

Ontario Annual Infectious Diseases Epidemiology Report, 2009

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Ministry of Health and Long-Term Care

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Ontario Annual Infectious Diseases Epidemiology Report, 2009

About this Report

The Ontario Annual Infectious Diseases Epidemiology Report (2009) 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 third 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, serving 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 ten year trends in infectious diseases in Ontario and identifies diseases or disease-specific areas where public health responses may be required 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 2009. 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 2009 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, summary tables, maps and figures. The tables, maps and figures summarize the following data:

- Baseline trends over the previous ten years in Ontario and Canada
- In-focus analysis of 2009 surveillance data including:
 - Distribution of reported cases per month for select diseases (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

In 2009, the MOHLTC implemented revised surveillance case definitions for all reportable diseases. The revisions reflect the changing epidemiology of infectious diseases and the use of more current laboratory diagnostic practices and technology. The revised case definitions apply to all cases of reportable diseases reported to public health on or after April 28, 2009. These updates impacted the classification of several diseases with the main changes being the addition of a probable case classification for all enteric and some vaccine preventable diseases and the requirement of laboratory confirmation for most sexually transmitted diseases. These changes should be considered to ensure valid comparisons to historical incidence.

It should be noted that there are other 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. The impacts of the revised case definitions and other data limitations specific to this report are laid out in the *Technical Notes* found at the end of this report.

The Ontario Annual Infectious Diseases Epidemiology Report is in its third year 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 iPHISupport@ontario.ca.

The 2009 report and earlier reports can be found online at the MOHLTC's website <http://www.health.gov.on.ca/>. The suggested citation for this report is:

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Report Highlights

- In 2009, the Ontario Ministry of Health and Long-Term Care (MOHLTC) monitored over 70 reportable infectious diseases (infectious diseases).
- Infectious diseases continue to be an important public health concern in Ontario with over 60,000 confirmed infections reported province-wide in 2009, affecting 460 out of every 100,000 Ontarians.
- Sexually transmitted and bloodborne infections accounted for 65% of new infections reported in Ontario in 2009 and affected 300 out of every 100,000 Ontarians. Chlamydia was the most commonly reported sexually transmitted infection with almost 29,000 reported cases in 2009.
- Simultaneous infections or co-infections were reported for several diseases in 2009. Forty-four percent of syphilis cases had HIV, four percent of chlamydia cases had gonorrhea and four percent of tuberculosis cases were co-infected with HIV.
- Enteric disease was the second most common category of infectious disease in Ontario in 2009. Diseases in this category accounted for 16% of infectious diseases reported in Ontario in 2009, and affected 72 out of every 100,000 Ontarians.
- The 2009 incidence for about half of all enteric diseases declined by 11% to 36% from their respective rates in 2000. These declines occurred among enteric diseases considered to be endemic in Ontario. Campylobacteriosis, yersiniosis, giardiasis and Hepatitis A experienced the largest declines, while shigellosis, amebiasis and E. coli (VTEC) experienced modest declines. The incidence of botulism and salmonellosis remained relatively unchanged over this period.
- With the exception of cholera which remained unchanged, the 2009 incidence rates for all non-endemic enteric diseases (cyclosporiasis, paratyphoid fever and typhoid fever) increased by at least 45% over their respective rates in 2000. Listeriosis and cryptosporidiosis were the only endemic enteric diseases that experienced increases over this period.
- Diseases transmitted by direct contact or by respiratory routes ranked as the third most common cause of infectious diseases in Ontario in 2009, affecting 67 out of every 100,000 Ontarians. Most of these infections were attributed to the occurrence of the second wave of the influenza H1N1 pandemic with influenza overall affecting 58 out of every 100,000 Ontarians. Tuberculosis was also significant, affecting five out of every 100,000 Ontarians.

- Since 2000, the proportion of foreign born tuberculosis cases has remained relatively stable ranging from 81% to 89%. Overall, 86% of tuberculosis cases reported in Ontario between 2000 and 2009 were born outside Canada, 10% were born in Canada and 3% had an unknown country of origin.
- From 2005 to 2009, the proportion of TB cases reporting resistance to one or more drugs remained fairly stable between 8% and 11%.
- Diseases routinely prevented by vaccine during childhood and vectorborne diseases made relatively smaller contributions to the overall incidence of infectious diseases in Ontario in 2009. With approximately 1,860 reported cases in 2009, vaccine preventable diseases affected 14 out of every 100,000 Ontarians in 2009. Vectorborne diseases accounted for less than 1% of infectious diseases reported in Ontario in 2009 and affected two 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 reported cases and outbreaks provides opportunities to identify sub-populations with lower levels of immunity and improve vaccine uptake in these populations.
- In 2009, the incidence of *Streptococcus pneumoniae* was at its highest since 2000 with 1,258 cases. Haemophilus influenzae B (HiB) was at its lowest since 2000 with four cases reported in 2009.
- Lyme disease is the most frequently reported endemic vectorborne disease in Ontario. Between 2000 and 2009, the incidence of Lyme disease increased steadily with the incidence of local acquisition increasing to 52% in 2009 compared to 31% in 2005.
- West Nile Virus (WNV) illness has declined sharply in Ontario since first being reported in 2002. The incidence of WNV was approximately one-hundred times lower in 2009 compared to 2002. Four cases were reported in both 2008 and 2009.
- Travel to, or recent immigration from malaria endemic countries accounted for 100% of malaria cases reported in Ontario in 2009.

Chapter 1: ENTERIC DISEASES

- The top five causes of enteric illness in Ontario in 2009 were campylobacteriosis (3,264 cases), salmonellosis (2,351 cases), giardiasis (1,503 cases), amebiasis (821 cases) and cryptosporidiosis (310 cases). These diseases represented 88% of all cases of enteric illnesses reported in Ontario in 2009.
- Incidence rates for most enteric diseases declined during the period 2000-2009 with declines occurring primarily among enteric diseases considered endemic in Ontario. Campylobacteriosis (36%), yersiniosis (28%) and giardiasis (25%) and Hepatitis A (24%) experienced the largest declines, while shigellosis and amebiasis experienced modest declines at 11% each. The incidence of *E. coli* declined by 53% in the period following the Walkerton outbreak from 2001-2009.
- The incidence of paratyphoid fever (258%), listeriosis (51%), typhoid fever (45%) and cryptosporidiosis (32%) increased over the same ten year period, while the incidence of cholera, botulism, and salmonellosis remained relatively unchanged. The increase in the incidence of cyclosporiasis from 2001-2009 was comparably higher at 540%.
- Males experienced higher incidence rates for most enteric diseases reported in 2009 with the exception of *E. coli*, typhoid fever, salmonellosis and cyclosporiasis. The incidence rate for paratyphoid fever was the same for both sexes.
- Enteric diseases occur throughout the year, although they tend to occur more frequently in the warmer months. In 2009, the months of May to October accounted for 66% of reported cases.
- Toronto had the highest number of cases for the top five enteric diseases in Ontario in 2009 because of its large population. As in 2008, Huron County (cryptosporidiosis) and Toronto (amebiasis) had the highest incidence rates for two of the top five enteric diseases in 2009. Thunder Bay District (salmonellosis), Huron County (campylobacteriosis) and Haliburton-Kawartha-Pine Ridge (giardiasis) reported the highest incidence rates for the other top five causes of enteric illness in 2009.
- In 2009, travel was the most common exposure setting for paratyphoid fever (93%), typhoid fever (84%), cyclosporiasis (55%), shigellosis (44%) and Hepatitis A (39%). It accounted for 14% to 30% of most other enteric diseases with a natural reservoir in Canada, and just 4% of listeriosis and 11% of VTEC cases reported in 2009.

Table 1.1: Incidence of Enteric and Zoonotic Diseases: Ontario, 2000-2009

Enteric and Zoonotic Diseases ^{3,4}	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009 ¹	
	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²	Case	Rate ²
Enteric Diseases																				
Amebiasis	925	7.9	851	7.2	825	6.8	771	6.3	678	5.5	772	6.1	659	5.2	815	6.4	764	5.9	821	6.3
Campylobacteriosis	5061	43.3	5033	42.3	4612	38.1	4127	33.7	3991	32.1	3796	30.2	3870	30.5	3873	30.2	3786	29.3	3264	25.0
Cryptosporidiosis	235	2.0	250	2.1	231	1.9	277	2.3	303	2.4	266	2.1	402	3.2	405	3.2	334	2.6	310	2.4
Cyclosporiasis ⁵	nr	nr	23	0.2	52	0.4	39	0.3	95	0.8	132	1.1	92	0.7	94	0.7	104	0.8	147	1.1
Giardiasis	2007	17.2	2060	17.3	1921	15.9	1633	13.3	1592	12.8	1626	12.9	1582	12.5	1623	12.7	1599	12.4	1503	11.5
Hepatitis A	157	1.3	175	1.5	151	1.2	143	1.2	185	1.5	150	1.2	206	1.6	121	0.9	114	0.9	120	0.9
Listeriosis	37	0.3	37	0.3	43	0.4	43	0.4	42	0.3	37	0.3	42	0.3	40	0.3	95	0.7	56	0.4
Paratyphoid Fever	12	0.1	12	0.1	27	0.2	21	0.2	47	0.4	55	0.4	51	0.4	47	0.4	58	0.4	43	0.3
Salmonellosis	2389	20.4	2564	21.6	2476	20.5	2008	16.4	2119	17.1	2956	23.5	2395	18.9	2820	22.0	2373	18.4	2351	18.0
Shigellosis	288	2.5	234	2.0	847	7.0	283	2.3	286	2.3	337	2.7	206	1.6	232	1.8	239	1.8	255	2.0
Typhoid Fever	53	0.5	62	0.5	60	0.5	50	0.4	69	0.6	68	0.5	92	0.7	86	0.7	95	0.7	77	0.6
<i>E. coli</i> , verotoxin producing	1746	14.7	358	3.0	394	3.3	462	3.8	318	2.6	259	2.1	343	2.7	365	2.9	279	2.2	167	1.3
Yersiniosis	338	2.9	314	2.6	383	3.2	329	2.7	297	2.4	354	2.8	364	2.9	269	2.1	260	2.0	243	1.9
Botulism	0	0.0	0	0.0	1	0.0	2	0.0	2	0.0	1	0.0	5	0.0	4	0.0	2	0.0	2	0.0
Cholera	0	0	3	0.0	1	0.0	2	0.0	0	0	1	0.0	1	0.0	1	0.0	3	0.0	1	0.0
Zoonotic Diseases																				
Brucellosis	2	0.1	3	0.1	5	0.1	4	0.0	3	0.1	6	0.0	2	0.0	5	0.0	5	0.0	6	0.0
Psittacosis/Ornithosis	2	0.0	0	0	2	0.0	1	0.0	0	0.0	0	0	0	0.0	0	0.0	0	0.0	0	0.0
Q-fever	12	0.1	12	0.1	1	0.1	8	0.0	6	0.1	2	0.0	4	0.0	3	0.0	4	0.0	6	0.0
Trichinosis	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tularemia	1	0.0	0	0.0	0	0.0	2	0.0	2	0.0	1	0.0	0	0.0	0	0.0	1	0.0	0	0.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Includes both confirmed and probable cases.

Note 2: Incidence rate per 100,000 population.

Note 3: No cases were reported for the following enteric and zoonotic diseases in Ontario during the period 2000-2009: anthrax, plague, rabies and Hantavirus pulmonary disease.

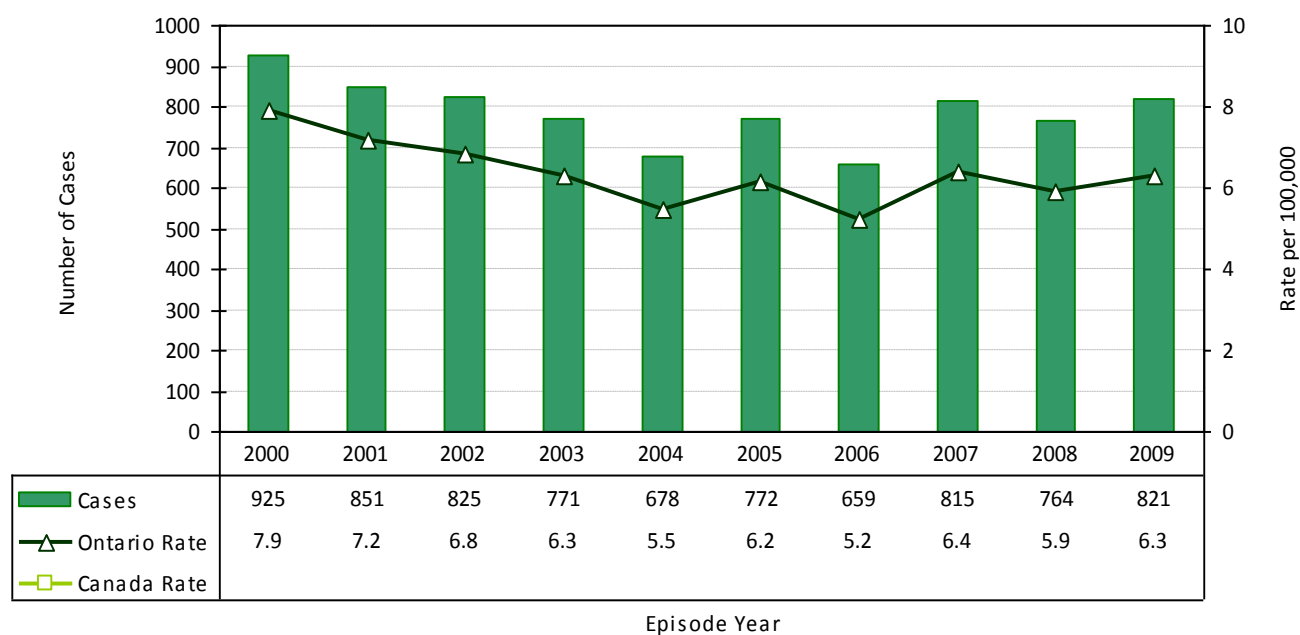
Note 4: Enteric diseases caused by etiologic agents other than those specified in table 1.1 are reported as food poisoning incidents; these incidents are not included in this report.

Note 5: nr – not reportable

1.1 AMEBIASIS

- Amebiasis was the fourth leading cause of enteric diseases in Ontario in 2009, accounting for 9% of all enteric and zoonotic diseases reported in the year (Table 1.1).
- In 2009, Ontario reported 821 confirmed and probable cases of amebiasis, which represents an incidence rate of 6.3 cases per 100,000 population. In 2009, the incidence of amebiasis increased by 7% (57 cases) from the 2008 total of 764 confirmed cases. The implementation of new provincial case definitions in early 2009 may have contributed to this increase (Table 1.1).
- Since 2004, the incidence rate of amebiasis has fluctuated between 5.2 and 6.3 cases per 100,000 population, with an average of approximately 790 cases per year.
- Similar to other enteric diseases, amebiasis demonstrated a seasonal summer peak with the months of June through to September of 2009 accounting for 42% of cases (Figure 1.1.2).
- In 2009, the overall incidence rate of amebiasis among males (9.0 cases per 100,000 population) in Ontario was 2.5 times that of their female counterparts (3.6 cases per 100,000 population) (Figure 1.1.3, Table 1.1.1).
- Age-specific incidence rates of amebiasis in 2009 were higher for males compared to females in all age groups except 0-4. Incidence among males peaked at 14.4 and 16.2 cases per 100,000 population in the 30-39 and 40-49 age groups, respectively. For females, incidence peaked at 5.4 and 6.6 cases per 100,000 population in the 20-29 and 30-39 age groups, respectively (Figure 1.1.3, Table 1.1.1).
- Same-sex sexual contact among males in the 30-49 age range is an emerging risk factor for amebiasis and other enteric diseases easily transmitted from person to person.
- Toronto reported the highest incidence rate of amebiasis in 2009 with 16.0 cases per 100,000 population, followed by Ottawa with 8.8 cases per 100,000. A similar geographic distribution of cases was reported in 2008 with Toronto (15.2) and Ottawa (12.1) reporting the first and second highest rates of amebiasis. (Map 1.1.1, Table 1.1.2).
- In 2009, travel outside of Ontario accounted for almost one-quarter (23%) of amebiasis cases who reported an exposure (Figure 1.1.4).

Figure 1.1.1: Incidence of Amebiasis in Ontario and Canada: 2000-2009

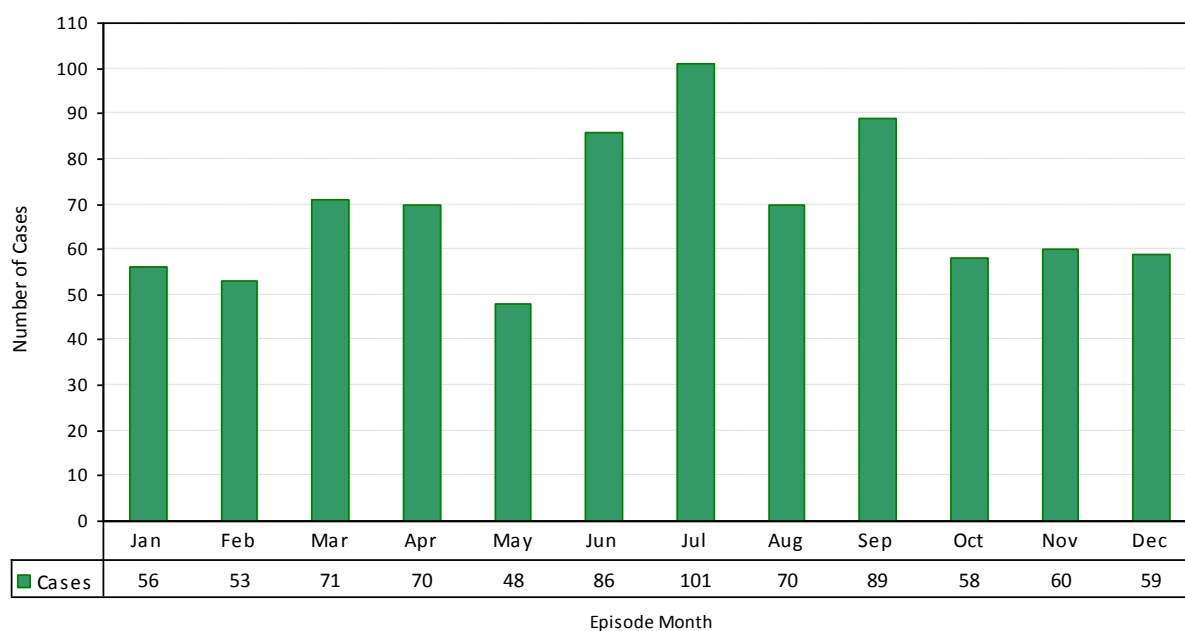


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Amebiasis was removed from the national notifiable diseases list in 1999

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

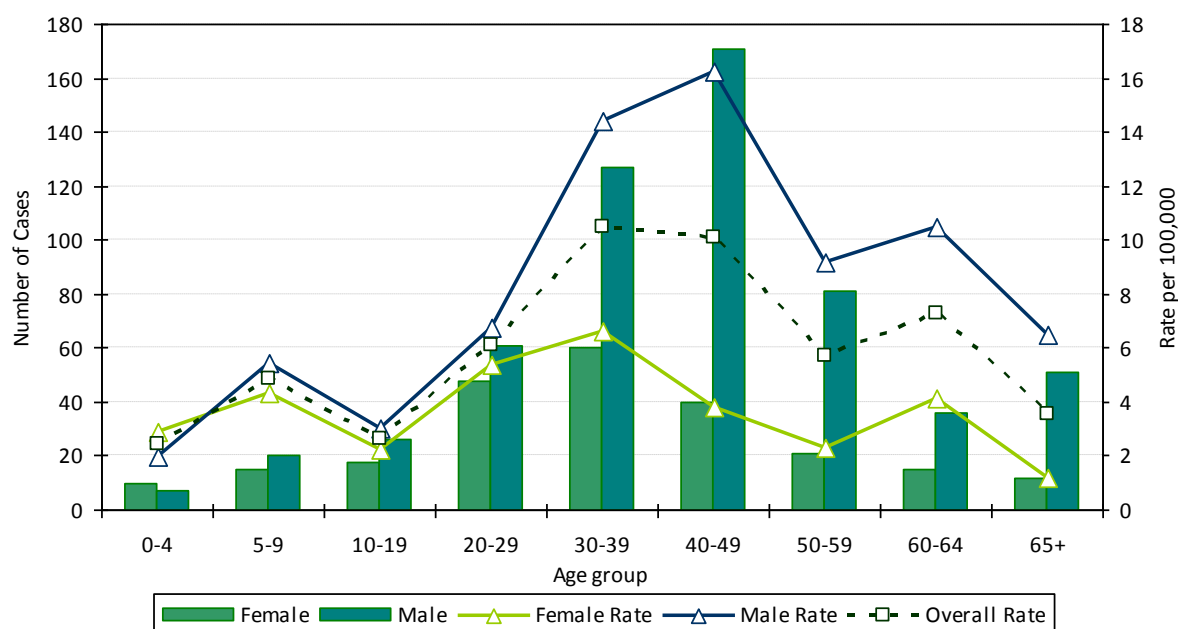
Figure 1.1.2: Incidence of Amebiasis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 1.1.1: Incidence of Amebiasis by Age and Sex: Ontario, 2009

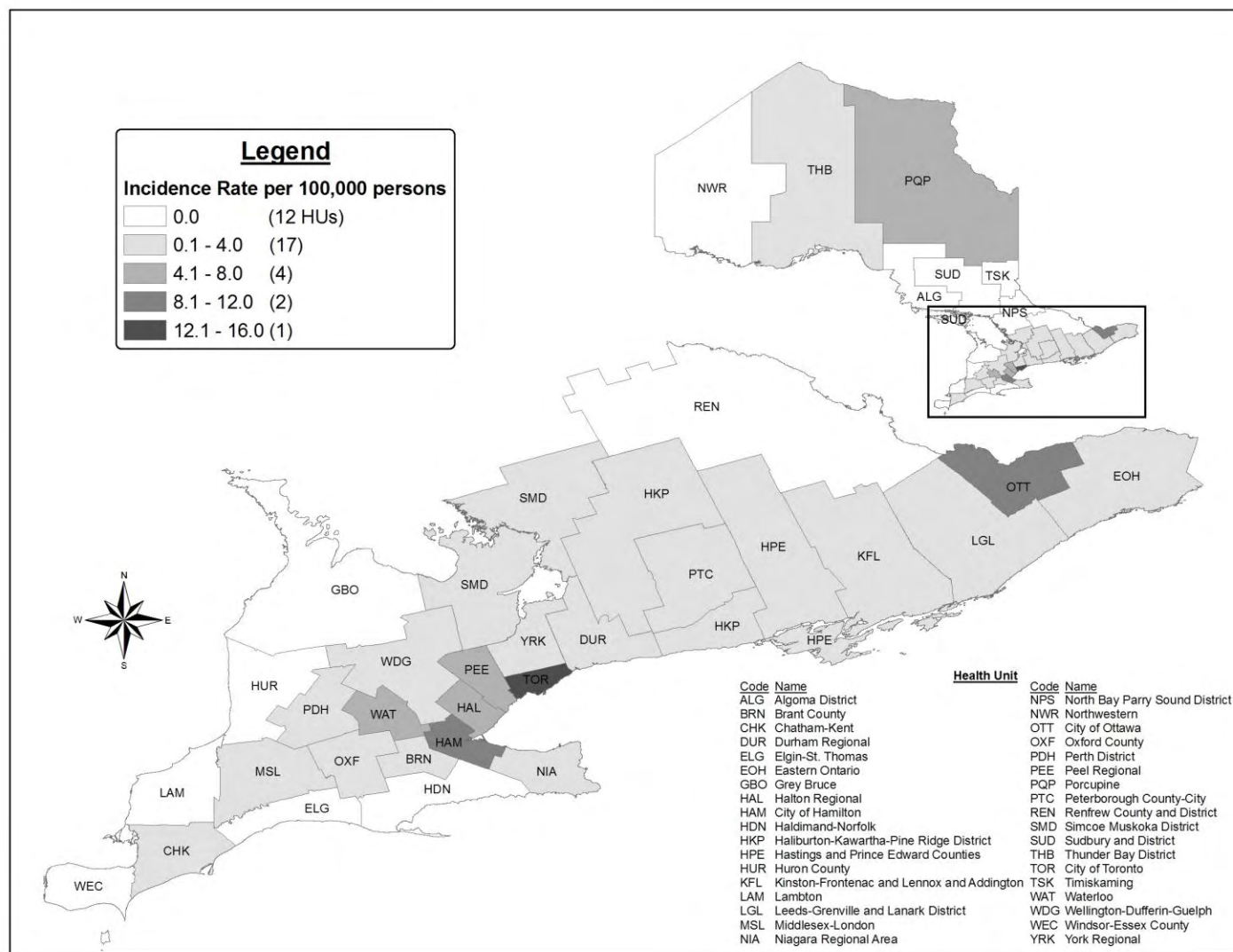
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	10	2.9	7	1.9	17	2.4
5-9	15	4.3	20	5.4	35	4.9
10-19	18	2.2	26	3.0	44	2.6
20-29	48	5.4	61	6.7	109	6.1
30-39	60	6.6	127	14.4	187	10.5
40-49	40	3.8	171	16.2	211	10.1
50-59	21	2.3	81	9.1	102	5.7
60-64	15	4.2	36	10.5	51	7.2
65+	12	1.2	51	6.5	63	3.5
Total	239	3.6	580	9.0	819	6.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 2 cases for which sex and/or age were reported as unknown.

Map 1.1.1: Incidence Rates of Amebiasis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

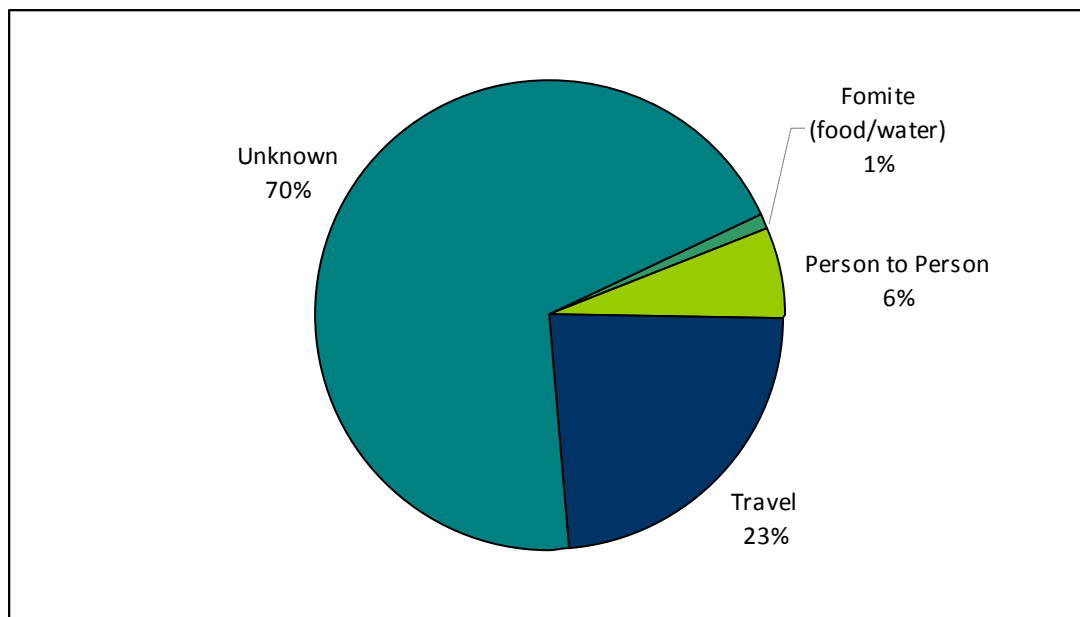
Public Health Unit	Number of cases	Rate/100,000 population
Toronto	429	16.0
Ottawa, City of	78	8.8
Hamilton, City of	43	8.1
Porcupine	7	8.0
Peel Region	99	7.5
Waterloo Region	26	5.0
Halton Region	20	4.1
York Region	38	3.7
Brant County	5	3.6
Haliburton, Kawartha, Pine Ridge	6	3.4
Middlesex-London	13	2.9
Chatham-Kent	3	2.7
Peterborough County-City	3	2.2
Wellington-Dufferin-Guelph	6	2.2
Kingston, Frontenac, Lennox & Addington	4	2.1
Durham Region	12	2.0
Eastern Ontario	4	2.0
Hastings & Prince Edward Counties	3	1.8
Leeds, Grenville and Lanark District	3	1.8
Niagara Region	8	1.8
Simcoe Muskoka District	8	1.6
Perth District	1	1.3
Oxford County	1	0.9
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
Huron County	0	0.0
Lambton County	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Renfrew County and District	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	821	6.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

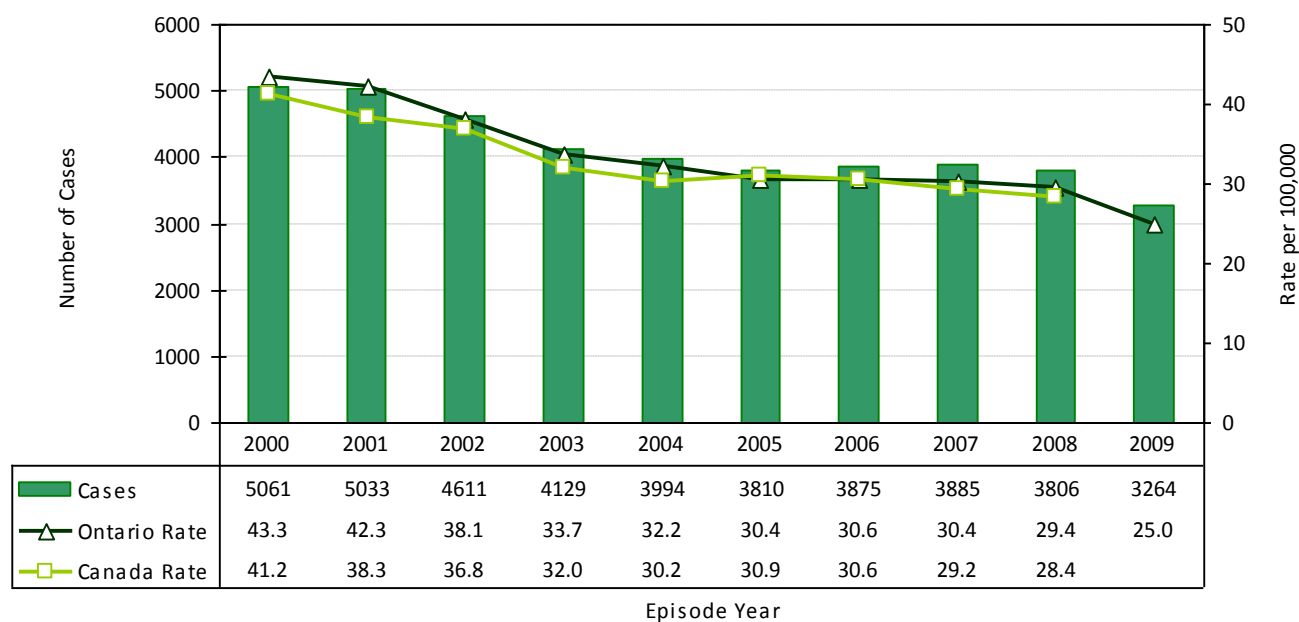
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposures were not reported for 19% of cases; these cases were excluded.

1.2 CAMPYLOBACTERIOSIS

- Campylobacteriosis was the leading cause of enteric disease in Ontario in 2009, accounting for 35% of enteric diseases reported in that year (Table 1.1).
- In 2009, Ontario reported 3,264 cases of campylobacteriosis, which represents an incidence rate of 25.0 cases per 100,000 population (Table 1.2.1).
- During the period 2000-2009, the incidence rate of campylobacteriosis declined by 42% from 43.3 cases per 100,000 population in 2000 to 25.0 cases per 100,000 population in 2009 (Figure 1.2.1).
- Ontario and Canada experienced comparable declines in the annual incidence rate of campylobacteriosis. Throughout the period 2000-2004, Canada experienced slightly lower rates than Ontario followed by a four year period up to 2008 where the gap between the provincial and national rates narrowed (Figure 1.2.1).
- Cases of campylobacteriosis in 2009 demonstrated a seasonal peak that occurred in the warmer months from June to October. The number of cases reported during this period accounted for 60% (1,961) of campylobacteriosis cases reported in 2009 (Figure 1.2.2).
- In 2009, the incidence rate of campylobacteriosis was 21% higher for males at 27.4 cases per 100,000 population compared to 22.6 cases per 100,000 population for females (Figure 1.2.3, Table 1.2.1).
- The incidence rate of campylobacteriosis was highest among the 0-4 age group at 38 cases per 100,000 population. The incidence rate for males in this age group was 45 cases per 100,000 population and 30 per 100,000 for females (Figure 1.2.3, Table 1.2.1).
- Forty-two percent of health units reported incidence rates for campylobacteriosis that were higher than or similar to the overall rate for Ontario. Huron County (56 cases per 100,000 population), Perth District (44 cases per 100,000 population) and Grey Bruce (43 cases per 100,000 population) reported the highest incidence rates of campylobacteriosis in 2009. Porcupine Health Unit reported the lowest incidence rate at 10 cases per 100,000 population (Map 1.2.1, Table 1.2.2).
- Of campylobacteriosis cases reporting exposures in 2009, 63% reported exposures in unknown settings, 17% reported travel outside of Ontario, 9% reported exposures within their homes, 6% reported exposures at food premises and 5% reported exposures in other settings (Figure 1.2.4).

Figure 1.2.1: Incidence of Campylobacteriosis in Ontario and Canada: 2000-2009



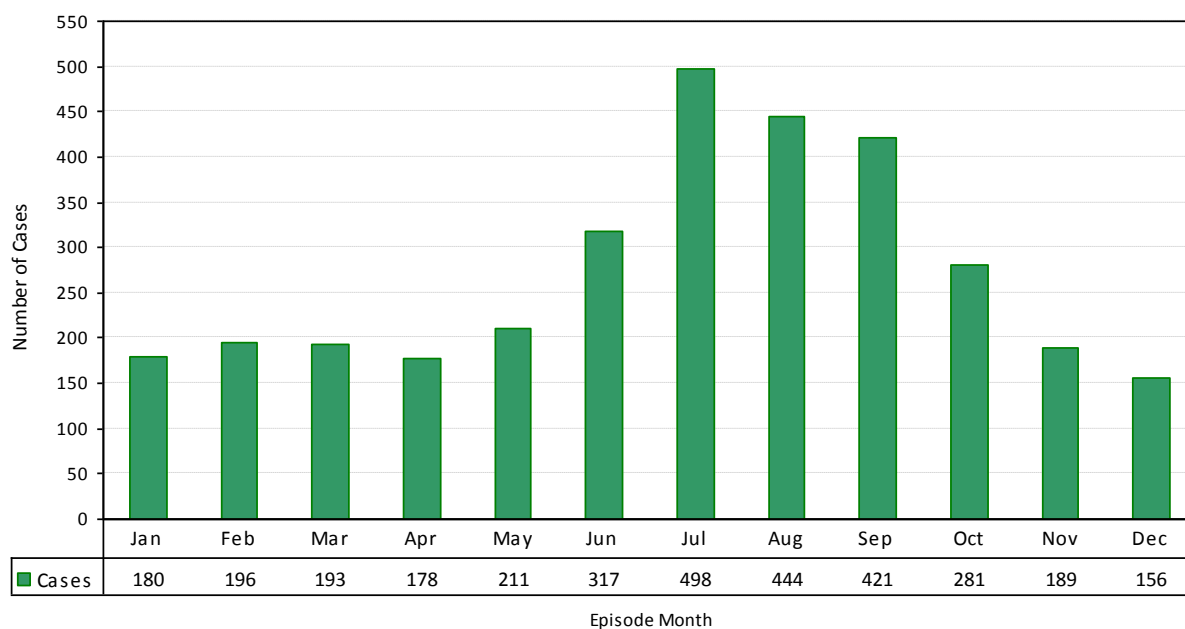
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian statistics available up to 2008.

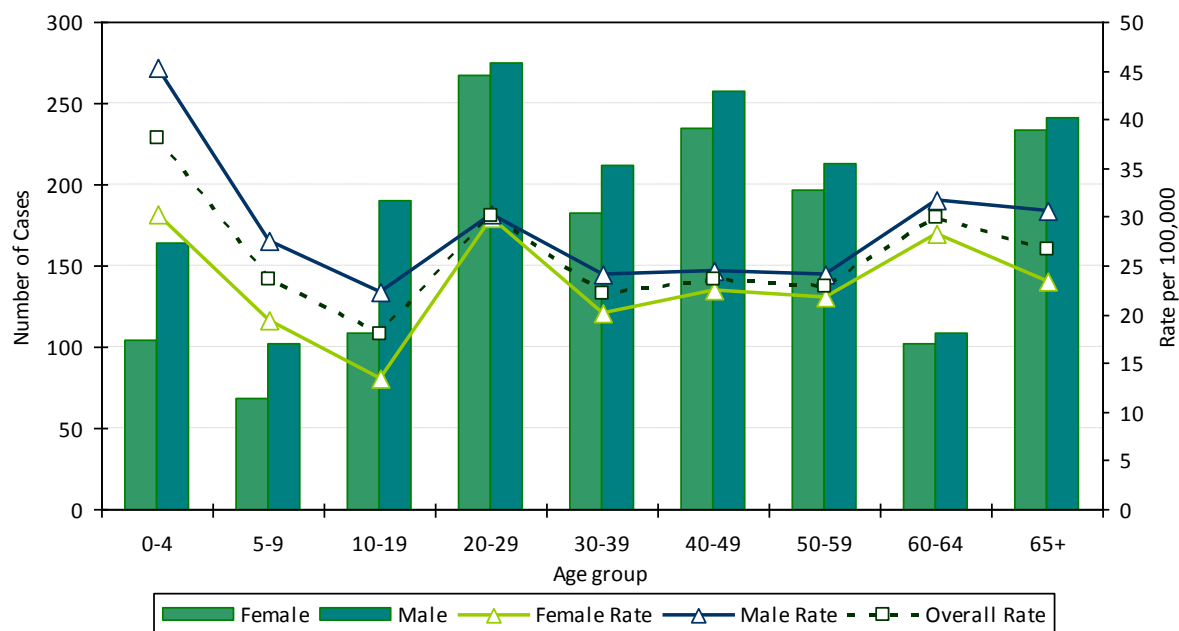
Figure 1.2.2: Incidence of Campylobacteriosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 1 case for which sex was reported as unknown.

Table 1.2.1: Incidence of Campylobacteriosis by Age and Sex: Ontario, 2009

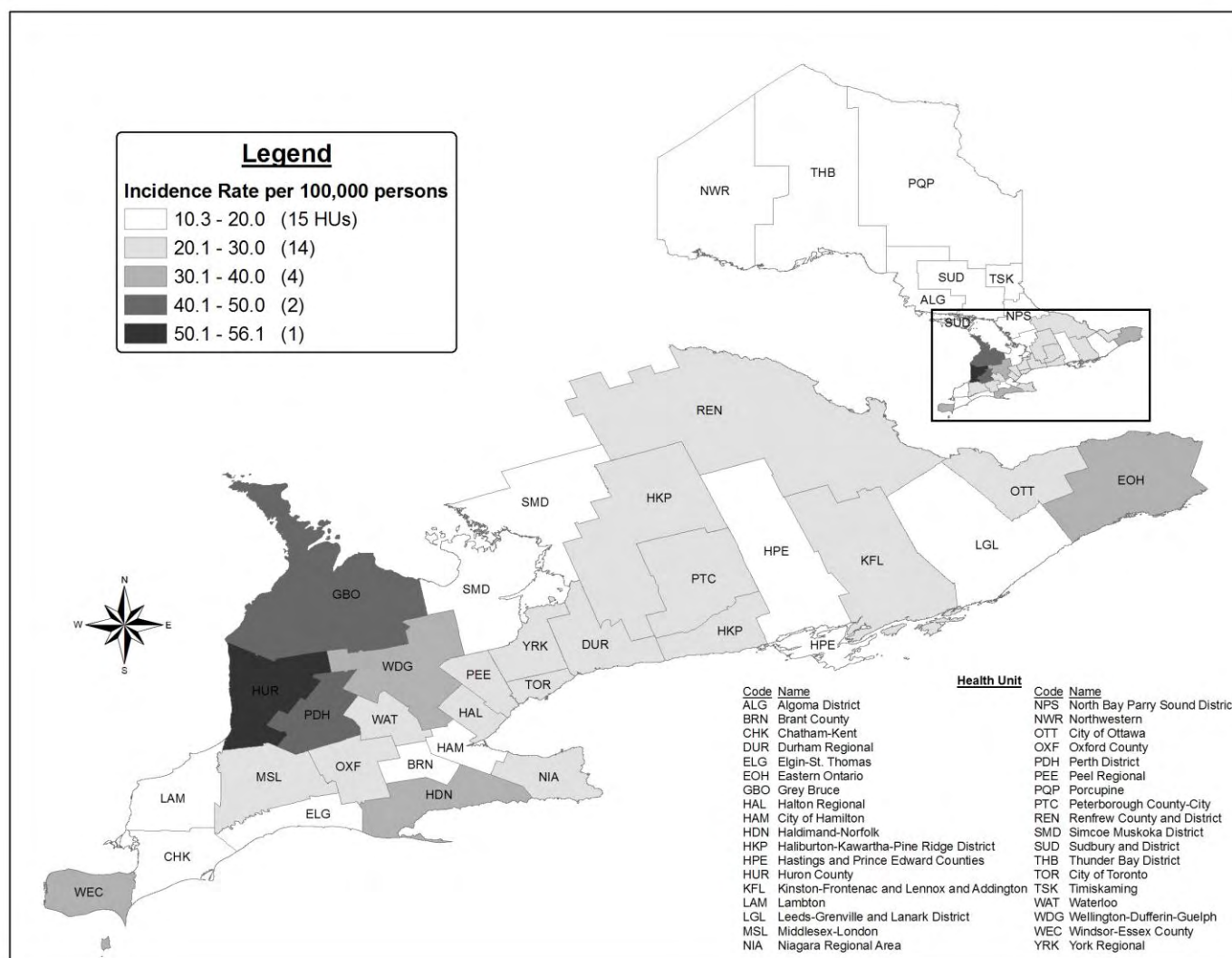
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	104	30.2	164	45.3	268	38.0
5-9	68	19.4	102	27.6	170	23.6
10-19	109	13.3	190	22.2	299	17.9
20-29	267	29.9	275	30.3	542	30.1
30-39	183	20.2	212	24.0	395	22.1
40-49	235	22.5	258	24.5	493	23.5
50-59	197	21.7	213	24.1	410	22.9
60-64	102	28.3	109	31.7	211	29.9
65+	234	23.3	241	30.7	475	26.6
Total	1,499	22.6	1,764	27.4	3,263	25.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex was reported as unknown

Map 1.2.1: Incidence Rates of Campylobacteriosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

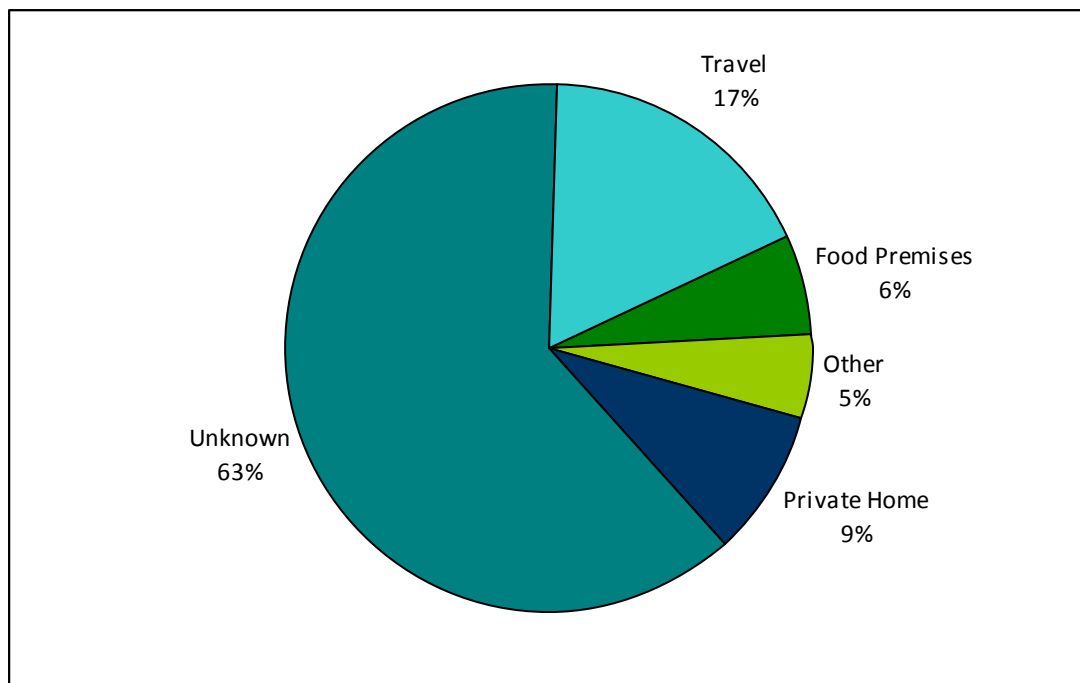
Public Health Unit	Number of cases	Rate/100,000 population
Huron County	34	56.1
Perth District	34	44.3
Grey Bruce	70	42.9
Haldimand-Norfolk	43	38.8
Windsor-Essex County	141	34.9
Eastern Ontario	62	31.1
Wellington-Dufferin-Guelph	84	30.8
York Region	299	29.4
Niagara Region	128	28.9
Toronto	768	28.7
Haliburton, Kawartha, Pine Ridge	49	27.6
Oxford County	29	27.1
Middlesex-London	116	25.7
Peterborough County-City	35	25.3
Ottawa	221	25.0
Halton Region	117	23.8
Durham Region	145	23.6
Peel Region	310	23.6
Kingston, Frontenac, Lennox & Addington	45	23.2
Waterloo Region	116	22.4
Renfrew County and District	21	20.4
Brant County	24	17.3
Hastings & Prince Edward Counties	28	17.2
Northwestern	14	17.1
Thunder Bay District	25	16.0
Hamilton	84	15.8
Simcoe Muskoka District	81	15.8
Chatham-Kent	17	15.4
Lambton County	20	15.1
Elgin-St. Thomas	13	14.4
Algoma District	16	13.5
Sudbury and District	26	13.0
North Bay Parry Sound District	16	12.7
Leeds, Grenville and Lanark District	20	11.9
Timiskaming	4	11.5
Porcupine	9	10.3
Ontario	3,264	25.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Exposures for Campylobacteriosis Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

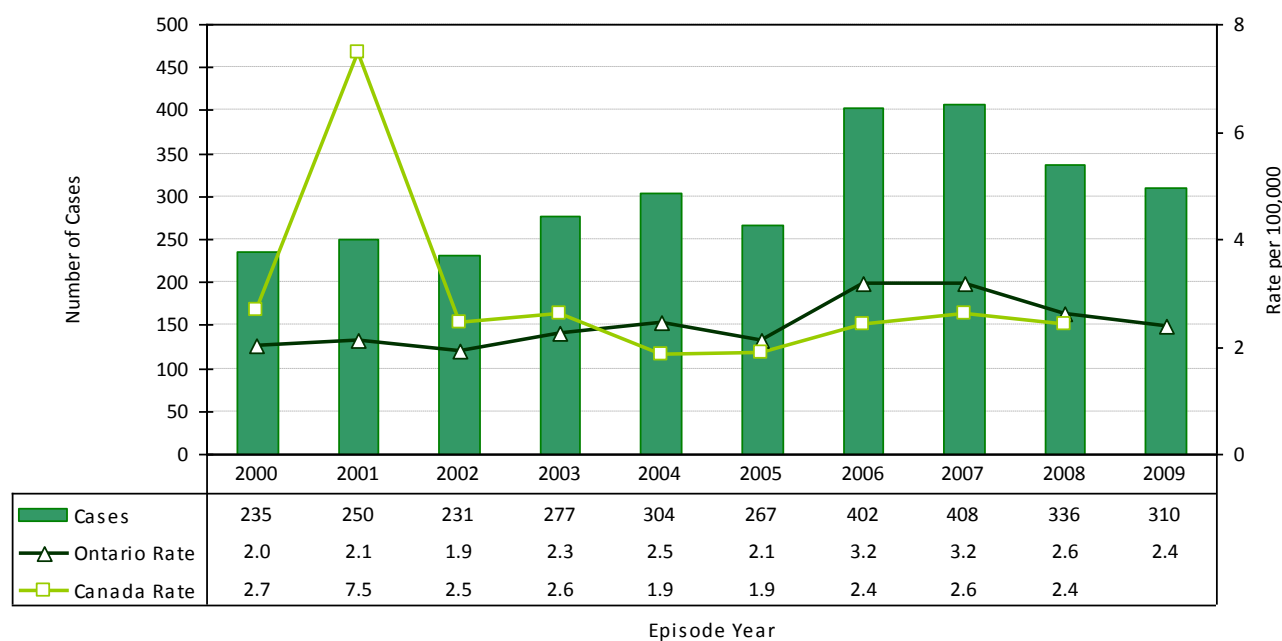
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 22% of cases; these cases were excluded.

