.3	462	3.8	318	2.6	259	2.1	343	2.7	365	2.9
Yersiniosis	359	3.2	370	3.2	338	2.9	314	2.6	383	3.2	329	2.7	297	2.4	354	2.8	364	2.9	269	2.1
Botulism	1	0.0	1	0.0	0	0.0	0	0.0	1	0.0	2	0.0	2	0.0	1	0.0	5	0.0	4	0.0
Brucellosis	4	0.1	2	0.2	2	0.1	3	0.1	5	0.1	4	0.0	3	0.1	6	0.0	2	0.0	5	0.0
Cholera	1	0.0	0	0	0	0	3	0.0	1	0.0	2	0.0	0	0	1	0.0	1	0.0	1	0.0
Psittacosis/Ornithosis	0	0	0	0	2	0.0	0	0	2	0.0	1	0.0	0	0.0	0	0	0	0.0	0	0.0
Q-fever	8	0.1	19	0.2	12	0.1	12	0.1	1	0.1	8	0.0	6	0.1	2	0.0	4	0.0	3	0.0
Trichinosis	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	1	0.0	0	0.0	0	0.0
Tularemia	1	0.0	0	0.0	1	0.0	0	0.0	0	0.0	2	0.0	2	0.0	1	0.0	0	0.0	0	0.0
Vaccine Preventable Diseases																				
Diphtheria	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Haemophilus Influenzae B	7	0.1	4	0.0	11	0.1	7	0.1	7	0.1	9	0.1	9	0.1	8	0.1	12	0.1	6	0.0
Measles	9	0.1	2	0.0	9	0.1	6	0.1	1	0.0	11	0.1	6	0.0	4	0.0	5	0.0	0	0.0
Meningococcal disease	52	0.5	80	0.7	82	0.7	106	0.9	59	0.5	58	0.5	55	0.4	43	0.3	67	0.5	62	0.5
Mumps	34	0.3	43	0.4	33	0.3	18	0.2	14	0.1	13	0.1	23	0.2	17	0.1	10	0.1	53	0.4
Pertussis	1881	16.5	1218	10.6	716	6.1	463	3.9	532	4.4	353	2.9	633	5.1	646	5.1	1265	10.0	933	7.3
Rubella	0	0.0	4	0.0	9	0.0	17	0.0	2	0.0	9	0.0	5	0.0	313	0.0	5	0.0	2	0.0
Rubella, congenital	0	0.0	0	0.0	1	0.0	0	0.0	1	0.0	1	0.0	2	0.0	0	0.0	0	0.0	0	0.0
S. pneumoniae	26.0	0.2	26.0	0.2	21.0	0.2	128	1.1	649	5.4	1016	8.3	1057	8.5	930	7.4	945	7.4	940	7.3
Tetanus	2	0.0	1	0.0	1	0.0	3	0.0	2	0.0	0	0.0	0	0.0	1	0.0	1	0.0	1	0.0