1.3 CRYPTOSPORIDIOSIS

- Cryptosporidiosis was the fifth leading cause of enteric diseases in Ontario in 2009 with a total of 310 confirmed cases, which represents an incidence rate of 2.4 cases per 100,000 population (Table 1.1).
- In 2009, the incidence rate of cryptosporidiosis decreased by 25% from its peak of 3.2 cases per 100,000 population in both 2006 and 2007 (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. In more recent years, the annual incidence rates for cryptosporidiosis in Ontario have exceeded the national rates by 8% to 33%. (Figure 1.3.1).
- Similar to previous years, cryptosporidiosis cases demonstrated a seasonal trend in 2009, with the majority (47%) of cases occurring during the months of July (32), August (71) and September (44) (Figure 1.3.2).
- In 2009, males accounted for 52% (162) of cryptosporidiosis cases and had a corresponding incidence rate of 2.5 cases per 100,000 population. Females accounted for a slightly smaller proportion of cases (48%; 148 cases) and had a corresponding incidence rate of 2.2 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). Overall, 90% of cases occurred among persons under the age of 40 years.
- Huron County (13.2 cases per 100,000 population), Perth District (13.0 cases per 100,000 population) and Elgin-St. Thomas (8.9 cases per 100,000 population) reported the highest incidence rates of cryptosporidiosis in 2009 (Map 1.3.1, Table 1.3.2).
- Travel outside of Ontario (30%) and on-farm exposures (10%) were the two most common exposures for cryptosporidiosis cases who reported an exposure in 2009. Exposures through recreational water use (8%), within private residences (5%) and in other settings (4%) accounted for the remaining cases (Figures 1.3.4).

Figure 1.3.1: Incidence of Cryptosporidiosis in Ontario and Canada: 2000-2009



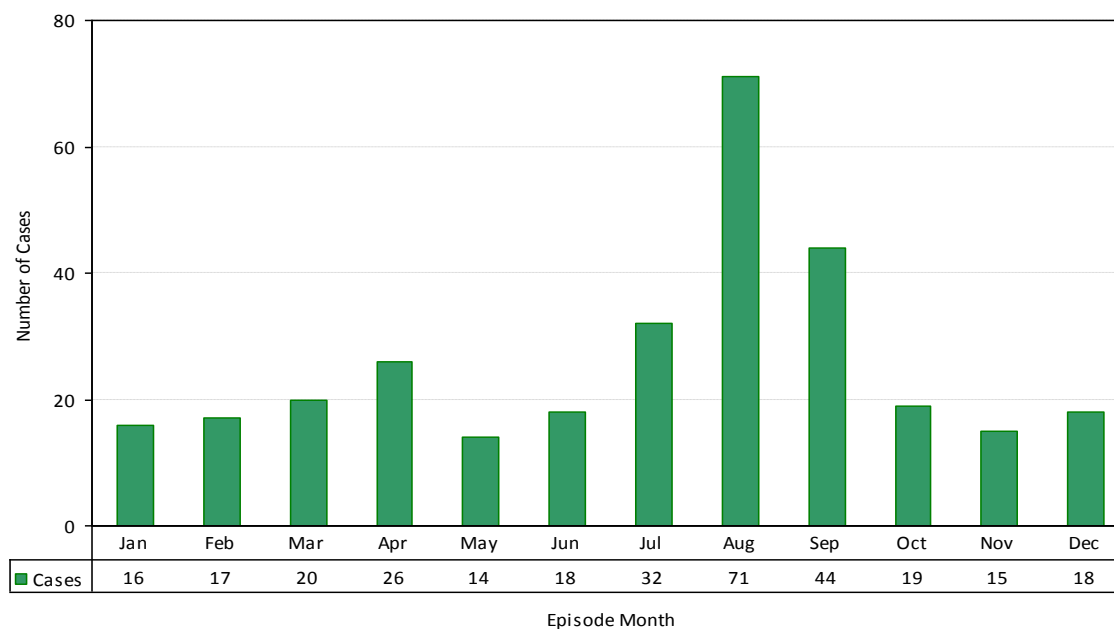
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario.

Note: Canadian statistics available up to 2008.

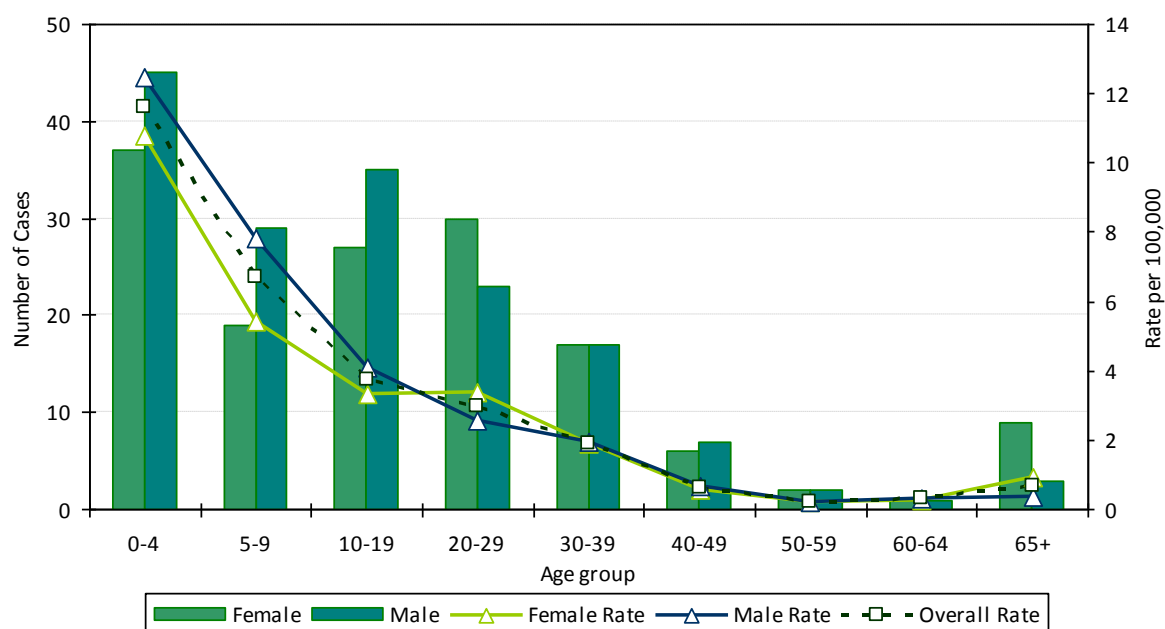
Figure 1.3.2: Incidence of Cryptosporidiosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2011/01/18].

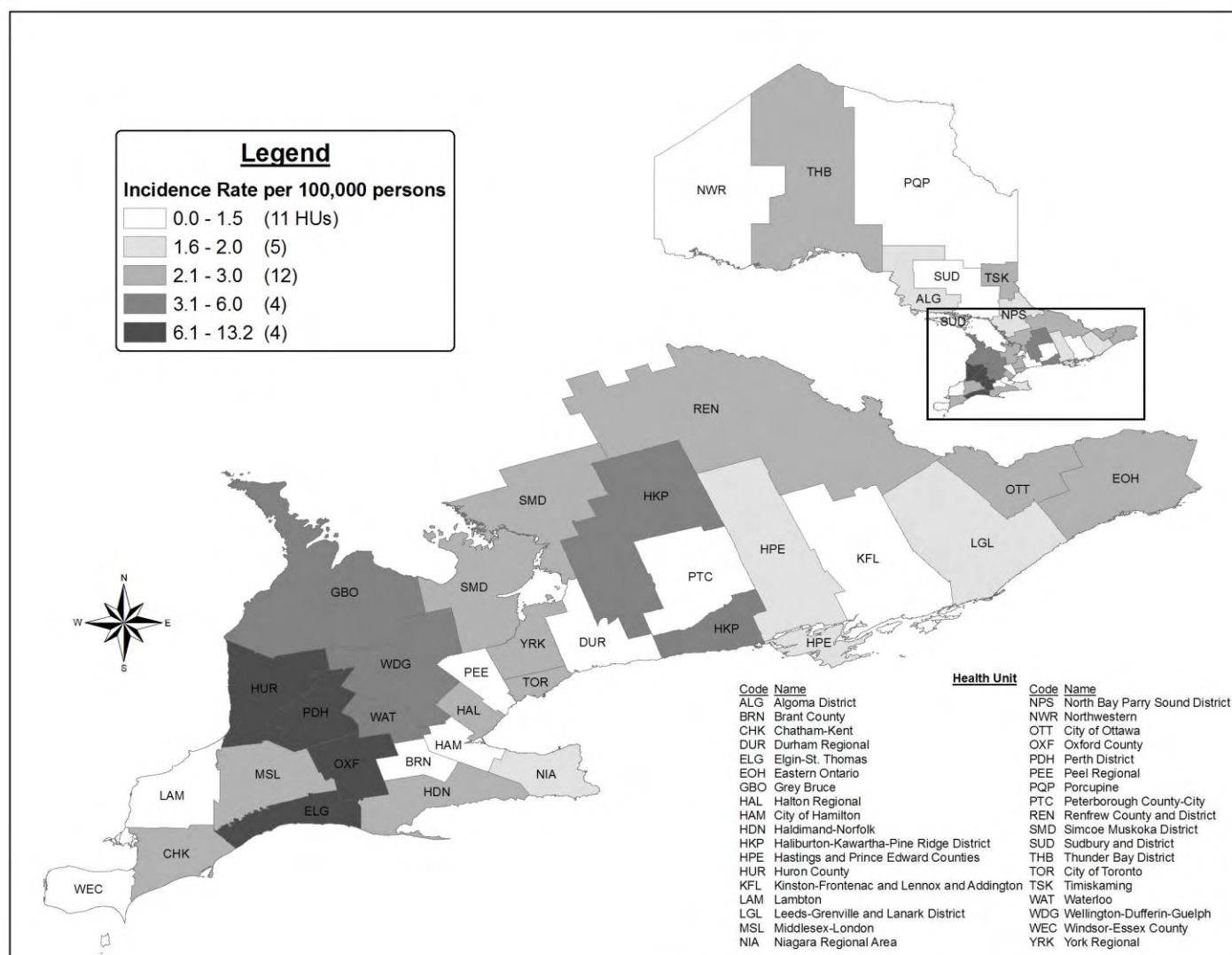
Table 1.3.1: Incidence of Cryptosporidiosis by Age and Sex: Ontario, 2009

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	37	10.8	45	12.4	82	11.6
5-9	19	5.4	29	7.8	48	6.7
10-19	27	3.3	35	4.1	62	3.7
20-29	30	3.4	23	2.5	53	2.9
30-39	17	1.9	17	1.9	34	1.9
40-49	6	0.6	7	0.7	13	0.6
50-59	2	0.2	2	0.2	4	0.2
60-64	1	0.3	1	0.3	2	0.3
65+	9	0.9	3	0.4	12	0.7
Total	148	2.2	162	2.5	310	2.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2011/01/18].

Map 1.3.1: Incidence Rates of Cryptosporidiosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

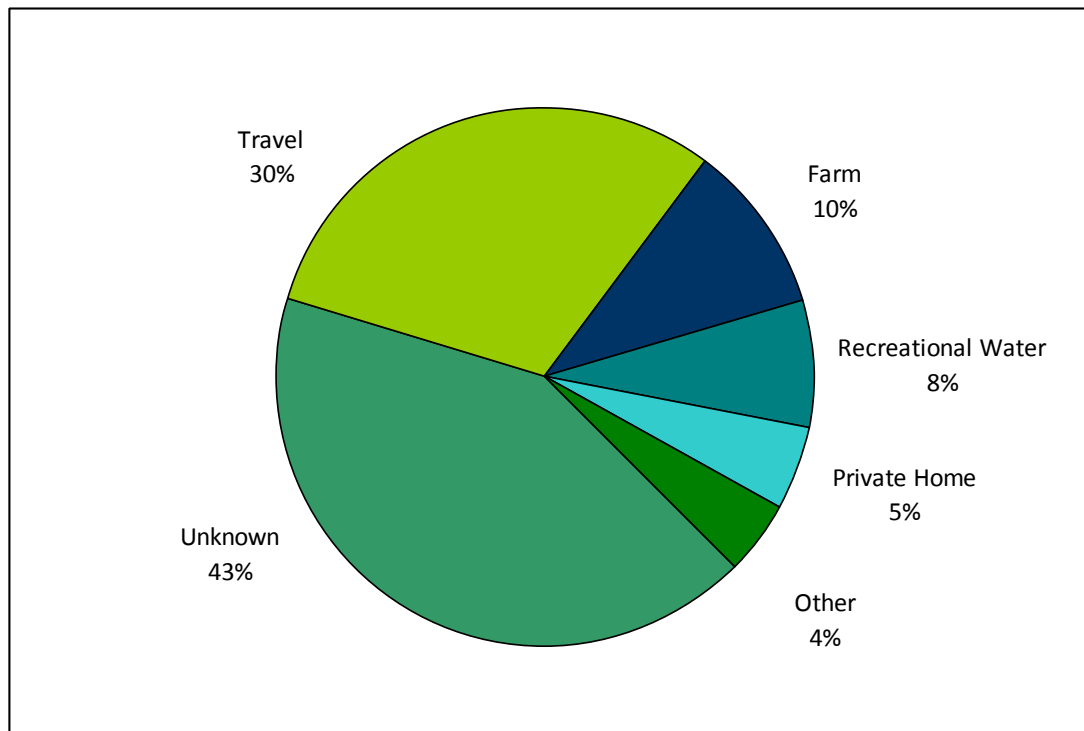
Public Health Unit	Number of cases	Rate/100,000 population
Huron County	8	13.2
Perth District	10	13.0
Elgin-St. Thomas	8	8.9
Oxford County	9	8.4
Wellington-Dufferin-Guelph	16	5.9
Haliburton, Kawartha, Pine Ridge	9	5.1
Grey Bruce	8	4.9
Waterloo Region	20	3.9
Eastern Ontario	6	3.0
Renfrew County and District	3	2.9
Timiskaming	1	2.9
Chatham-Kent	3	2.7
Haldimand-Norfolk	3	2.7
Middlesex-London	12	2.7
Thunder Bay District	4	2.6
Simcoe Muskoka District	13	2.5
City of Ottawa	21	2.4
York Region	23	2.3
Halton Region	11	2.2
Toronto	59	2.2
Hastings & Prince Edward Counties	3	1.8
Leeds, Grenville and Lanark District	3	1.8
Algoma District	2	1.7
North Bay Parry Sound District	2	1.6
Niagara Region	7	1.6
Peel Region	20	1.5
Lambton County	2	1.5
Peterborough County-City	2	1.4
Brant County	2	1.4
City of Hamilton	7	1.3
Porcupine	1	1.1
Kingston, Frontenac, Lennox & Addington	2	1.0
Sudbury and District	2	1.0
Windsor-Essex County	4	1.0
Durham Region	4	0.7
Northwestern	0	0.0
Ontario	310	2.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

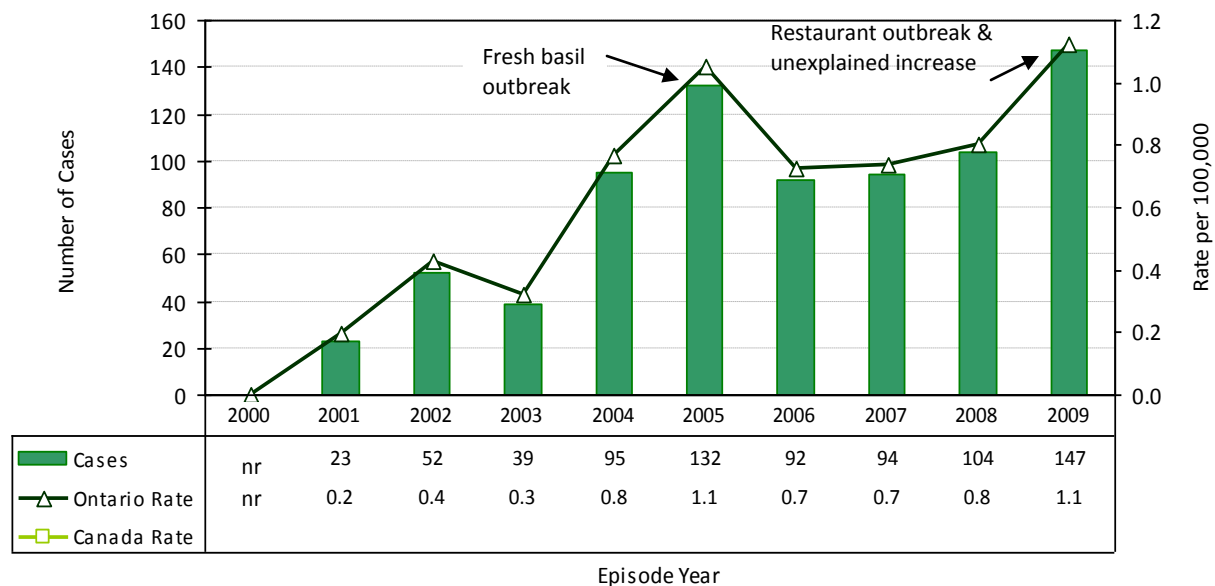
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 18% of cases; these cases were excluded.

1.4 CYCLOSPORIASIS

- The incidence of cyclosporiasis has increased sharply in Ontario since becoming reportable in 2001. In 2009, Ontario reported 147 cases of cyclosporiasis, representing an incidence rate of 1.1 cases per 100,000 population (Table 1.1).
- During the period 2001 to 2009, the incidence of cyclosporiasis in Ontario fluctuated. Since 2004, the incidence 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, and a concurrent restaurant outbreak and unexplained increase in June 2009 (Figure 1.4.1).
- Seventy-one percent (116 cases) of cyclosporiasis cases in 2009 occurred during the months from March through July, with the month of June accounting for 51 of these cases (Figure 1.4.2).
- In 2009, the incidence rate of cyclosporiasis was 31% lower for males at 0.9 cases per 100,000 population compared to females at 1.3 cases per 100,000 population (Figure 1.4.3, Table 1.4.1).
- Age-specific incidence rate of cyclosporiasis was highest in the 50-59 age group (2.1 cases per 100,000 population). The highest sex-specific incidence rates were also reported for males and females in this age group (1.8 and 2.4 cases per 100,000 population, respectively) (Figure 1.4.3, Table 1.4.1).
- Eleven of 36 health units reported incidence rates for cyclosporiasis that were higher than the provincial rate of 1.1 cases per 100,000 population; twelve health units reported no cases of cyclosporiasis in 2009 (Map 1.4.1, Table 1.4.2).
- At 55%, travel outside of Ontario was the most commonly reported exposure setting for cases who reported an exposure for cyclosporiasis in 2009. Exposures in food premises (13%) and other settings (2%) accounted for another 15% of cases, and 30% reported an unknown exposure setting (Figure 1.4.4).

Figure 1.4.1: Incidence of Cyclosporiasis in Ontario: 2000-2009



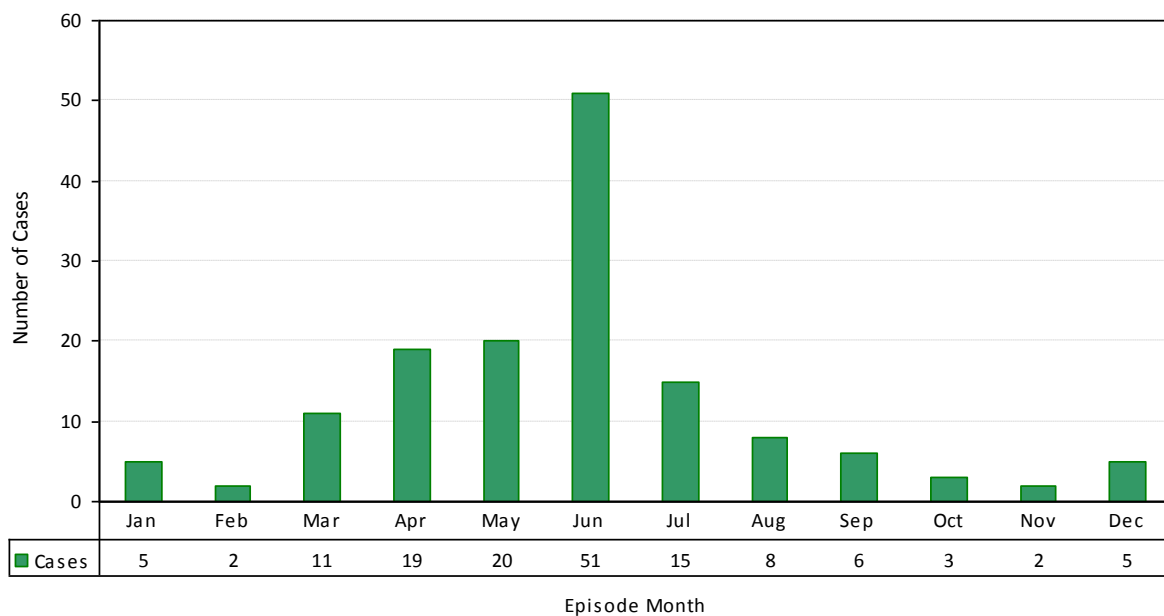
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: No national data available.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: nr – not reportable.

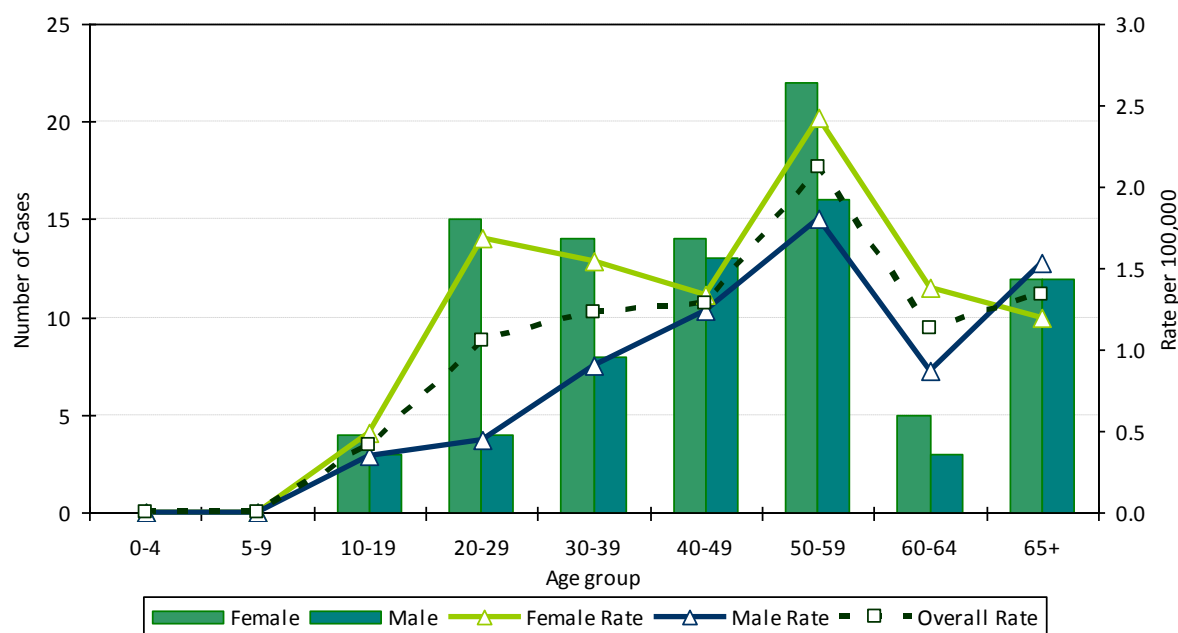
Figure 1.4.2: Incidence of Cyclosporiasis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 2 cases for which age was unknown and/or sex was reported as other.

Table 1.4.1: Incidence of Cyclosporiasis by Age and Sex: Ontario, 2009

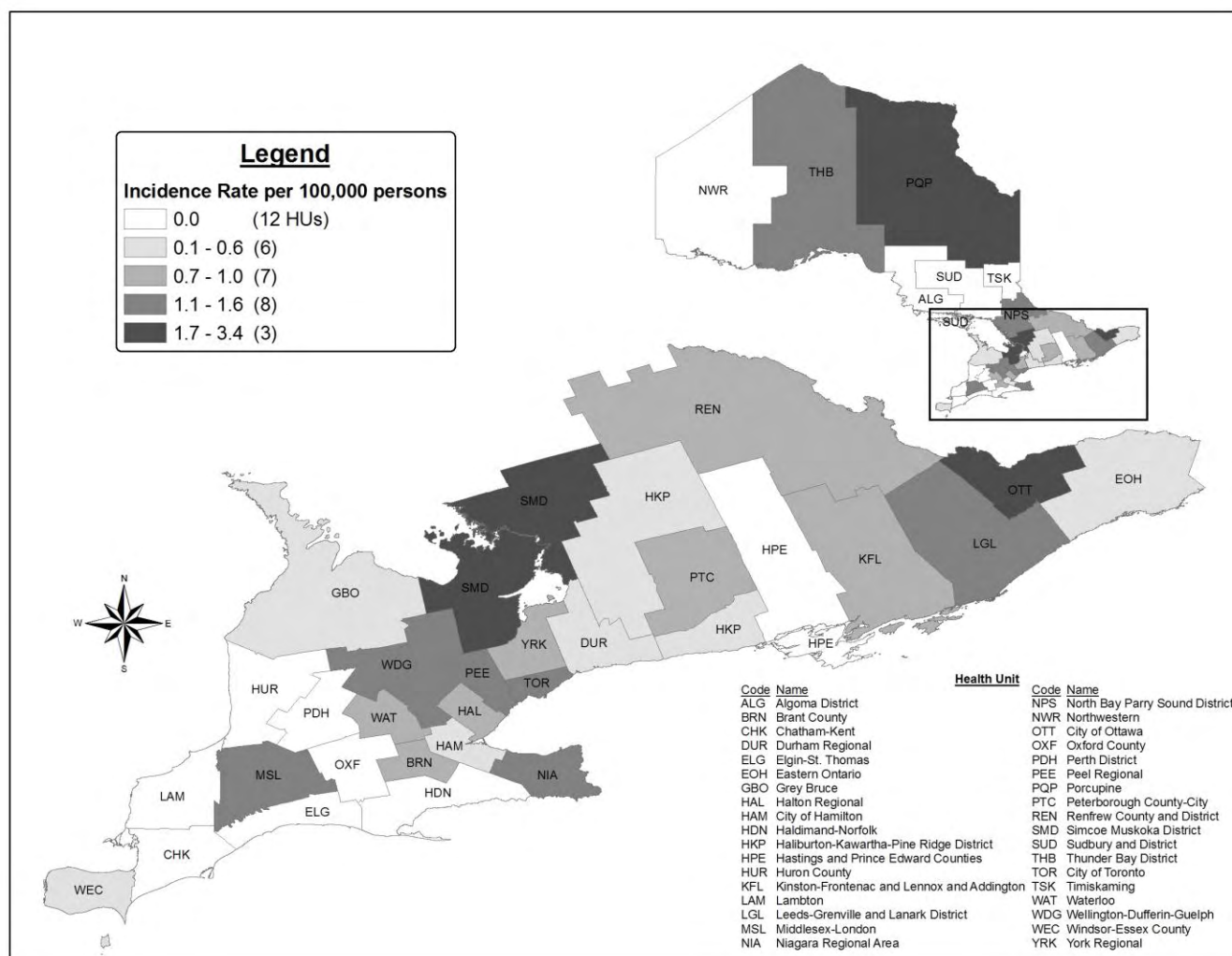
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	0	0.0	0	0.0	0	0.0
5-9	0	0.0	0	0.0	0	0.0
10-19	4	0.5	3	0.4	7	0.4
20-29	15	1.7	4	0.4	19	1.1
30-39	14	1.5	8	0.9	22	1.2
40-49	14	1.3	13	1.2	27	1.3
50-59	22	2.4	16	1.8	38	2.1
60-64	5	1.4	3	0.9	8	1.1
65+	12	1.2	12	1.5	24	1.3
Total	86	1.3	59	0.9	145	1.1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 2 cases for which age was unknown and/or sex was reported as other.

Map 1.4.1: Incidence Rates of Cyclosporiasis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

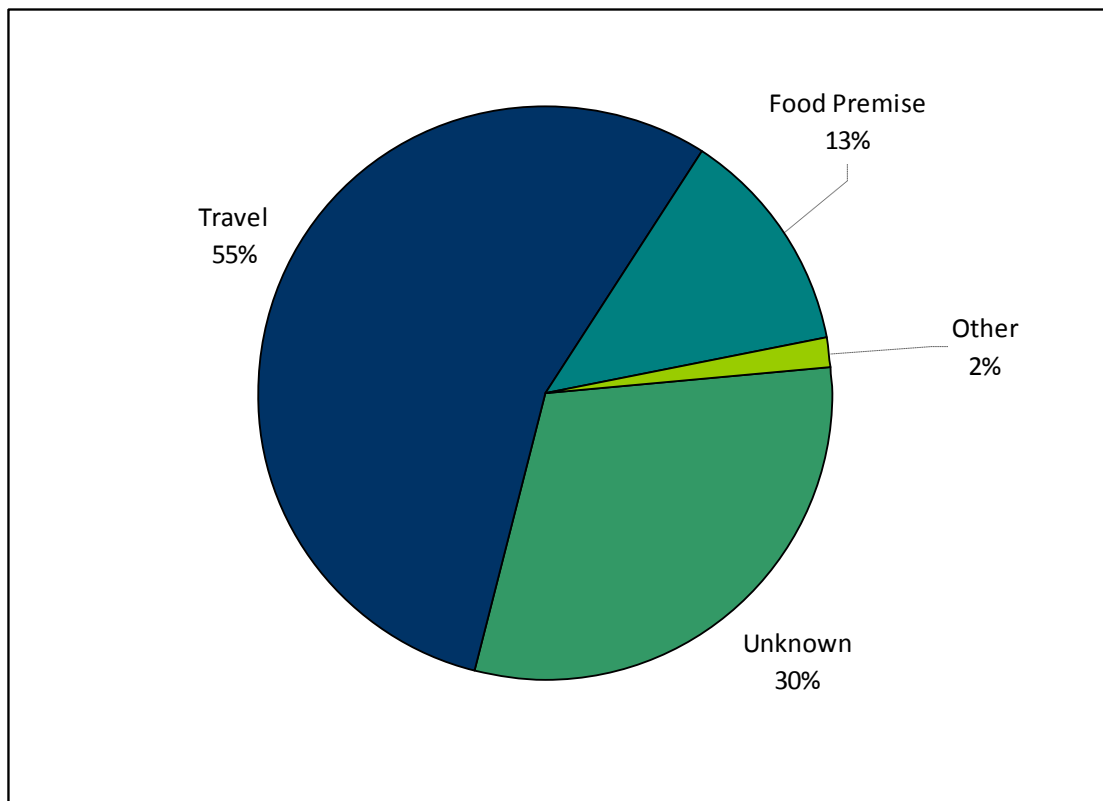
Public Health Unit	Number of cases	Rate/100,000 population
Porcupine	3	3.4
Simcoe Muskoka District	17	3.3
City of Ottawa	15	1.7
Toronto	43	1.6
North Bay Parry Sound District	2	1.6
Niagara Region	7	1.6
Wellington-Dufferin-Guelph	4	1.5
Middlesex-London	6	1.3
Peel Region	17	1.3
Thunder Bay District	2	1.3
Leeds, Grenville and Lanark District	2	1.2
Kingston, Frontenac, Lennox & Addington	2	1.0
Renfrew County and District	1	1.0
Halton Region	4	0.8
Waterloo Region	4	0.8
Peterborough County-City	1	0.7
Brant County	1	0.7
York Region	7	0.7
Grey Bruce	1	0.6
Haliburton, Kawartha, Pine Ridge	1	0.6
Eastern Ontario	1	0.5
Durham Region	3	0.5
City of Hamilton	2	0.4
Windsor-Essex County	1	0.2
Algoma District	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Hastings & Prince Edward Counties	0	0.0
Huron County	0	0.0
Lambton County	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	147	1.1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

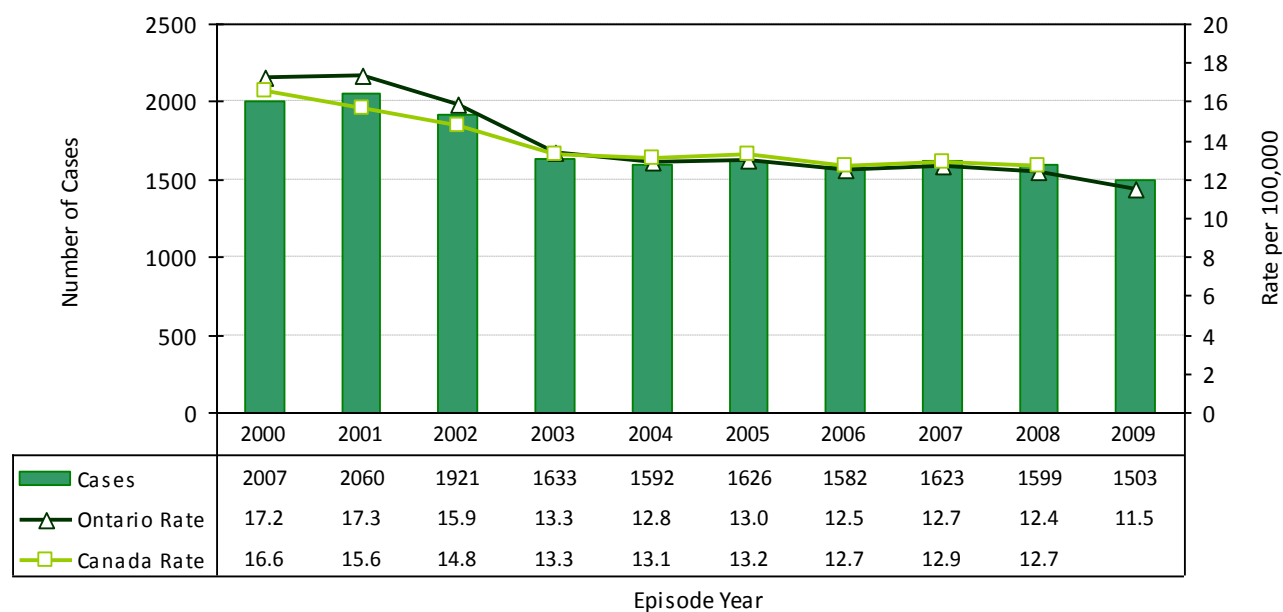
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 15% of cases; these cases were excluded.

1.5 GIARDIASIS

- Giardiasis was the third leading cause of enteric disease in Ontario in 2009, accounting for 16% of all enteric diseases reported (Table 1.1).
- Ontario reported a total of 1,503 cases of giardiasis in 2009, which represents an incidence rate of 11.5 cases per 100,000 population (Table 1.1). This is a 6% decrease from the 2008 total of 1,599 cases.
- During the period 2000 to 2009, the incidence rate of giardiasis in Ontario declined by 33% from 17.2 cases per 100,000 population in 2000 to 11.5 cases per 100,000 population in 2009. The incidence rate of giardiasis was stable at approximately 13 cases per 100,000 population between 2003 and 2008 but has dropped slightly in 2009 (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 2009, July (173), August (187 cases), and September (172 cases) accounted for the highest number of cases (Figure 1.5.2).
- In 2009, males accounted for 59% of confirmed cases of giardiasis reported in Ontario with an incidence rate of 13.7 cases per 100,000 population. Females accounted for 41% of cases with a corresponding incidence rate of 9.3 cases per 100,000 population (Figure 1.5.3, Table 1.5.1).
- Similar to 2007 and 2008, the incidence rate of giardiasis was highest among persons in the 0-4 age group in 2009. In 2009, the 0-4 age group had an incidence rate of 23 cases per 100,000 population which was lower than the 2007 and 2008 incidence rate of approximately 31 cases per 100,000 population. (Figure 1.5.3, Table 1.5.1).
- In 2009, ten Ontario health units (28%) reported incidence rates for giardiasis that exceeded the provincial incidence rate of 11.5 cases per 100,000 population. Haliburton-Kawartha-Pine Ridge, Toronto and Ottawa reported the highest incidence rates at 17.5, 17.0 and 16.9 cases per 100,000 population, respectively (Map 1.5.1, Table 1.5.2).
- Of giardiasis cases reporting a known exposure setting in 2009, travel outside of Ontario accounted for the largest proportion at 29% (Fig 1.5.4). In 2008, the corresponding travel proportion was 32%.

Figure 1.5.1: Incidence of Giardiasis in Ontario and Canada: 2000-2009



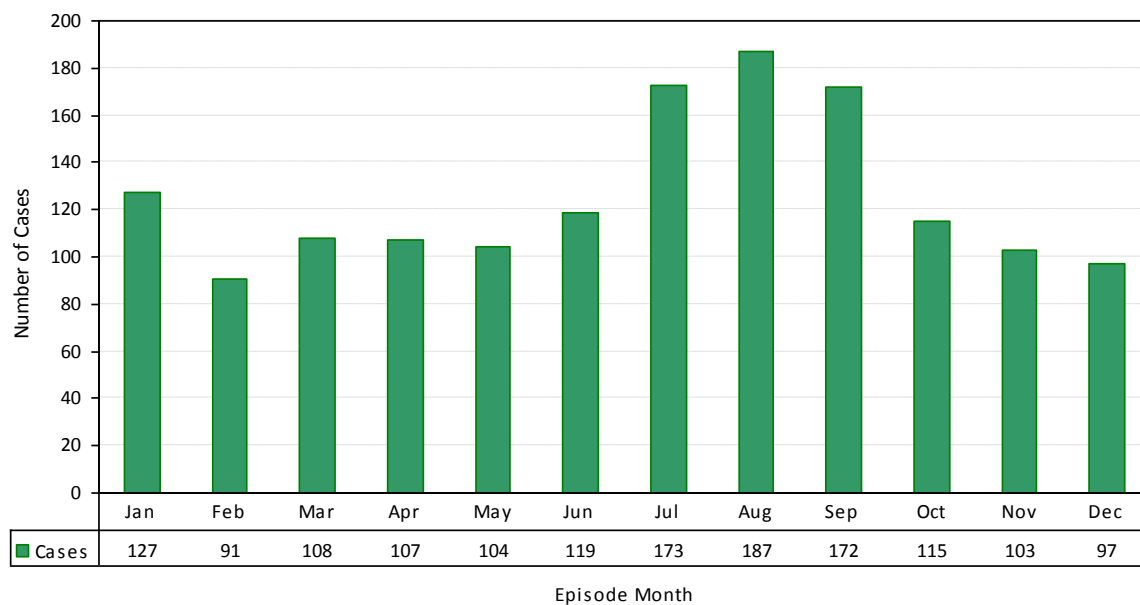
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian statistics available up to 2008.

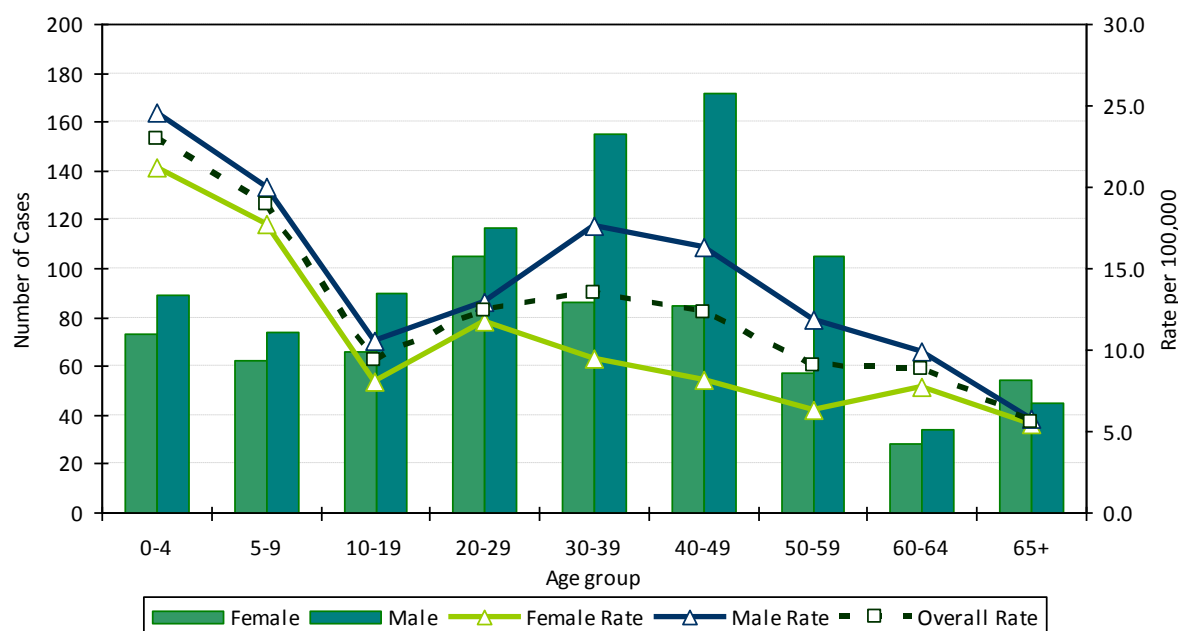
Figure 1.5.2: Incidence of Giardiasis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 6 cases for which age was unknown, sex was reported as unknown, and/or sex was reported as other.

Table 1.5.1: Incidence of Giardiasis by Age and Sex: Ontario, 2009

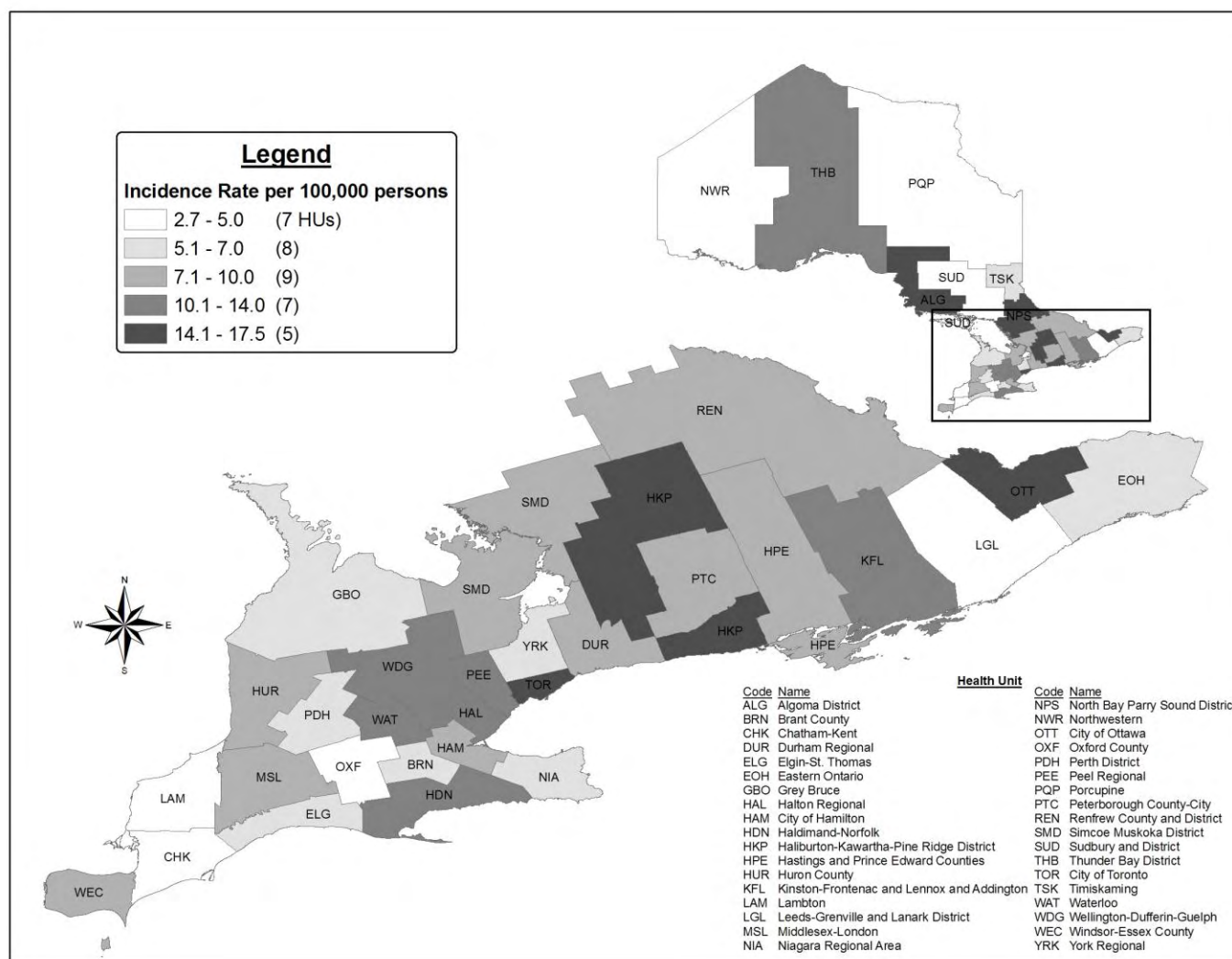
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	73	21.2	89	24.6	162	23.0
5-9	62	17.7	74	20.0	136	18.9
10-19	66	8.1	90	10.5	156	9.3
20-29	105	11.8	117	12.9	222	12.3
30-39	86	9.5	155	17.6	241	13.5
40-49	85	8.1	172	16.3	257	12.3
50-59	57	6.3	105	11.9	162	9.0
60-64	28	7.8	34	9.9	62	8.8
65+	54	5.4	45	5.7	99	5.5
Total	616	9.3	881	13.7	1,497	11.5

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 6 cases for which age was unknown, sex was reported as unknown, and/or sex was reported as other.