Disease Categories	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
Sexually Transmitted and Blood-borne Infections	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹	Case	Rate ¹
AIDS	245	2.2	216	1.9	172	1.5	204	1.7	186	1.5	213	1.7	189	1.5	196	1.6	131	1.0	129	1.0
Chlamydia	12720	111.9	13513	117.4	14805	126.7	16360	137.5	18363	151.7	19478	158.8	20801	167.5	21931	174.6	22542	177.7	23275	181.8
Gonorrhea	2322	20.4	2271	19.7	2858	24	2954	24.8	3085	25.5	3360	27.4	3513	28.3	3325	26.5	3860	30.4	3954	30.9
Group B Streptococcus	31	0.3	47	0.4	53	0.5	64	0.5	69	0.6	65	0.5	55	0.4	52	0.4	55	0.4	46	0.3
Hepatitis B	149	1.3	143	1.2	148	1.3	123	1.0	152	1.3	172	1.4	168	1.4	161	1.3	187	1.5	182	1.4
Hepatitis C	7487	65.9	6811	59.2	6009	51.4	5572	46.8	5479	45.3	5491	44.8	5418	43.6	4616	36.8	3999	31.5	4512	35.4
HIV	747	6.6	750	6.5	773	6.6	857	7.2	982	8.1	943	7.7	990	8.0	901	7.2	983	7.7	946	7.4
Syphilis	45	0.4	54	0.5	49	0.4	52	0.4	241	2.0	427	3.5	496	4.0	360	2.9	366	2.9	401	3.1
Cytomegalovirus, congenital	5	0.0	11	0.1	8	0.1	4	0.0	6	0.0	8	0.1	7	0.1	7	0.1	8	0.1	4	0.0
Hepatitis D	5	0.0	7	0.1	10	0.1	8	0.1	9	0.1	2	0.0	2	0.0	9	0.1	4	0.0	2	0.0
Herpes, neonatal	3	0.0	10	0.1	1	0.0	4	0.0	5	0.0	2	0.0	11	0.1	5	0.0	5	0.0	3	0.0
Ophthalmia neonatorum	7	0.1	7	0.1	11	0.1	7	0.1	3	0.0	4	0.0	6	0.0	6	0.0	3	0.0	3	0.0
Diseases Transmitted by Direct Contact and Respiratory Routes																				
Invasive Group A Streptococcus	279	2.5	310	2.7	409	3.5	328	2.8	385	3.2	409	3.3	288	2.3	392	3.1	465	3.7	501	3.9
Influenza	2,367	20.6	2,882	24.7	791	6.6	2,274	18.8	981	8.0	5,389	43.4	5,778	46.0	2,486	19.6	2,930	22.9	5,163	40.3
Legionellosis	49	0.4	45	0.4	41	0.4	21	0.2	24	0.2	32	0.3	11	0.1	75	0.6	69	0.5	58	0.5
Tuberculosis	742	6.5	698	6.1	700	6.0	699	5.9	716	5.9	693	5.7	661	5.3	654	5.2	691	5.4	680	5.3
Vectorborne Diseases																				
Lyme Disease	20	0.2	23	0.2	46	0.4	24	0.2	28	0.2	26	0.2	33	0.3	41	0.3	48	0.4	69	0.5
Malaria	161	1.4	166	1.4	184	1.6	162	1.4	154	1.3	167	1.4	181	1.5	187	1.5	188	1.5	176	1.4
West Nile Virus (WNV)	nr	nr	nr	nr	nr	nr	nr	nr	394	3.3	89	0.7	14	0.1	101	0.8	42	0.3	17	0.1
Other Diseases																				
Creutzfeldt-Jakob Disease, all	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	4	0.0	5	0.0	5	0.0
Leprosy	2	0.0	6	0.0	5	0.0	3	0.0	2	0.0	4	0.0	2	0.0	3	0.0	0	0.0	2	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note 1: Incidence rate per 100,000 population

Note 2: Nr – Not reportable

Note 3: Publicly funded Meningococcal vaccine (serogroup C) introduced in September 2004 for one year olds and in September 2005 for grade 7 students, youths aged 15 to 19 and high-risk people of all ages.

Two dose schedule for measles vaccine with a catch-up program for students aged 4-18 years introduced in 1996.

Publicly funded tetanus, diphtheria and acellular pertussis vaccine (Adacel [Tdap]) for adolescents aged 14-16 years introduced in 2003 - replaced the Td-IPV adolescent booster dose.

Publicly funded Pneumococcal conjugate vaccine introduced in September 2003 for high risk children under the age of 2 years. Expanded in July 2004 to include high risk children under the age of 5 years and in January 2005 to include all children under the age of 2 years.

Data Table 2: Incidence of Infectious Diseases in Ontario by Public Health Unit, 2007

Data Table 2a: Frequently Reported Enteric Diseases: Ontario, 2007	Amebiasis		Campylobacteriosis		Cryptosporidiosis		Cyclosporiasis		Giardiasis		Hepatitis A		Listeriosis		Paratyphoid Fever		Salmonellosis		Shigellosis		Typhoid Fever		E. coli (VTEC)		Yersiniosis	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	0	0.0	21	17.6	2	1.7	0	0.0	17	14.3	0	0.0	0	0.0	0	0.0	16	13.4	0	0.0	0	0.0	2	1.7	0	0.0
Brant County	3	2.2	29	21.2	4	2.9	1	0.7	9	6.6	1	0.7	0	0.0	0	0.0	29	21.2	2	1.5	0	0.0	0	0.0	1	0.7
Chatham-Kent	0	0.0	23	21.0	3	2.7	0	0.0	6	5.5	1	0.9	0	0.0	0	0.0	15	13.7	1	0.9	0	0.0	1	0.9	0	0
Durham Region	10	1.7	151	25.4	11	1.8	1	0.2	45	7.6	2	0.3	1	0.2	0	0.0	150	25.2	12	2.0	2	0.3	13	2.2	7	1.2
Eastern Ontario	5	2.5	75	37.6	8	4.0	1	0.5	13	6.5	0	0.0	0	0.0	0	0.0	28	14.1	2	1.0	1	0.5	6	3.0	0	0.0
Elgin-St. Thomas	0	0.0	14	15.4	9	9.9	1	1.1	4	4.4	0	0.0	1	1.1	0	0.0	14	15.4	0	0.0	0	0.0	1	1.1	0	0.0
Grey-Bruce	0	0.0	68	42.0	15	9.3	0	0.0	18	11.1	5	3.1	3	1.9	0	0.0	49	30.3	0	0.0	0	0.0	28	17.3	3	1.9
Haldimand-Norfolk	0	0.0	35	31.3	0	0.0	0	0.0	9	8.1	1	0.9	0	0.0	0	0.0	39	34.9	0	0.0	0	0.0	7	6.3	0	0.0
Haliburton-Kawartha-Pine Ridge District	1	0.6	58	33.1	8	4.6	1	0.6	34	19.4	0	0.0	0	0.0	0	0.0	21	12.0	1	0.6	0	0.0	9	5.1	1	0.6
Halton Region	18	3.8	139	29.6	8	1.7	5	1.1	65	13.9	4	0.9	1	0.2	3	0.6	114	24.3	9	1.9	3	0.6	9	1.9	11	2.3
Hamilton, City of	24	4.6	107	20.6	13	2.5	3	0.6	48	9.2	2	0.4	1	0.2	0	0.0	87	16.7	6	1.2	0	0.0	12	2.3	8	1.5
Hastings Prince Edward Counties	2	1.2	16	9.8	7	4.3	0	0.0	11	6.7	0	0.0	0	0.0	0	0.0	38	23.3	0	0.0	0	0.0	4	2.5	2	1.2
Huron County	0	0.0	41	66.8	7	11.4	0	0.0	3	4.9	0	0.0	0	0.0	0	0.0	26	42.4	1	1.6	0	0.0	8	13.0	2	3.3
Kingston-Frontenac & Lennox & Addington	4	2.1	41	21.8	1	0.5	2	1.1	13	6.9	2	1.1	0	0.0	0	0.0	28	14.9	6	3.2	0	0.0	3	1.6	0	0.0
Lambton County	2	1.5	30	22.7	1	0.8	1	0.8	6	4.5	0	0.0	0	0.0	0	0.0	18	13.6	2	1.5	0	0.0	4	3.0	1	0.8
Leeds-Grenville and Lanark District	6	3.5	28	16.5	3	1.8	0	0.0	18	10.6	2	1.2	2	1.2	0	0.0	30	17.6	0	0.0	0	0.0	2	1.2	0	0.0
Middlesex-London	23	5.2	109	24.9	11	2.5	2	0.5	35	8.0	4	0.9	1	0.2	1	0.2	154	35.1	6	1.4	1	0.2	13	3.0	5	1.1
Niagara Region	11	2.5	140	32.3	9	2.1	0	0.0	48	11.1	5	1.2	1	0.2	0	0.0	102	23.5	3	0.7	0	0.0	67	15.4	1	0.2
North Bay Parry Sound District	0	0.0	13	10.4	3	2.4	1	0.8	20	16.0	0	0.0	2	1.6	0	0.0	16	12.8	0	0.0	0	0.0	1	0.8	2	1.6
Northwestern	1	1.2	12	15.0	2	2.5	0	0.0	7	8.7	2	2.5	0	0.0	0	0.0	11	13.7	0	0.0	0	0.0	1	1.2	1	1.2
Ottawa, City of	91	10.8	244	28.8	25	3.0	5	0.6	151	17.8	11	1.3	4	0.5	1	0.1	152	18.0	25	3.0	4	0.5	23	2.7	14	1.7
Oxford County	0	0.0	27	25.3	15	14.1	1	0.9	7	6.6	2	1.9	2	1.9	0	0.0	17	16.0	0	0.0	0	0.0	0	0.0	2	1.9
Peel Region	122	9.4	392	30.2	41	3.2	12	0.9	194	15.0	14	1.1	2	0.2	22	1.7	262	20.2	23	1.8	36	2.8	21	1.6	36	2.8
Perth District	1	1.3	58	75.2	12	15.6	0	0.0	3	3.9	0	0.0	0	0.0	0	0.0	27	35.0	0	0.0	0	0.0	4	5.2	1	1.3
Peterborough County	5	3.7	36	26.9	6	4.5	0	0.0	14	10.5	2	1.5	0	0.0	0	0.0	22	16.5	2	1.5	0	0.0	4	3.0	0	0.0
Porcupine	0	0.0	10	11.5	4	4.6	0	0.0	3	3.4	0	0.0	0	0.0	0	0.0	13	14.9	1	1.1	0	0.0	0	0.0	1	1.1
Renfrew County and District	2	2.0	34	33.8	9	9.0	2	2.0	6	6.0	1	1.0	0	0.0	0	0.0	11	10.9	2	2.0	0	0.0	3	3.0	2	2
Simcoe Muskoka District	9	1.8	130	26.3	11	2.2	1	0.2	50	10.1	2	0.4	0	0.0	0	0.0	89	18.0	5	1.0	0	0.0	6	1.2	7	1.4
Sudbury and District	0	0.0	27	13.6	0	0.0	2	1.0	18	9.1	0	0.0	0	0.0	0	0.0	29	14.6	0	0.0	0	0.0	2	1.0	0	0.0
Thunder Bay District	4	2.6	28	18.1	3	1.9	1	0.6	16	10.3	4	2.6	2	1.3	0	0.0	10	6.4	1	0.6	0	0.0	2	1.3	3	1.9
Timiskaming	0	0.0	6	17.4	5	14.5	0	0.0	4	11.6	0	0.0	0	0.0	0	0.0	1	2.9	0	0.0	0	0.0	1	2.9	1	2.9
Toronto	402	15.2	982	37.0	66	2.5	37	1.4	536	20.2	31	1.2	13	0.5	15	0.6	684	25.8	74	2.8	31	1.2	54	2.0	86	3.2
Waterloo Region	30	6.0	183	36.9	20	4.0	3	0.6	53	10.7	6	1.2	2	0.4	2	0.4	128	25.8	10	2.0	1	0.2	18	3.6	18	3.6
Wellington-Dufferin-Guelph	10	3.8	88	33.2	24	9.0	5	1.9	31	11.7	5	1.9	1	0.4	0	0.0	60	22.6	5	1.9	1	0.4	11	4.1	1	0.4
Windsor-Essex County	0	0.0	110	27.2	13	3.2	1	0.2	28	6.9	5	1.2	0	0.0	0	0.0	88	21.8	8	2.0	1	0.2	8	2.0	4	1
York Region	29	3.0	368	37.7	26	2.7	5	0.5	80	8.2	7	0.7	1	0.1	3	0.3	242	24.8	25	2.6	5	0.5	17	1.7	48	4.9
Ontario	815	6.4	3873	30.2	405	3.2	94	0.7	1623	12.7	121	0.9	40	0.3	47	0.4	2820	22.0	232	1.8	86	0.7	365	2.9	269	2.1