Map 1.5.1: Incidence Rates of Giardiasis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

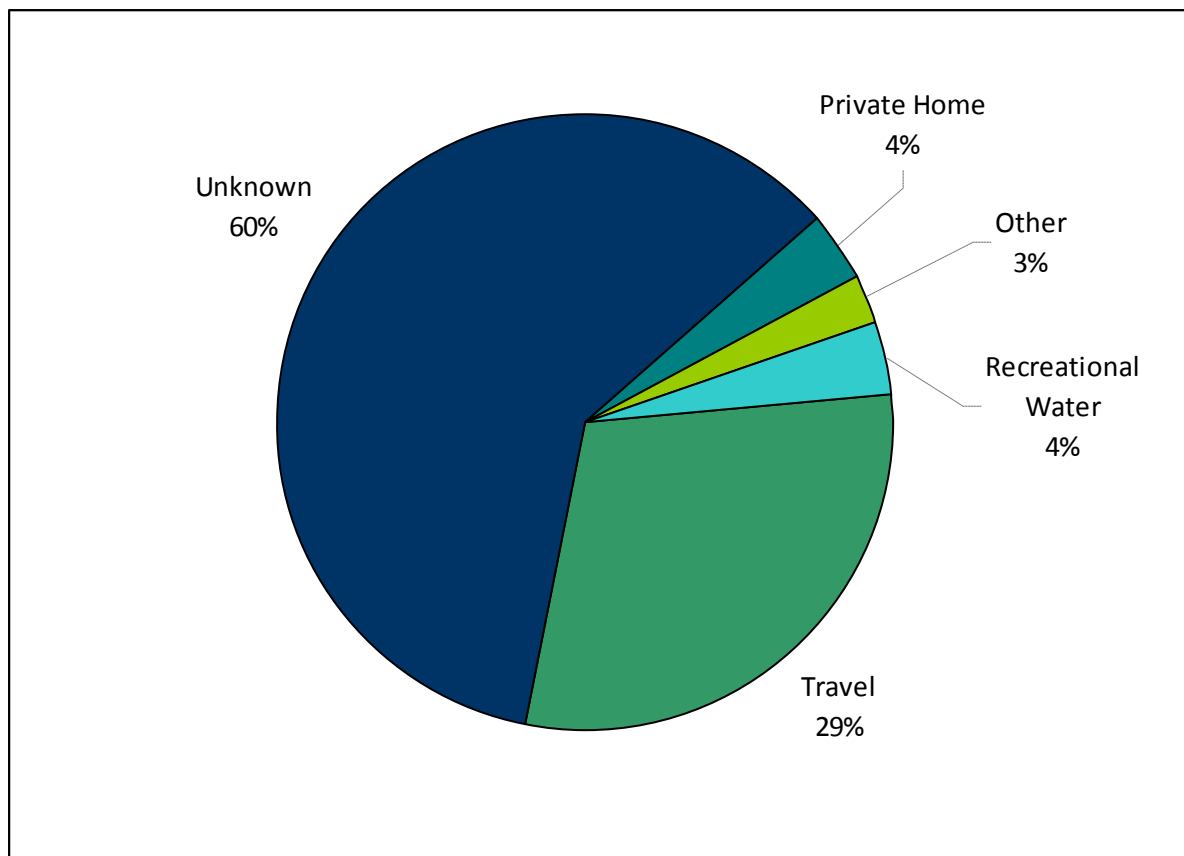
Public Health Unit	Number of cases	Rate/100,000 population
Haliburton, Kawartha, Pine Ridge	31	17.5
Toronto	455	17.0
City of Ottawa	149	16.9
Algoma District	17	14.3
North Bay Parry Sound District	18	14.2
Thunder Bay District	21	13.4
Kingston, Frontenac, Lennox & Addington	26	13.4
Waterloo Region	68	13.1
Peel Region	172	13.1
Haldimand-Norfolk	14	12.6
Halton Region	55	11.2
Wellington-Dufferin-Guelph	30	11.0
Hastings & Prince Edward Counties	16	9.8
Windsor-Essex County	38	9.4
Simcoe Muskoka District	48	9.3
Middlesex-London	41	9.1
Durham Region	54	8.8
City of Hamilton	46	8.7
Peterborough County-City	12	8.7
Huron County	5	8.2
Renfrew County and District	8	7.8
Eastern Ontario	14	7.0
York Region	71	7.0
Grey Bruce	11	6.7
Elgin-St. Thomas	6	6.7
Brant County	8	5.8
Timiskaming	2	5.7
Niagara Region	25	5.6
Perth District	4	5.2
Sudbury and District	10	5.0
Northwestern	4	4.9
Oxford County	5	4.7
Porcupine	4	4.6
Lambton County	6	4.5
Leeds, Grenville and Lanark District	6	3.6
Chatham-Kent	3	2.7
Ontario	1,503	11.5

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

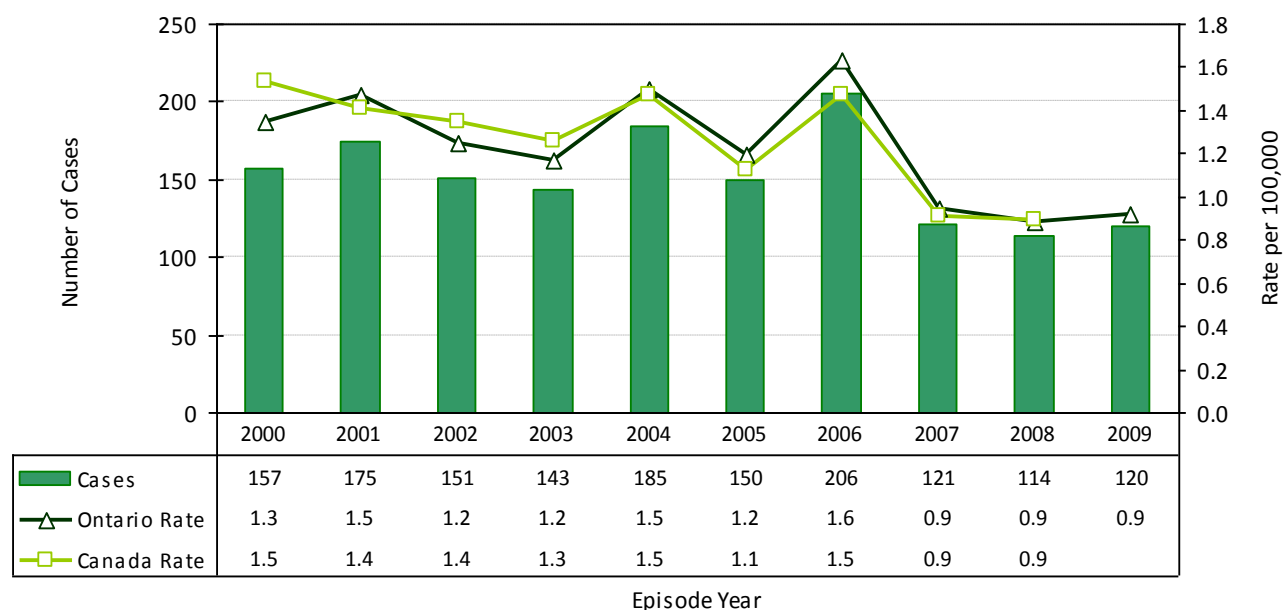
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 22% of cases; these cases were excluded.

1.6 HEPATITIS A

- In 2009, Ontario reported 120 cases of Hepatitis A, which represents an incidence rate of 0.9 cases per 100,000 population (Table 1.1). There was no change in the incidence rate of Hepatitis A in 2009 compared to 2007 and 2008.
- The incidence rate of Hepatitis A in Ontario declined by 31% from 1.3 cases per 100,000 population in 2000 to 0.9 cases per 100,000 population in 2009 (Figure 1.6.1).
- From 2000 to 2009, the incidence rate of Hepatitis A in Ontario was generally comparable to the national rate; there was no difference between the national and the Ontario incidence rates in 2008 and 2009 (0.9 cases per 100,000 population) (Figure 1.6.1).
- The incidence of Hepatitis A in Ontario in 2009 was highest from April to June (14 to 17 cases each month), and lowest in October (3 cases), but was otherwise similar for the rest of the year with 6 to 10 cases each month (Figure 1.6.2).
- In 2009, males accounted for slightly more than half (52%) of reported cases of Hepatitis A in Ontario. The incidence rate for females and males was similar, at 0.9 and 1.0 per 100,000 population, respectively (Figure 1.6.3, Table 1.6.1).
- Overall incidence rate of Hepatitis A in 2009 was highest in the 5-9 age group at 1.9 cases per 100,000 population. The highest sex-specific incidence rates were also reported in this age group at 2.0 and 1.9 cases per 100,000 population for females and males, respectively (Figure 1.6.3, Table 1.6.1).
- Toronto reported the highest number of Hepatitis A cases in Ontario in 2009 (36 cases), whereas Porcupine and Huron County health units reported the highest incidence rates at 3.4 and 3.3 cases per 100,000 population, respectively (Map 1.6.1, Table 1.6.2).
- Travel outside of Ontario accounted for 39% of Hepatitis A cases in 2009 who reported an exposure (Figure 1.6.4).

Figure 1.6.1: Incidence of Hepatitis A in Ontario and Canada: 2000-2009



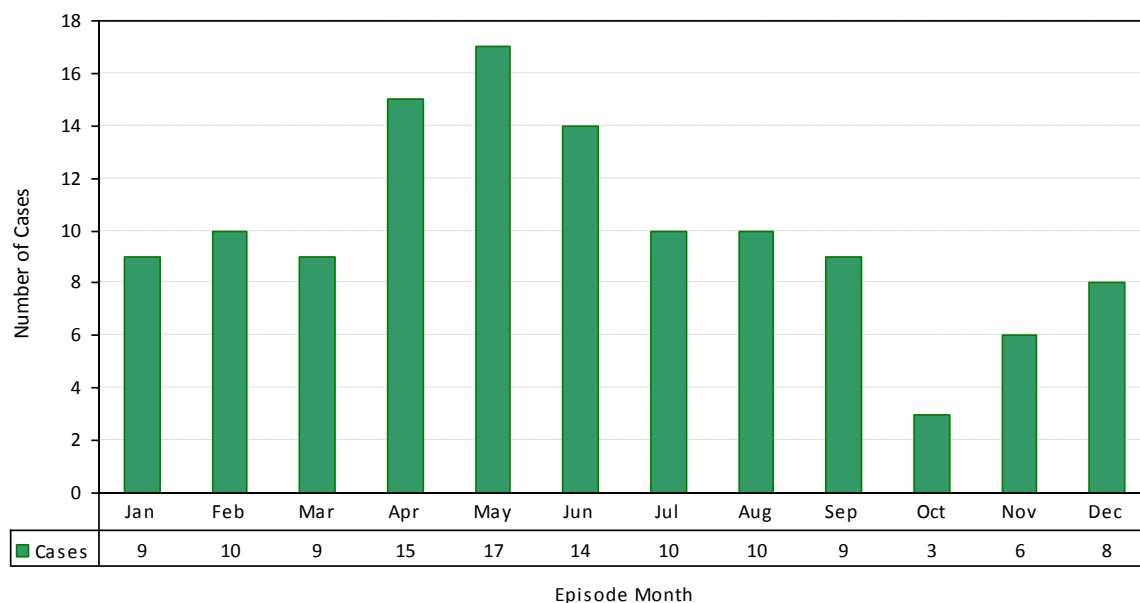
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

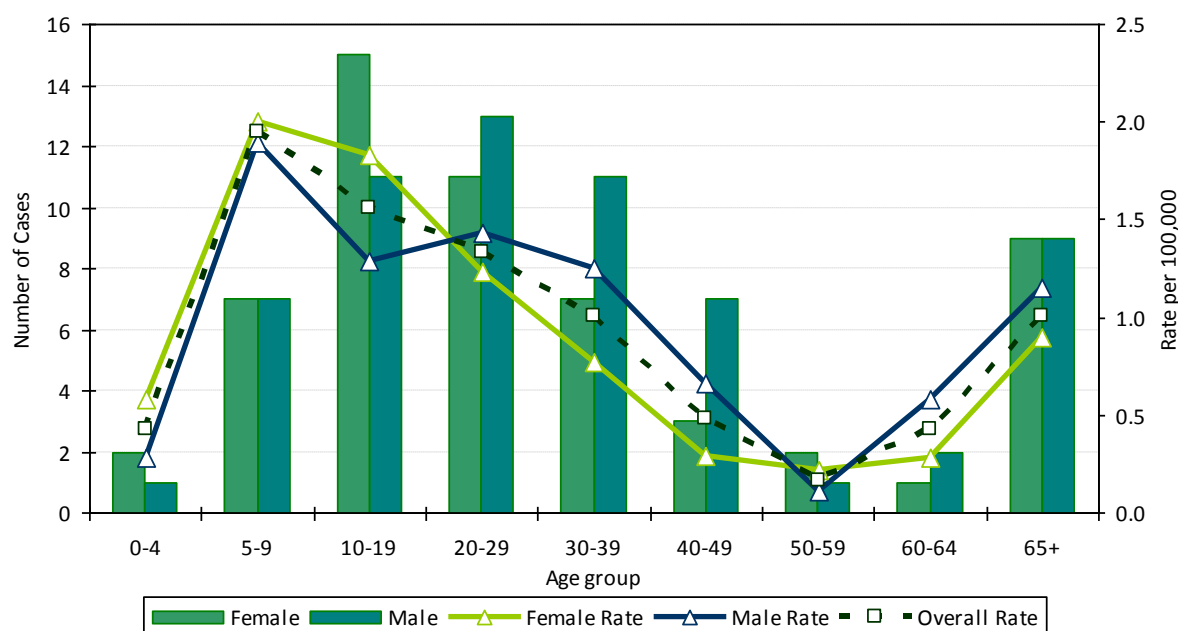
Figure 1.6.2: Incidence of Hepatitis A by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 1.6.1: Incidence of Hepatitis A by Age and Sex: Ontario, 2009

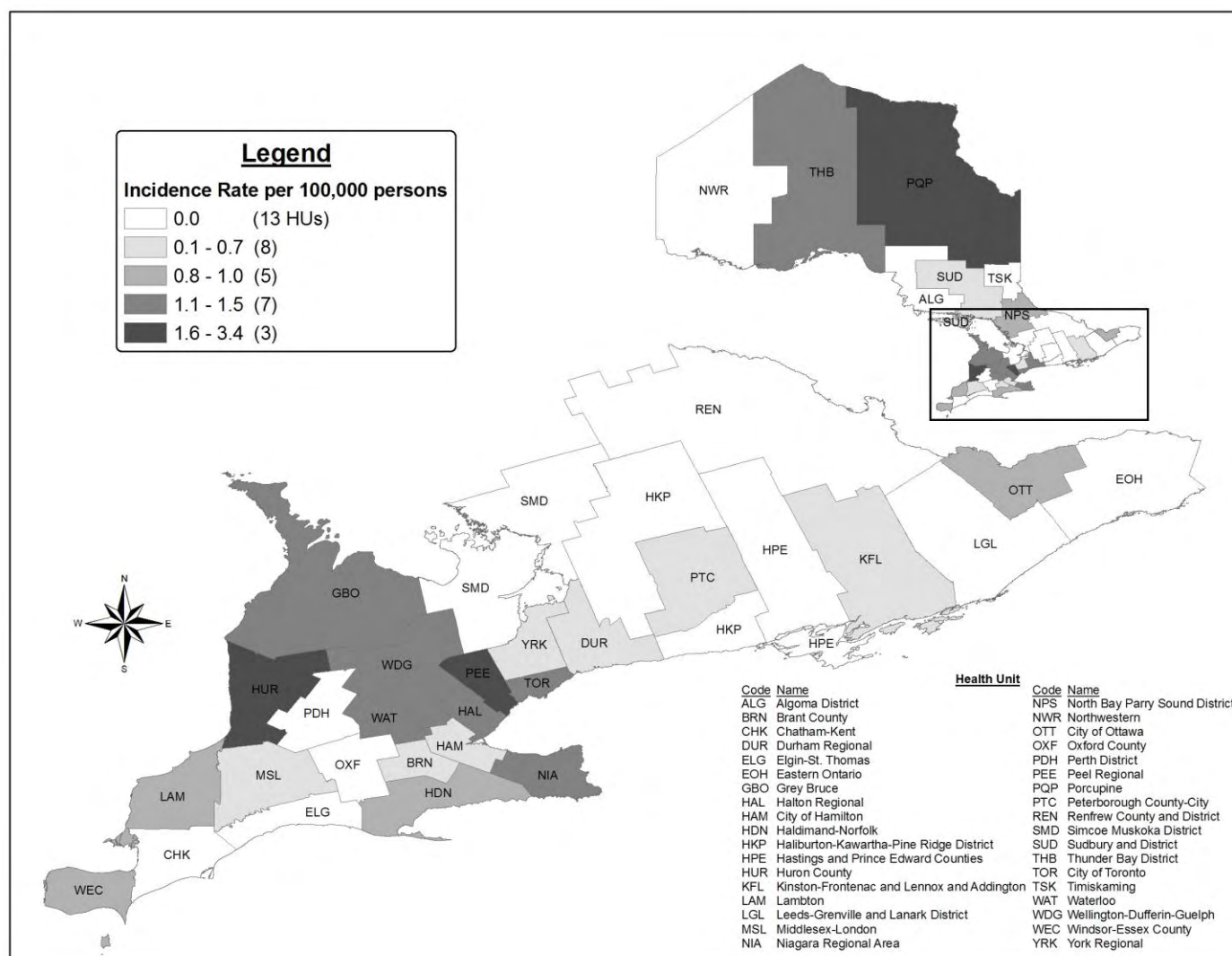
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	2	0.6	1	0.3	3	0.4
5-9	7	2.0	7	1.9	14	1.9
10-19	15	1.8	11	1.3	26	1.6
20-29	11	1.2	13	1.4	24	1.3
30-39	7	0.8	11	1.2	18	1.0
40-49	3	0.3	7	0.7	10	0.5
50-59	2	0.2	1	0.1	3	0.2
60-64	1	0.3	2	0.6	3	0.4
65+	9	0.9	9	1.1	18	1.0
Total	57	0.9	62	1.0	119	0.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex and/or age was reported as unknown.

Map 1.6.1: Incidence Rates of Hepatitis A by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

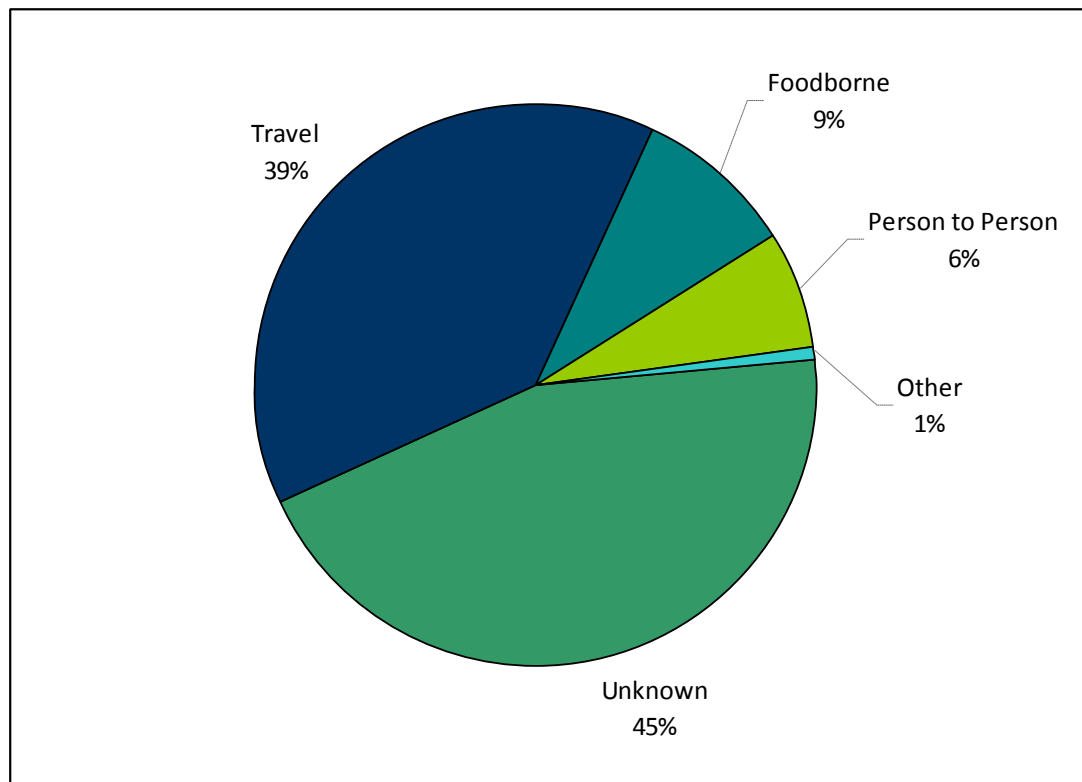
Public Health Unit	Number of cases	Rate/100,000 population
Porcupine	3	3.4
Huron County	2	3.3
Peel Region	21	1.6
Wellington-Dufferin-Guelph	4	1.5
Halton Region	7	1.4
Niagara Region	6	1.4
Toronto	36	1.3
Thunder Bay District	2	1.3
Grey Bruce	2	1.2
Waterloo Region	6	1.2
Windsor-Essex County	4	1.0
Haldimand-Norfolk	1	0.9
City of Ottawa	7	0.8
North Bay Parry Sound District	1	0.8
Lambton County	1	0.8
Peterborough County-City	1	0.7
Brant County	1	0.7
City of Hamilton	3	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Sudbury and District	1	0.5
York Region	5	0.5
Durham Region	3	0.5
Middlesex-London	2	0.4
Algoma District	0	0.0
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Hastings & Prince Edward Counties	0	0.0
Leeds, Grenville and Lanark District	0	0.0
Northwestern	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Renfrew County and District	0	0.0
Simcoe Muskoka District	0	0.0
Timiskaming	0	0.0
Ontario	120	0.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Modes of Transmission for Hepatitis A Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

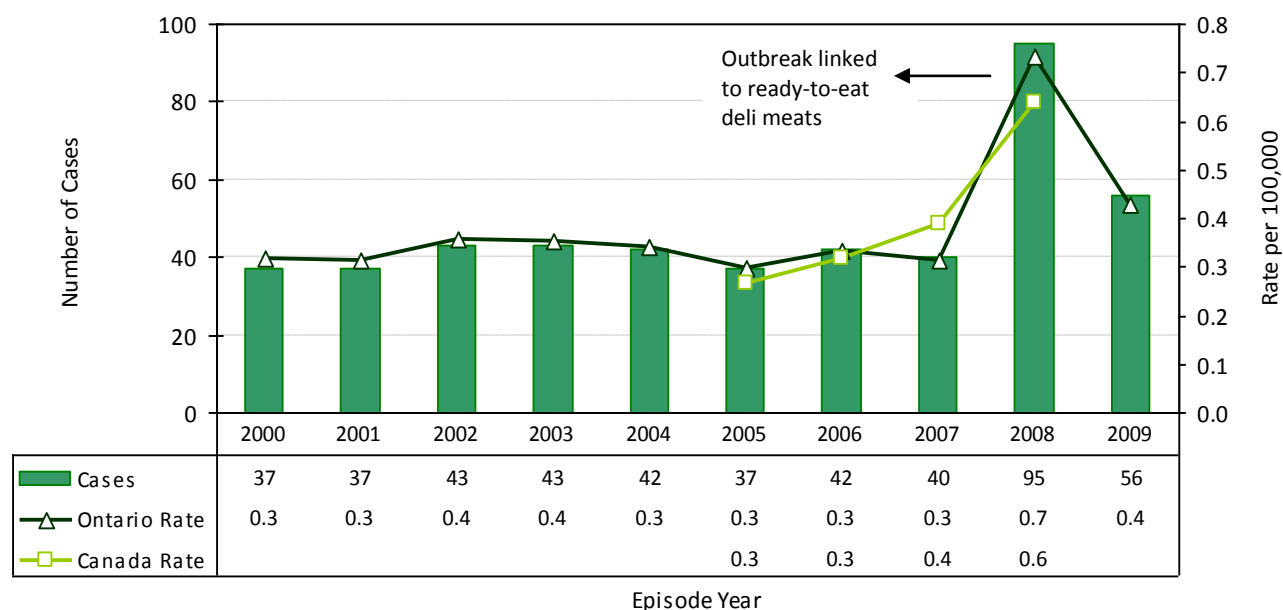
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 10% of cases; these cases were excluded.

1.7 LISTERIOSIS

- In 2009, Ontario reported 56 cases of listeriosis, representing an incidence rate of 0.4 cases per 100,000 population (Table 1.7.1).
- With the exception of a marked increase in 2008, the incidence rate of listeriosis has remained relatively stable since 2000 ranging from 0.3 to 0.4 cases per 100,000 population. The increase in 2008 to 0.7 cases per 100,000 population was attributed to an outbreak of 42 cases in which ready-to-eat deli meats were implicated (Figure 1.7.1).
- Although there was no difference in the incidence rate in 2009 compared to the historical range of 0.3 to 0.4 cases per 100,000 population, the 2009 case count represented a 40% increase over the historical average of 40 cases per year. This increase is due likely to improved reporting in the aftermath of the 2008 outbreak (Figure 1.7.1).
- The incidence rate of listeriosis in Canada for the available years 2005 to 2008 indicates comparable rates to Ontario ranging from 0.3 to 0.4 cases per 100,000 population, but with a marked increase in 2008 to 0.6 cases per 100,000 population, which was attributed to the deli meat outbreak (Figure 1.7.1).
- In 2009, the seasonal distribution of listeriosis cases was less apparent, although there was an increase in cases in August (Figure 1.7.2).
- Males and females aged 65 years and older accounted for 67% of listeriosis cases and reported incidence rates that were 5 times higher than the provincial incidence rate (Figure 1.7.3, Table 1.7.1). This age distribution is typical for listeriosis.
- Half (18) of Ontario health units did not report any cases of listeriosis in 2009. Peterborough County-City and Perth District reported the highest incidence rates at 1.4 and 1.3 cases per 100,000 population, respectively, while Toronto reported the highest number of cases at 18 (Map 1.7.1, Table 1.7.2).
- Compared to other enteric diseases reported in Ontario in 2009, listeriosis cases were less likely to have acquired their illness while travelling outside of the province. Of cases reporting exposures, 20% occurred in private homes, 22% occurred in other settings and 4% while travelling outside of Ontario; the remaining 54% of exposures occurred in Ontario but of unknown source (Figure 1.7.4).
- Foodborne exposures accounted for 28% of cases who reported no travel outside of Ontario.

Figure 1.7.1: Incidence of Listeriosis in Ontario and Canada: 2000-2009



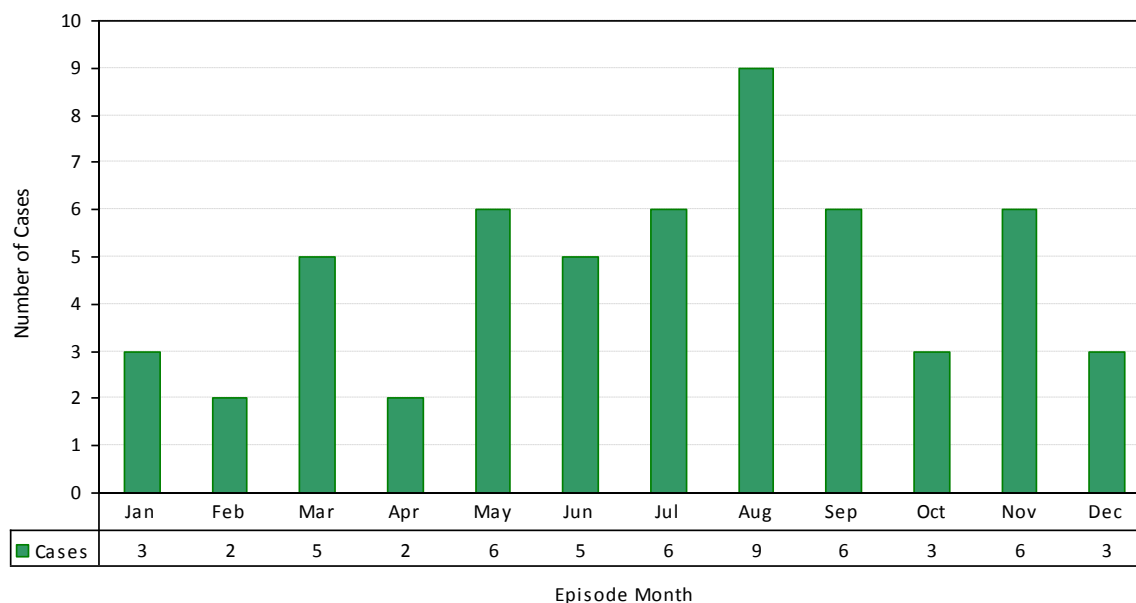
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate available for 2005-2008 only.

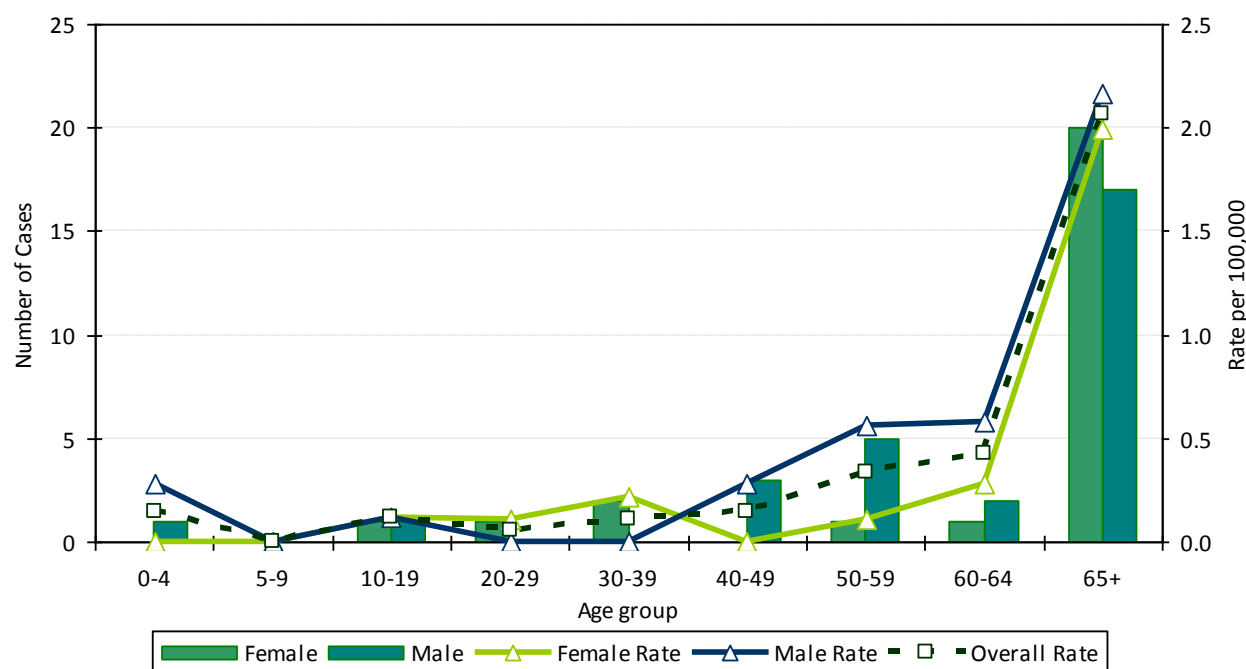
Figure 1.7.2: Incidence of Listeriosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 1 case for which sex was reported as unknown.

Table 1.7.1: Incidence of Listeriosis by Age and Sex: Ontario, 2009

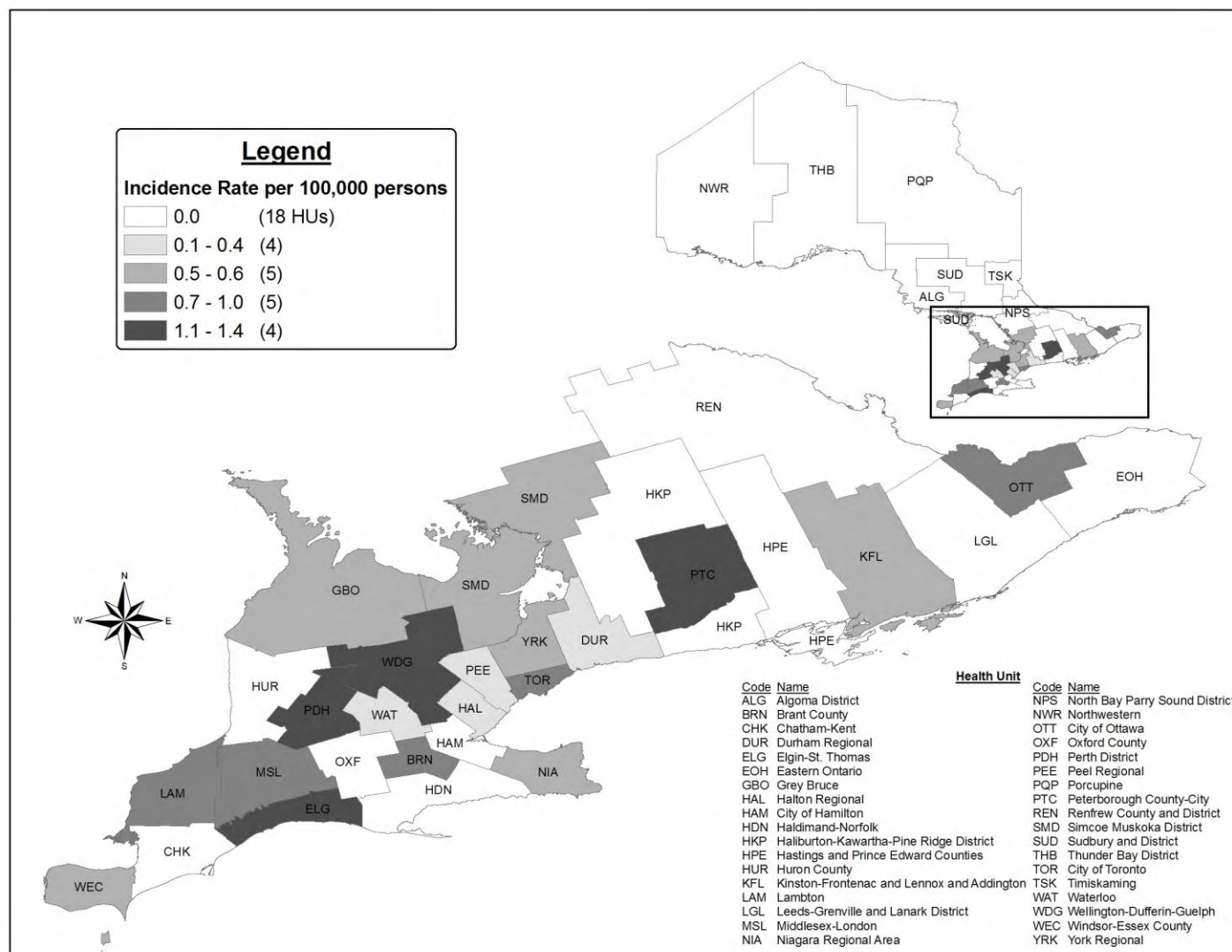
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	0	0.0	1	0.3	1	0.1
5-9	0	0.0	0	0.0	0	0.0
10-19	1	0.1	1	0.1	2	0.1
20-29	1	0.1	0	0.0	1	0.1
30-39	2	0.2	0	0.0	2	0.1
40-49	0	0.0	3	0.3	3	0.1
50-59	1	0.1	5	0.6	6	0.3
60-64	1	0.3	2	0.6	3	0.4
65+	20	2.0	17	2.2	37	2.1
Total	26	0.4	29	0.5	55	0.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex was reported as unknown.

Map 1.7.1: Incidence Rates of Listeriosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

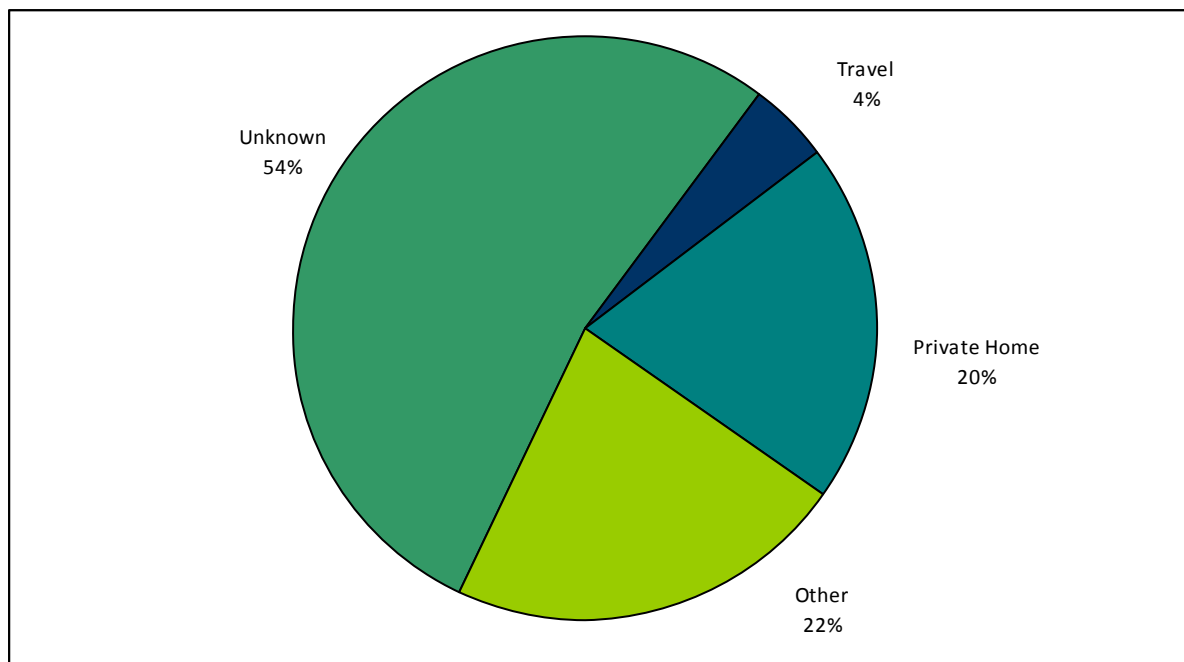
Public Health Unit	Number of cases	Rate/100,000 population
Peterborough County-City	2	1.4
Perth District	1	1.3
Elgin-St. Thomas	1	1.1
Wellington-Dufferin-Guelph	3	1.1
Lambton County	1	0.8
Brant County	1	0.7
City of Ottawa	6	0.7
Toronto	18	0.7
Middlesex-London	3	0.7
Grey Bruce	1	0.6
Simcoe Muskoka District	3	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Windsor-Essex County	2	0.5
York Region	5	0.5
Peel Region	5	0.4
Halton Region	1	0.2
Waterloo Region	1	0.2
Durham Region	1	0.2
Algoma District	0	0
Chatham-Kent	0	0
City of Hamilton	0	0
Eastern Ontario	0	0
Haldimand-Norfolk	0	0
Haliburton, Kawartha, Pine Ridge	0	0
Hastings & Prince Edward Counties	0	0
Huron County	0	0
Leeds, Grenville and Lanark District	0	0
Niagara Region	0	0
North Bay Parry Sound District	0	0
Northwestern	0	0
Oxford County	0	0
Porcupine	0	0
Renfrew County and District	0	0
Sudbury and District	0	0
Thunder Bay District	0	0
Timiskaming	0	0
Ontario	56	0.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

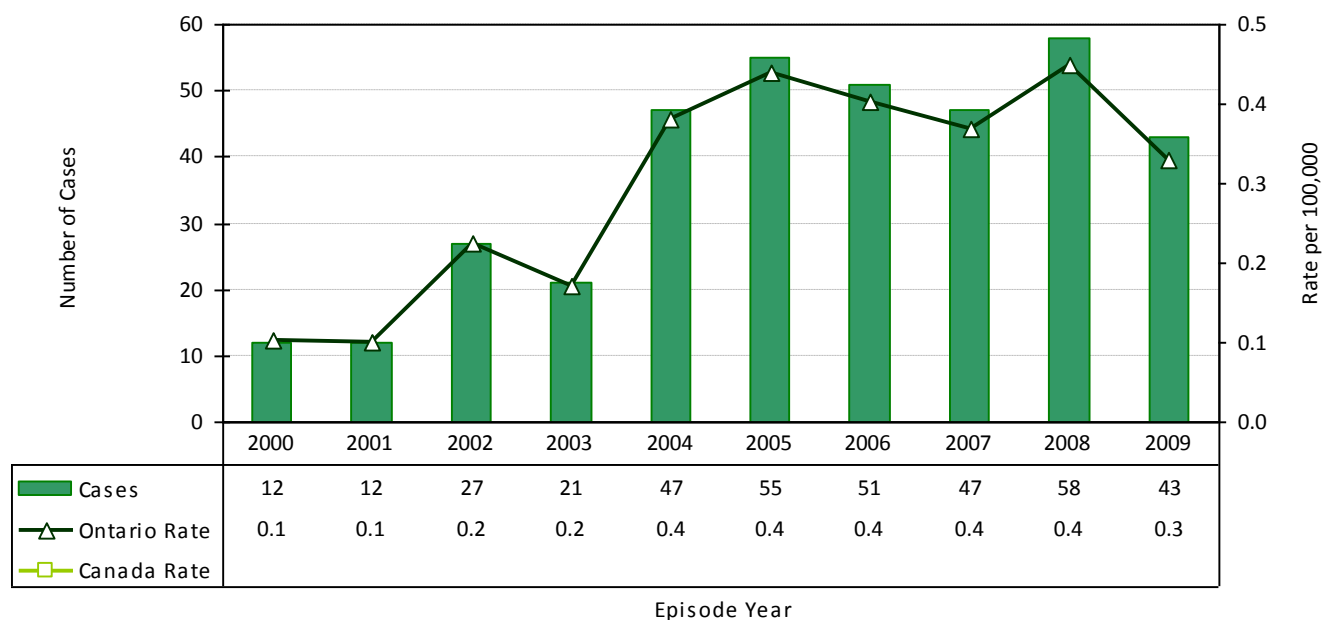
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

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

1.8 PARATYPHOID FEVER

- In 2009, Ontario reported 43 cases of paratyphoid fever, representing an incidence rate of 0.3 cases per 100,000 population (Table 1.1).
- In 2009, the incidence of paratyphoid fever decreased by 26% from its 10-year high of 58 cases in 2008 (Figure 1.8.1).
- Between 2000 and 2003, the number of paratyphoid fever cases remained relatively low with an average of approximately 18 cases per year. Since 2004, the incidence of paratyphoid fever has increased sharply with an average of 50 reported cases per year or 0.4 cases per 100,000 population (Figure 1.8.1).
- Paratyphoid fever is not endemic in Canada and the temporal distribution of cases over the course of the year is likely a reflection of travel patterns. In 2009, January (7 cases) and February (6 cases) accounted for the highest number of cases (Figure 1.8.2).
- Females accounted for slightly more than half of paratyphoid fever cases reported in Ontario in 2009: 23 cases among females compared to 20 cases among males. In contrast, the incidence rate of paratyphoid fever was the same for both males and females at 0.3 cases per 100,000 population (Figure 1.8.3, Table 1.8.1).
- The age-specific incidence and incidence rate was highest among the 20-29 age group in 2008 and 2009. In 2009, 12 cases representing an incidence rate of 0.7 cases per 100,000 population were reported in this age group (Figure 1.8.3, Table 1.8.1).
- Peel Region accounted for 44% of paratyphoid fever cases in Ontario in 2009, with 19 cases and an incidence rate of 1.4 cases per 100,000 population (Map 1.8.1, Table 1.8.2). Peel Region accounted for a similar proportion of paratyphoid fever cases in 2008 (43%).
- Of paratyphoid fever cases reporting an exposure setting in 2009, 93% reported traveling outside of Ontario; exposures were unknown for the remaining 7% of cases (Figure 1.8.4).

Figure 1.8.1: Incidence of Paratyphoid Fever in Ontario and Canada: 2000-2009

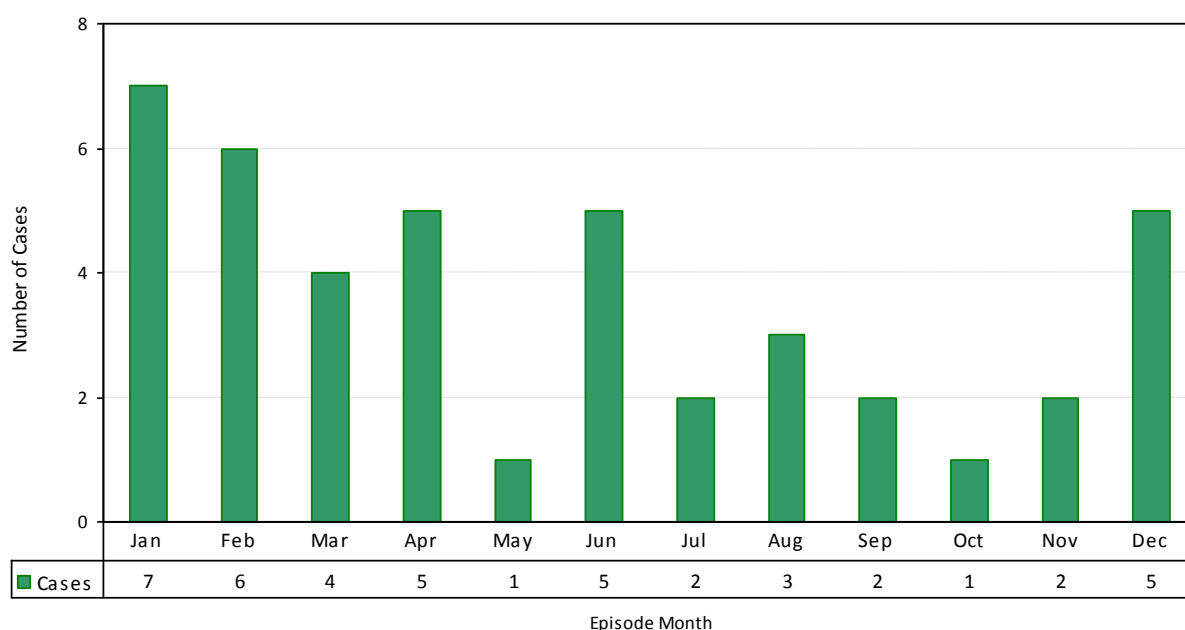


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Paratyphoid fever is not nationally notifiable.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

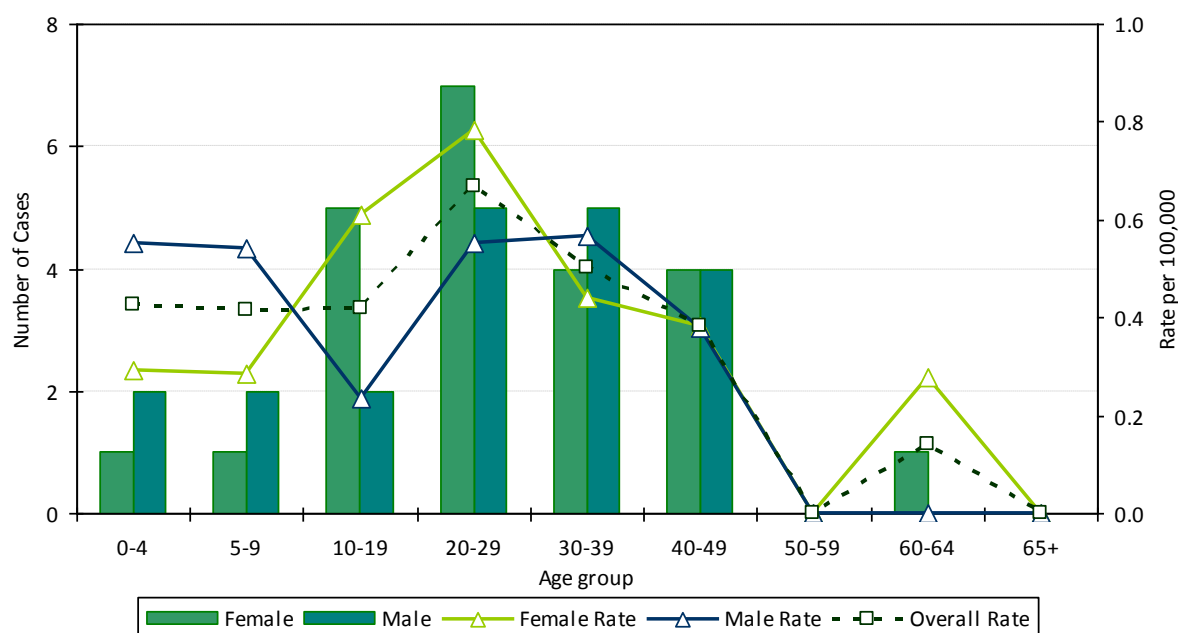
Figure 1.8.2: Incidence of Paratyphoid Fever by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [2011/01/18].

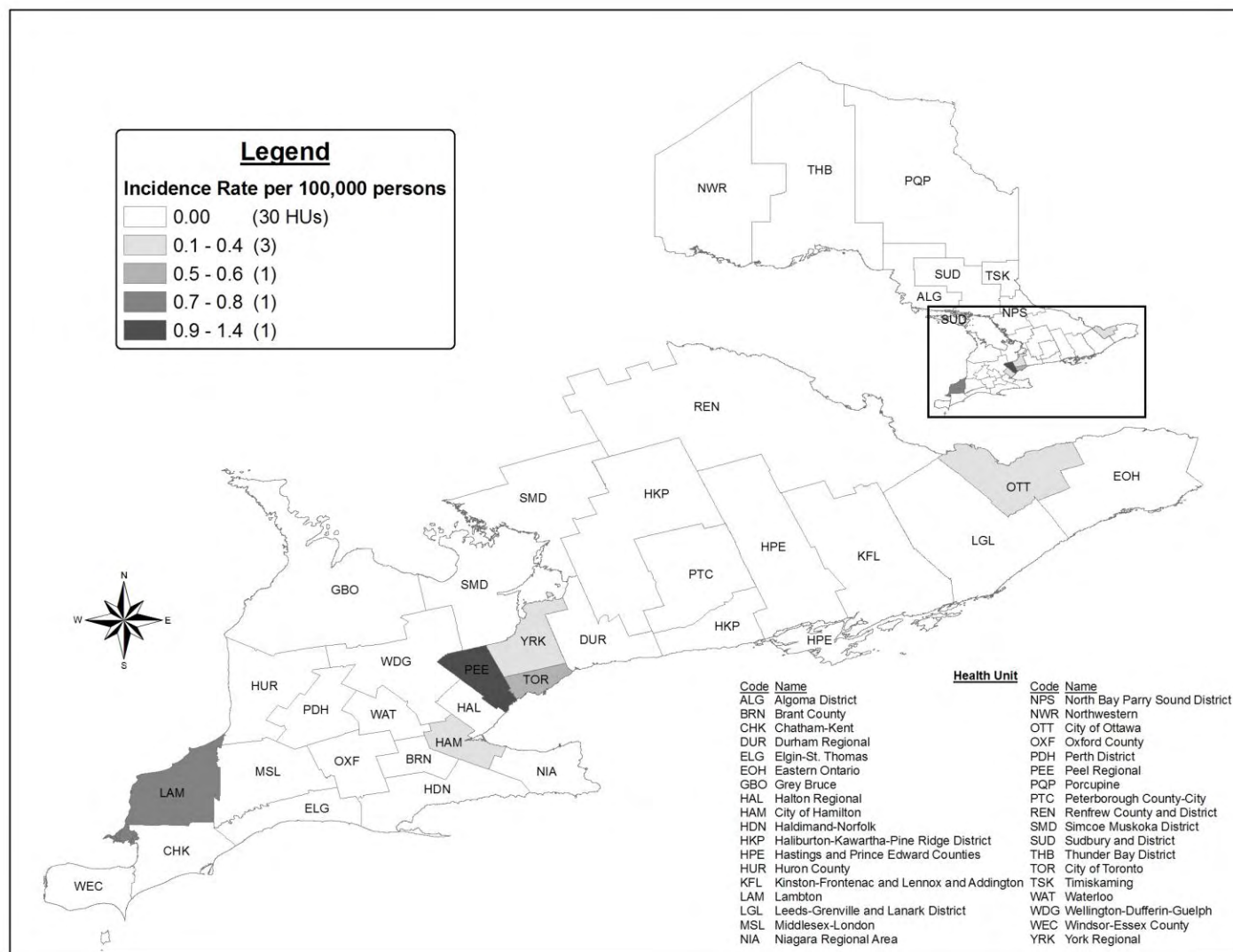
Table 1.8.1: Incidence of Paratyphoid Fever by Age and Sex: Ontario, 2009

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	1	0.3	2	0.5	3	0.4
10-19	5	0.6	2	0.2	7	0.4
20-29	7	0.8	5	0.6	12	0.7
30-39	4	0.4	5	0.6	9	0.5
40-49	4	0.4	4	0.4	8	0.4
50-59	0	0.0	0	0.0	0	0.0
60-64	1	0.3	0	0.0	1	0.1
65+	0	0.0	0	0.0	0	0.0
Total	23	0.3	20	0.3	43	0.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [2011/01/18].

Map 1.8.1: Incidence Rates of Paratyphoid Fever by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

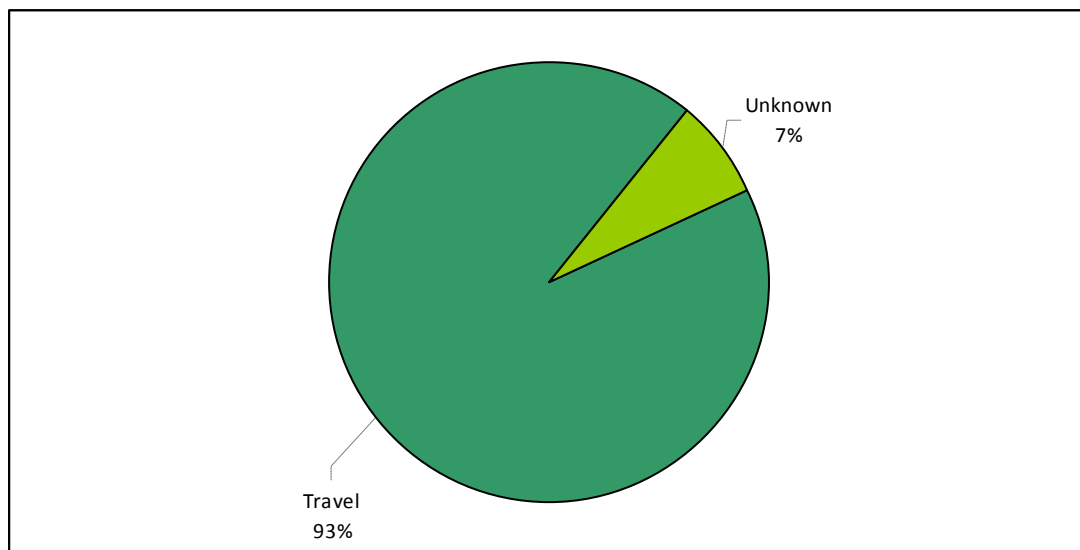
Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	19	1.4
Lambton County	1	0.8
Toronto	17	0.6
Hamilton	2	0.4
York Region	3	0.3
Ottawa	1	0.1
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Durham Region	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Grey Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Halton Region	0	0.0
Hastings & Prince Edward Counties	0	0.0
Huron County	0	0.0
Kingston, Frontenac, Lennox & Addington	0	0.0
Leeds, Grenville and Lanark District	0	0.0
Middlesex-London	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-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
Waterloo Region	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Windsor-Essex County	0	0.0
Ontario	43	0.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

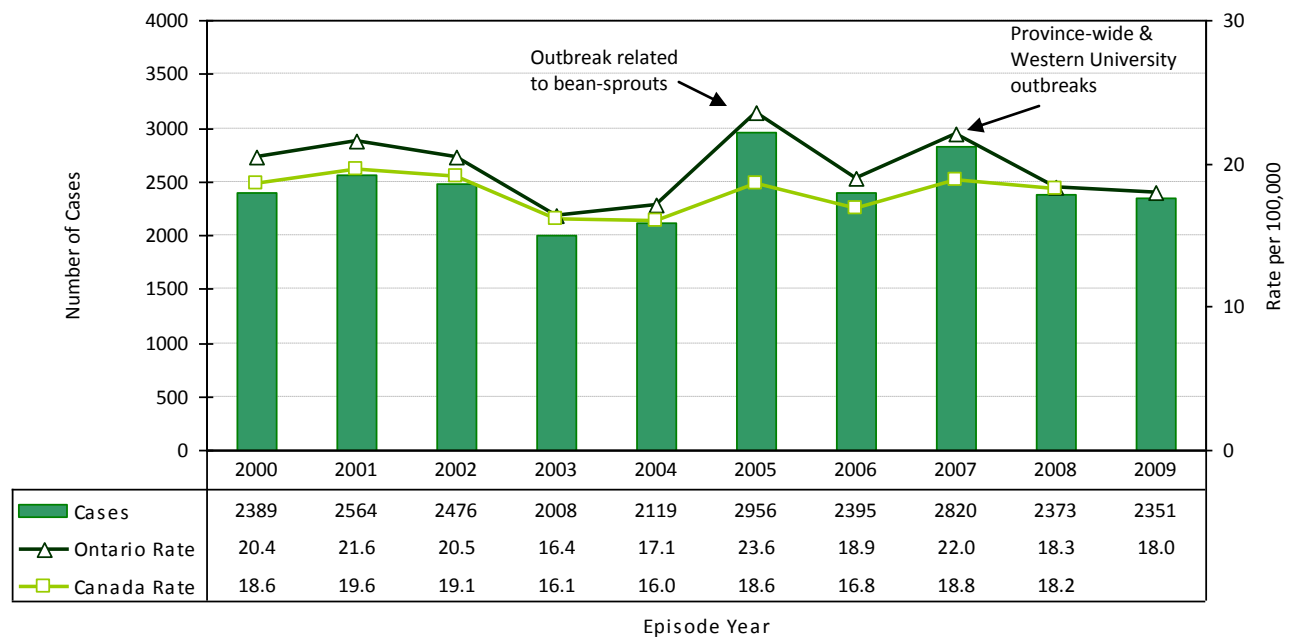
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

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

1.9 SALMONELLOSIS

- Salmonellosis is second to campylobacteriosis as a leading cause of enteric disease in Ontario, accounting for 25% of enteric diseases reported in 2009. Ontario reported 2,351 cases of salmonellosis in 2009, representing an incidence rate of 18.0 cases per 100,000 population, and a 1% decline compared to the 2008 incidence of 2,373 cases (Table 1.1).
- During the period 2000-2009, the incidence rate of salmonellosis declined by 12% from 20.5 cases per 100,000 population in 2000 to 18.0 cases per 100,000 population in 2009. 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 *Salmonella* Typhimurium that culminated in a large point-source outbreak at the University of Western Ontario in London, Ontario (Figure 1.9.1).
- In 2008, the most recent year for which national data is available, the Canadian incidence rate for salmonellosis became comparable to that of Ontario after several years of higher rates in Ontario.
- The incidence of salmonellosis peaked in the months of August and September, accounting for 22% of salmonellosis cases reported in 2009 (Figure 1.9.2).
- The sex-specific incidence rate for salmonellosis in 2009 was slightly higher for females compared to males at 18.5 and 17.4 cases per 100,000 population, respectively. The incidence rates of salmonellosis decreased sharply with increasing age for both males and females before stabilizing to approximately 14 cases per 100,000 population after age 29 (Figure 1.9.3, Table 1.9.1).
- Thunder Bay district reported the highest incidence rate of salmonellosis in Ontario in 2009, with 34.5 cases per 100,000. Toronto reported the highest number of confirmed cases (557), accounting for 24% of salmonellosis cases in 2009 (Map 1.9.1, Table 1.9.2).
- In 2009, *S. Enteritidis* (29.6%) was the leading cause of salmonellosis in Ontario, followed by *S. Typhimurium* at 15.5%, *S. Heidelberg* at 8.0% and *S. Group B* at 3.4%. 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 2009, 22% reported travel outside of Ontario, 11% reported exposures within their homes, 10% reported being exposed at a food premise and 3% reported exposures in other settings; 54% of cases did not know their place of exposure (Figure 1.9.4).
- Overall, 21% of salmonellosis exposures that occurred in Ontario in 2009 were related to food.

Figure 1.9.1: Incidence of Salmonellosis in Ontario and Canada: 2000-2009



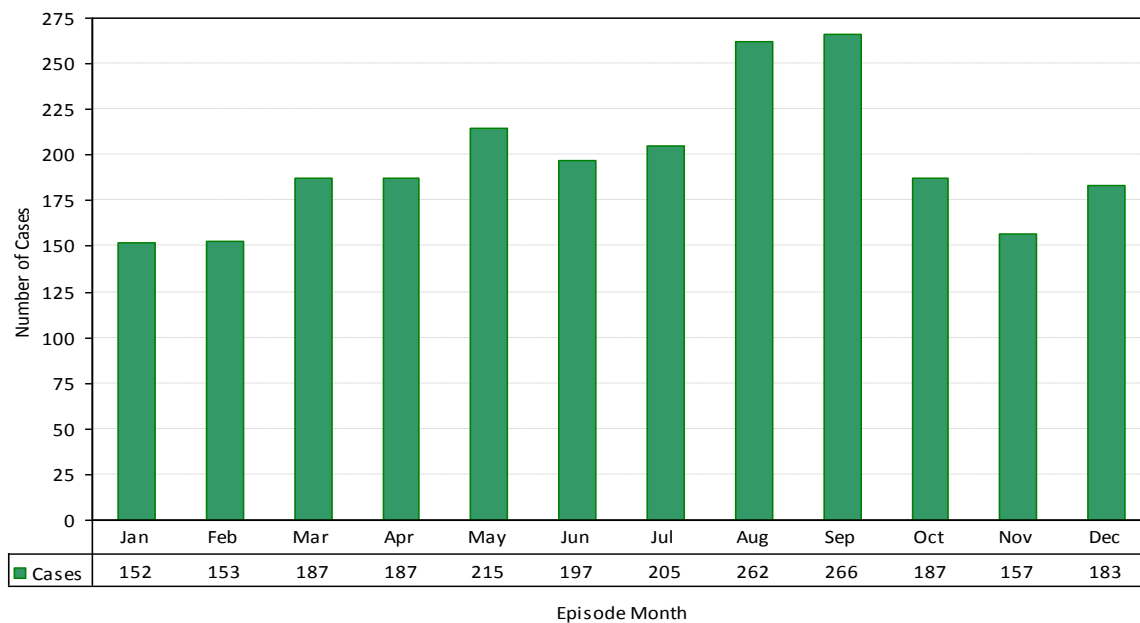
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

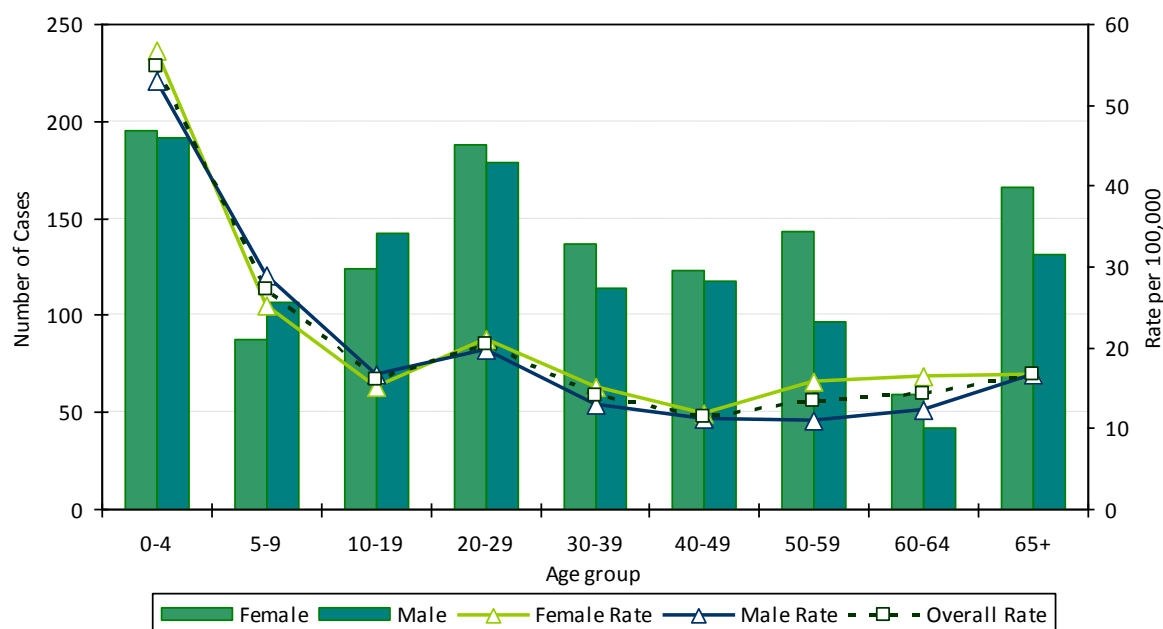
Figure 1.9.2: Incidence of Salmonellosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 6 cases for which age was unknown, sex was reported as unknown, and/or sex was reported as other.

Table 1.9.1: Incidence of Salmonellosis by Age and Sex: Ontario, 2009

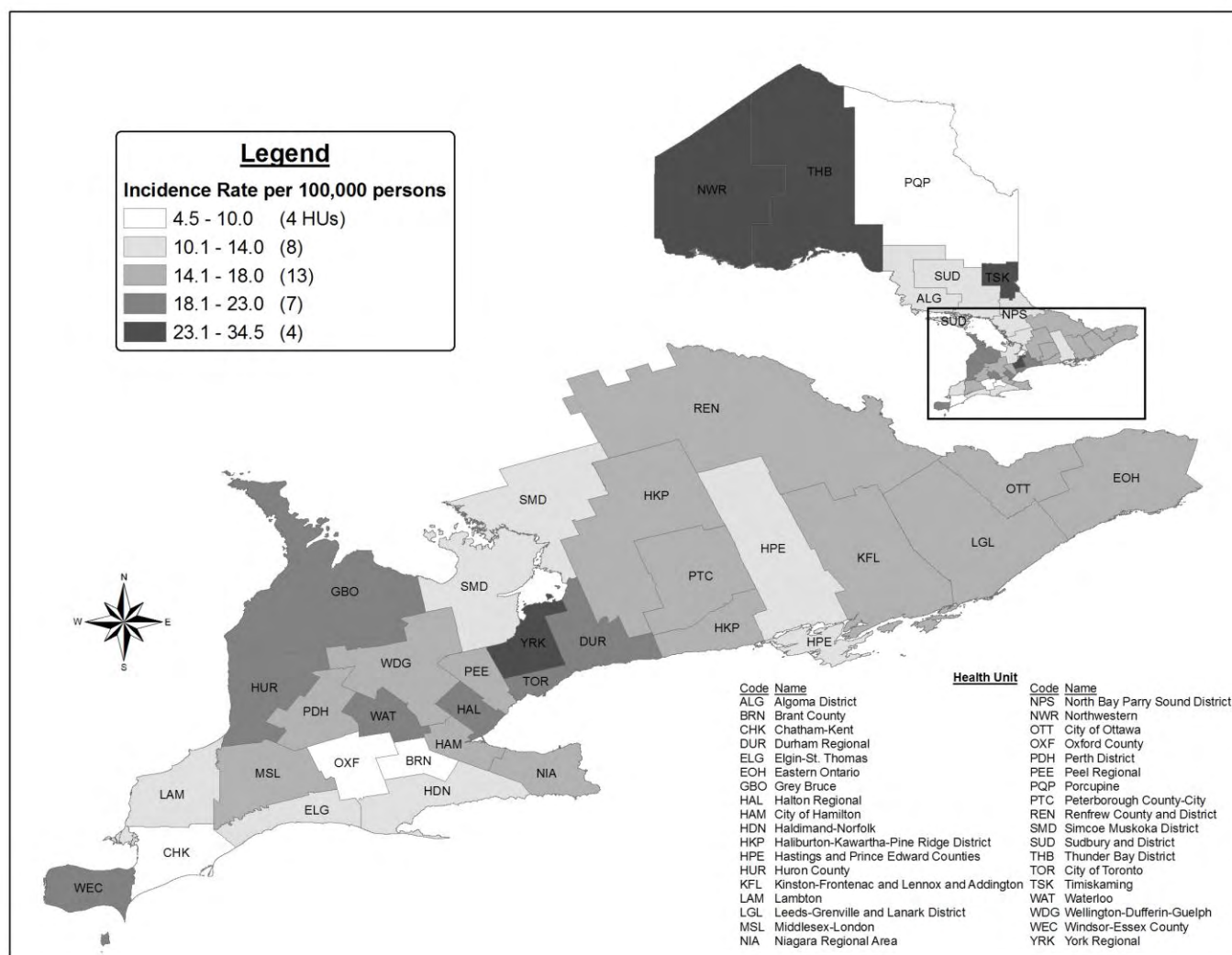
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	195	56.7	192	53.1	387	54.8
5-9	88	25.2	107	28.9	195	27.1
10-19	124	15.2	142	16.6	266	15.9
20-29	188	21.1	179	19.7	367	20.4
30-39	137	15.1	114	12.9	251	14.0
40-49	123	11.8	118	11.2	241	11.5
50-59	143	15.8	97	11.0	240	13.4
60-64	59	16.3	42	12.2	101	14.3
65+	166	16.6	131	16.7	297	16.6
Total	1,223	18.5	1,122	17.4	2,345	17.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 5 cases for which age and/or sex were unknown and 1 case that is transgender.

Map 1.9.1: Incidence Rates of Salmonellosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Thunder Bay District	54	34.5
Timiskaming	10	28.7
Northwestern	20	24.5
York Region	248	24.4
Grey Bruce	37	22.7
Waterloo Region	115	22.2
Toronto	557	20.8
Windsor-Essex County	79	19.6
Halton Region	94	19.1
Huron County	11	18.1
Durham Region	111	18.1
Peterborough County-City	25	18.0
Peel Region	234	17.8
Wellington-Dufferin-Guelph	47	17.3
City of Ottawa	149	16.9
Leeds, Grenville and Lanark District	28	16.6
Niagara Region	69	15.6
Renfrew County and District	16	15.6
Kingston, Frontenac, Lennox & Addington	29	14.9
Haliburton, Kawartha, Pine Ridge	26	14.7
City of Hamilton	76	14.3
Perth District	11	14.3
Middlesex-London	64	14.2
Eastern Ontario	28	14.1
Algoma District	16	13.5
Hastings & Prince Edward Counties	21	12.9
North Bay Parry Sound District	16	12.7
Sudbury and District	25	12.5
Simcoe Muskoka District	63	12.3
Elgin-St. Thomas	11	12.2
Lambton County	16	12.1
Haldimand-Norfolk	13	11.7
Oxford County	10	9.4
Porcupine	7	8.0
Brant County	10	7.2
Chatham-Kent	5	4.5
Ontario	2,351	18.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

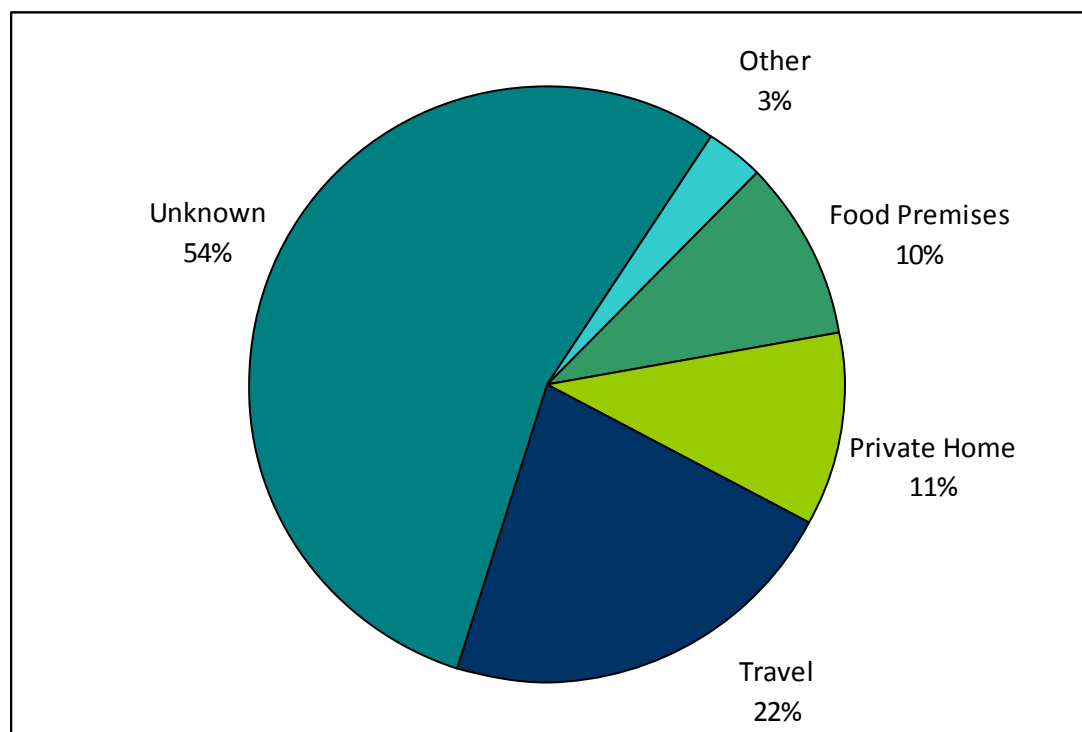
<i>Salmonella</i> Serovars	Cases	
	Number	Percent
<i>S. Enteritidis</i>	695	29.6
<i>S. Typhimurium</i>	364	15.5
<i>S. Heidelberg</i>	189	8.0
<i>S. Group B</i>	80	3.4
<i>S. Hadar</i>	64	2.7
<i>S. Infantis</i>	48	2.0
<i>S. Newport</i>	48	2.0
Unspecified <i>Salmonella</i> serovar ¹	243	10.3
Other <i>Salmonella</i> serovars ²	620	26.4
Total	2,351	100.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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 Exposure Setting for Salmonellosis Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

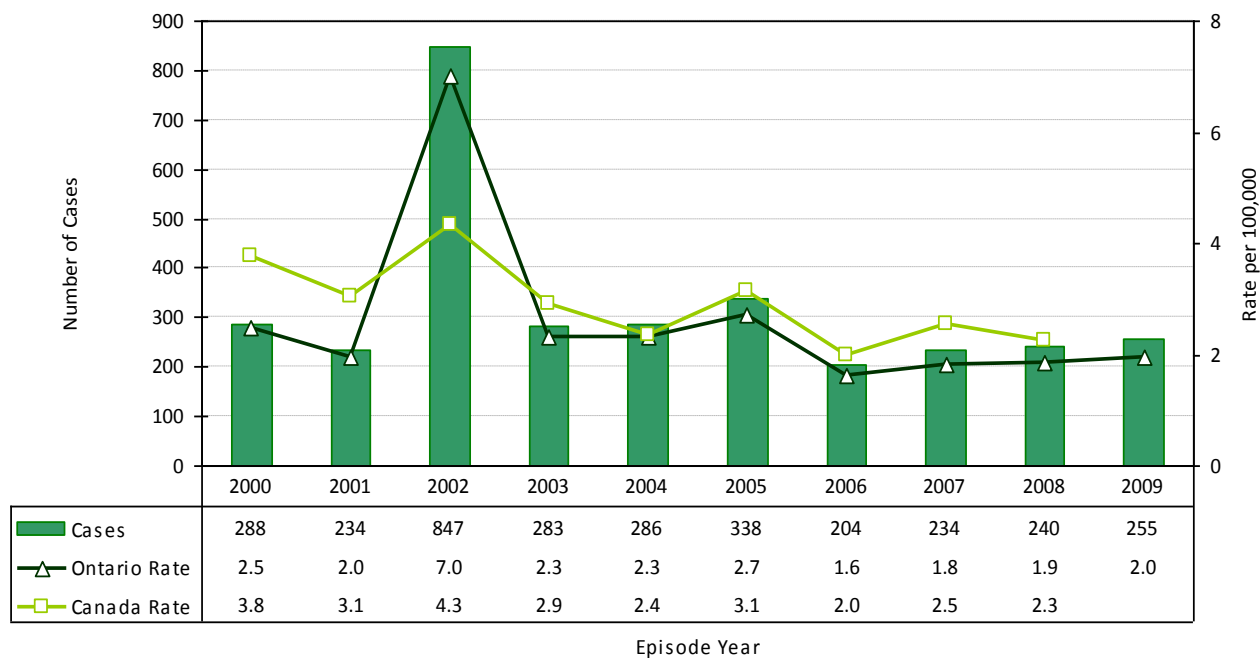
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 18% of cases; these cases were excluded.

1.10 SHIGELLOSIS

- In 2009, Ontario reported 255 confirmed cases of shigellosis, representing an incidence rate of 2.0 cases per 100,000 population (Table 1.1).
- From 2000-2006, the incidence rate of shigellosis in Ontario decreased by 36% from 2.5 cases per 100,000 population in 2000 to 1.6 cases per 100,000 population in 2006. Since 2007, the incidence rate of shigellosis has increased every year by 5 to 13% (Figure 1.10.1).
- With the exception of 2002, Ontario's incidence rate of shigellosis remained below the Canadian rate from 2000 to 2008. The increase in Ontario in 2002 was attributed to an outbreak in which Greek-style pasta salad contaminated by *Shigella sonnei* bacteria was implicated (Figure 1.10.1).
- The incidence of shigellosis did not exhibit a clear seasonal pattern in 2009. June (29 cases), July (29 cases) and November (25 cases) accounted for the highest number of cases (Figure 1.10.2).
- In 2009, the incidence rate of shigellosis among males was 78% higher than that of females at 2.5 and 1.4 cases per 100,000 population, respectively (Figure 1.10.3, Table 1.10.1).
- Age-specific incidence rates of shigellosis in 2009 were higher for males compared to females in all age groups except the 10-19 age group. In the adult age ranges, incidence among males peaked at 3.4 and 4.3 cases per 100,000 population in the 20-29 and 30-39 age groups, respectively. For females, incidence peaked at 2.5 and 1.8 cases per 100,000 population in the 20-29 and 30-39 age groups, respectively (Figure 1.10.3, Table 1.10.1).
- Same-sex sexual contact among males in the 20-59 age range is an emerging risk factor for shigellosis and other enteric diseases easily transmitted from person to person.
- Over one third (13/36) of health units did not report any cases of shigellosis in 2009. Toronto reported the highest incidence rate of shigellosis at 4.2 cases per 100,000 as well as the highest number of cases in Ontario for 2009 (Map 1.10.1, Table 1.10.2).
- *S. flexneri* (44%), *S. sonnei* (38%), and *S. boydii* (4%) accounted for 86% of all reported cases of shigellosis in Ontario in 2009. Other *Shigella* serogroups (2%) and unspecified *Shigella* species accounted for the remaining cases of shigellosis in 2009 (Table 1.10.3).
- Travel outside of Ontario (44%) was the primary source of shigellosis among cases that reported an exposure in 2009, which is comparable to the 2008 proportion of 45%. Person-to-person (8%) and foodborne (4%) transmission accounted for another 12% of cases while the exposure was unknown for the remaining 44% (Figure 1.10.4).
- Person-to-person transmission (15%) involving men who have sex with men (MSM) was the most likely mode of transmission for shigellosis cases that reported an exposure not related to travel outside of Ontario (figure not shown).

Figure 1.10.1: Incidence of Shigellosis in Ontario and Canada: 2000-2009



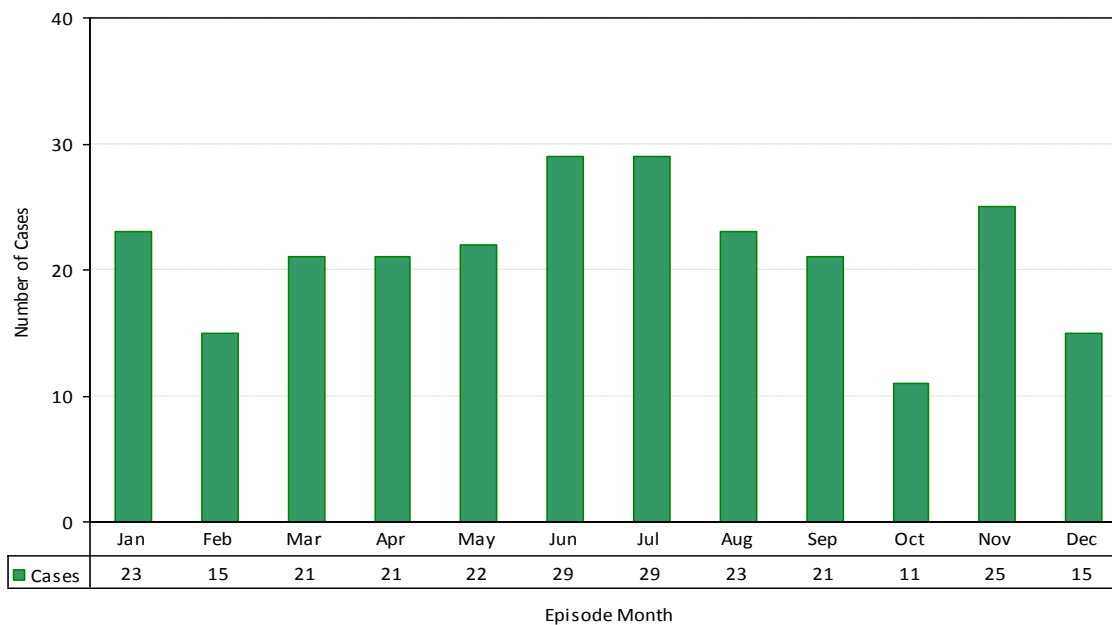
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

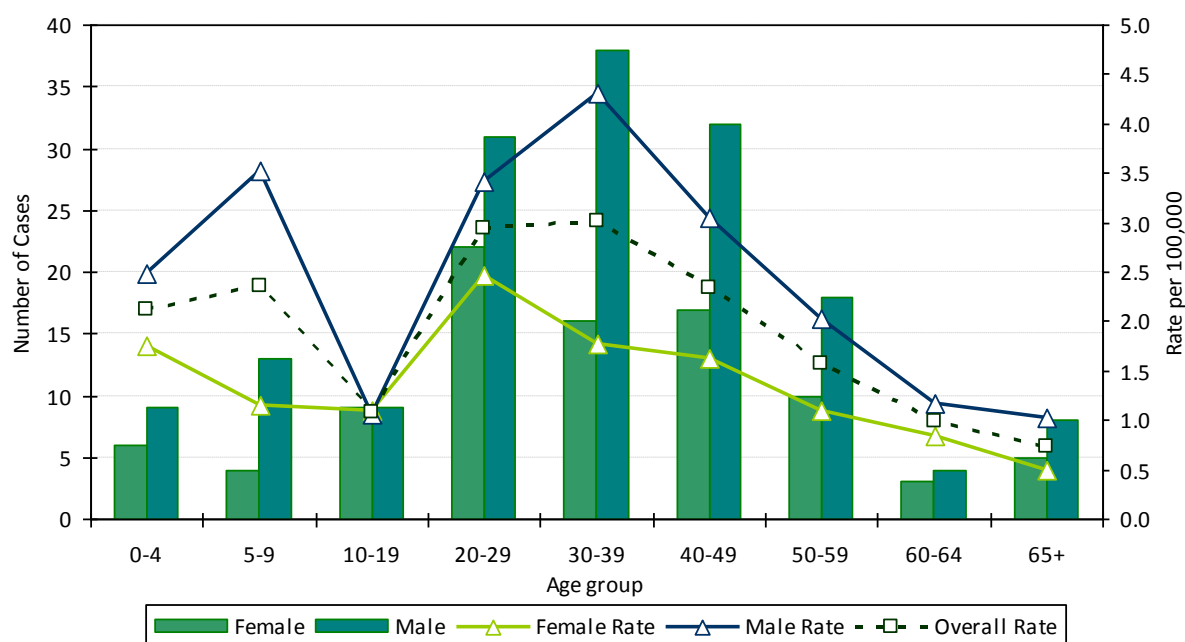
Figure 1.10.2: Incidence of Shigellosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 1 case for which sex was reported as unknown.

Table 1.10.1: Incidence of Shigellosis by Age and Sex: Ontario, 2009

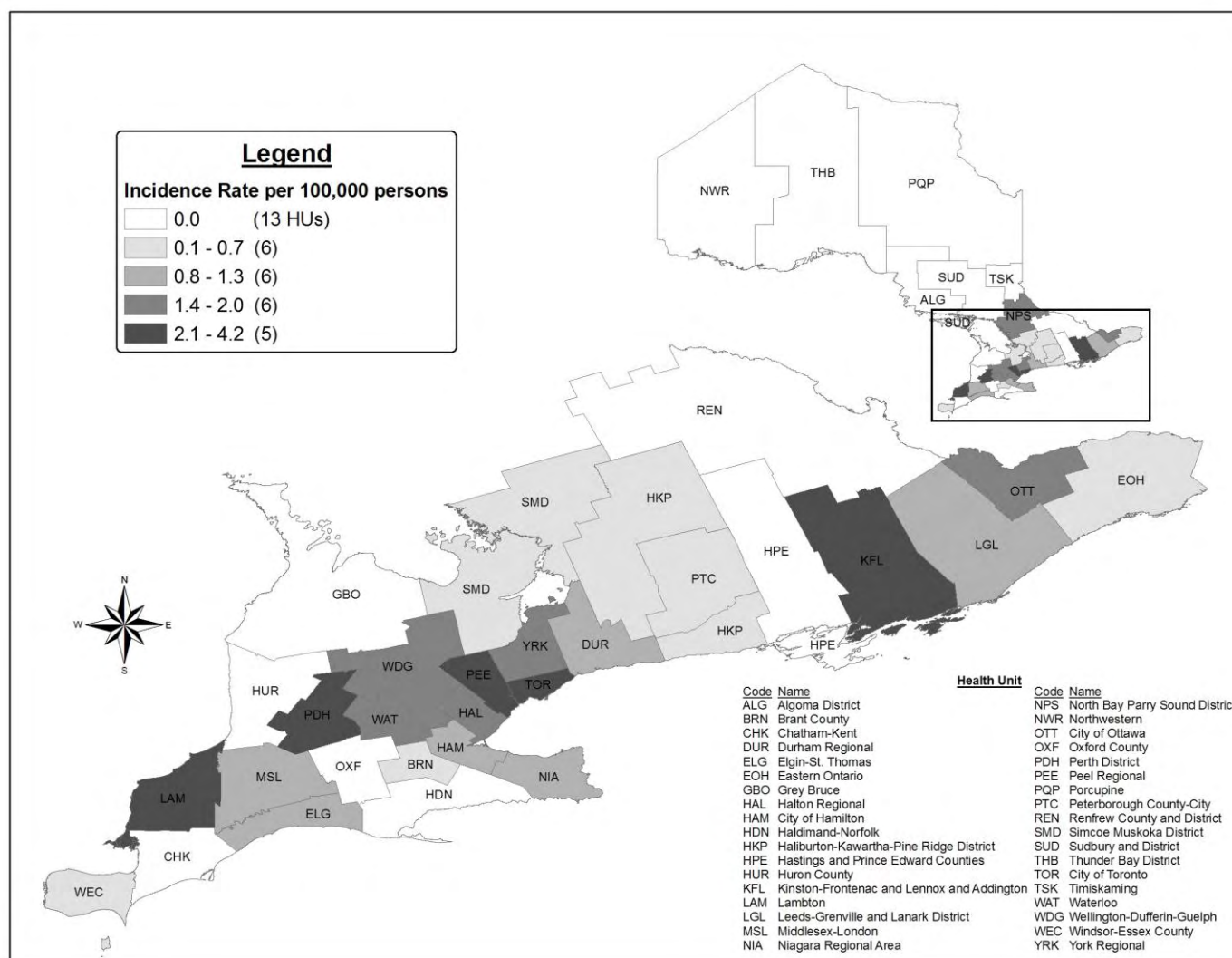
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	6	1.7	9	2.5	15	2.1
5-9	4	1.1	13	3.5	17	2.4
10-19	9	1.1	9	1.1	18	1.1
20-29	22	2.5	31	3.4	53	2.9
30-39	16	1.8	38	4.3	54	3.0
40-49	17	1.6	32	3.0	49	2.3
50-59	10	1.1	18	2.0	28	1.6
60-64	3	0.8	4	1.2	7	1.0
65+	5	0.5	8	1.0	13	0.7
Total	92	1.4	162	2.5	254	1.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex was reported as unknown.

Map 1.10.1: Incidence Rates of Shigellosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Toronto	113	4.2
Perth District	3	3.9
Lambton County	4	3.0
Peel Region	37	2.8
Kingston, Frontenac, Lennox & Addington	5	2.6
York Region	19	1.9
Wellington-Dufferin-Guelph	5	1.8
City of Ottawa	16	1.8
Waterloo Region	9	1.7
North Bay Parry Sound District	2	1.6
Halton Region	7	1.4
Durham Region	8	1.3
Leeds, Grenville and Lanark District	2	1.2
City of Hamilton	6	1.1
Elgin-St. Thomas	1	1.1
Middlesex-London	5	1.1
Niagara Region	4	0.9
Windsor-Essex County	3	0.7
Peterborough County-City	1	0.7
Brant County	1	0.7
Haliburton, Kawartha, Pine Ridge	1	0.6
Eastern Ontario	1	0.5
Simcoe Muskoka District	2	0.4
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
Northwestern	0	0.0
Oxford 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
Ontario	255	2.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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.

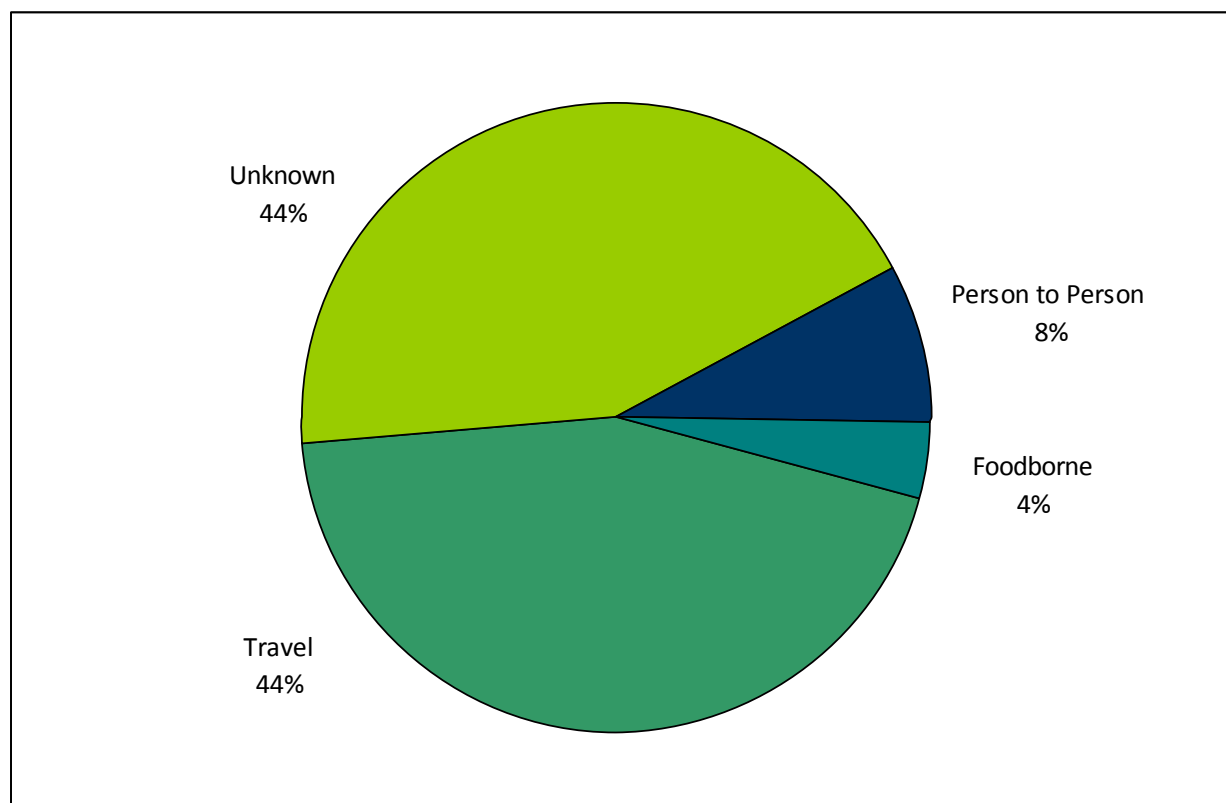
Table 1.10.3: Shigellosis Cases by Shigella Serogroup: Ontario, 2009

<i>Shigella</i> Serogroup	Cases	
	Number	Percent
<i>S. flexneri</i>	111	44
<i>S. sonnei</i>	98	38
<i>S. boydii</i>	9	4
Shigella, other	4	2
Shigella, unspecified	33	13
Total	255	100

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Note: Unspecified *Shigella* refers to shigellosis cases for which no serogroup was reported.