Data Table 2b: Other Enteric Diseases and Zoonotic/Vectorborne Diseases: Ontario, 2007	Botulism*		Cholera		Brucellosis*		Psittacosis/ Ornithosis		Q-fever*		Trichinosis		Tularemia		Lyme Disease		Malaria		West Nile Virus (WNV)	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Brant County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chatham-Kent	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9	0	0.0
Durham Region	1	0.2	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0	6	6.6	1	0.2	1	0.2
Eastern Ontario	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.2	0	0.0	0	0.0
Elgin-St. Thomas	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9	0	0.0	0	0.0
Grey-Bruce	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0
Haldimand-Norfolk	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.4	0	0.0	0	0.0
Halton Region	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	1.8	3	0.6	2	0.4
Hamilton, City of	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	0.2	1	0.2
0.0Hastings Prince Edward Counties	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.6	0	0.0	0	0.0
Huron County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0	0.0	1	1.6
Kingston-Frontenac & Lennox & Addington	0	0.0	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0	2	1.5	0	0.0	0	0.0
Lambton County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1.2	0	0.0	0	0.0
Leeds-Grenville and Lanark District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.7	0	0.0	0	0.0
Middlesex-London	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.7	1	0.2
Niagara Region	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	2.4	0	0.0	0	0.0
North Bay Parry Sound District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.8	0	0.0
Northwestern	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Ottawa, City of	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	1	10	1.2	0	0.0
Oxford County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9	1	0.9	0	0.0
Peel Region	1	0.1	0	0.0	1	0.1	0	0.0	1	0.1	0	0.0	0	0.0	6	0.5	45	3.5	1	0.1
Perth District	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peterborough County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Porcupine	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Renfrew County and District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	2	1	1	0	0.0
Simcoe Muskoka District	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.4	2	0.4	0	0.0
Sudbury and District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thunder Bay District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	1.9	0	0.0	2	1.3
Timiskaming	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	2.9	1	2.9	0	0.0
Toronto	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	15	0.6	85	3.2	4	0.2
Waterloo Region	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	1	5	1	0	0.0
Wellington-Dufferin-Guelph	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0
Windsor-Essex County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	1	3	0.7
York Region	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.4	8	0.8	1	0.1
Ontario	4	0.0	1	0.0	3	0.0	0	0.0	3	0.0	0	0.0	0	0.0	69	0.5	174	1.4	17	0.1