Figure 1.10.4: Most Likely Exposure Transmission Mode for Shigellosis Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

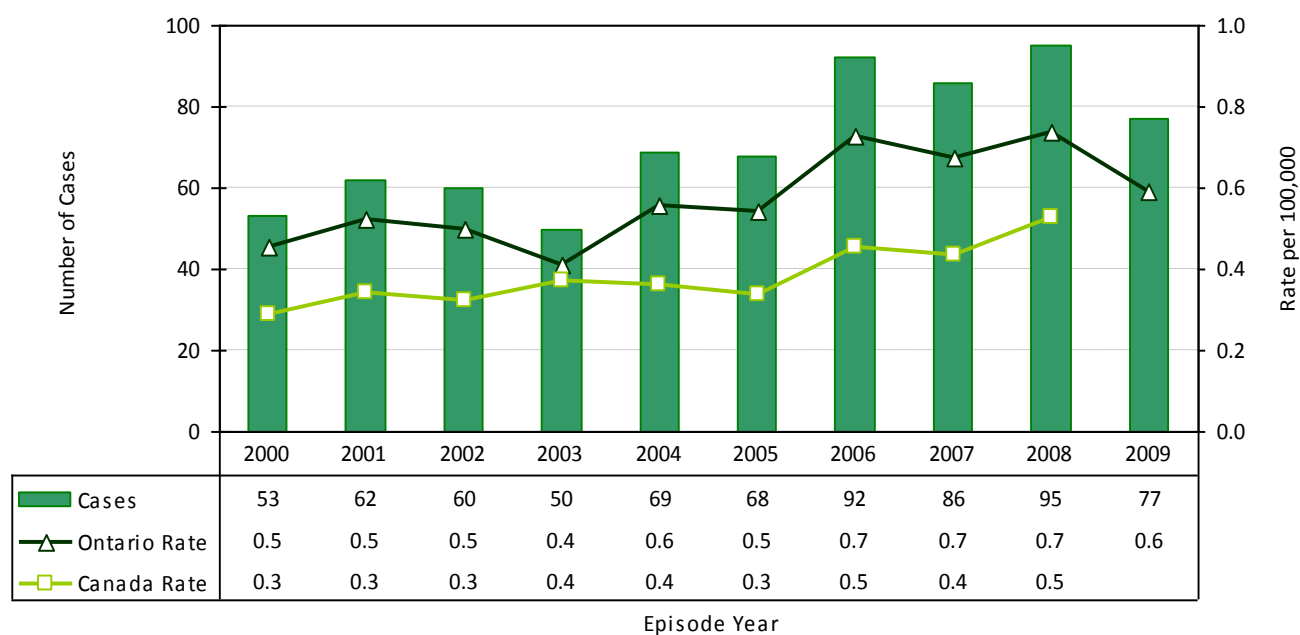
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 8% of cases; these cases were excluded.

1.11 TYPHOID FEVER

- Ontario reported 77 cases of typhoid fever in 2009, representing an incidence rate of 0.6 cases per 100,000 population (Figure 1.11.1). The 2009 incidence represents a 19% decrease from the 2008 ten-year high of 95 cases.
- Since 2006, Ontario has reported between 77 (2009) and 95 (2008) cases of typhoid fever per year, with incidence rates remaining unchanged at 0.7 cases per 100,000 population from 2006-2008. In comparison, a lower average of 60 cases were reported in the period 2000-2005 with the incidence rate averaging 0.5 cases per 100,000 population (Figure 1.11.1).
- Similar to Ontario, the national incidence rate of typhoid fever has increased since 2006. However, annual rates at the national level have remained lower than the corresponding incidence rates in Ontario, averaging 0.5 cases per 100,000 population per year (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 2009, March and August (9 cases each) accounted for the highest number of cases (Figure 1.11.2).
- In general, incidence rates for typhoid fever decreased with increasing age for both males and females with the highest rates occurring among those under the age of 20 years and the lowest rates among those aged 40 years and older (Figure 1.11.3, Table 1.11.1).
- In 2009, the sex-specific incidence rate for females was 75% higher than that of males at 0.7 cases per 100,000 population compared to 0.4 cases per 100,000 population (Figure 1.11.3, Table 1.11.1).
- Twenty-six health units did not report any cases of typhoid fever in 2009. Of health units reporting cases, Peel Region reported the highest incidence rate at 2.7 cases per 100,000 population, more than four times the 2009 provincial rate of 0.6 cases per 100,000 population (Map 1.11.1, Table 1.11.2).
- Among confirmed cases of typhoid fever in 2009 reporting an exposure, 84% identified travel outside of Ontario as their most likely exposure setting, 1% reported close person to person exposure, while the remaining 15% was unknown (Figure 1.11.4).

Figure 1.11.1: Incidence of Typhoid Fever in Ontario and Canada: 2000-2009



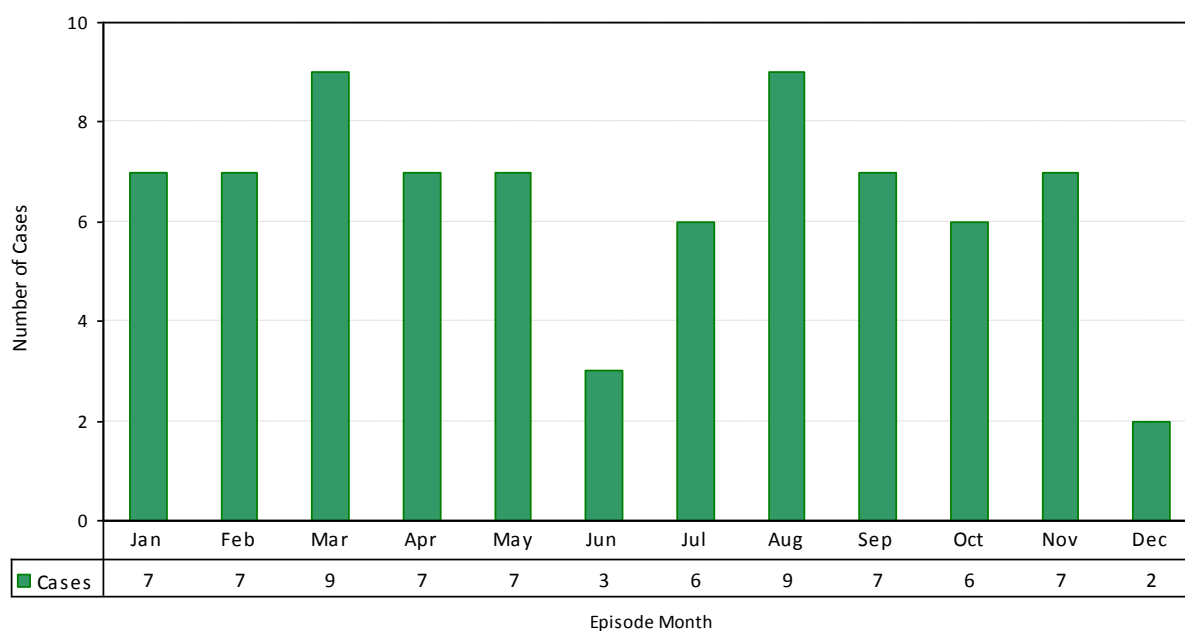
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

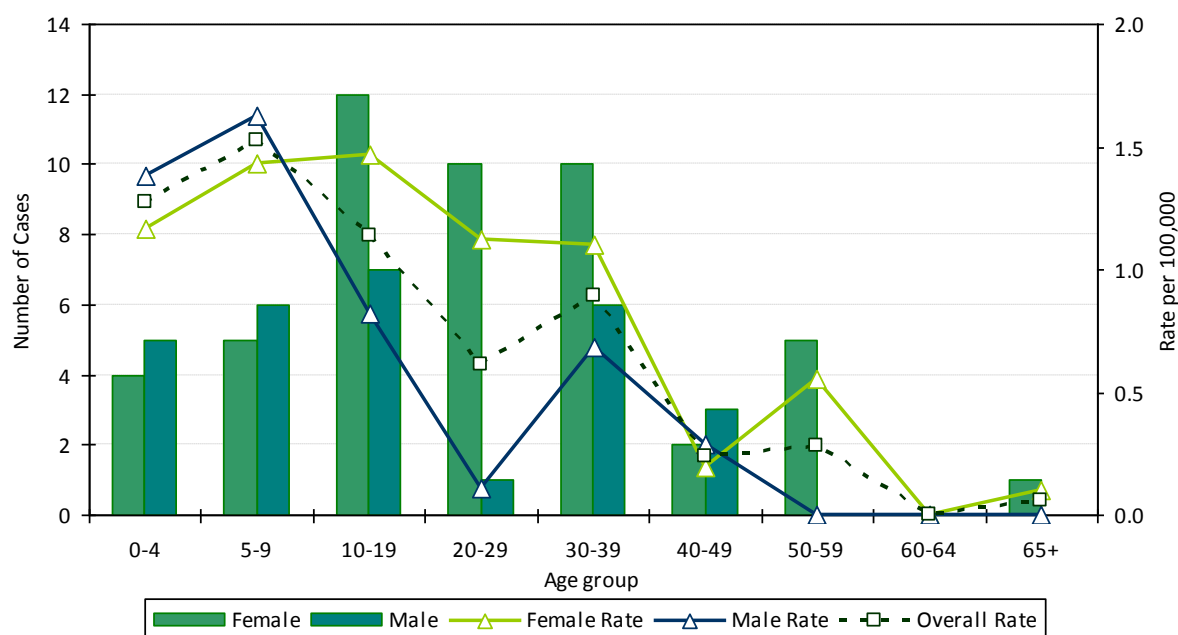
Figure 1.11.2: Incidence of Typhoid Fever by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

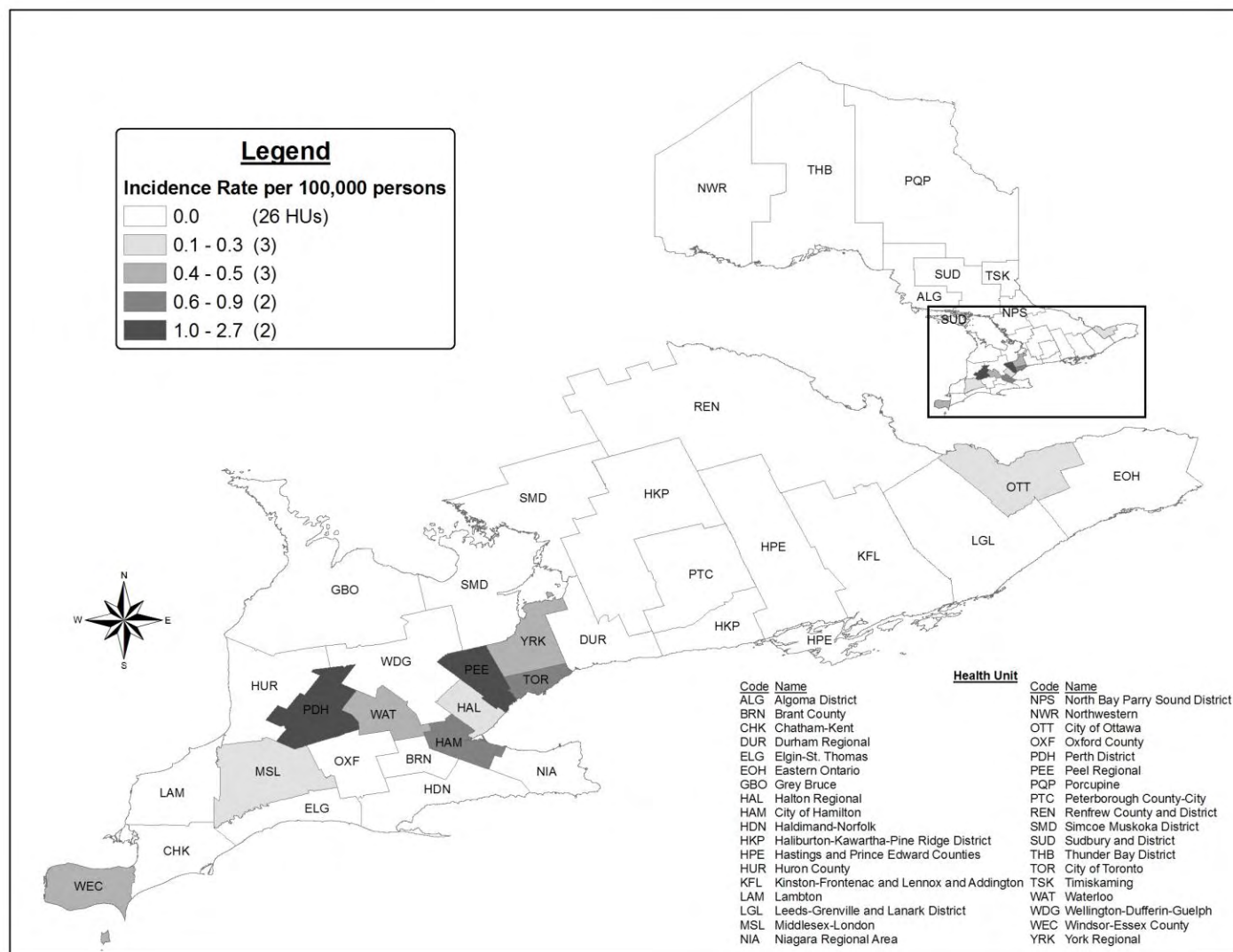
Table 1.11.1: Incidence of Typhoid Fever by Age and Sex: Ontario, 2009

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	4	1.2	5	1.4	9	1.3
5-9	5	1.4	6	1.6	11	1.5
10-19	12	1.5	7	0.8	19	1.1
20-29	10	1.1	1	0.1	11	0.6
30-39	10	1.1	6	0.7	16	0.9
40-49	2	0.2	3	0.3	5	0.2
50-59	5	0.6	0	0.0	5	0.3
60-64	0	0.0	0	0.0	0	0.0
65+	1	0.1	0	0.0	1	0.1
Total	49	0.7	28	0.4	77	0.6

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 1.11.1: Incidence Rate of Typhoid Fever by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

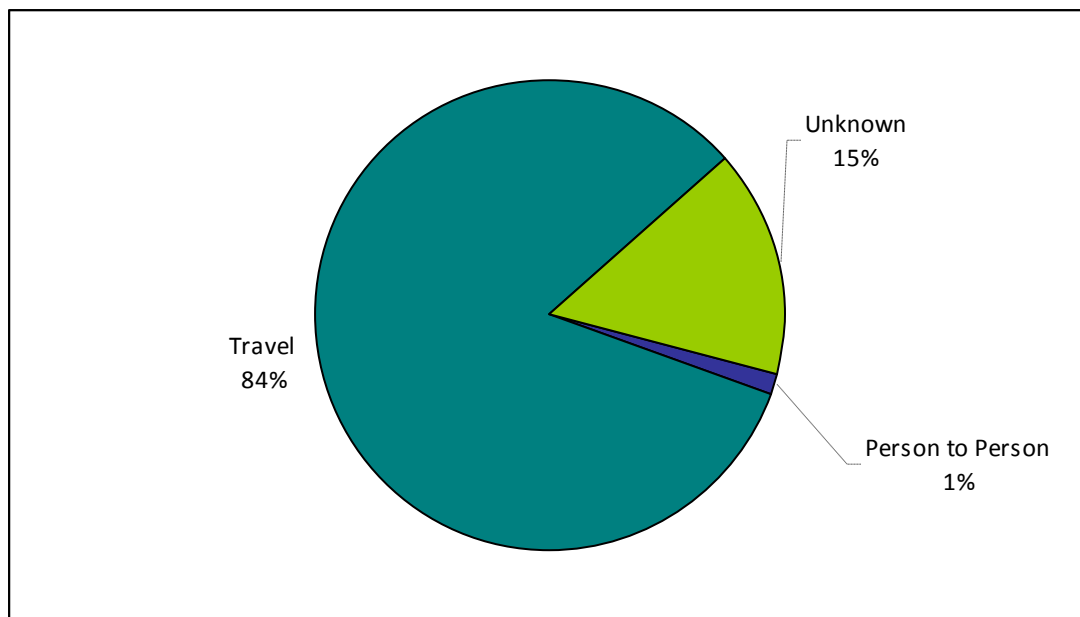
Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	35	2.7
Perth District	1	1.3
Toronto	23	0.9
Hamilton	4	0.8
Windsor-Essex County	2	0.5
York Region	5	0.5
Waterloo Region	2	0.4
Ottawa	3	0.3
Halton Region	1	0.2
Middlesex-London	1	0.2
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	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	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 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
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
Wellington-Dufferin-Guelph	0	0.0
Ontario	77	0.6

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Exposures for Typhoid Fever Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

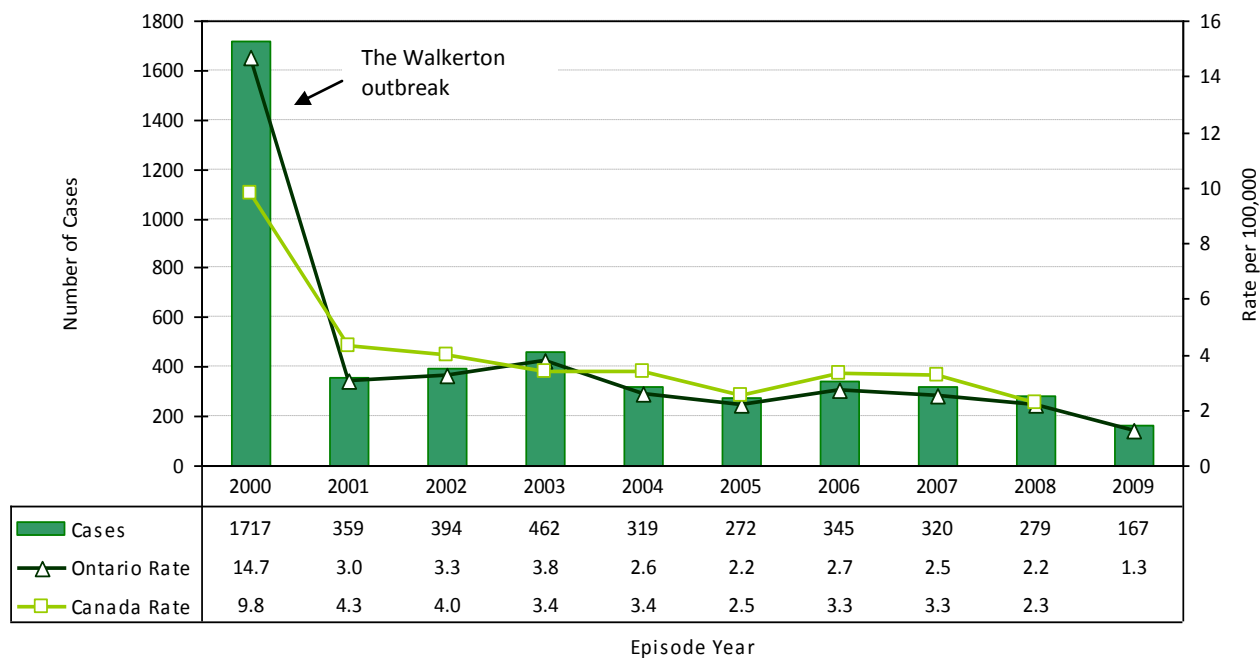
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 8% of cases; these cases were excluded.

1.12 VEROTOXIN PRODUCING *E. COLI* (VTEC)

- Ontario reported 167 cases of verotoxin producing *E. coli* (VTEC) in 2009, representing an incidence of 1.3 cases per 100,000 population (Figure 1.12.1).
- In 2009, Ontario reported its lowest incidence rate for VTEC since the year 2000. In 2000, a VTEC outbreak associated with the Walkerton municipal drinking water supply occurred. The incidence rate of VTEC in that year was 14.7 cases per 100,000 population, almost six times higher than the post-Walkerton provincial annual average of 2.6 cases per 100,000 population (324 cases). The national incidence rate was comparable to the provincial rate except in 2000, the year of the Walkerton outbreak (Figure 1.12.1).
- VTEC cases in Ontario demonstrated a seasonal peak, with the warmer months accounting for a disproportionate share of cases. VTEC cases peaked between May and October with 125 cases or 75% of cases reported in 2009 (Figure 1.12.2).
- In 2009, the incidence rate of VTEC was 27% higher among females at 1.4 cases per 100,000 population compared to that of males at 1.1 cases per 100,000 population (Figure 1.12.3, Table 1.12.1).
- The incidence rates of VTEC decreased with increasing age for both males and females, with children in the 0-4 (4.7 cases per 100,000 population) and the 5-9 (3.2 cases per 100,000 population) age groups reporting the highest incidence rates in 2009. (Figure 1.12.3, Table 1.12.1).
- Perth District (3.9 cases per 100,000), Oxford County (3.7 cases per 100,000 population) and Wellington-Dufferin-Guelph (3.7 cases per 100,000 population) reported the highest incidence rates of VTEC in Ontario in 2009 (Map 1.12.1, Table 1.12.2).
- Foodborne exposures accounted for 21% of VTEC cases who reported an exposure in 2009. Travel (11%), animal contact (9%), waterborne (6%) and other exposures (4%) accounted for another 30% of VTEC cases; the source of illness was unknown for the remaining 49% of cases (Figure 1.12.5).

Figure 1.12.1: Incidence of VTEC in Ontario and Canada: 2000-2009



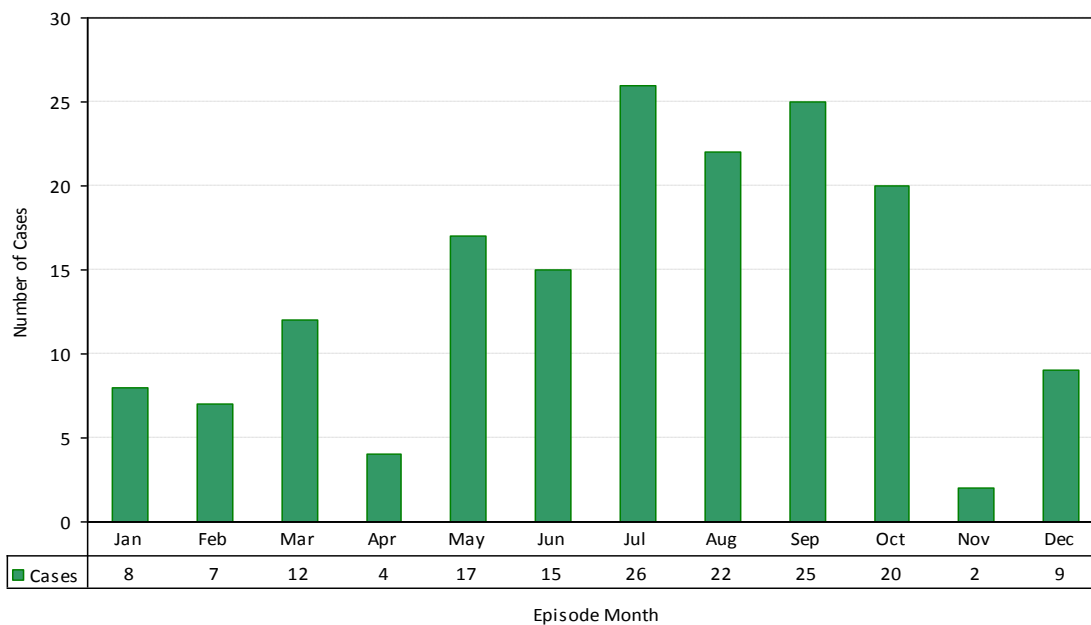
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

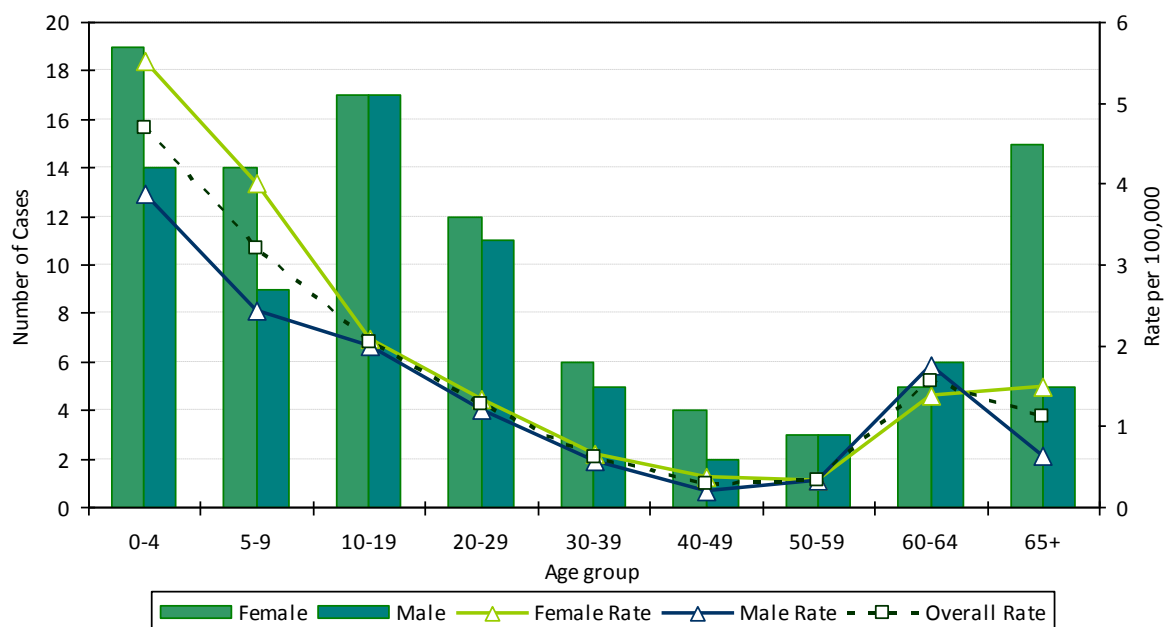
Figure 1.12.2: Incidence of VTEC by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

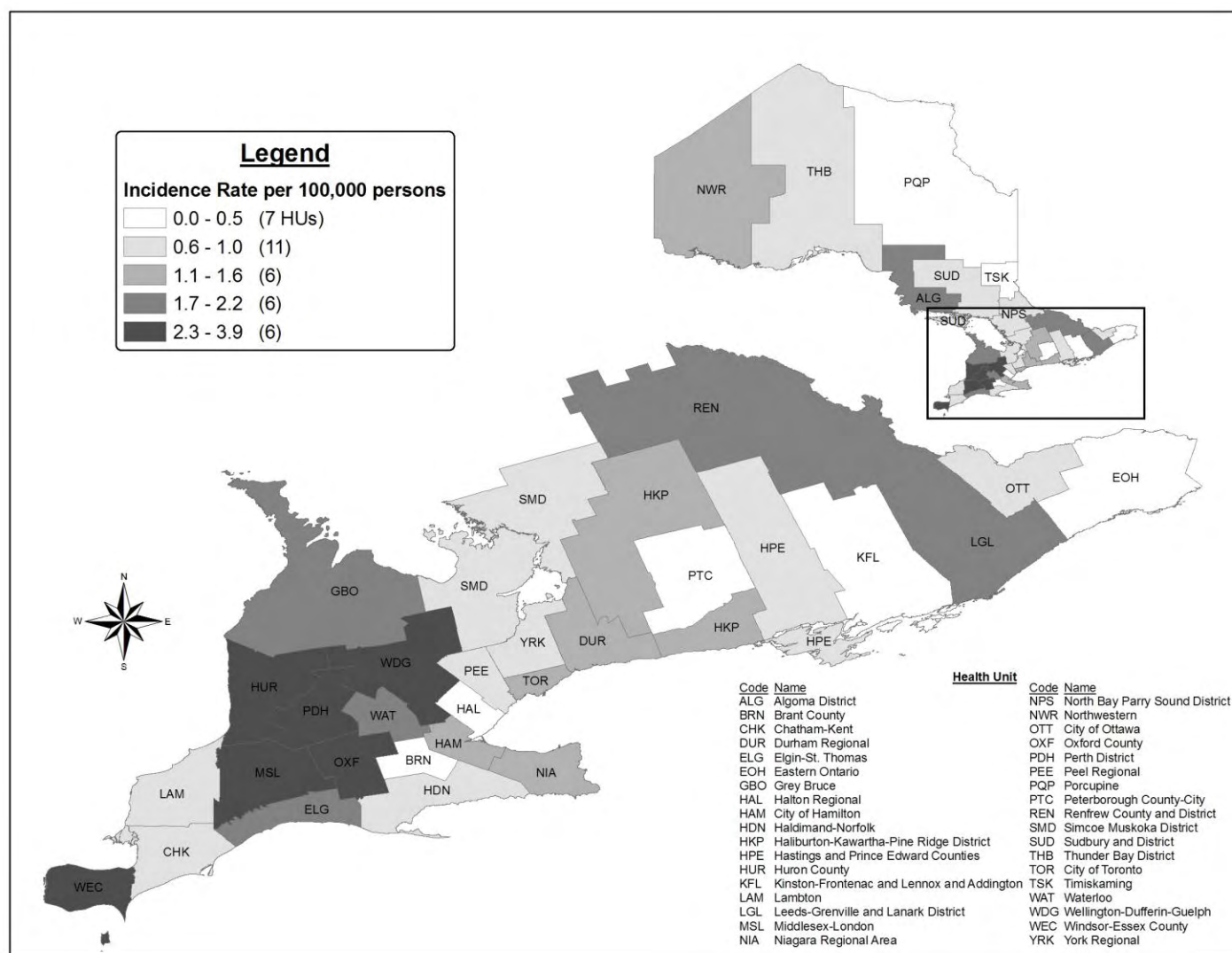
Table 1.12.1: Incidence of VTEC by Age and Sex: Ontario, 2009

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	19	5.5	14	3.9	33	4.7
5-9	14	4.0	9	2.4	23	3.2
10-19	17	2.1	17	2.0	34	2.0
20-29	12	1.3	11	1.2	23	1.3
30-39	6	0.7	5	0.6	11	0.6
40-49	4	0.4	2	0.2	6	0.3
50-59	3	0.3	3	0.3	6	0.3
60-64	5	1.4	6	1.7	11	1.6
65+	15	1.5	5	0.6	20	1.1
Total	95	1.4	72	1.1	167	1.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 1.12.1: Incidence Rate of VTEC by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

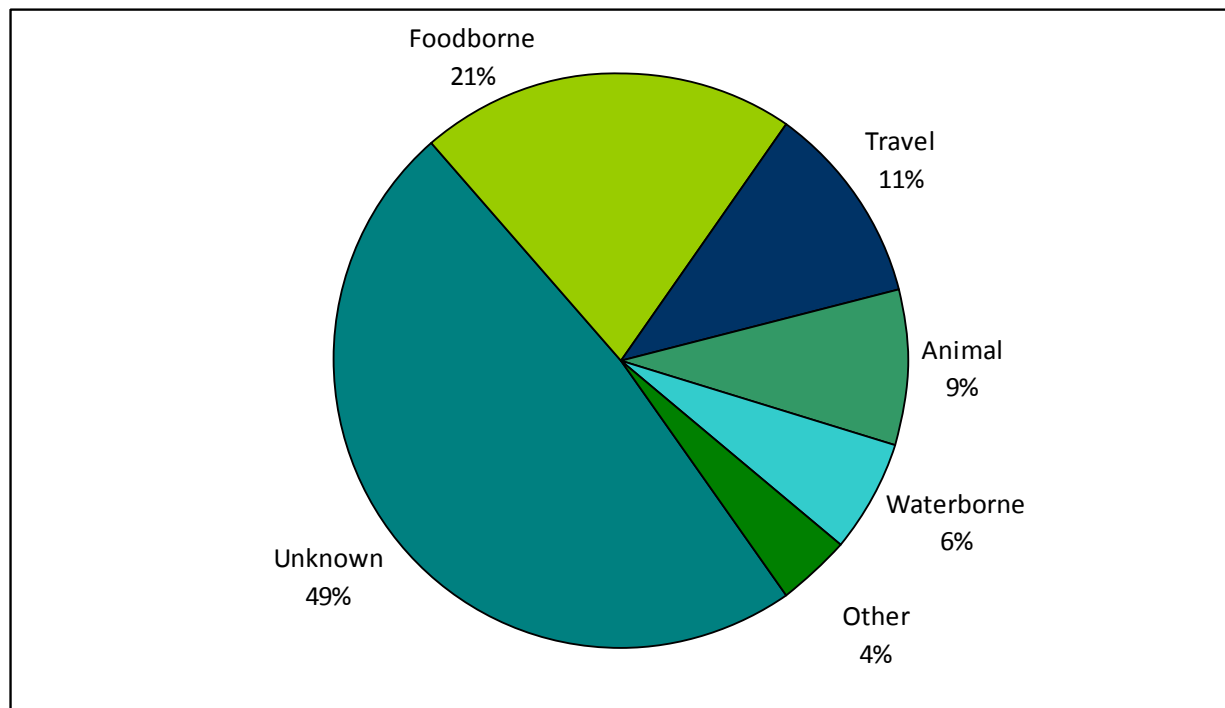
Public Health Unit	Number of cases	Rate/100,000 population
Perth District	3	3.9
Oxford County	4	3.7
Wellington-Dufferin-Guelph	10	3.7
Huron County	2	3.3
Middlesex-London	13	2.9
Windsor-Essex County	10	2.5
Elgin-St. Thomas	2	2.2
Renfrew County and District	2	1.9
Waterloo Region	10	1.9
Grey Bruce	3	1.8
Leeds, Grenville and Lanark District	3	1.8
Algoma District	2	1.7
Niagara Region	7	1.6
Toronto	35	1.3
Durham Region	8	1.3
Northwestern	1	1.2
City of Hamilton	6	1.1
Haliburton, Kawartha, Pine Ridge	2	1.1
City of Ottawa	9	1.0
Sudbury and District	2	1.0
Peel Region	13	1.0
Chatham-Kent	1	0.9
Haldimand-Norfolk	1	0.9
North Bay Parry Sound District	1	0.8
York Region	8	0.8
Lambton County	1	0.8
Thunder Bay District	1	0.6
Hastings & Prince Edward Counties	1	0.6
Simcoe Muskoka District	3	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Halton Region	2	0.4
Brant County	0	0.0
Eastern Ontario	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Timiskaming	0	0.0
Ontario	167	1.3

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Modes of Transmission for VTEC Cases: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

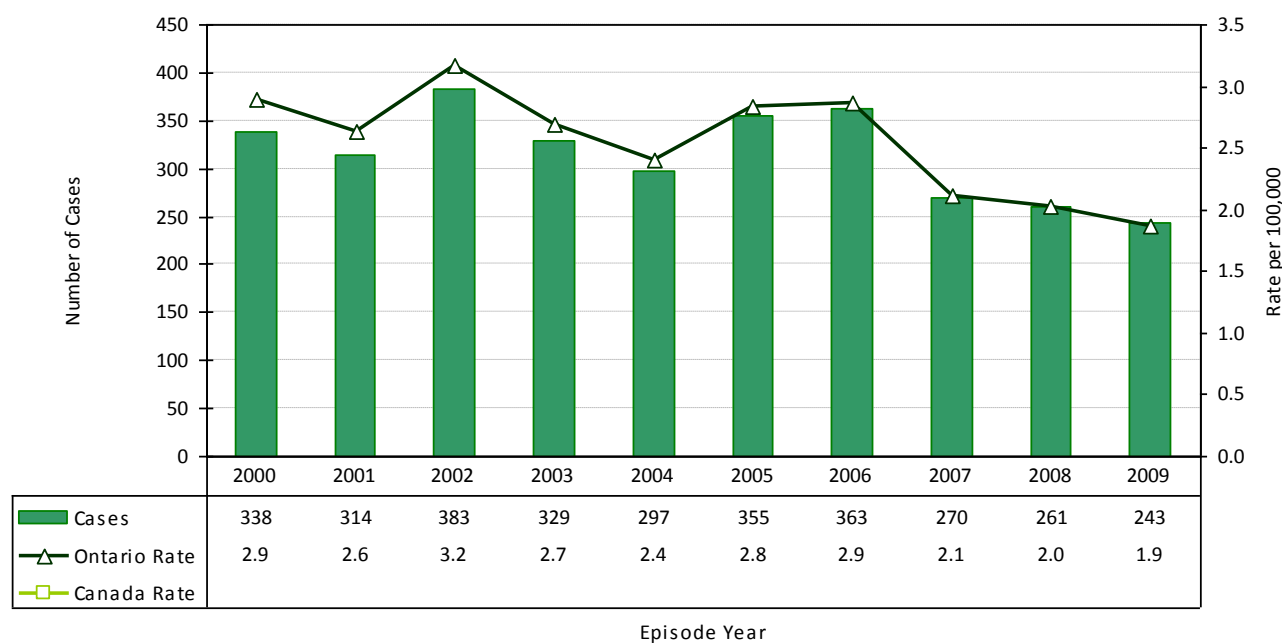
Note 1: The most likely exposure was selected for cases reporting more than one exposure.

Note 2: Exposure details were not reported for 16% of cases; these cases were excluded.

1.13 YERSINIOSIS

- In 2009, Ontario reported 243 cases of yersiniosis, representing an incidence rate of 1.9 cases per 100,000 population (Table 1.13.1).
- During the period 2000-2009, the incidence rate of yersiniosis in Ontario declined by 34% from 2.9 cases per 100,000 population in 2000 to 1.9 cases per 100,000 population in 2009 (Figure 1.13.1).
- There was no clear seasonal trend among yersiniosis cases in 2009. Thirty-two cases each (13%) were reported in the months of March and October, which accounted for the highest number of cases reported in a month (Figure 1.13.2).
- In 2009, males (58%) accounted for more cases of yersiniosis than females. Males also had a 47% higher sex-specific incidence rate than females at 2.2 cases per 100,000 population compared to 1.5 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 (12.0 cases per 100,000 population). This rate was more than six times higher than the provincial incidence rate of 1.9 cases per 100,000 population (Figure 1.13.3, Table 1.13.1).
- York Region reported the highest incidence rate of yersiniosis in 2009 with 4.0 cases per 100,000 population; Peel Region ranked second with 3.2 cases per 100,000 population. Toronto reported the highest number of cases (n=77), representing 32% of yersiniosis cases reported in Ontario for an incidence rate of 2.9 cases per 100,000 population (Map 1.13.1, Table 1.13.2).
- Travel outside of Ontario (14%) and exposures in private homes (14%) were the most frequently reported exposure settings among cases reporting a specific exposure in 2009. Exposures in food premise (2%) and other settings (2%) and unknown exposures (68%) accounted for remaining cases (Figure 1.13.4).

Figure 1.13.1: Incidence of Yersiniosis in Ontario and Canada: 2000-2009

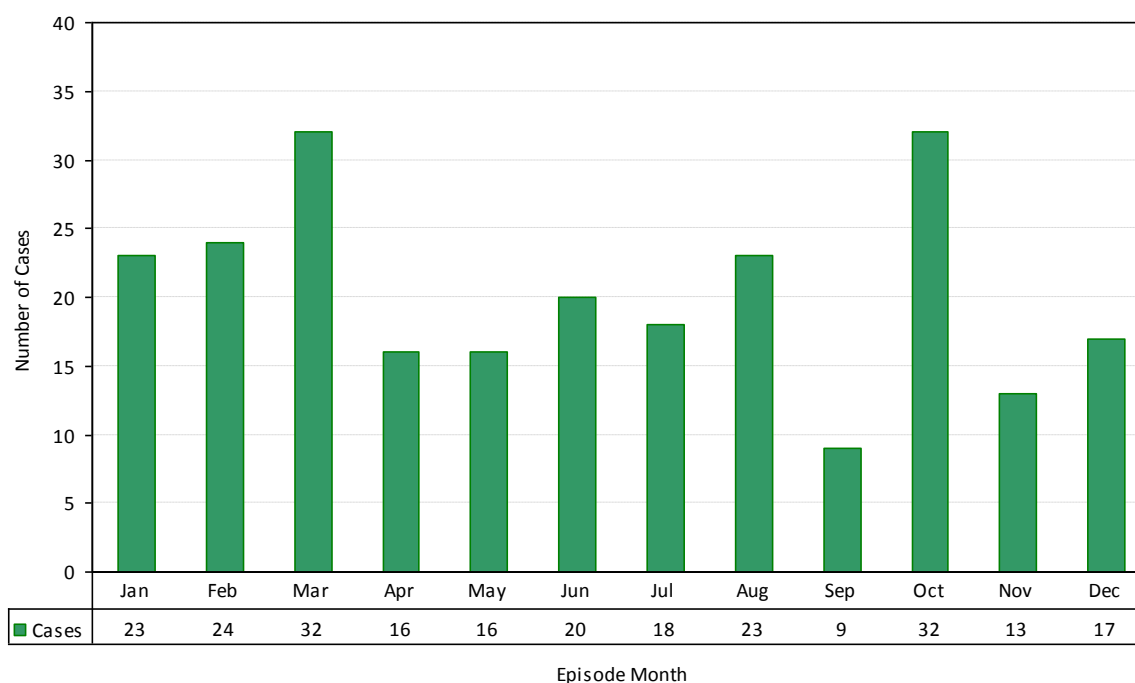


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Yersiniosis is not nationally reportable.

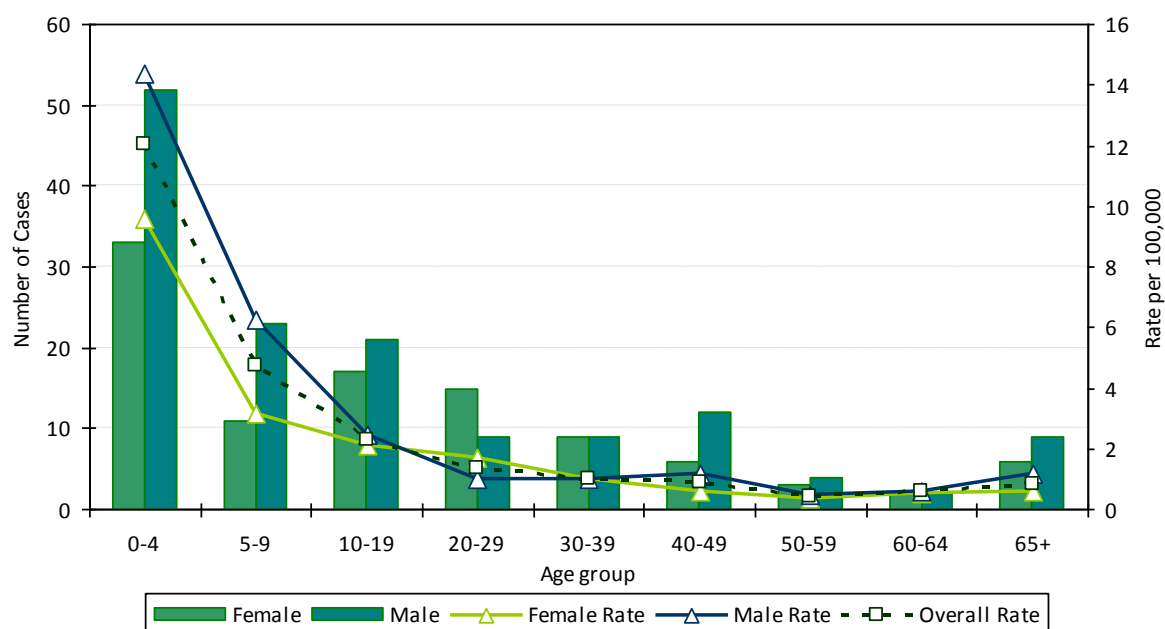
Figure 1.13.2: Incidence of Yersiniosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

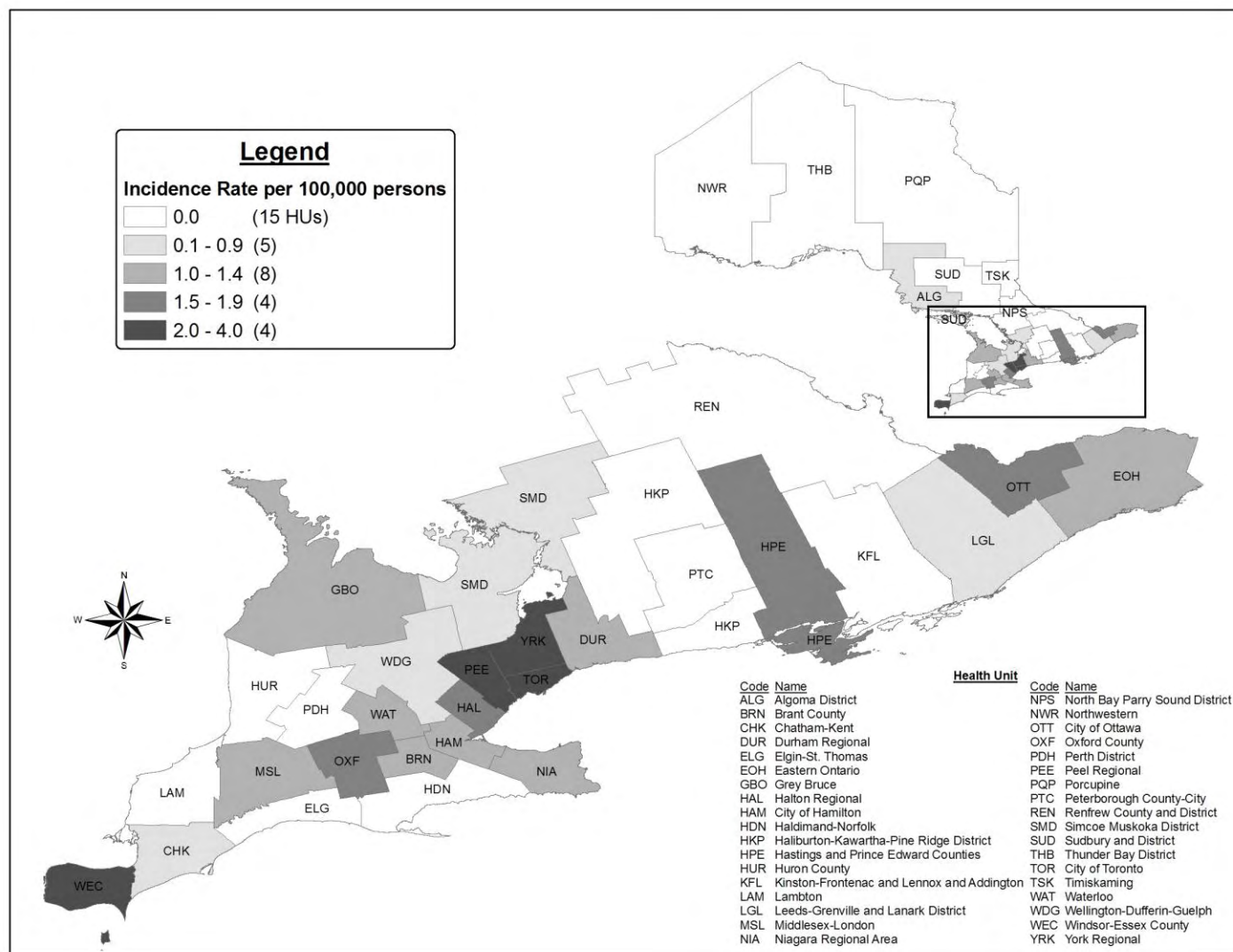
Table 1.13.1: Incidence of Yersiniosis by Age and Sex: Ontario, 2009

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	33	9.6	52	14.4	85	12.0
5-9	11	3.1	23	6.2	34	4.7
10-19	17	2.1	21	2.5	38	2.3
20-29	15	1.7	9	1.0	24	1.3
30-39	9	1.0	9	1.0	18	1.0
40-49	6	0.6	12	1.1	18	0.9
50-59	3	0.3	4	0.5	7	0.4
60-64	2	0.6	2	0.6	4	0.6
65+	6	0.6	9	1.1	15	0.8
Total	102	1.5	141	2.2	243	1.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 1.13.1: Incidence Rates of Yersiniosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

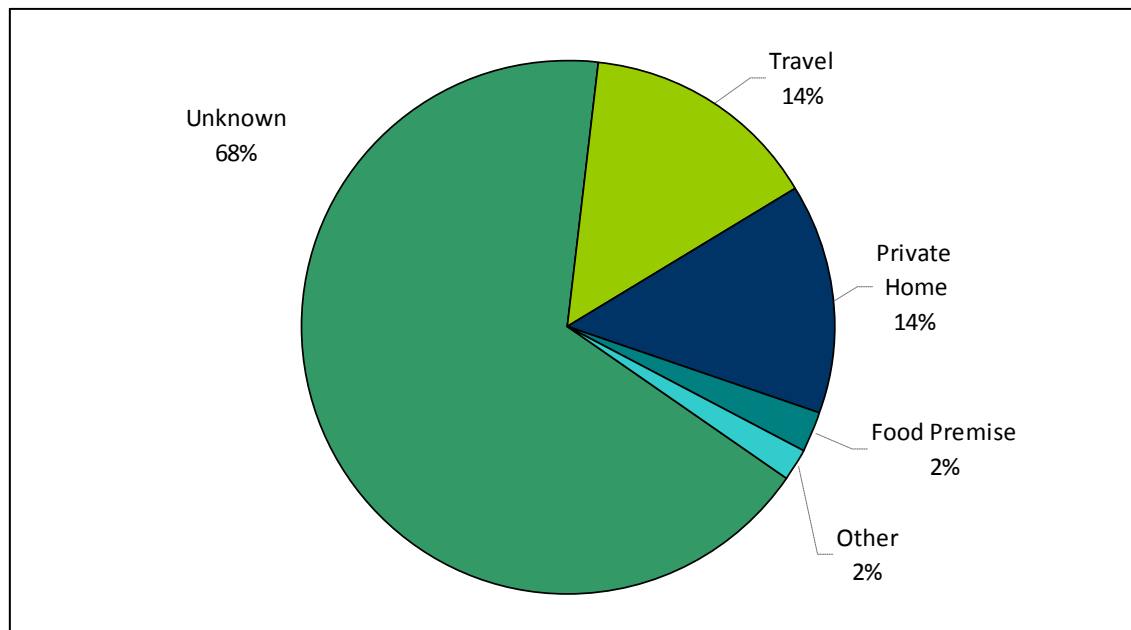
Public Health Unit	Number of cases	Rate/100,000 population
York Region	41	4.0
Peel Region	42	3.2
Windsor-Essex County	12	3.0
Toronto	77	2.9
Oxford County	2	1.9
Hastings & Prince Edward Counties	3	1.8
City of Ottawa	15	1.7
Halton Region	8	1.6
Brant County	2	1.4
Waterloo Region	7	1.4
Grey Bruce	2	1.2
Durham Region	7	1.1
City of Hamilton	6	1.1
Niagara Region	5	1.1
Middlesex-London	5	1.1
Eastern Ontario	2	1.0
Chatham-Kent	1	0.9
Algoma District	1	0.8
Wellington-Dufferin-Guelph	2	0.7
Leeds, Grenville and Lanark District	1	0.6
Simcoe Muskoka District	2	0.4
Elgin-St. Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Huron County	0	0.0
Kingston, Frontenac, Lennox & Addington	0	0.0
Lambton County	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County-City	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
Ontario	243	1.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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.

Chapter 2: VACCINE PREVENTABLE DISEASES

- In 2009, *Streptococcus pneumoniae* (*S. pneumoniae*), pertussis, mumps and invasive meningococcal disease were the most commonly reported of the diseases routinely prevented by vaccines during childhood and early adolescence in Ontario.
- In 2009, age-specific incidence rates for invasive meningococcal disease and pertussis were highest among children ages 0-4 years. For *S. Pneumoniae*, age-specific incidence rates were highest among the same age group and among adults aged 65 years and older; for mumps, the highest rates were reported in the 20-29 age group.
- Since 2002, the incidence 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, for which there is no vaccine available in Canada, accounted for most (42%) cases of IMD that were reported in Ontario in 2009 (Figure 2.1.4).
- The incidence of mumps in Ontario has generally been on a decline since 2000, although the number of reported cases spiked in 2007, 2008 and 2009. Outbreaks were reported in these years. (Figure 2.2.1).
- Compared to earlier years, a significant reduction in the incidence of pertussis in Ontario was observed from 2000 to 2003 following the introduction of a more immunogenic vaccine against pertussis. In subsequent years (2004-2009), the incidence of pertussis increased, peaking at 10.0 cases per 100,000 population in 2006 (Figure 2.3.1). The increase was due in part to changes in laboratory techniques and reporting practices.
- As a result of increased testing and reporting starting in 2008, the incidence rate of *S. pneumoniae* increased by 9% to 8.2 cases per 100,000 population, and by an additional 17% in 2009 to 9.6 cases per 100,000 population (Figure 2.4.1).
- Other vaccine-preventable diseases have a very low incidence and are rarely reported. Over the ten year period from 2000 to 2009, no cases of diphtheria were reported in Ontario. During this period, an average of eight cases of Haemophilus Influenzae B and one case of tetanus were reported annually in Ontario.
- For measles, the number of cases reported annually ranged from 0 to 11 cases in non-outbreak years from 2000 to 2009. Over the same ten year period six cases of congenital rubella were reported in Ontario. An average of three rubella cases has been reported in Ontario since the 2005 rubella outbreak in Oxford County.

Table 2.1: Incidence of Vaccine Preventable Diseases; Ontario, 2000-2009

Vaccine Preventable Diseases ^{2, 4}	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
	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	11	0.1	7	0.1	7	0.1	9	0.1	9	0.1	8	0.1	12	0.1	6	0.0	7	0.1	4	0.0
Measles	9	0.1	6	0.1	1	0.0	11	0.1	6	0.0	4	0.0	5	0.0	0	0.0	58	0.5	8	0.1
Meningococcal disease	82	0.7	106	0.9	59	0.5	58	0.5	55	0.4	43	0.3	67	0.5	62	0.5	48	0.4	71	0.5
Mumps	33	0.3	18	0.2	14	0.1	13	0.1	23	0.2	17	0.1	10	0.1	53	0.4	336	2.6	108	0.8
Pertussis 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	831	6.4	405	3.1
Rubella	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	2	0.0	3	0.0
Rubella, congenital	1	0.0	0	0.0	1	0.0	1	0.0	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
S. pneumoniae ³	21	0.2	128	1.1	649	5.4	1016	8.3	1057	8.5	930	7.4	945	7.4	940	7.3	1062	8.2	1258	9.6
Tetanus	1	0.0	3	0.0	2	0.0	0	0.0	0	0.0	1	0.0	1	0.0	1	0.0	0	0.0	2	0.0

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (IPHIS) database.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

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 2000-2009: poliomyelitis and small pox

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

Note 4: Does not include chicken-pox which is reported to the MOHLTC as aggregated case counts rather than individual case counts.

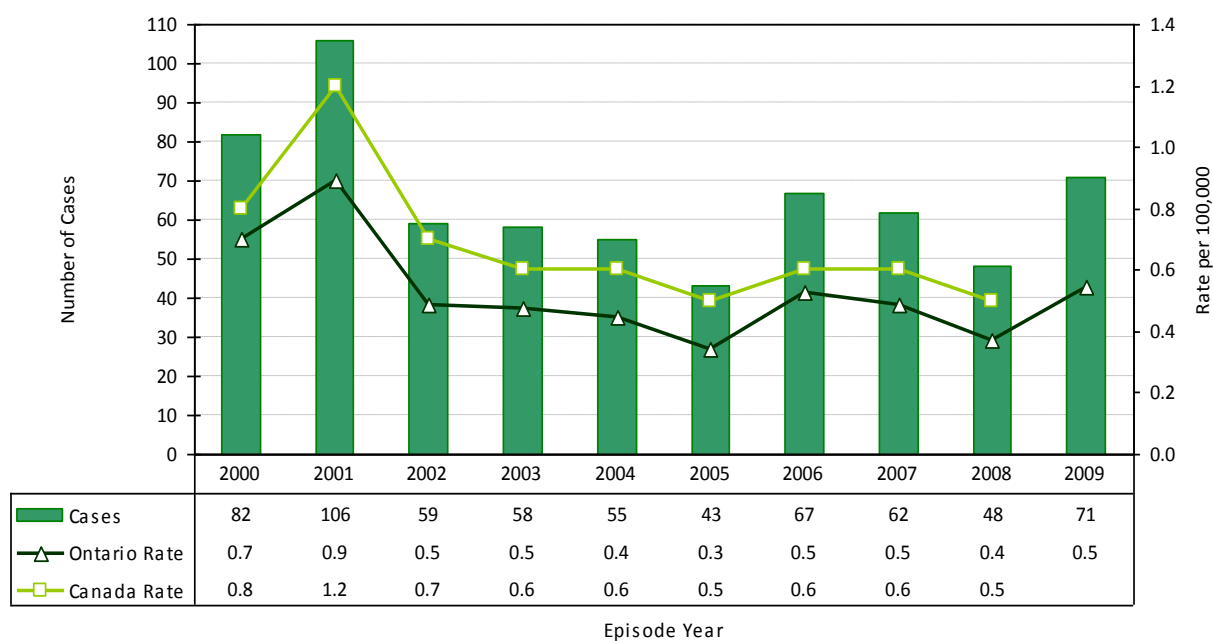
Note 5: Publicly funded Meningococcal vaccine (serogroup C) introduced in September 2004 for one year olds and in January 2005 for grade 7 students, youths aged 15 to 19 and high-risk people of all ages. In 1996, a two dose schedule of measles, mumps, and rubella vaccine (MMR) was introduced, with a one time catch-up program of mono-valent measles vaccine for students aged 4-18 years. Publicly funded tetanus, diphtheria and acellular vaccine (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. The program was 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: The increase in the incidence of pertussis since 2005 was due in part to a change to a more sensitive polymerase chain reaction (PCR) laboratory test for pertussis. In 2009, new reporting standards were introduced for cases with low levels of *B. pertussis* and *B. paraptussis*, resulting in a decline in the incidence of pertussis to the lowest observed in the past decade (2000-2009).

2.1 MENINGOCOCCAL DISEASE, INVASIVE

- In 2009, Ontario reported 71 cases of invasive meningococcal disease (IMD), representing an incidence rate of 0.5 cases per 100,000 population (Figure 2.1.1).
- From 2000 to 2009, the incidence rate of IMD in Ontario was maintained below one case per 100,000 population, with the highest rate occurring in 2001 (0.9 cases per 100,000 population). The increase in 2001 was attributed to an outbreak of IMD serogroup C. Since 2002, the incidence of IMD has declined to a yearly average of 0.5 cases per 100,000 population (Figure 2.1.1).
- The overall trend in the incidence of IMD in Canada from 2000 to 2008 was comparable to that of Ontario, but with higher annual incidence rates in all years for which national data were available (Figure 2.1.1). The largest difference in rates was observed in 2001. In that year, outbreaks of IMD were reported in Ontario, Quebec, British Columbia and Alberta.
- In 2009, the highest number of cases was reported in February (10 cases); only one case was reported in August (Figure 2.1.2).
- In 2009, the incidence rate for IMD was 0.6 cases per 100,000 population for males and 0.5 cases per 100,000 population for females (Figure 2.1.3, Table 2.1.1).
- Children in the 0-4 age group (2.7 cases per 100,000 population) experienced the highest burden of IMD with an incidence rate that was more than five times the overall rate of 0.5 cases per 100,000 for Ontario. (Figure 2.1.3, Table 2.1.1).
- Half (18) of public health units reported incidence rates for IMD that were greater than the overall rate for Ontario while 33% reported no cases in 2009. The highest rates were reported by North Bay-Parry Sound (3.2 cases per 100,000 population) and Renfrew County and District (1.9 cases per 100,000 population) (Map 2.1.1, Table 2.1.2).
- The most frequently identified meningococcal serogroups in 2009 were Group B (42%), Group Y (27%) and Group C (20%); other (4%) and unknown (7%) serogroups made up the remaining cases (Figure 2.1.4). There is no vaccine available in Canada for serogroup B.
- The Ontario immunization coverage for Meningococcal C conjugate vaccine, which protects against IMD serogroup C, was approximately 86% of all Grade 7 students during the 2007/2008 and 2008/2009 school years.

Figure 2.1.1: Incidence of Invasive Meningococcal Disease in Ontario and Canada: 2000-2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

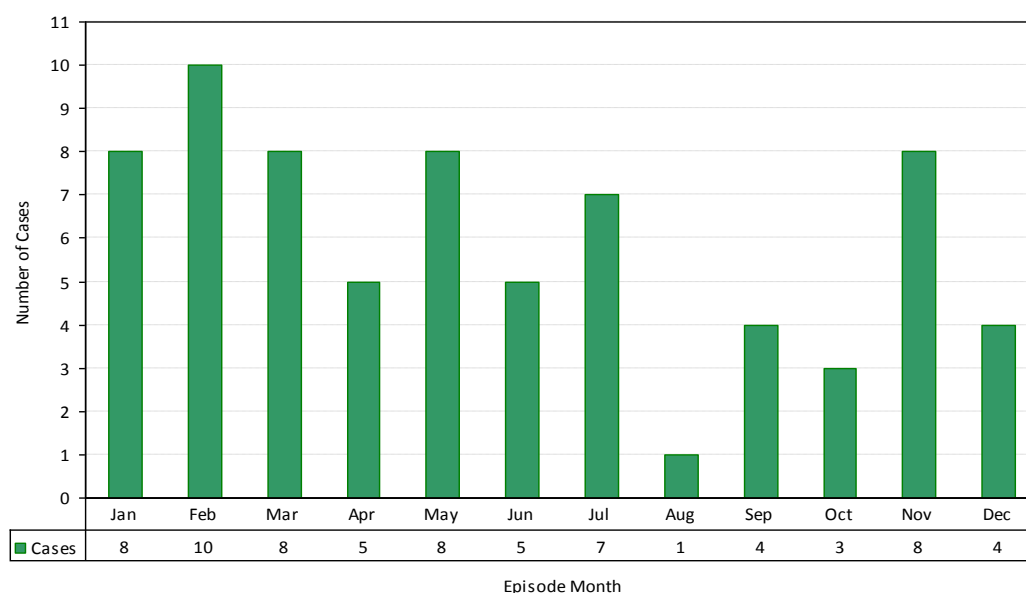
Canadian rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario.

Note 1: Canadian rate not available for 2009.

Note 2: 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 Ontarians of all ages.

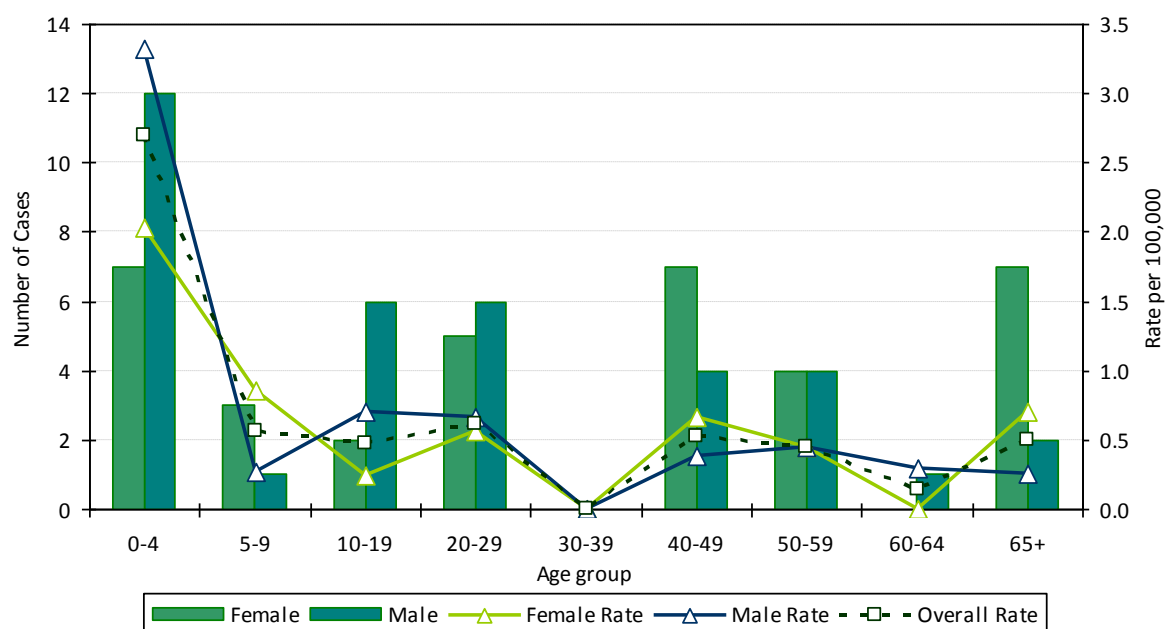
Figure 2.1.2: Incidence of Invasive Meningococcal Disease by Episode Month: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

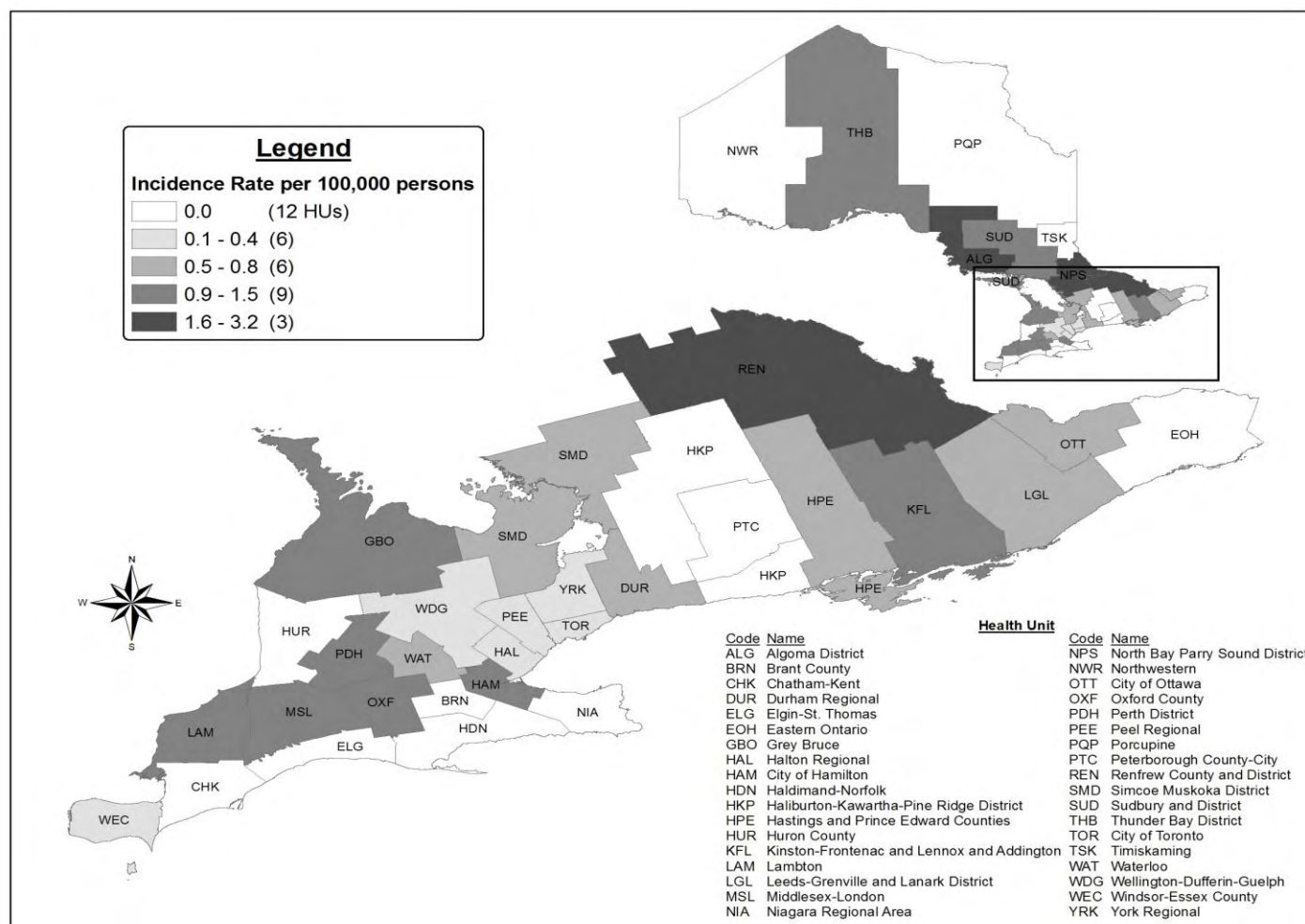
Table 2.1.1: Incidence of Invasive Meningococcal Disease by Age and Sex: Ontario, 2009

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	7	2.0	12	3.3	19	2.7
5-9	3	0.9	1	0.3	4	0.6
10-19	2	0.2	6	0.7	8	0.5
20-29	5	0.6	6	0.7	11	0.6
30-39	0	0.0	0	0.0	0	0.0
40-49	7	0.7	4	0.4	11	0.5
50-59	4	0.4	4	0.5	8	0.4
60-64	0	0.0	1	0.3	1	0.1
65+	7	0.7	2	0.3	9	0.5
Total	35	0.5	36	0.6	71	0.5

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 2.1.1: Incidence Rates of Invasive Meningococcal Disease by Public Health Unit: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

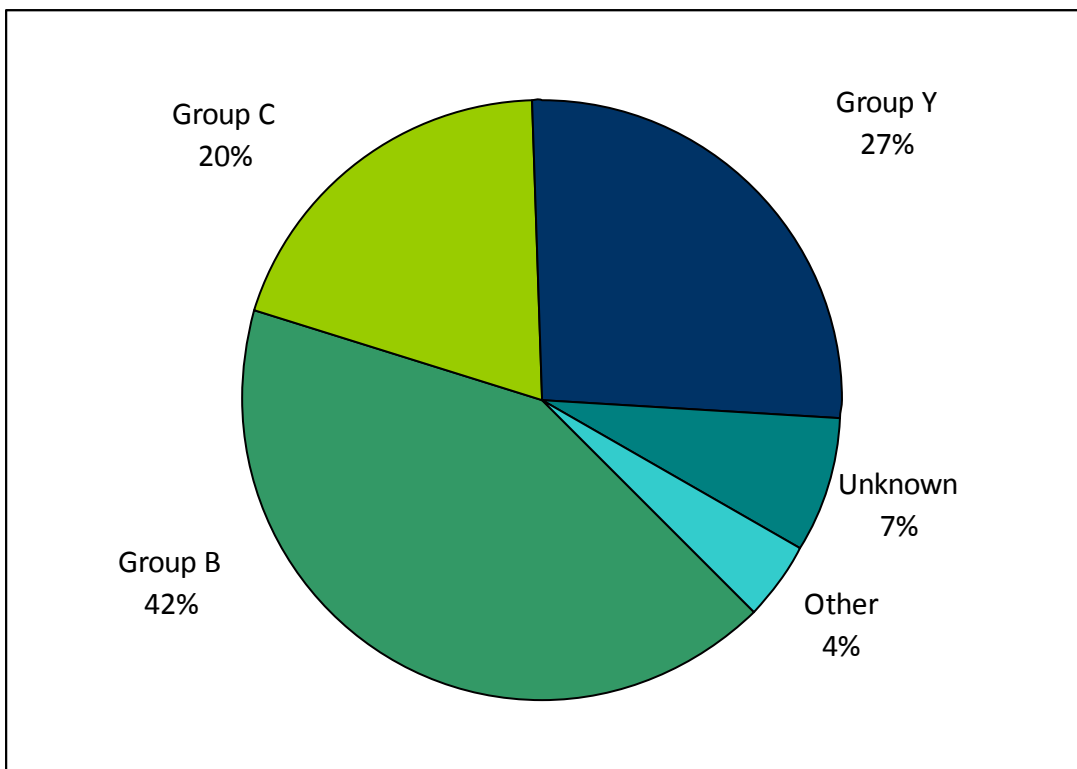
Public Health Unit	Number of cases	Rate/100,000 population
North Bay Parry Sound District	4	3.2
Renfrew County and District	2	1.9
Algoma District	2	1.7
Middlesex-London	7	1.5
Lambton County	2	1.5
Perth District	1	1.3
Thunder Bay District	2	1.3
Grey Bruce	2	1.2
Kingston, Frontenac, Lennox & Addington	2	1.0
Sudbury and District	2	1.0
City of Hamilton	5	0.9
Oxford County	1	0.9
Durham Region	5	0.8
City of Ottawa	7	0.8
Simcoe Muskoka District	4	0.8
Hastings & Prince Edward Counties	1	0.6
Leeds, Grenville and Lanark District	1	0.6
Waterloo Region	3	0.6
Halton Region	2	0.4
Wellington-Dufferin-Guelph	1	0.4
Toronto	9	0.3
York Region	3	0.3
Windsor-Essex County	1	0.2
Peel Region	2	0.2
Brant County	0	0.0
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Huron County	0	0.0
Niagara Region	0	0.0
Northwestern	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Timiskaming	0	0.0
Ontario	71	0.5

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



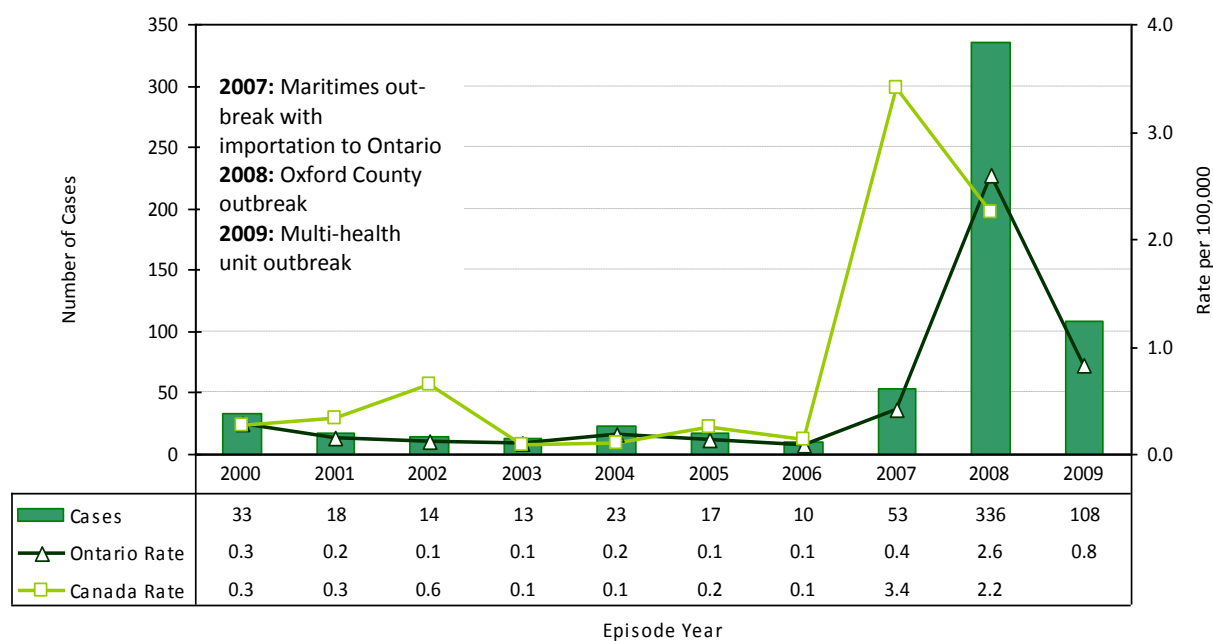
Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Note: 'Other' includes cases whose serotypes were noted as group W-135 serotype, non groupable/typeable, or other. 'Unknown' includes cases whose serotypes were noted as unspecified or missing in iPHIS.

2.2 MUMPS

- Mumps is a designated disease under the [*Immunization of School Pupils Act*](#).
- In 2009, Ontario reported 108 cases of mumps, which represents an incidence rate of 0.8 cases per 100,000 population (Figure 2.2.1).
- The incidence of mumps in Ontario has generally been on a decline since 2000, although the number of reported cases spiked from 2007 to 2009 (Figure 2.2.1). The increase in 2007 was attributed to the importation of mumps from Nova Scotia and New Brunswick; in 2008, to an outbreak in an under-unimmunized community in Oxford County; and in 2009, to a multi-health unit outbreak that began in September and primarily affected young adult males. Many of the 2009 outbreak cases did not receive a second dose of measles-mumps-rubella (MMR) vaccine, which confers greater protection against disease than a single dose of MMR.
- The incidence rate for mumps in Canada decreased following the introduction of the routine second dose of measles-mumps-rubella vaccine by most provinces and territories for measles control in 1996/1997. During the period 2000-2008, incidence rates ranged from 0.1 to 3.4 cases per 100,000 population, with higher annual rates occurring in outbreak years - notably in 2002 in Alberta; 2007 in Nova Scotia and New Brunswick; and in 2008 in Ontario and British Columbia (Figure 2.2.1).
- In 2009, there were two distinct peaks in the incidence of mumps with the first cluster of 8 cases in May and the second from September to December, which accounted for 81% (87/108) of reported mumps cases in Ontario. The second peak corresponds with the onset of a large outbreak involving North Bay-Parry Sound District and a number of other health units that was linked to outbreaks in Europe and the United States (Figure 2.2.2).
- Corresponding with the demographic of the outbreak, the incidence rate of mumps in 2009 was 2.4 times higher among males at 1.2 cases per 100,000 population (77 cases) compared to 0.5 cases per 100,000 (30 cases) among females. The highest incidence rates by age and sex also occurred among young adult males at 3.6 and 3.1 cases per 100,000 population for the 20-29 and 10-19 age groups, respectively (Figure 2.2.3, Table 2.2.1).
- North Bay-Parry Sound District reported the highest incidence rate and number of cases of mumps in 2009 with 18.2 cases per 100,000 population for a total of 23 cases. (Map 2.1.1, Table 2.1.2). This rate is approximately eight times the next highest health unit incidence rate and almost 23 times the provincial rate. The high rate in North Bay-Parry Sound resulted from the large number of outbreak cases occurring in the small population.
- The Ontario immunization coverage for two doses of mumps vaccine was approximately 86% for all school-aged children aged 7 to 17 years during the 2008/2009 school year.

Figure 2.2.1: Incidence of Mumps in Ontario and Canada: 2000-2009



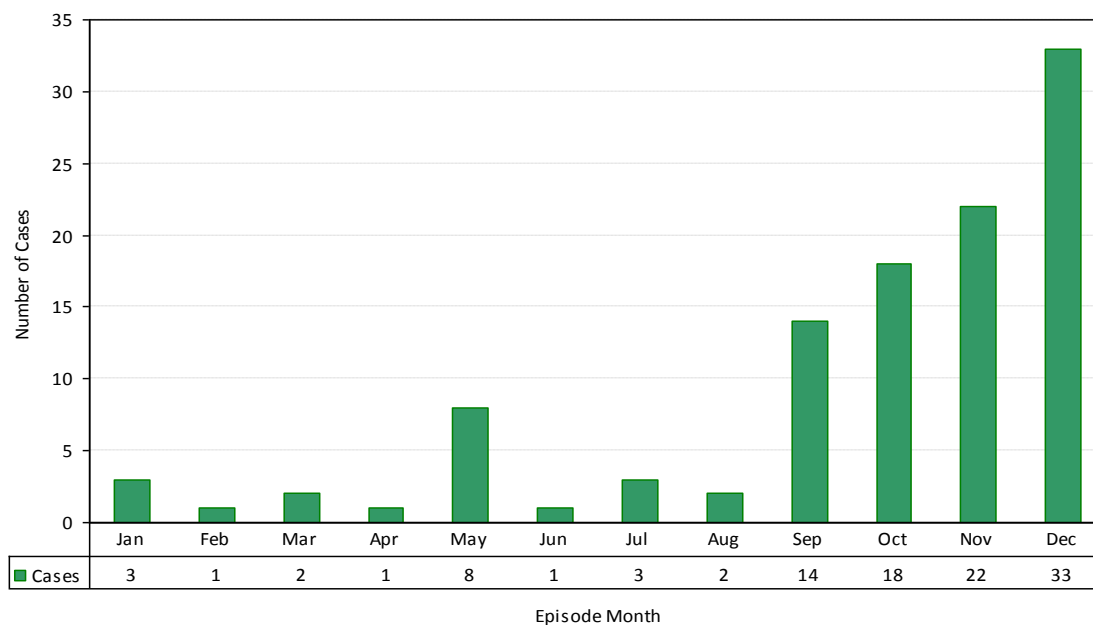
Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rates available up to 2008.

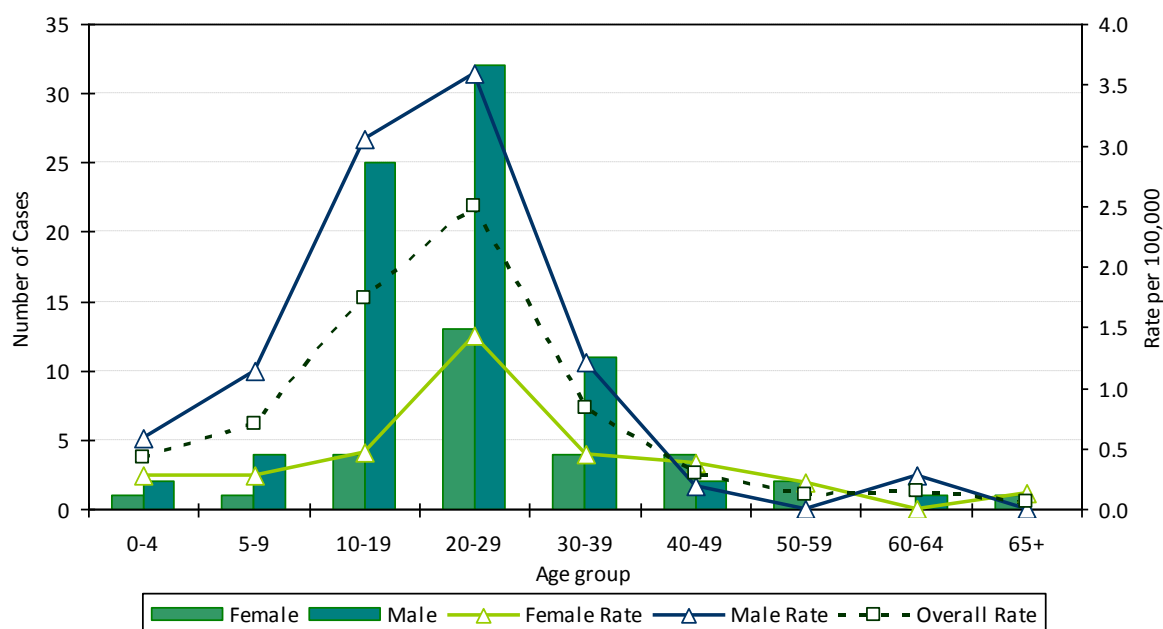
Figure 2.2.2: Incidence of Mumps by Episode Month: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 2.2.1: Incidence of Mumps by Age and Sex: Ontario, 2009

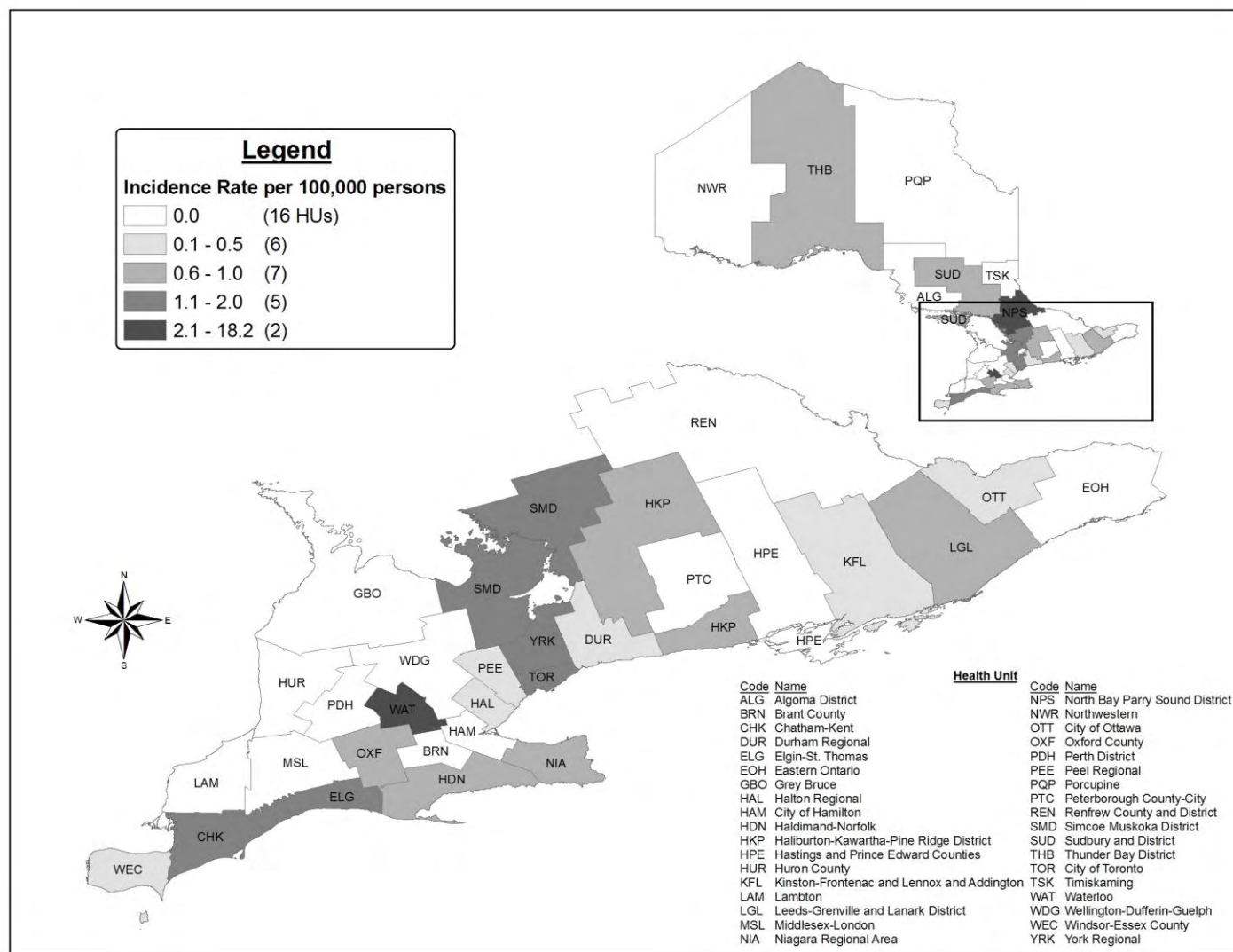
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	1	0.3	2	0.6	3	0.4
5-9	1	0.3	4	1.1	5	0.7
10-19	4	0.5	25	3.1	29	1.7
20-29	13	1.4	32	3.6	45	2.5
30-39	4	0.5	11	1.2	15	0.8
40-49	4	0.4	2	0.2	6	0.3
50-59	2	0.2	0	0.0	2	0.1
60-64	0	0.0	1	0.3	1	0.1
65+	1	0.1	0	0.0	1	0.1
Total	30	0.5	77	1.2	107	0.8

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex and/or age was reported as unknown.

Map 2.3.1: Incidence Rates of Mumps by Public Health Unit: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
North Bay Parry Sound District	23	18.2
Waterloo Region	12	2.3
Chatham-Kent	2	1.8
Simcoe Muskoka District	7	1.4
Toronto	33	1.2
Elgin-St. Thomas	1	1.1
York Region	11	1.1
Sudbury and District	2	1.0
Oxford County	1	0.9
Haldimand-Norfolk	1	0.9
Niagara Region	3	0.7
Thunder Bay District	1	0.6
Leeds, Grenville and Lanark District	1	0.6
Haliburton, Kawartha, Pine Ridge	1	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Durham Region	2	0.3
Windsor-Essex County	1	0.2
City of Ottawa	2	0.2
Halton Region	1	0.2
Peel Region	2	0.2
Algoma District	0	0.0
Brant County	0	0.0
City of Hamilton	0	0.0
Eastern Ontario	0	0.0
Grey Bruce	0	0.0
Hastings & Prince Edward Counties	0	0.0
Huron County	0	0.0
Lambton County	0	0.0
Middlesex-London	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Timiskaming	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Ontario	108	0.8

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

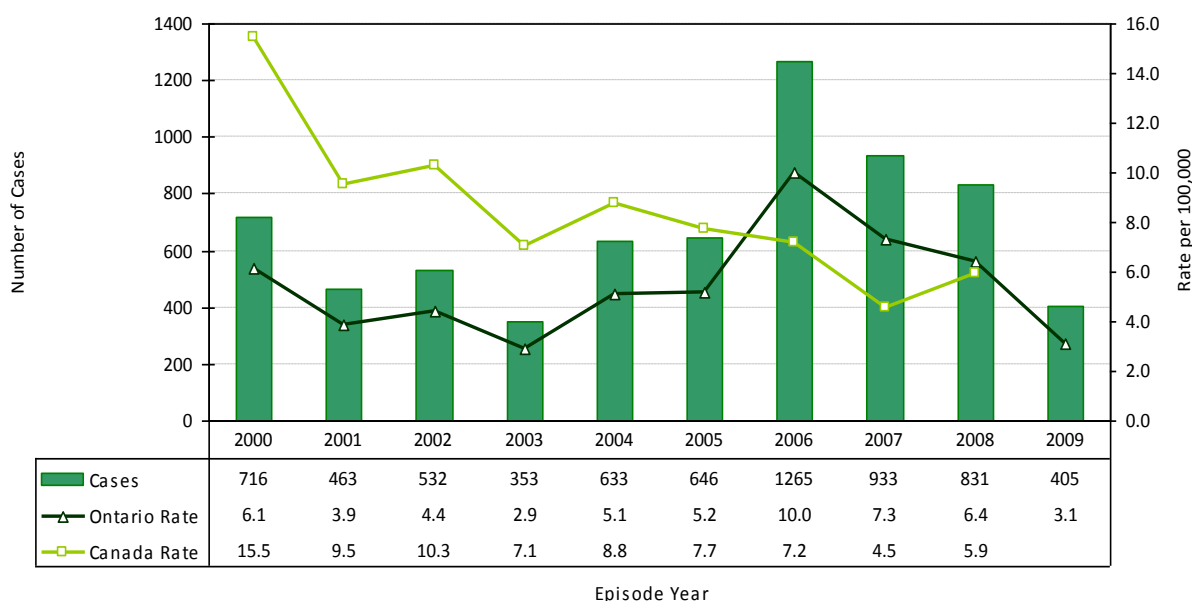
Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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.

2.3 PERTUSSIS

- In 2009, Ontario reported 405 cases of pertussis, which represents an incidence rate of 3.1 cases per 100,000 population (Figure 2.3.1). Of these cases, 107 were part of an outbreak that affected mainly children in an under-immunized community in and around Oxford County.
- Compared to earlier years, a significant reduction in the incidence of pertussis in Ontario was observed from 2000 to 2003 following the introduction of a more immunogenic vaccine against pertussis. In subsequent years (2004-2008), the incidence of pertussis increased, peaking at 10.0 cases per 100,000 population in 2006 (Figure 2.3.1). This increase is due in part to changes to more sensitive laboratory testing techniques in 2005 and the introduction of new laboratory reporting standards in May 2009.
- In comparison, Canada experienced a sharper decline in the incidence rate of pertussis between 2000 and 2008, from rates that were much higher than Ontario's in the early to mid 2000s to rates that are below the provincial rates of more recent years (Figure 2.4.1).
- Cases of pertussis in 2009 peaked in April (70 cases), and steadily declined with the fewest cases occurring in November (12 cases) and December (15 cases) (Figure 2.3.2). This peak corresponds with the Oxford County outbreak.
- In 2009, the incidence rates for pertussis for males and females were similar, at 2.9 and 3.3 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 almost half (45%) of all cases in 2009 (Figure 2.3.3, Table 2.3.1). Children under the age of one year reported the highest incidence rate with 52.9 cases per 100,000 population (Figure not shown).
- As a result of the outbreak, Oxford County reported the highest incidence rates of pertussis at 100.2 cases per 100,000 population, which is thirty-three times the provincial rate of 3.1 cases per 100,000 population. Nine health units reported zero cases of pertussis in 2009 (Map 2.3.1, Table 2.3.2).
- The Ontario immunization coverage for protection against pertussis was approximately 75% for all school-aged children aged 7 to 17 years during the 2008/2009 school year.

Figure 2.3.1: Incidence of Pertussis in Ontario and Canada: 2000-2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

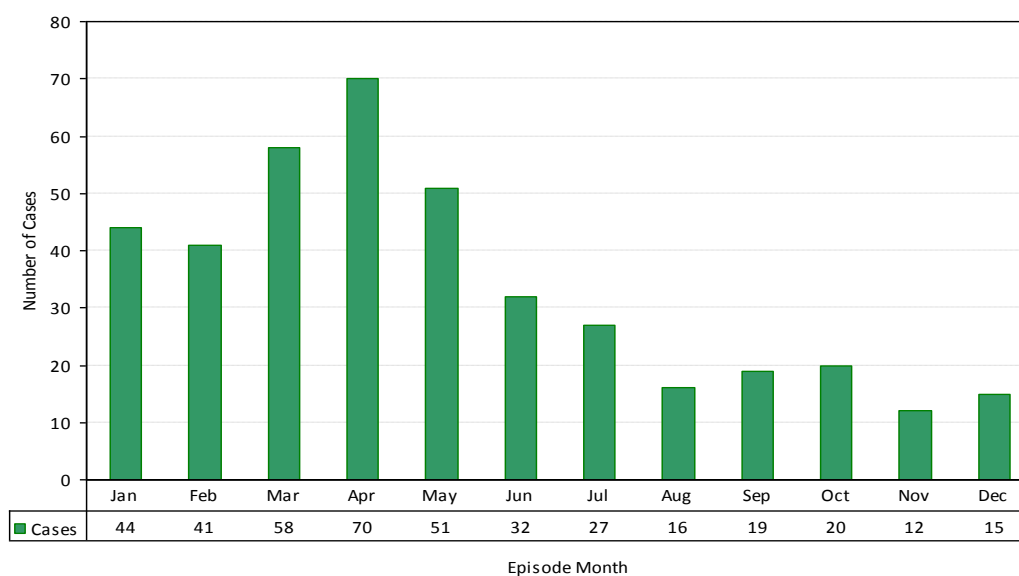
Canadian rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Canadian rates available up to 2008.