Data Table 2c: Vaccine Preventable Diseases: Ontario, 2007	Meningococcal disease		Mumps		Pertussis		S. pneumoniae		Diphtheria		Haemophilus Influenzae B		Measles		Rubella		Rubella, congenital		Tetanus	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	0	0.0	0	0.0	0	0.0	9	7.6	0	0.0	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0
Brant County	0	0.0	0	0.0	0	0.0	11	8.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7
Chatham-Kent	0	0.0	1	0.9	2	1.8	14	12.8	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0	0	0.0
Durham Region	4	0.7	0	0.0	51	8.6	46	7.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eastern Ontario	3	1.5	0	0.0	1	0.5	4	2.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Elgin-St. Thomas	0	0.0	1	1.1	5	5.5	8	8.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Grey-Bruce	0	0.0	0	0.0	1	0.6	13	8.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Haldimand-Norfolk	0	0.0	0	0.0	4	3.6	7	6.3	0	0.0	0	0.0	0	0.0	1	0.9	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	2	1.1	0	0.0	4	2.3	22	12.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Halton Region	4	0.9	3	0.6	33	7.0	38	8.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hamilton, City of	0	0.0	0	0.0	9	1.7	42	8.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hastings Prince Edward Counties	1	0.6	0	0.0	0	0.0	17	10.4	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0	0	0.0
Huron County	0	0.0	0	0.0	1	1.6	1	1.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Kingston-Frontenac & Lennox & Addington	0	0.0	1	0.5	2	1.1	25	13.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Lambton County	3	2.3	1	0.8	0	0.0	6	4.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Leeds-Grenville and Lanark District	0	0.0	1	0.6	1	0.6	8	4.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Middlesex-London	3	0.7	2	0.5	8	1.8	4	0.9	0	0.0	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0
Niagara Region	1	0.2	2	0.5	7	1.6	44	10.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
North Bay Parry Sound District	0	0.0	1	0.8	0	0.0	7	5.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Northwestern	0	0.0	0	0.0	0	0.0	5	6.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ottawa, City of	2	0.2	0	0.0	6	0.7	71	8.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Oxford County	1	0.9	7	6.6	0	0.0	4	3.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peel Region	6	0.5	3	0.2	49	3.8	74	5.7	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0
Perth District	1	1.3	1	1.3	0	0.0	12	15.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peterborough County	1	0.7	0	0.0	1	0.7	13	9.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Porcupine	0	0.0	0	0.0	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Renfrew County and District	1	1.0	0	0.0	1	1.0	9	9.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Simcoe Muskoka District	2	0.4	3	0.6	10	2.0	43	8.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sudbury and District	0	0.0	0	0.0	20	10.1	15	7.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thunder Bay District	1	0.6	0	0.0	0	0.0	6	3.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Timiskaming	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Toronto	12	0.5	16	0.6	501	18.9	232	8.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Waterloo Region	5	1.0	4	0.8	25	5.0	56	11.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wellington-Dufferin-Guelph	0	0.0	0	0.0	8	3.0	19	7.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Windsor-Essex County	2	0.5	0	0.0	0	0.0	17	4.2	0	0.0	1	0.2	0	0.0	1	0.2	0	0.0	0	0.0
York Region	7	0.7	6	0.6	182	18.6	35	3.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ontario	62	0.5	53	0.4	933	7.3	937	7.3	0	0.0	6	0.0	0	0.0	2	0.0	0	0.0	1	0.0