Note 2: The increase in the incidence of pertussis since 2005 was due in part to a change to a more sensitive polymerase chain reaction (PCR) laboratory test for pertussis. In 2009, new reporting standards were introduced for cases with low levels of *B. pertussis* and *B. parapertussis*, resulting in a decline in the incidence of pertussis to the lowest observed in the past decade (2000-2009).

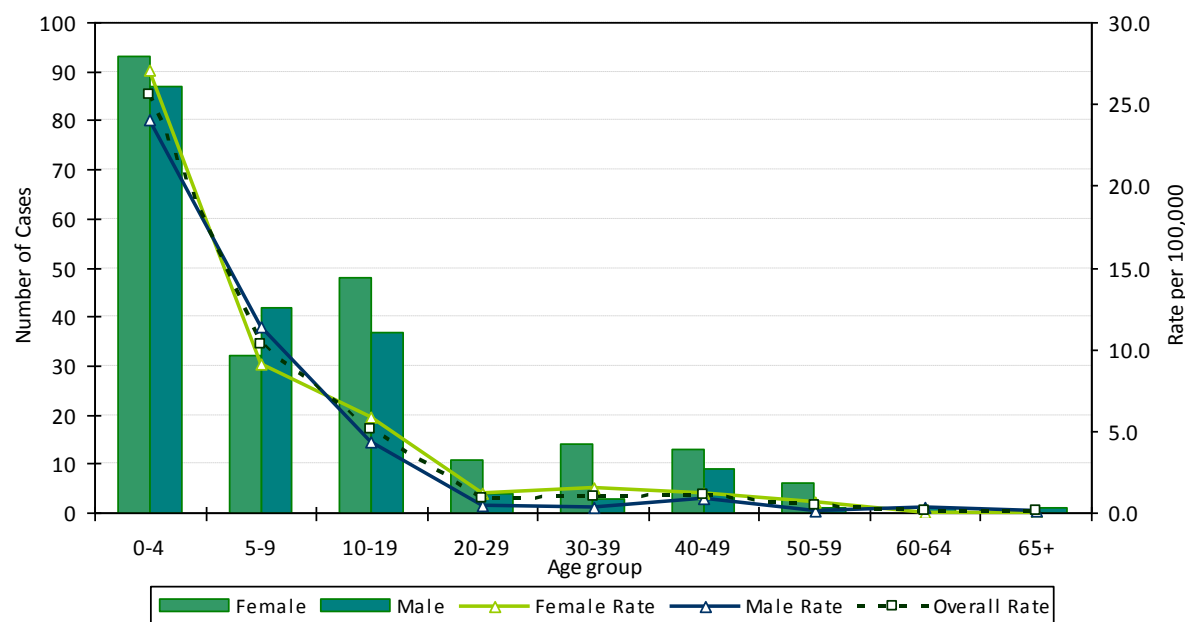
Figure 2.3.2: Incidence of Pertussis by Episode Month: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 2.3.1: Incidence of Pertussis by Age and Sex: Ontario, 2009

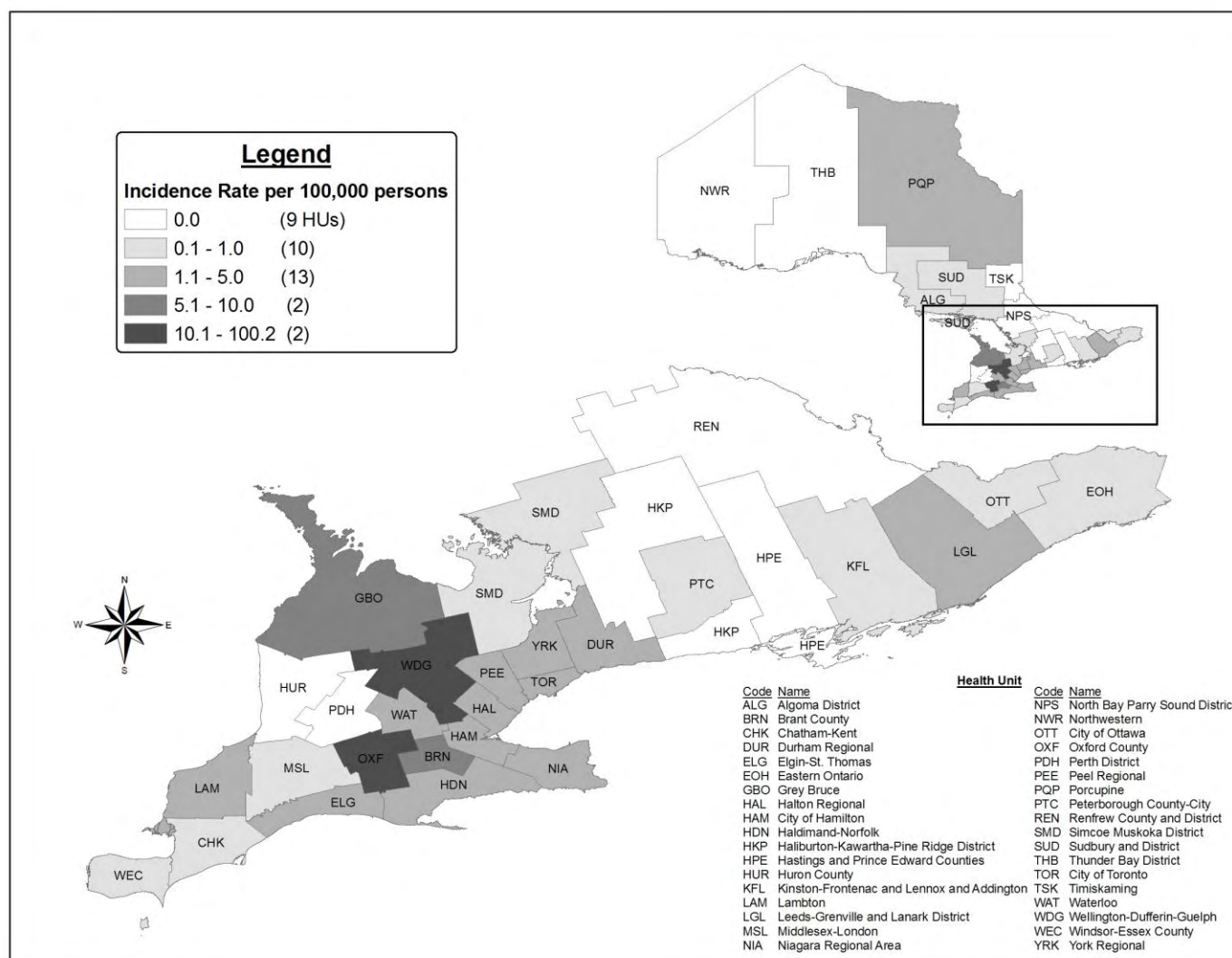
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	93	27.0	87	24.1	180	25.5
5-9	32	9.1	42	11.4	74	10.3
10-19	48	5.9	37	4.3	85	5.1
20-29	11	1.2	4	0.4	15	0.8
30-39	14	1.5	3	0.3	17	1.0
40-49	13	1.2	9	0.9	22	1.0
50-59	6	0.7	1	0.1	7	0.4
60-64	0	0.0	1	0.3	1	0.1
65+	0	0.0	1	0.1	1	0.1
Total	217	3.3	185	2.9	402	3.1

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 3 cases for which sex and/or age were reported as unknown.

Map 2.3.1: Incidence Rates of Pertussis by Public Health Unit: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Oxford County	107	100.2
Wellington-Dufferin-Guelph	28	10.3
Grey Bruce	12	7.4
Brant County	8	5.8
Toronto	126	4.7
Haldimand-Norfolk	5	4.5
Lambton County	5	3.8
Porcupine	3	3.4
Niagara Region	11	2.5
Elgin-St. Thomas	2	2.2
Halton Region	10	2.0
York Region	20	2.0
Waterloo Region	8	1.5
Peel Region	19	1.4
Durham Region	8	1.3
Leeds, Grenville and Lanark District	2	1.2
City of Hamilton	6	1.1
Kingston, Frontenac, Lennox & Addington	2	1.0
City of Ottawa	9	1.0
Eastern Ontario	2	1.0
Chatham-Kent	1	0.9
Middlesex-London	4	0.9
Algoma District	1	0.8
Peterborough County-City	1	0.7
Simcoe Muskoka District	3	0.6
Sudbury and District	1	0.5
Windsor-Essex County	1	0.2
Haliburton, Kawartha, Pine Ridge	0	0.0
Hastings & Prince Edward Counties	0	0.0
Huron County	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Renfrew County and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Ontario	405	3.1

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

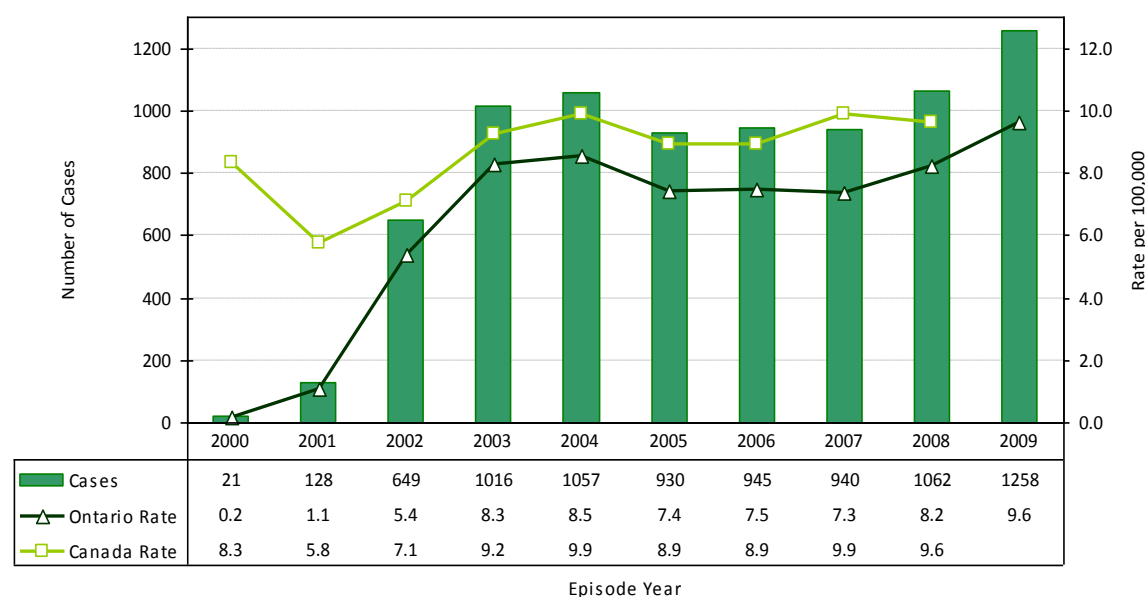
Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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.

2.4 STREPTOCOCCUS PNEUMONIAE, INVASIVE

- In 2009, Ontario reported 1,258 cases of invasive *S. pneumoniae*, which represents an incidence rate of 9.6 cases per 100,000 population (Figure 2.4.1).
- From 2005 to 2007, the incidence rate of invasive *S. pneumoniae* stabilized to approximately 7.5 cases per 100,000 population (940 cases per year). In 2008, the incidence rate of *S. pneumoniae* increased by 9% to 8.2 cases per 100,000 population and by an additional 17% in 2009 to 9.6 cases per 100,000 population. The increase since 2008 is likely due to more comprehensive reporting from all testing laboratories in the province (Figure 2.4.1).
- The national incidence rate of invasive *S. pneumoniae* was higher than Ontario's between 2000 and 2008. However, the incidence rates at both the national and provincial levels stabilized after 2002 following the start of mandatory reporting at the national level in 2000 and at the provincial level in 2001 (Figure 2.4.1).
- Cases of invasive *S. pneumoniae* followed a seasonal trend, with the majority of cases in 2009 occurring in the cooler months from January to May and from October to December (81%). The remaining cases (19%) occurred in the warmer months from June to September (Figure 2.4.2).
- In 2009, invasive *S. pneumoniae* was reported more frequently among males at 10.3 cases per 100,000 population compared to females at 9.0 per 100,000 (Figure 2.4.3, Table 2.4.1).
- While persons aged 65 years and older accounted for the highest number of cases, the highest incidence rates occurred among persons at both ends of the age spectrum. Cases aged 65 years and older had the highest incidence rate at 26.7 cases per 100,000 population and cases under the age of one had the second highest incidence rate at 23.6 cases per 100,000 population (Figure 2.4.3, Table 2.4.1).
- The incidence rate of *S. pneumoniae* varied across health units with the three highest rates occurring in Thunder Bay (21.7 cases per 100,000 population), Northwestern (20.8 cases per 100,000), and Huron County health units (19.8 cases 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: 2000-2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS).

Canadian rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

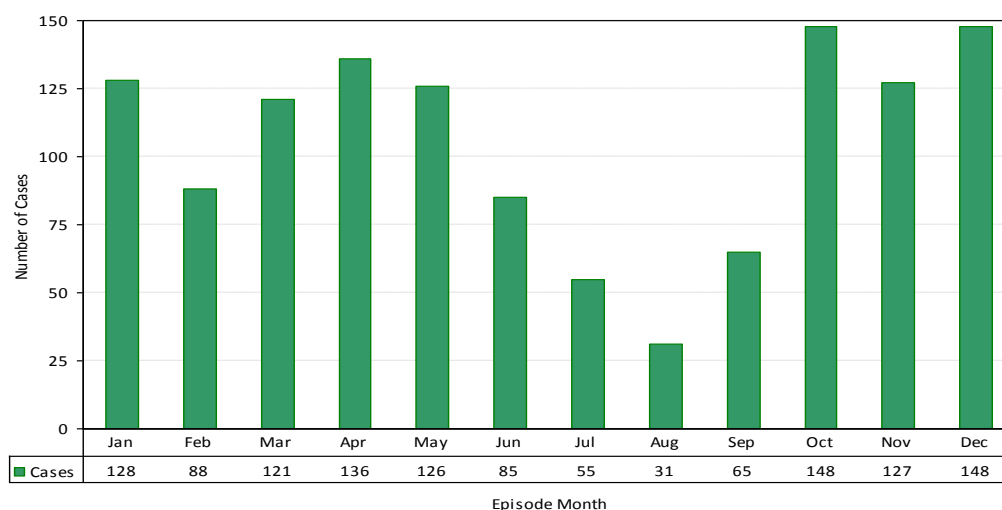
Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Invasive *S. pneumoniae* became nationally reportable in 2000 and are available up to 2008.

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

Note 3: Publicly funded Pneumococcal conjugate vaccine was 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.

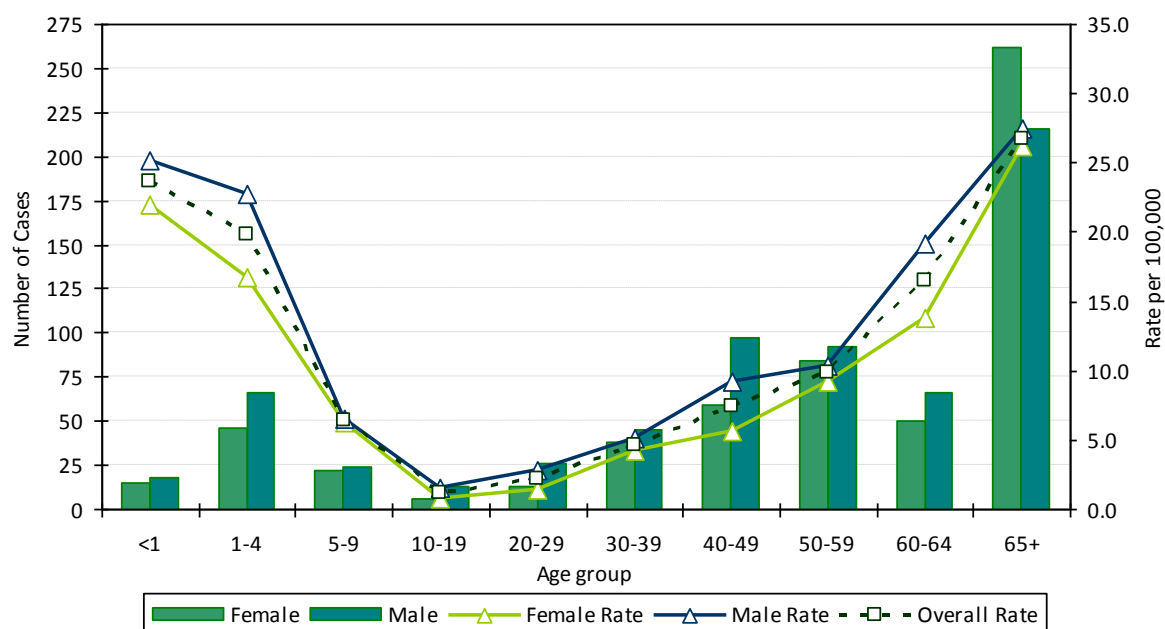
Figure 2.4.2: Incidence of Invasive Streptococcus Pneumoniae by Episode Month: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

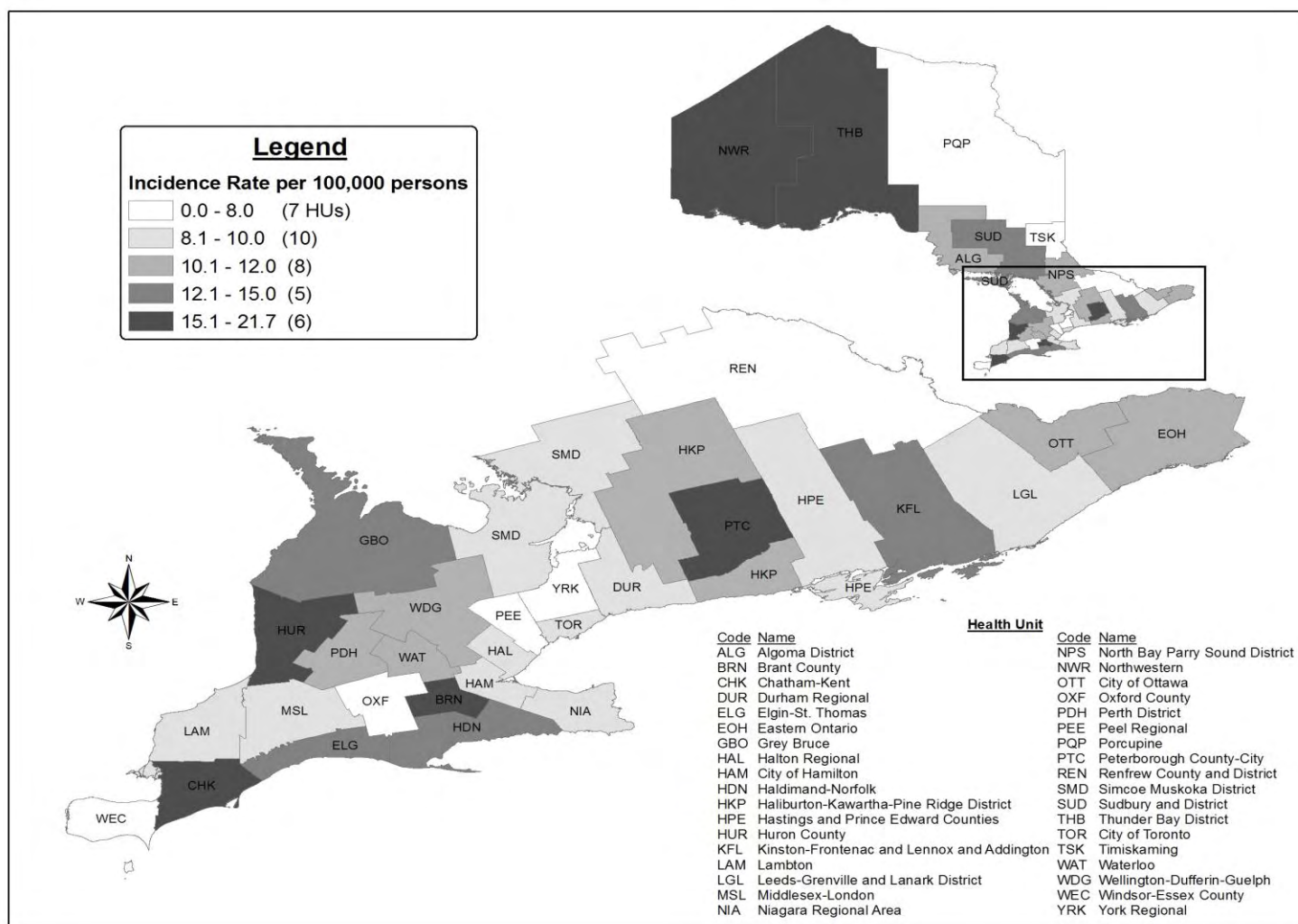
Table 2.4.1: Incidence of Streptococcus Pneumoniae by Age and Sex: Ontario, 2009

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	15	21.9	18	25.2	33	23.6
1-4	46	16.7	66	22.7	112	19.8
5-9	22	6.3	24	6.5	46	6.4
10-19	6	0.7	13	1.5	19	1.1
20-29	13	1.5	26	2.9	39	2.2
30-39	38	4.2	45	5.1	83	4.6
40-49	59	5.6	97	9.2	156	7.4
50-59	84	9.3	92	10.4	176	9.8
60-64	50	13.8	66	19.2	116	16.5
65+	262	26.1	216	27.5	478	26.7
Total	595	9.0	663	10.3	1,258	9.6

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 2.4.1: Incidence Rates of Streptococcus Pneumoniae by Public Health Unit: Ontario, 2009



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Thunder Bay District	34	21.7
Northwestern	17	20.8
Huron County	12	19.8
Chatham-Kent	19	17.2
Brant County	23	16.5
Peterborough County-City	21	15.2
Sudbury and District	30	15.0
Kingston, Frontenac, Lennox & Addington	28	14.4
Grey Bruce	21	12.9
Haldimand-Norfolk	14	12.6
Elgin-St. Thomas	11	12.2
Algoma District	14	11.8
Perth District	9	11.7
Waterloo Region	60	11.6
Eastern Ontario	23	11.6
Wellington-Dufferin-Guelph	30	11.0
City of Ottawa	96	10.9
North Bay Parry Sound District	13	10.3
Haliburton, Kawartha, Pine Ridge	18	10.1
Niagara Region	44	9.9
Simcoe Muskoka District	50	9.7
Toronto	255	9.5
City of Hamilton	50	9.4
Middlesex-London	41	9.1
Leeds, Grenville and Lanark District	15	8.9
Hastings & Prince Edward Counties	14	8.6
Halton Region	42	8.5
Lambton County	11	8.3
Durham Region	51	8.3
Renfrew County and District	8	7.8
Oxford County	8	7.5
Peel Region	92	7.0
Windsor-Essex County	25	6.2
York Region	56	5.5
Porcupine	3	3.4
Timiskaming	0	0.0
Ontario	1,258	9.6

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 2009 with 28,820 confirmed cases. Gonorrhea and syphilis were the second and third most commonly reported bacterial STIs with 3,547 and 784 confirmed cases, respectively (Table 3.1).
- During the period 2000-2009, the number of cases of chlamydia and gonorrhea increased by 95% and 24%, respectively (Figures 3.1.1 and 3.2.1).
- The annual incidence rate of syphilis increased from 0.4 cases per 100,000 population in the early 2000's to a high of 6.0 cases per 100,000 population in 2009 (Figure 3.7.1).
- Rates of chlamydia and gonorrhea were highest among the 20-24 age group (Table 3.1.1 and 3.2.1). Northwestern and Porcupine health units had the highest incidence rates for both diseases in 2009 (Tables 3.1.2 and 3.2.2).
- Lack of condom use during sex was reported as the main risk factor for acquiring both chlamydia and gonorrhea (Tables 3.1.3 and 3.2.3).
- Most confirmed cases of HIV and syphilis were reported in the health units of Toronto and Ottawa (Tables 3.6.3 and 3.7.2), and among men between the ages of 25 and 49 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 3.6.4 and 3.7.3).
- From 2000-2009, the rate of HIV in Ontario has remained relatively stable and comparable to that of Canada (Figure 3.6.1). During this period, the rate of AIDS continued to decline, although the decline has been faster in Canada than in Ontario (Figure 3.6.2).
- The rate of Hepatitis C declined over the past 10 years (Figure 3.5.1). The top three risk factors reported were intravenous and intranasal drug use; non-medical invasive procedures such as tattooing, piercing, electrolysis and acupuncture; and out of Canada exposures (Table 3.5.3).
- The incidence rate 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. The most commonly reported risks factors were out of Canada exposures and sexual exposures (Table 3.4.3).
- At least 82 cases of mother to child transmission of sexually transmitted and blood-borne infections were reported in 2009. These infections included 50 cases of neonatal Group B streptococcal disease, 9 cases of cytomegalovirus, 7 cases of congenital chlamydia, 6 cases of neonatal herpes, 4 cases of Hepatitis C, 4 cases of HIV and 2 cases of Hepatitis B. No cases of congenital syphilis or gonorrhea were reported in 2009.

Table 3.1: Incidence of Sexually Transmitted and Bloodborne Infections: Ontario, 2000-2009

Sexually Transmitted and Bloodborne Infections ²	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
	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
Chlamydia	14805	126.7	16360	137.5	18363	151.7	19478	158.8	20801	167.5	21931	174.6	22542	177.7	23275	181.8	26200	202.6	28820	220.5
Gonorrhea	2858	24.0	2954	24.8	3085	25.5	3360	27.4	3513	28.3	3325	26.5	3860	30.4	3954	30.9	3868	29.9	3547	27.1
Infectious Syphilis	49	0.4	52	0.4	241	2.0	427	3.5	496	4.0	360	2.9	366	2.9	401	3.1	452	3.5	784	6.0
Hepatitis B (acute)	148	1.3	123	1.0	152	1.3	172	1.4	168	1.4	161	1.3	187	1.5	182	1.4	144	1.1	151	1.2
Hepatitis C (acute)	6009	51.4	5572	46.8	5479	45.3	5491	44.8	5418	43.6	4616	36.8	3999	31.5	4512	35.4	4695	36.1	4586	35.1
Hepatitis D	10	0.1	8	0.1	9	0.1	2	0.0	2	0.0	9	0.1	4	0.0	2	0.0	5	0.0	3	0.0
HIV ³	773	6.6	857	7.2	982	8.1	943	7.7	990	8.0	901	7.2	1022	8.1	999	7.8	949	7.3	865	6.6
AIDS	172	1.5	204	1.7	186	1.5	213	1.7	189	1.5	196	1.6	131	1.0	129	1.0	133	1.0	113	0.9
Group B Streptococcus	53	0.5	64	0.5	69	0.6	65	0.5	55	0.4	52	0.4	55	0.4	46	0.3	54	0.4	50	0.4
Cytomegalovirus, congenital	8	0.1	4	0.0	6	0.0	8	0.1	7	0.1	7	0.1	8	0.1	4	0.0	3	0.0	9	0.1
Herpes, neonatal	1	0.0	4	0.0	5	0.0	2	0.0	11	0.1	5	0.0	5	0.0	3	0.0	8	0.1	6	0.0
Ophthalmia neonatorum	11	0.1	7	0.1	3	0.0	4	0.0	6	0.0	6	0.0	3	0.0	3	0.0	3	0.0	1	0.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Incidence rate per 100,000 population.

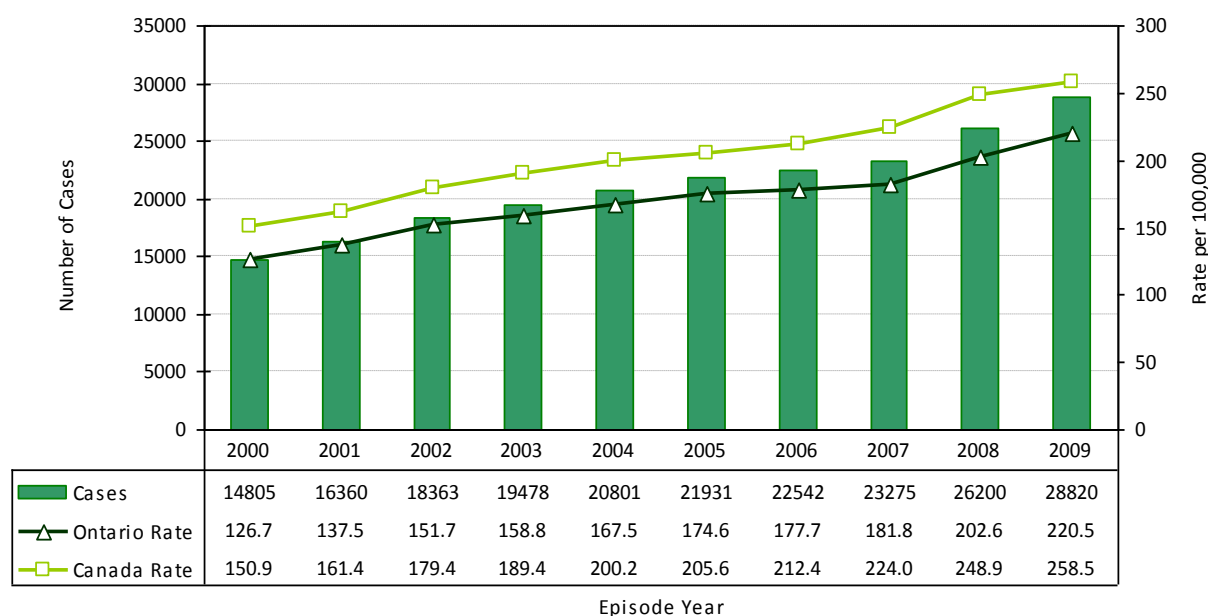
Note 2: No cases were reported for the following sexually transmitted and bloodborne infections in Ontario during the period 1999-2007: hemorrhagic fevers and chancroid.

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 counts since 2002.

3.1 CHLAMYDIA

- In 2009, chlamydia was the most frequently reported sexually transmitted infection in Ontario with a total of 28,820 cases which represents 221 cases per 100,000 population (Table 3.1).
- Over the last ten years, the incidence rate of chlamydia in Ontario increased steadily from 127 cases per 100,000 population in 2000 to 221 cases per 100,000 population in 2009, an increase of 74%. During this period, Canada reported a comparable and increasing trend that grew faster than Ontario's at an average of 11 cases per 100,000 population per year compared to 9 cases per 100,000 population per year for Ontario (Figure 3.1.1).
- In 2009, the incidence rate of chlamydia among females was about 80% higher than that of their male counterparts (282 cases per 100,000 compared to 157 cases per 100,000 population, respectively) (Table 3.1.1). This may be explained in part by the higher likelihood of chlamydia screening and detection during routine medical care for females.
- The incidence rate of chlamydia was highest among persons aged 20-24 years at 1,171 cases per 100,000 population. Sex-specific incidence rates for this age group were also the highest at 1,553 and 804 cases per 100,000 population for females and males, respectively (Figure 3.1.2).
- Northwestern Health Unit (579 cases per 100,000 population), Porcupine (458 cases per 100,000 population) and Thunder Bay District (385 cases per 100,000 population) in northern Ontario reported the three highest incidence rates of chlamydia in 2009. Toronto Public Health reported the highest incidence with 7,953 cases. Huron County Health Unit had the lowest incidence rate of chlamydia in 2009 at 111 cases per 100,000 population (Map 3.1.1, Table 3.1.2).
- The most frequently reported risk factors for acquiring chlamydia among chlamydia cases reporting at least one risk factor were lack of condom use (84%), having multiple sex partners in the last 6 months (16%), and having a new partner in the last 2 months (16%) (Table 3.1.3).
- Among women with chlamydia reporting at least one risk factor in 2009, 514 reported being pregnant.
- Seven cases of mother to child transmission of chlamydia occurred in 2009.
- Of the 28,820 cases of chlamydia reported in 2009, 1,163 (4%) reported having a simultaneous infection (co-infection) with gonorrhea. In 2008, this proportion was 5%.
- Individuals with single episodes of chlamydia accounted for 91% (26,342) of chlamydia cases reported in 2009. The remaining 9% (2,477) of cases were reported by 1,197 individuals who had reoccurring infections. Among these individuals, 1,116 had two episodes of chlamydia, 79 had three episodes and 2 had four or more episodes.

Figure 3.1.1: Incidence of Chlamydia in Ontario and Canada: 2000-2009

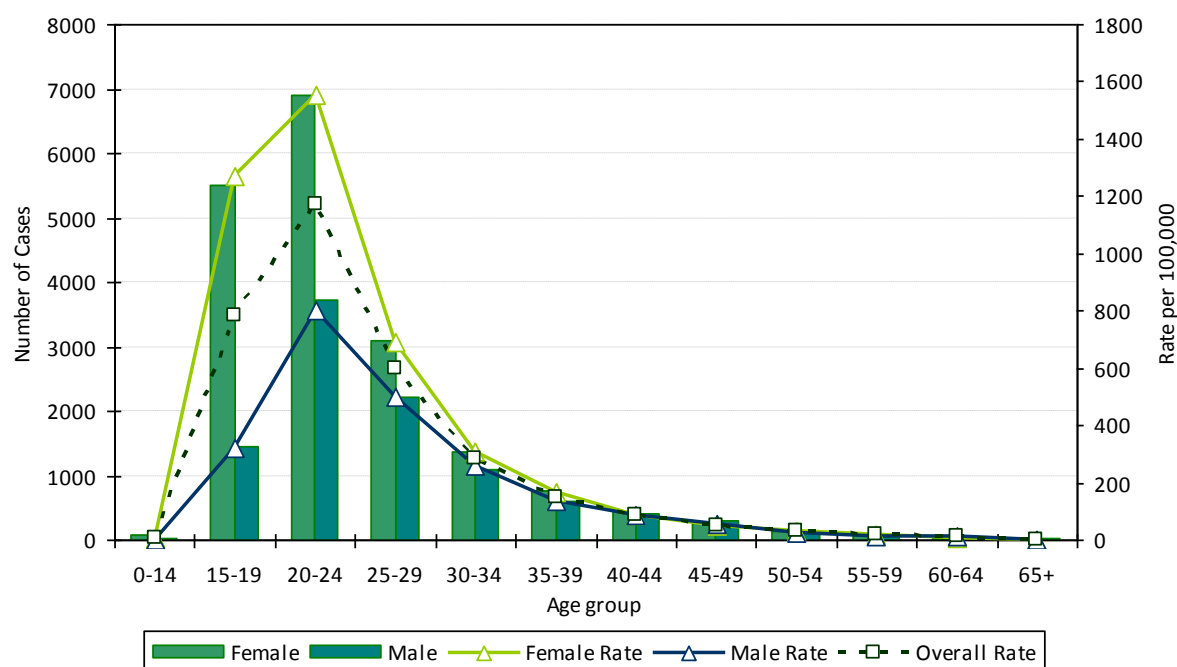


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Figure 3.1.2: Incidence of Chlamydia by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 24 cases for which sex and/or age were reported as unknown.

Table 3.1.1: Incidence of Chlamydia by Age and Sex: Ontario, 2009

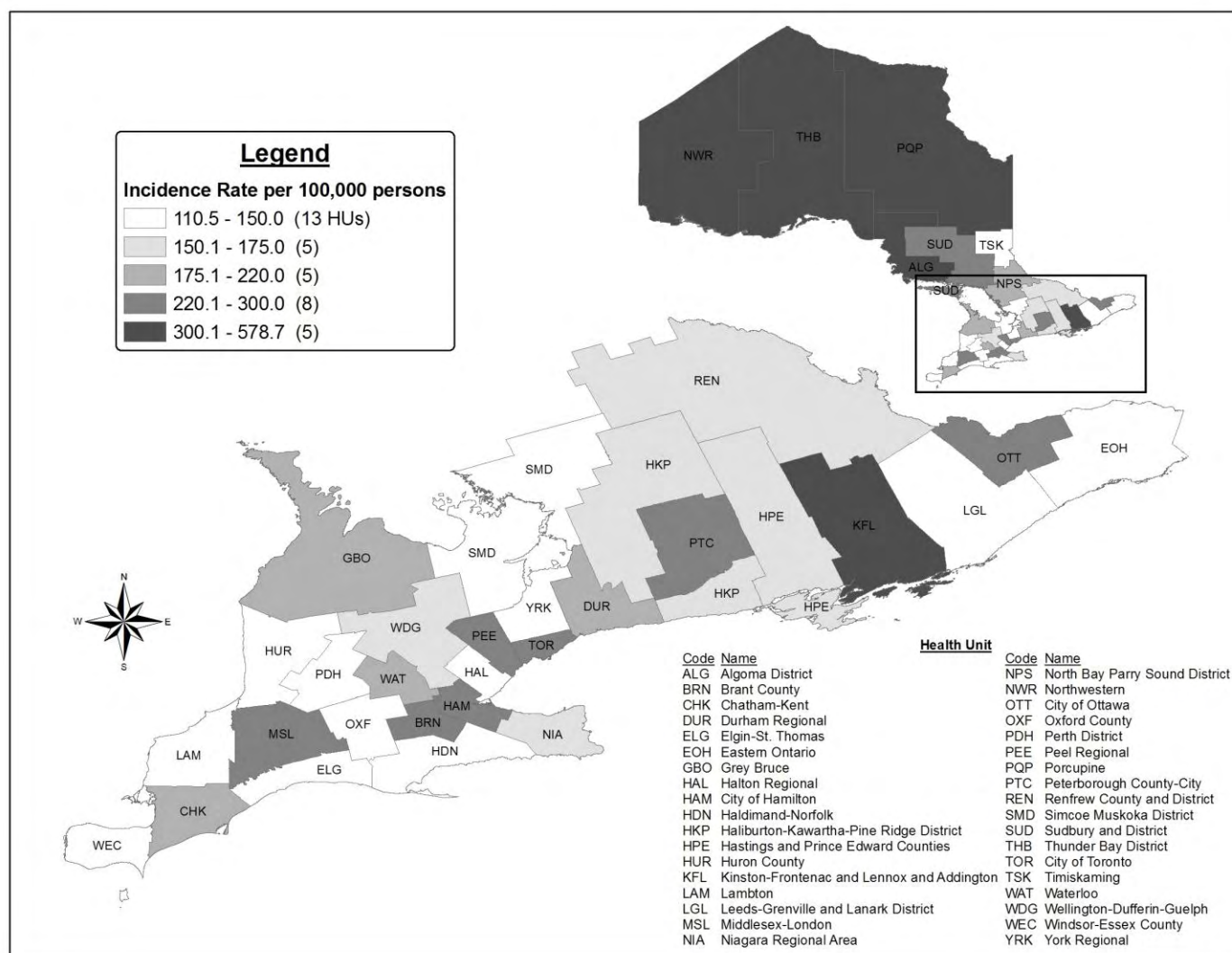
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14	90	8.3	20	1.8	110	5.0
15-19	5,505	1,269.8	1,449	320.5	6,954	785.2
20-24	6,910	1,553.4	3,730	803.6	10,640	1,170.5
25-29	3,102	692.8	2,220	501.9	5,322	597.9
30-34	1,376	310.2	1,092	257.1	2,468	284.3
35-39	769	166.0	610	133.4	1,379	149.8
40-44	426	85.3	424	84.7	850	85.0
45-49	262	48.0	297	53.8	559	50.9
50-54	142	29.2	133	27.6	275	28.4
55-59	72	17.1	59	14.6	131	15.9
60-64	29	8.0	41	11.9	70	9.9
65+	18	1.8	20	2.5	38	2.1
Total	18,701	282.2	10,095	156.7	28,796	220.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 24 cases for which sex and/or age were reported as unknown.

Map 3.1.1: Incidence Rates of Chlamydia by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Northwestern	473	578.7
Porcupine	401	458.0
Thunder Bay District	602	384.6
Kingston, Frontenac, Lennox & Addington	644	331.7
Algoma District	391	328.7
Toronto	7,953	297.0
Middlesex-London	1,308	289.2
Peterborough County-City	369	266.3
Brant County	332	238.8
Hamilton	1,234	232.6
Ottawa	2,025	229.5
Peel Region	2,939	223.7
Sudbury and District	442	220.7
North Bay Parry Sound District	276	218.5
Chatham-Kent	235	213.1
Durham Region	1,278	208.3
Waterloo Region	1,018	196.4
Grey Bruce	292	178.9
Wellington-Dufferin-Guelph	466	171.1
Niagara Region	750	169.3
Renfrew County and District	170	165.4
Hastings & Prince Edward Counties	254	156.1
Haliburton, Kawartha, Pine Ridge	274	154.4
Timiskaming	52	149.4
Simcoe Muskoka District	759	147.7
York Region	1,484	146.0
Elgin-St. Thomas	127	141.1
Windsor-Essex County	566	140.2
Halton Region	682	138.5
Lambton County	180	136.2
Oxford County	130	121.7
Leeds, Grenville and Lanark District	204	121.2
Eastern Ontario	232	116.5
Haldimand-Norfolk	126	113.6
Perth District	85	110.7
Huron County	67	110.5
Ontario	28,820	220.5

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Risk Factors and Settings ¹	Females		Males		Total	
	Cases (n=8,498)	Percent (%)	Cases (n=4,665)	Percent (%)	Cases (n=13,163)	Percent (%)
No condom used	7,170	84.4%	3,898	83.6%	11,068	84.1%
Multiple sex partners in last 6 months	1,020	12.0%	1,076	23.1%	2,096	15.9%
New partner in last 2 months	1,215	14.3%	905	19.4%	2,120	16.1%
Condom breakage	495	5.8%	337	7.2%	832	6.3%
Partner with multiple sex partners	616	7.2%	150	3.2%	766	5.8%
Judgement impaired by alcohol/drugs	302	3.6%	259	5.6%	561	4.3%
Other ²	176	2.1%	439	9.4%	615	4.7%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

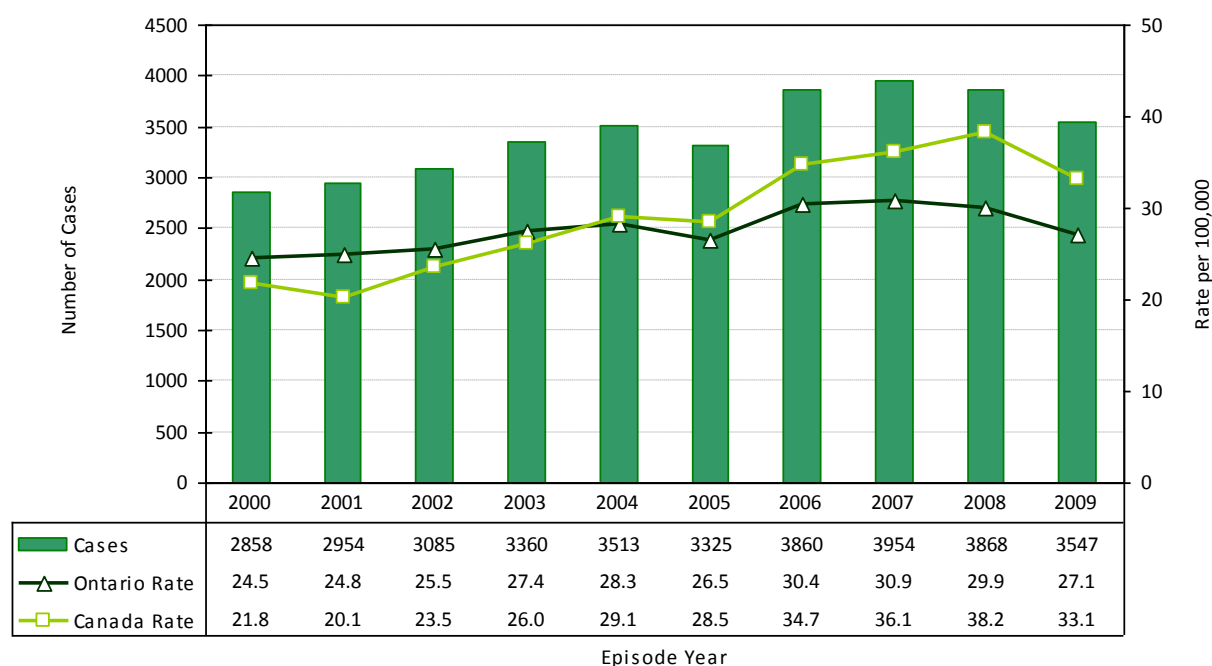
Note 1: Cases may report more than 1 risk factor; risk factors were reported by ~46% of reported cases in 2009.

Note 2: Other includes (but is not limited to) 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.

3.2 GONORRHEA

- Gonorrhea was the second most frequently reported sexually transmitted infection in Ontario in 2009 with a total of 3,547 cases, which represents an incidence rate of 27 cases per 100,000 population. 2009 was the second consecutive year of decrease in the incidence of gonorrhea since 2006 (Table 3.1).
- The incidence rate of gonorrhea in Ontario remained fairly stable from 2000 to 2005, with an annual average of 26 cases per 100,000 population; starting in 2006, the incidence rate of gonorrhea increased to an average of 30 cases per 100,000 population. Over this period, the incidence rate of gonorrhea in Canada increased gradually from 22 cases per 100,000 population in 2000 to 33 cases per 100,000 population in 2009 (Figure 3.2.1).
- Overall, the incidence rate of gonorrhea in Ontario in 2009 was higher among males (31 cases per 100,000 population) compared to females (24 cases per 100,000 population). However, females under the age of 25 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, Porcupine (118 cases per 100,000 population) and Northwestern (98 cases per 100,000 population) were among the top three health units for highest incidence rates for gonorrhea. Toronto reported the third highest incidence rate at 55 cases per 100,000 population. Timiskaming was the only health unit that reported no cases of gonorrhea in 2009 (Map 3.2.1, Table 3.2.2).
- The most frequently reported risk factors for acquiring gonorrhea 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 (28%), same-sex sexual contact among males (35% of male cases) and having a new partner in the last 2 months (17%) (Table 3.2.3).
- Among women with gonorrhea reporting at least one risk factor, 47 reported being pregnant. There were no cases of mother to child transmission of gonorrhea in 2009.
- Of the 3,547 confirmed cases of gonorrhea reported in 2009, 1,163 (33%) reported having a simultaneous infection (co-infection) with chlamydia.
- Individuals with single episodes of gonorrhea accounted for 92% (3,254) of gonorrhea cases reported in 2009. The remaining 8% (293) of cases were reported by 140 individuals who had recurring infections. Among these individuals, 128 had two episodes of gonorrhea, 11 had three episodes and 1 had four or more episodes.