Data Table 2d: Sexually Transmitted and Bloodborne Diseases, Ontario, 2007	AIDS		Chlamydia		Gonorrhea		Group B Streptococcus disease		Hepatitis B		Hepatitis C		HIV		Syphilis, infectious		Ophthalmia neonatorum		Cytomegalovirus, congenital *		Herpes, neonatal	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	1	0.8	250	209.9	21	17.6	0	0	4	3.4	59	49.5	4	3.4	0	0	0	0.0	0	0.0	0	0.0
Brant County	5	3.7	217	158.6	30	21.9	1	0.7	3	2.2	57	41.6	5	3.7	1	0.7	0	0.0	0	0.0	0	0.0
Chatham-Kent	1	0.9	131	119.5	26	23.7	1	0.9	2	1.8	29	26.5	2	1.8	0	0	0	0.0	0	0.0	0	0.0
Durham Region	4	0.7	1,017	170.8	171	28.7	0	0	16	2.7	167	28.1	13	2.2	4	0.7	0	0.0	0	0.0	0	0.0
Eastern Ontario	1	0.5	153	76.8	10	5	0	0	5	2.5	57	28.6	2	1	1	0.5	0	0.0	1	0.5	0	0.0
Elgin-St. Thomas	0	0	75	82.6	15	16.5	1	1.1	2	2.2	26	28.6	0	0	0	0	0	0.0	0	0.0	0	0.0
Grey-Bruce	0	0	187	115.5	10	6.2	0	0	1	0.6	37	22.9	2	1.2	0	0	0	0.0	0	0.0	0	0.0
Haldimand-Norfolk	1	0.9	91	81.5	8	7.2	0	0	4	3.6	38	34	1	0.9	0	0	0	0.0	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	1	0.6	199	113.6	13	7.4	0	0	4	2.3	100	57.1	3	1.7	1	0.6	0	0.0	0	0.0	0	0.0
Halton Region	2	0.4	401	85.5	52	11.1	1	0.2	1	0.2	140	29.9	17	3.6	8	1.7	0	0.0	0	0.0	0	0.0
Hamilton, City of	2	0.4	1,060	203.9	197	37.9	2	0.4	4	0.8	156	30	31	6	9	1.7	0	0.0	0	0.0	0	0.0
Hastings Prince Edward Counties	0	0	221	135.5	10	6.1	0	0	2	1.2	54	33.1	0	0	3	1.8	0	0.0	0	0.0	0	0.0
Huron County	0	0	37	60.3	1	1.6	0	0	0	0	9	14.7	0	0	1	1.6	0	0.0	0	0.0	0	0.0
Kingston-Frontenac & Lennox & Addington	1	0.5	424	225.7	28	14.9	1	0.5	9	4.8	227	120.8	6	3.2	2	1.1	0	0.0	0	0.0	0	0.0
Lambton County	0	0	174	131.6	15	11.3	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	0	0.0
Leeds-Grenville and Lanark District	0	0	152	89.3	6	3.5	0	0	4	2.4	55	32.3	0	0	0	0	0	0.0	0	0.0	0	0.0
Middlesex-London	4	0.9	1,008	229.9	189	43.1	1	0.2	5	1.1	208	47.4	15	3.4	5	1.1	0	0.0	1	0.2	0	0.0
Niagara Region	3	0.7	655	150.9	65	15	2	0.5	7	1.6	230	53	8	1.8	3	0.7	0	0.0	0	0.0	0	0.0
North Bay Parry Sound District	0	0	224	178.7	9	7.2	0	0	1	0.8	45	35.9	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0
Northwestern	2	2.5	452	564.7	113	141.2	0	0	2	2.5	24	30	2	2.5	1	1.2	0	0.0	0	0.0	0	0.0
Ottawa, City of	7	0.8	1,583	187.1	219	25.9	2	0.2	5	0.6	235	27.8	93	11	44	5.2	0	0.0	0	0.0	0	0.0
Oxford County	1	0.9	111	104.2	19	17.8	0	0	1	0.9	39	36.6	0	0	0	0	0	0.0	0	0.0	0	0.0
Peel Region	3	0.2	2,180	168.1	379	29.2	3	0.2	15	1.2	390	30.1	48	3.7	17	1.3	0	0.0	0	0.0	0	0.0
Perth District	1	1.3	93	120.5	2	2.6	0	0	0	0	13	16.8	1	1.3	3	3.9	0	0.0	0	0.0	0	0.0
Peterborough County	0	0	259	193.9	21	15.7	1	0.7	2	1.5	55	41.2	2	1.5	0	0	0	0.0	0	0.0	0	0.0
Porcupine	1	1.1	224	256.6	25	28.6	0	0	1	1.1	18	20.6	1	1.1	0	0	0	0.0	0	0.0	0	0.0
Renfrew County and District	1	1	115	114.5	4	4	0	0	1	1	42	41.8	2	2	1	1	0	0.0	0	0.0	0	0.0
Simcoe Muskoka District	2	0.4	654	132.4	28	5.7	0	0	0	0	154	31.2	11	2.2	1	0.2	0	0.0	0	0.0	0	0.0
Sudbury and District	4	2	471	237.6	38	19.2	1	0.5	17	8.6	88	44.4	5	2.5	0	0	0	0.0	0	0.0	0	0.0
Thunder Bay District	0	0	511	329.5	80	51.6	0	0	10	6.4	135	87.1	4	2.6	0	0	0	0.0	0	0.0	0	0.0
Timiskaming	0	0	48	138.9	0	0	0	0	0	0	16	46.3	0	0	0	0	0	0.0	0	0.0	0	0.0
Toronto	73	2.8	7,013	264.5	1,809	68.2	21	0.8	28	1.1	1,056	39.8	620	23.4	276	10.4	3	0.1	1	0.1	1	0.1
Waterloo Region	1	0.2	860	173.3	150	30.2	4	0.8	4	0.8	146	29.4	17	3.4	5	1	0	0.0	0	0.0	0	0.0
Wellington-Dufferin-Guelph	3	1.1	365	137.6	24	9	0	0	14	5.3	58	21.9	6	2.3	1	0.4	0	0.0	0	0.0	0	0.0
Windsor-Essex County	2	0.5	525	130	66	16.3	1	0.2	3	0.7	121	30	8	2	0	0	0	0.0	0	0.0	0	0.0
York Region	2	0.2	1,135	116.3	101	10.3	3	0.3	5	0.5	228	23.4	16	1.6	13	1.3	0	0.0	1	0.1	0	0.0
Ontario	129	1	23,275	181.8	3,954	30.9	46	0.4	182	1.4	4,512	35.2	946	7.4	401	3.1	3	0.0	4	0.0	3	0.0

Data Table 2e: Diseases Transmitted by Direct Contact or Respiratory Routes: Ontario, 2007	Invasive Group A Streptococcus disease		Influenza		Legionellosis		Tuberculosis	
	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	9	7.6	43	36.1	1	0.8	0	0
Brant County	11	8	21	15.3	1	0.7	3	2.2
Chatham-Kent	2	1.8	23	21	0	0	0	0
Durham Region	15	2.5	151	25.4	2	0.3	14	2.4
Eastern Ontario	6	3	49	24.6	0	0	2	1
Elgin-St. Thomas	7	7.7	15	16.5	2	2.2	3	3.3
Grey-Bruce	6	3.7	69	42.6	1	0.6	1	0.6
Haldimand-Norfolk	4	3.6	32	28.7	0	0	1	0.9
Haliburton-Kawartha-Pine Ridge District	5	2.9	136	77.6	0	0	0	0
Halton Region	13	2.8	184	39.2	4	0.9	11	2.3
Hamilton, City of	40	7.7	346	66.6	3	0.6	28	5.4
Hastings Prince Edward Counties	7	4.3	48	29.4	0	0	2	1.2
Huron County	2	3.3	86	140.1	1	1.6	0	0
Kingston-Frontenac & Lennox & Addington	11	5.9	64	34.1	1	0.5	1	0.5
Lambton County	0	0	33	25	0	0	0	0
Leeds-Grenville and Lanark District	7	4.1	38	22.3	0	0	0	0
Middlesex-London	11	2.5	65	14.8	3	0.7	9	2.1
Niagara Region	15	3.5	111	25.6	1	0.2	5	1.2
North Bay Parry Sound District	7	5.6	86	68.6	0	0	3	2.4
Northwestern	11	13.7	30	37.5	0	0	7	8.7
Ottawa, City of	26	3.1	244	28.8	1	0.1	35	4.1
Oxford County	7	6.6	29	27.2	0	0	0	0
Peel Region	35	2.7	537	41.4	12	0.9	126	9.7
Perth District	4	5.2	56	72.6	1	1.3	1	1.3
Peterborough County	8	6	127	95.1	0	0	1	0.7
Porcupine	1	1.1	13	14.9	0	0	0	0
Renfrew County and District	7	7	27	26.9	0	0	1	1
Simcoe Muskoka District	27	5.5	269	54.4	0	0	0	0
Sudbury and District	11	5.5	37	18.7	3	1.5	3	1.5
Thunder Bay District	26	16.8	30	19.3	0	0	2	1.3
Timiskaming	1	2.9	25	72.3	0	0	1	2.9
Toronto	96	3.6	1,475	55.6	14	0.5	332	12.5
Waterloo Region	29	5.8	224	45.1	1	0.2	17	3.4
Wellington-Dufferin-Guelph	12	4.5	124	46.7	1	0.4	3	1.1
Windsor-Essex County	7	1.7	84	20.8	3	0.7	5	1.2
York Region	15	1.5	231	23.7	2	0.2	63	6.5
Ontario	501	3.9	5,163	40.3	58	0.5	680	5.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009] and [08/06/2010*].

Note: Rate is incidence per 100,000 population

Data Table 2f: Other Diseases: Ontario, 2007	Creutzfeldt-Jakob disease, all		Leprosy *	
	#	Rate	#	Rate
Algoma District	0	0.0	0	0.0
Brant County	0	0.0	0	0.0
Chatham-Kent	0	0.0	0	0.0
Durham Region	0	0.0	0	0.0
Eastern Ontario	0	0.0	0	0.0
Elgin-St. Thomas	0	0.0	0	0.0
Grey-Bruce	0	0.0	0	0.0
Haldimand-Norfolk	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0	0	0.0
Halton Region	0	0.0	0	0.0
Hamilton, City of	0	0.0	0	0.0
Hastings Prince Edward Counties	1	0.6	0	0.0
Huron County	1	1.6	0	0.0
Kingston-Frontenac & Lennox & Addington	0	0.0	0	0.0
Lambton County	0	0.0	0	0.0
Leeds-Grenville and Lanark District	0	0.0	0	0.0
Middlesex-London	0	0.0	0	0.0
Niagara Region	1	0.2	0	0.0
North Bay Parry Sound District	0	0.0	0	0.0
Northwestern	0	0.0	0	0.0
Ottawa, City of	1	0.1	0	0.0
Oxford County	0	0.0	0	0.0
Peel Region	1	0.1	0	0.0
Perth District	0	0.0	0	0.0
Peterborough County	0	0.0	0	0.0
Porcupine	0	0.0	0	0.0
Renfrew County and District	0	0.0	0	0.0
Simcoe Muskoka District	0	0.0	0	0.0
Sudbury and District	0	0.0	0	0.0
Thunder Bay District	0	0.0	0	0.0
Timiskaming	0	0.0	0	0.0
Toronto	0	0.0	1	0.1
Waterloo Region	0	0.0	0	0.0
Wellington-Dufferin-Guelph	0	0.0	0	0.0
Windsor-Essex County	0	0.0	1	0.2
York Region	0	0.0	0	0.0
Ontario	5	0.0	2	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [01/15/2009].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [01/08/2009].

Note: Rate is incidence per 100,000 population