Figure 3.2.1: Incidence of Gonorrhea in Ontario and Canada: 2000-2009

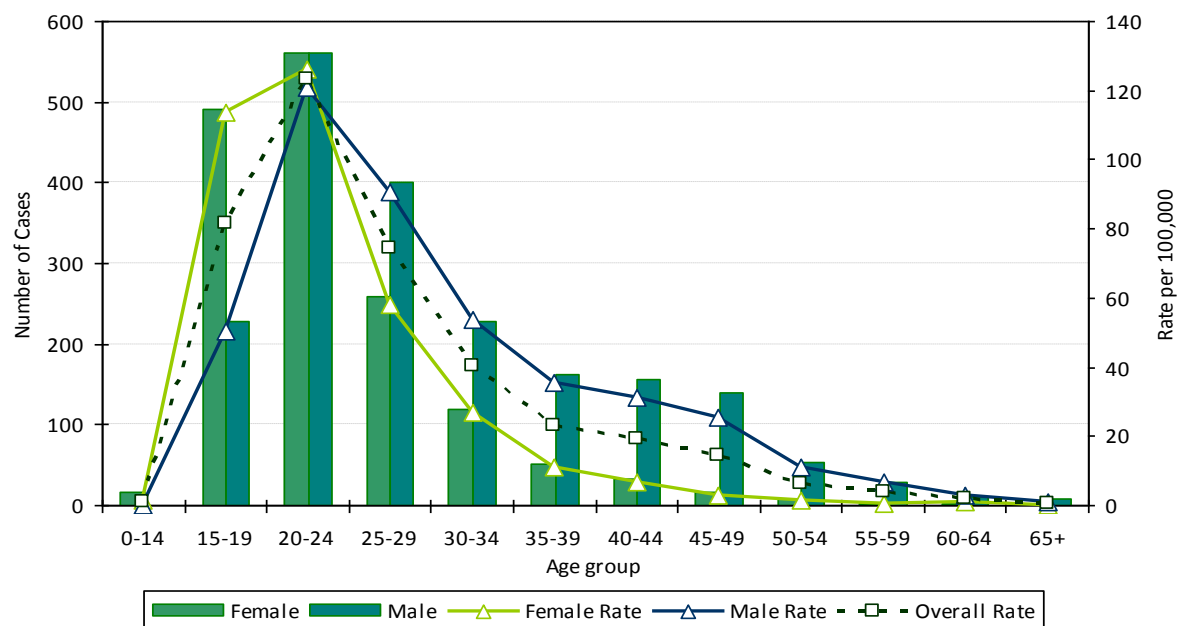


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Figure 3.2.2: Incidence of Gonorrhea by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 3.2.1: Incidence of Gonorrhea by Age and Sex: Ontario, 2009

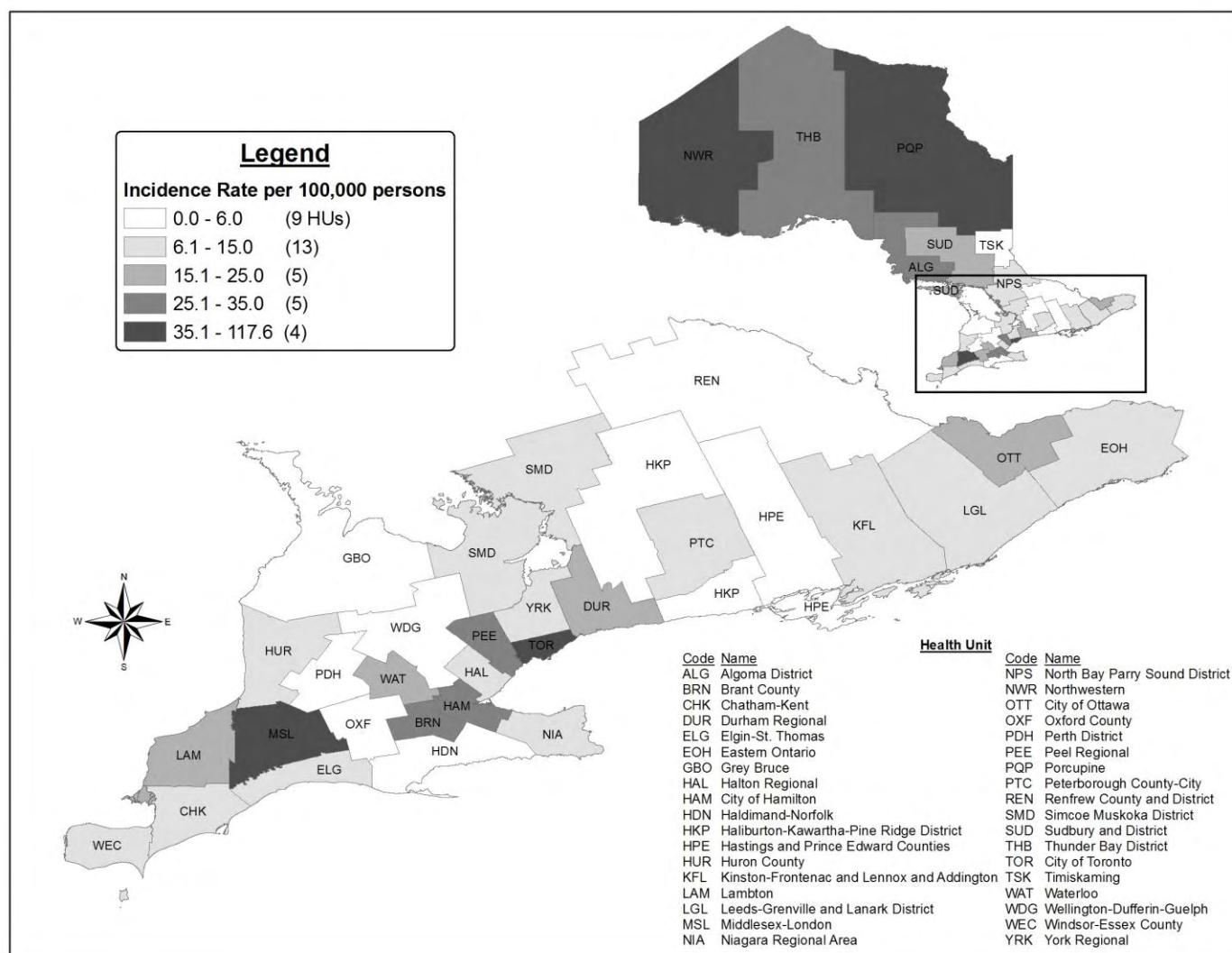
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14 ¹	16	1.5	1	0.1	17	0.8
15-19	492	113.5	228	50.4	720	81.3
20-24	561	126.1	561	120.9	1,122	123.4
25-29	259	57.8	401	90.7	660	74.2
30-34	120	27.1	229	53.9	349	40.2
35-39	52	11.2	162	35.4	214	23.2
40-44	33	6.6	157	31.4	190	19.0
45-49	16	2.9	140	25.4	156	14.2
50-54	8	1.6	54	11.2	62	6.4
55-59	3	0.7	28	6.9	31	3.8
60-64	3	0.8	10	2.9	13	1.8
65+	2	0.2	8	1.0	10	0.6
Total	1,565	23.6	1,979	30.7	3,544	27.1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 3 cases for which sex and/or age were reported as unknown.

Map 3.2.1: Incidence Rates of Gonorrhea Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Porcupine	103	117.6
Northwestern	80	97.9
Toronto	1,476	55.1
Middlesex-London	209	46.2
Algoma District	39	32.8
Peel Region	426	32.4
Thunder Bay District	49	31.3
Brant County	39	28.0
Hamilton	137	25.8
Ottawa	218	24.7
Durham Region	149	24.3
Sudbury and District	34	17.0
Waterloo Region	87	16.8
Lambton County	20	15.1
Peterborough County-City	19	13.7
Windsor-Essex County	54	13.4
Chatham-Kent	14	12.7
Halton Region	61	12.4
Kingston, Frontenac, Lennox & Addington	24	12.4
Elgin-St. Thomas	11	12.2
Niagara Region	51	11.5
York Region	105	10.3
Simcoe Muskoka District	48	9.3
Leeds, Grenville and Lanark District	14	8.3
Huron County	5	8.2
Eastern Ontario	15	7.5
North Bay Parry Sound District	9	7.1
Renfrew County and District	6	5.8
Haldimand-Norfolk	6	5.4
Hastings & Prince Edward Counties	8	4.9
Oxford County	5	4.7
Wellington-Dufferin-Guelph	12	4.4
Grey Bruce	6	3.7
Haliburton, Kawartha, Pine Ridge	6	3.4
Perth District	2	2.6
Timiskaming	0	0.0
Ontario	3,547	27.1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Risk Factors and Settings ¹	Females		Males		Total	
	Cases (n=751)	Percent (%)	Cases (n=1,096)	Percent (%)	Cases (n=1,847)	Percent (%)
No condom used	609	81.1%	892	81.4%	1,501	81.3%
Multiple sex partners in last 6 months	133	17.7%	378	34.5%	511	27.7%
MSM	n/a	n/a	380	34.7%	380	20.6%
New partner in past 2 months	112	14.9%	204	18.6%	316	17.1%
Condom breakage	64	8.5%	94	8.6%	158	8.6%
Partner with multiple sex partners	65	8.7%	69	6.3%	134	7.3%
Judgement impaired by alcohol/drugs	28	3.7%	72	6.6%	100	5.4%
Bath house	0	0.0%	26	2.4%	26	1.4%
Other ²	19	2.5%	53	4.8%	72	3.9%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

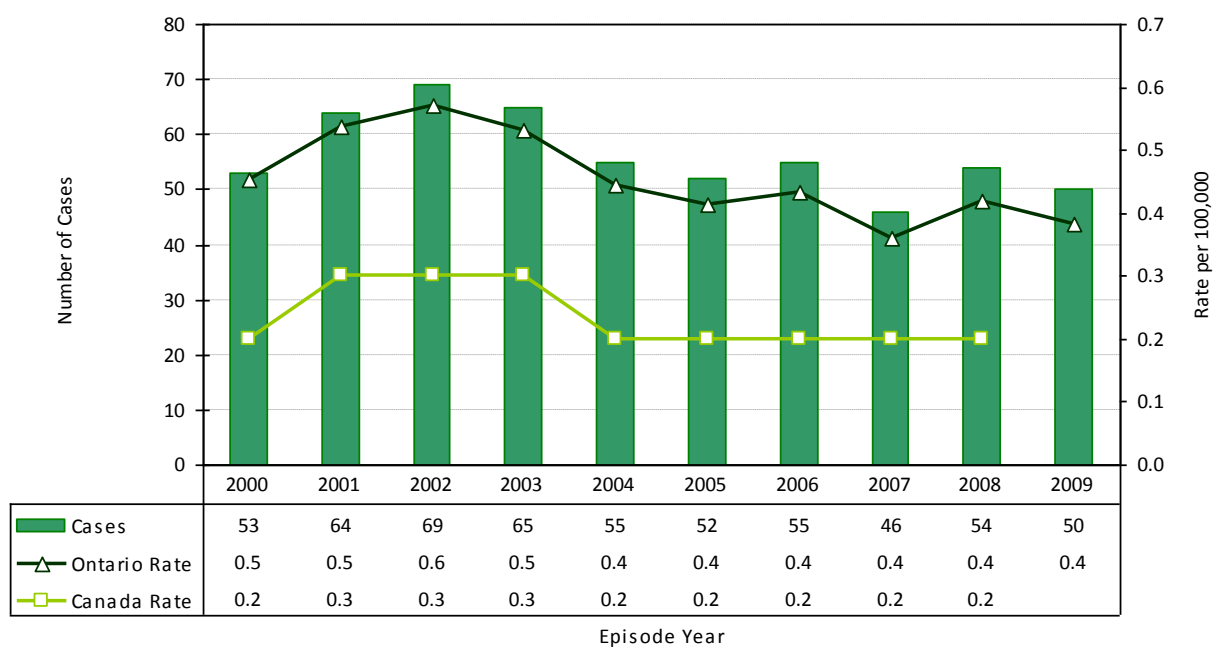
Note 1: Cases may report more than 1 risk factor; Risk factors were reported by ~ 52% of reported cases in 2009.

Note 2: Other includes (but is not limited to) 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.

3.3 GROUP B STREPTOCOCCAL DISEASE, NEONATAL

- Neonatal group B streptococcal disease is reportable in newborns up to 28 days. In 2009, 50 cases of neonatal group B streptococcal disease were reported in Ontario, representing an incidence rate of 0.4 cases per 100,000 population (Table 3.1). Of the cases reported, 47 were confirmed cases and 3 were probable cases.
- The incidence of neonatal group B streptococcal disease peaked in the early 2000's but has remained relatively stable at approximately 50 cases per year since 2004 (Figure 3.3.1).
- From 2000 to 2008 Ontario's annual incidence rates for neonatal group B streptococcal disease were approximately double the corresponding national rates (Figure 3.1.1).
- There was an equal split in the number of male and female cases of neonatal group B streptococcal disease in 2009: 25 cases each for males and females.
- Infection of newborns with group B streptococcal disease is serious and can be fatal. Four deaths related to group B streptococcal disease were reported in Ontario in 2009.
- Half of Ontario's thirty-six public health units reported no cases of group B streptococcal disease in 2009. The highest incidence rates were reported in Grey-Bruce, Haldimand-Norfolk, Algoma district and Lambton County (Map 3.3.1, Table 3.3.2).

Figure 3.3.1: Incidence of Group B Streptococcal Disease in Ontario and Canada: 2000-2009



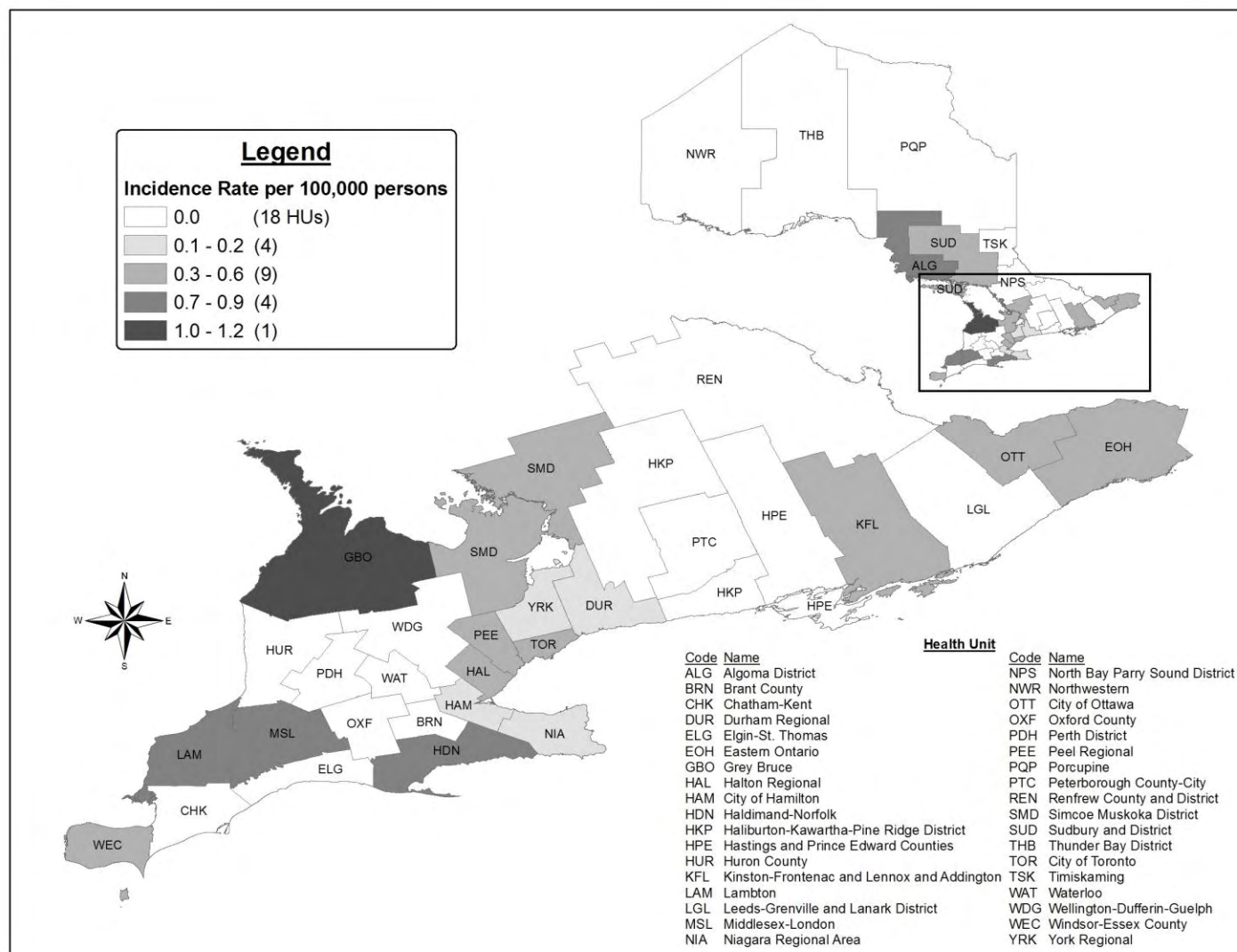
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

Map 3.3.1: Group B Streptococcal Disease Cases by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Streptococcal Disease by Public Health Unit: Ontario, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Grey Bruce	2	1.2
Haldimand-Norfolk	1	0.9
Algoma District	1	0.8
Lambton County	1	0.8
Middlesex-London	3	0.7
Halton Region	3	0.6
Peel Region	8	0.6
Toronto	15	0.6
Kingston, Frontenac, Lennox & Addington	1	0.5
Eastern Ontario	1	0.5
Sudbury and District	1	0.5
Windsor-Essex County	2	0.5
Ottawa	4	0.5
Simcoe Muskoka District	2	0.4
Niagara Region	1	0.2
York Region	2	0.2
Hamilton	1	0.2
Durham Region	1	0.2
Brant County	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Hastings & Prince Edward Counties	0	0.0
Huron County	0	0.0
Leeds, Grenville and 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
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Waterloo Region	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Ontario	50	0.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

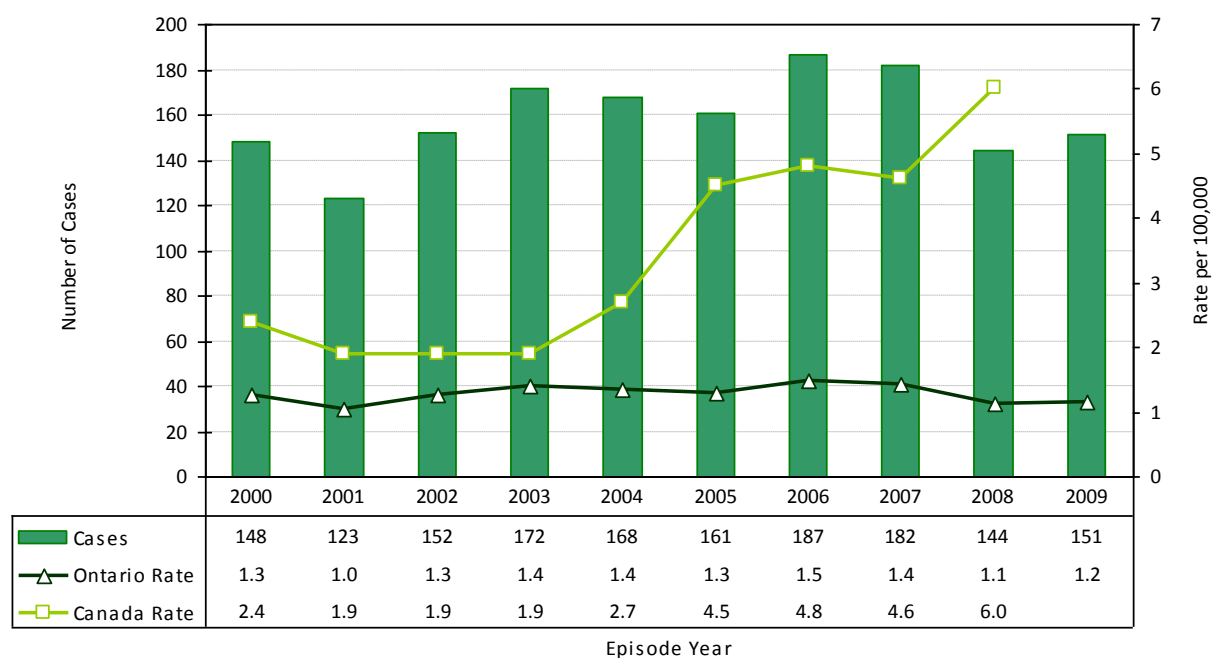
Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 (Acute)

- In 2009, 151 confirmed cases of Hepatitis B were reported in Ontario, which represents an incidence rate of 1.2 cases per 100,000 population (Table 3.1). This figure represents an increase of 5% from the 2008 total of 144 cases.
- During the period 2000 to 2009, the incidence rate of Hepatitis B in Ontario remained relatively stable, ranging between 1.0 and 1.5 cases per 100,000 population. The lowest rate was observed in 2001 (1.0 per 100,000) and the highest rate in 2006 (1.5 per 100,000).
- The incidence rate of Hepatitis B in Canada remained higher than Ontario's from 2000 to 2008 and increased from a low of 1.9 cases per 100,000 from 2001 to 2003 up to 6.0 cases per 100,000 in 2008 (Figure 3.4.1).
- Males accounted for 65% (98/151) of Hepatitis B cases reported in Ontario in 2009, down from 71% in 2008. Conversely, females accounted for 35% (53/151) of Hepatitis B cases reported in Ontario in 2009, up from 29% in 2008 (Table 3.4.1 and Figure 3.4.2).
- The incidence rate for Hepatitis B incidence among males in 2009 was 1.5 per 100,000 compared to 0.8 per 100,000 for females. Men aged 45-49 years had the highest incidence rate at 3.3 cases per 100,000 population (Table 3.4.1 and Figure 3.4.2).
- The average age of Hepatitis B cases in 2009 was 44 years.
- Kingston Frontenac Lennox Addington (7.7 cases per 100,000 population), Huron County (6.6 cases per 100,000 population), and Leeds Grenville and Lanark District (4.2 cases per 100,000 population) health units reported the highest incidence rates of Hepatitis B in Ontario in 2009 (Map 3.4.1, Table 3.4.2).
- Exposures outside of Canada (35%), sexual risks (30%), and non-medical invasive procedures such as tattooing, piercing, electrolysis and acupuncture (15%) were the most frequently reported risk factors for acquiring Hepatitis B among cases reporting risk factors or exposures in 2009 (Table 3.4.3).
- There were two cases of maternal transmission of Hepatitis B in 2009.

Figure 3.4.1: Incidence of Hepatitis B in Ontario and Canada: 2000-2009



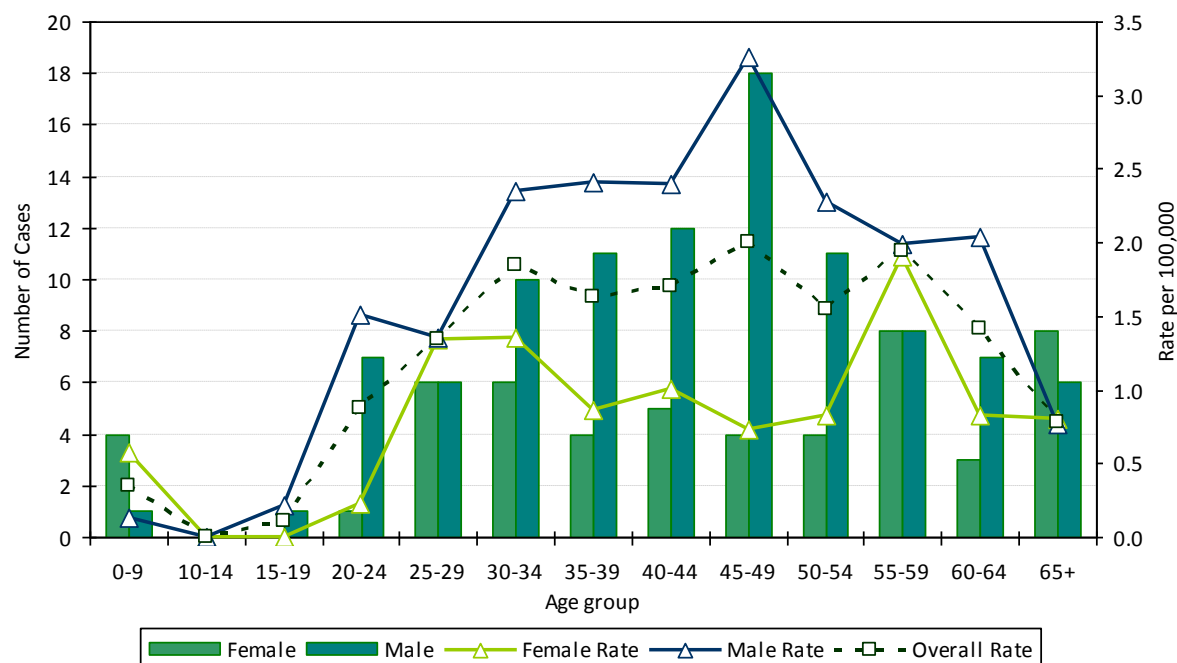
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

Figure 3.4.2: Incidence of Hepatitis B by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

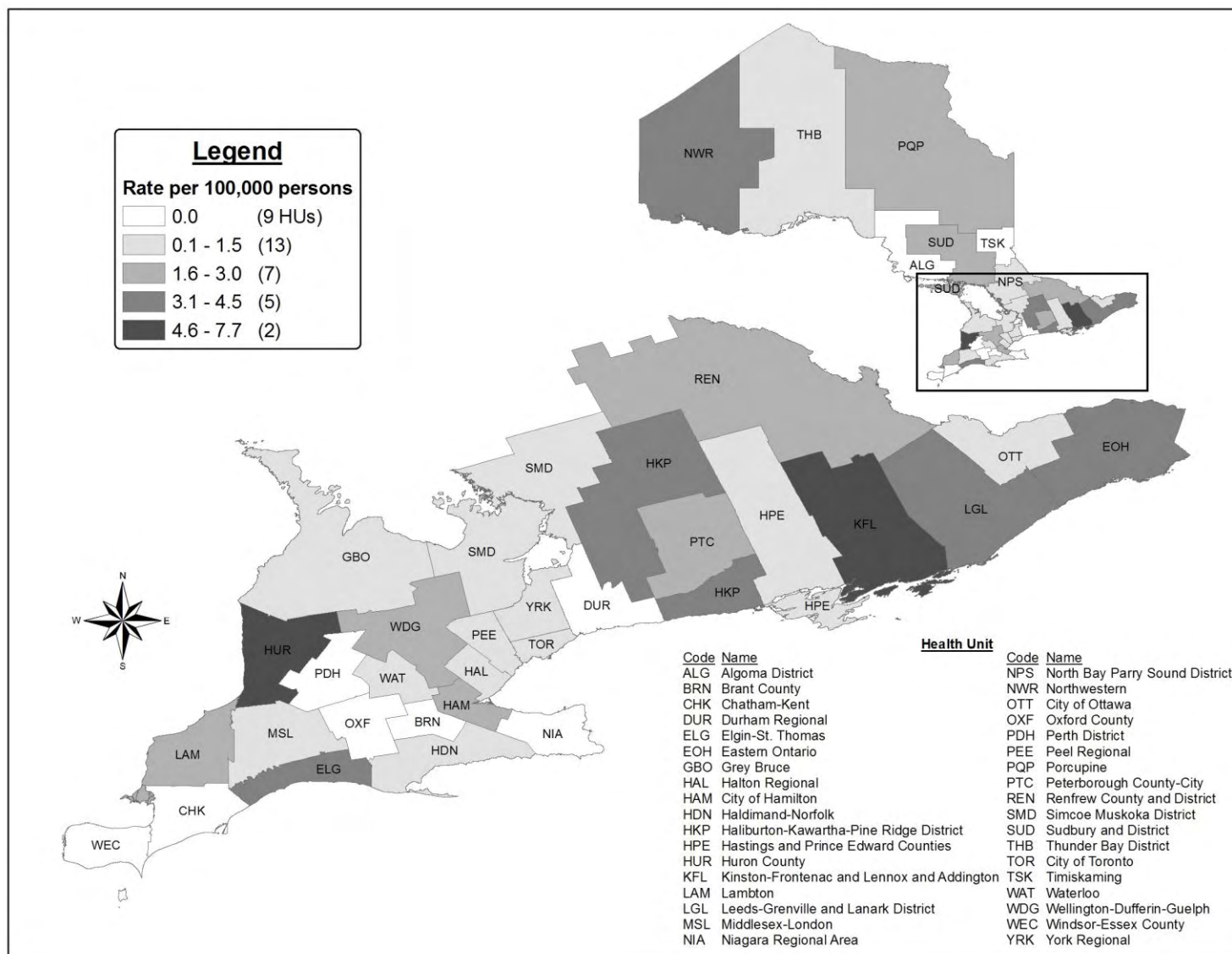
Table 3.4.1: Incidence of Hepatitis B by Age and Sex: Ontario, 2009

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	4	0.6	1	0.1	5	0.4
10-14	0	0.0	0	0.0	0	0.0
15-19	0	0.0	1	0.2	1	0.1
20-24	1	0.2	7	1.5	8	0.9
25-29	6	1.3	6	1.4	12	1.3
30-34	6	1.4	10	2.4	16	1.8
35-39	4	0.9	11	2.4	15	1.6
40-44	5	1.0	12	2.4	17	1.7
45-49	4	0.7	18	3.3	22	2.0
50-54	4	0.8	11	2.3	15	1.5
55-59	8	1.9	8	2.0	16	1.9
60-64	3	0.8	7	2.0	10	1.4
65+	8	0.8	6	0.8	14	0.8
Total	53	0.8	98	1.5	151	1.2

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 3.4.1: Incidence Rates of Hepatitis B by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Kingston, Frontenac, Lennox & Addington	15	7.7
Huron County	4	6.6
Leeds, Grenville and Lanark District	7	4.2
Northwestern	3	3.7
Eastern Ontario	7	3.5
Haliburton, Kawartha, Pine Ridge	6	3.4
Elgin-St. Thomas	3	3.3
Sudbury and District	6	3.0
Renfrew County and District	3	2.9
Lambton County	3	2.3
Porcupine	2	2.3
Peterborough County-City	3	2.2
Wellington-Dufferin-Guelph	6	2.2
Hamilton	9	1.7
Waterloo Region	7	1.4
Grey Bruce	2	1.2
Toronto	33	1.2
Haldimand-Norfolk	1	0.9
Peel Region	12	0.9
North Bay Parry Sound District	1	0.8
Middlesex-London	3	0.7
York Region	7	0.7
Hastings & Prince Edward Counties	1	0.6
Thunder Bay District	1	0.64
Halton Region	2	0.4
Ottawa	3	0.3
Simcoe Muskoka District	1	0.2
Algoma District	0	0.0
Brant County	0	0.0
Chatham-Kent	0	0.0
Durham Region	0	0.0
Niagara Region	0	0.0
Oxford County	0	0.0
Perth District	0	0.0
Timiskaming	0	0.0
Windsor-Essex County	0	0.0
Ontario	151	1.2

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 3.4.3: Risk Factors for Hepatitis B: Ontario, 2009

Risk Factors & Settings ¹	Females		Males		Total	
	Cases (n=32)	Percent (%)	Cases (n=98)	Percent (%)	Cases (n=130)	Percent (%)
Out of Canada exposure ²	14	43.8%	31	31.6%	45	34.6%
Sexual risks	7	21.9	32	32.7	38	30.0%
Sexual risks and other non-sexual risks ³	3	9.4%	24	24.5%	27	20.8%
Sexual contact only ⁴	4	12.5%	8	8.2%	12	9.2%
Tattoo/acupuncture/piercing/electrolysis	10	31.3%	10	10.2%	20	15.4%
Intravenous or intranasal drug use	4	12.5%	12	12.2%	16	12.3%
Medical/dental procedures	6	18.8%	8	8.2%	14	10.8%
Immuno-compromised	2	6.3%	4	4.1%	6	4.6%
Blood transfusion	4	12.5%	0	0.0%	4	3.1%
Dialysis	2	6.3%	1	1.0%	3	2.3%
Other ⁵	4	12.5%	11	11.2%	15	11.5%
Unknown	10	31.3%	19	19.4%	29	22.3%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Note 1: Cases may report more than one risk factor and exposure setting; Risk factors and exposures including unknown were reported by 86% of cases reported in 2009.

Note 2: Out of Canada exposures include travel to, living in or receiving medical care in an endemic area.

Note 3: Case reported sexual risks and other risks such as IDU, tattoo etc.

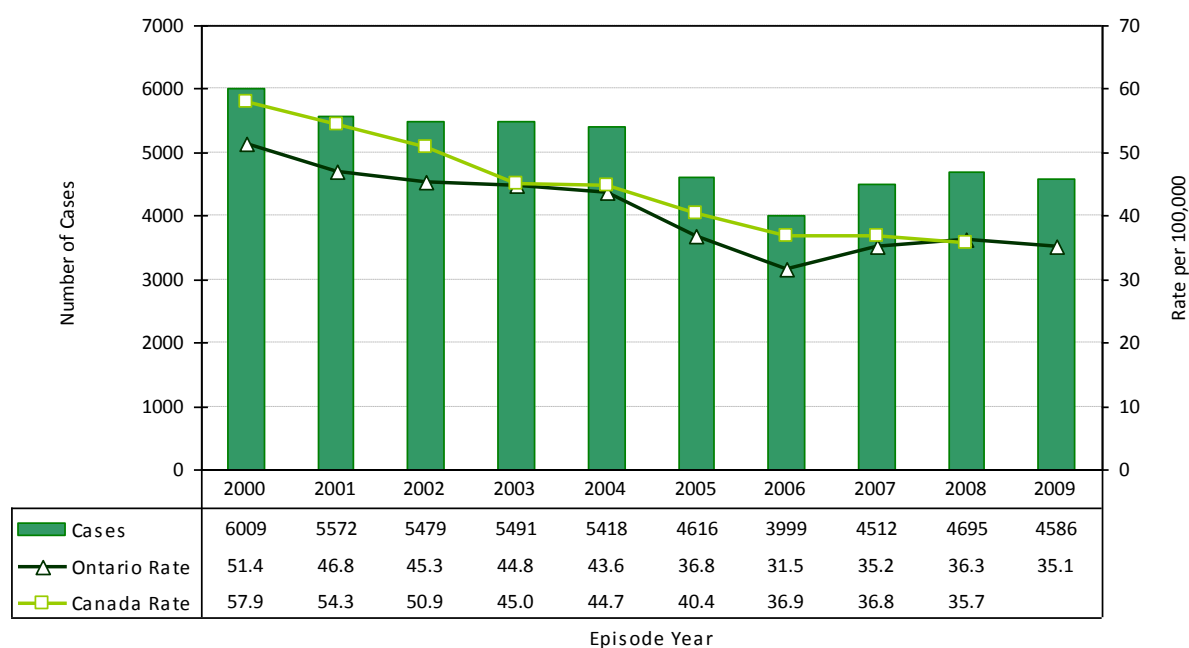
Note 4: Cases reported sexual contact as their only risk factor

Note 5: Includes: household exposure, fighting, incarceration, occupational risks, mother to child transmission and organ transplant.

3.5 HEPATITIS C (acute)

- There were 4,586 (35 cases per 100,000 population) confirmed cases of Hepatitis C reported in Ontario in 2008, down 2% from 4,695 cases in 2007 (Table 3.1).
- The rate of Hepatitis C in Ontario declined by 32% from 51 cases per 100,000 population in 2000 to 31 cases per 100,000 population in 2006. Since 2007, the rate of Hepatitis C in Ontario has increased to approximately 32 cases per 100,000 population. (Figure 3.5.1).
- During the period 2000-2009, the rate of Hepatitis C in Ontario remained below the national rate until 2008 when both rates converged at 36 cases per 100,000 population (Figure 3.5.1).
- Overall, men accounted for 61% of Hepatitis C cases reported in Ontario in 2009 and had higher incidence rates than females in all age groups except the 15-19 and 20-24 age groups (Figure 3.5.2, Table 3.5.1).
- In 2009, males aged 50 to 54 years had the highest rate of Hepatitis C at 94 cases per 100,000 population. This figure is almost triple the overall rate for Ontario, but 10% lower than the corresponding rate of 104 cases per 100,000 population in 2008 (Figure 3.5.2, Table 3.5.1).
- Eighteen cases of Hepatitis C were reported for infants under the age of one year in 2009. Of these cases, at least four were transmitted from mother to child during pregnancy or birth.
- The health units of Kingston-Frontenac and Lennox and Addington (100 cases per 100,000 population), Timiskaming (78 cases per 100,000 population) and Thunder Bay District (77 cases per 100,000 population) reported the highest rates of Hepatitis C in 2009. On the other hand, the highest number of cases were reported by Toronto (959 cases), Peel Region (399 cases) and the City of Ottawa (305 cases) (Map 3.5.1, Table 3.5.2).
- For the second consecutive year (2008 and 2009), intravenous/intranasal drug use (43%), receipt of invasive procedures by tattoo, acupuncture, piercing or electrolysis (25%), and exposures outside of Canada (16%) were the most commonly reported risks for acquiring Hepatitis C among cases that reported risk factors and/or exposures (Table 3.5.3).
- Although sexual transmission of Hepatitis C is not widely recognized, 78 cases reported it as their only risk factor.

Figure 3.5.1: Reported Cases and Rates of Hepatitis C in Ontario and Canada: 2000-2009



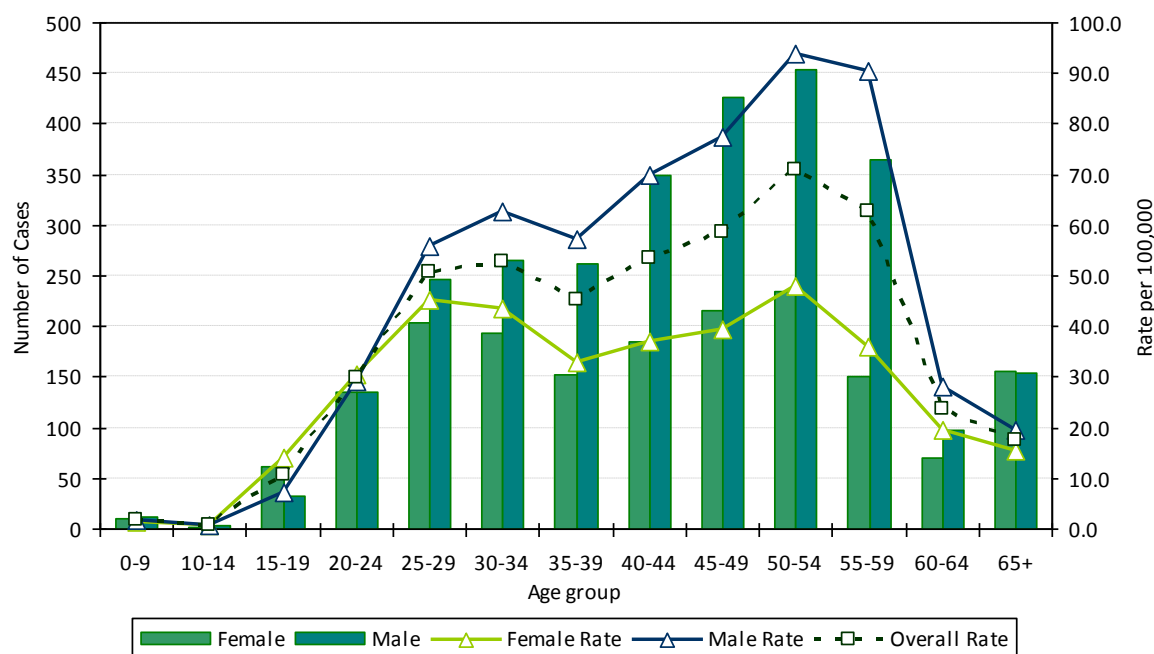
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

Figure 3.5.2: Reported Cases and Rates of Hepatitis C by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 15 cases for which sex and/or age were reported as unknown.

Table 3.5.1: Reported Cases and Rates of Hepatitis C by Age and Sex: Ontario, 2009

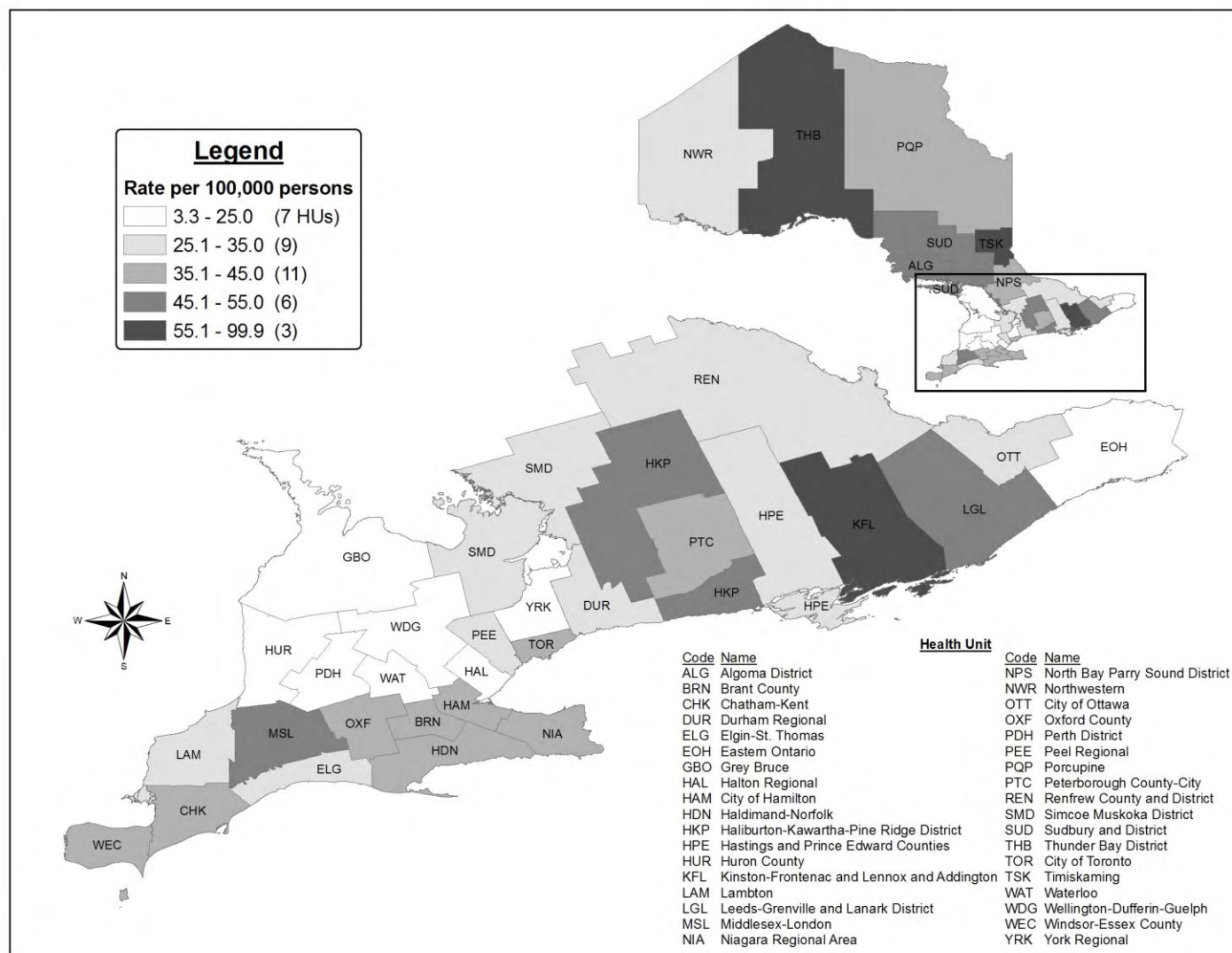
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-9	10	1.4	12	1.6	22	1.5
10-14	2	0.5	3	0.7	5	0.6
15-19	61	14.1	33	7.3	94	10.6
20-24	136	30.6	135	29.1	271	29.8
25-29	203	45.3	247	55.8	450	50.6
30-34	193	43.5	266	62.6	459	52.9
35-39	153	33.0	262	57.3	415	45.1
40-44	185	37.0	349	69.7	534	53.4
45-49	215	39.4	427	77.4	642	58.5
50-54	234	48.0	453	93.9	687	70.9
55-59	151	35.9	364	90.3	515	62.6
60-64	70	19.4	97	28.2	167	23.7
65+	156	15.6	154	19.6	310	17.3
Total	1,769	26.7	2,802	43.5	4,571	35.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 15 cases for which sex and/or age were reported as unknown.

Map 3.5.1: Rates of Hepatitis C by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Kingston, Frontenac, Lennox & Addington	194	99.9
Timiskaming	27	77.6
Thunder Bay District	121	77.3
Middlesex-London	248	54.8
Algoma District	64	53.8
Sudbury and District	98	48.9
Haliburton, Kawartha, Pine Ridge	86	48.5
Leeds, Grenville and Lanark District	77	45.7
Niagara Region	195	44.0
Oxford County	46	43.1
Brant County	59	42.4
Hamilton	215	40.5
Haldimand-Norfolk	44	39.7
Chatham-Kent	43	39.0
Windsor-Essex County	153	37.9
Peterborough County-City	52	37.5
Porcupine	32	36.5
North Bay Parry Sound District	46	36.4
Toronto	959	35.8
Ottawa	305	34.6
Lambton County	45	34.1
Simcoe Muskoka District	173	33.7
Elgin-St. Thomas	30	33.3
Northwestern	27	33.0
Peel Region	399	30.4
Durham Region	174	28.4
Renfrew County and District	28	27.2
Hastings & Prince Edward Counties	43	26.4
Eastern Ontario	47	23.6
Wellington-Dufferin-Guelph	62	22.8
Waterloo Region	116	22.4
York Region	227	22.3
Halton Region	105	21.3
Perth District	16	20.8
Grey Bruce	28	17.2
Huron County	2	3.3
Ontario	4,586	35.1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Risk Factors and Settings ¹	Females		Males		Total ⁵	
	Cases (n=1,495)	Percent (%)	Cases (n=2,325)	Percent (%)	Cases (n=3,834)	Percent (%)
Intravenous/intranasal drug use	559	37.4%	1,094	47.1%	1,660	43.3%
Tattoo/acupuncture/piercing/electrolysis	351	23.5%	603	25.9%	958	25.0%
Out of Canada exposures ²	301	20.1%	310	13.3%	613	16.0%
Invasive medical/dental procedures	206	13.8%	315	13.5%	521	13.6%
Transfusion recipient	221	14.8%	194	8.3%	415	10.8%
Sexual risks and other non-sexual risks	175	11.7%	205	8.8%	381	9.9%
History of incarceration	38	2.5%	161	6.9%	201	5.2%
Household transmission (not sexual)	52	3.5%	43	1.8%	95	2.5%
Sexual contact only ³	34	2.3%	44	1.9%	78	2.0%
Immunocompromised	21	1.4%	35	1.5%	56	1.5%
Occupational	14	0.9%	18	0.8%	32	0.8%
Fighting	3	0.2%	25	1.1%	28	0.7%
Organ or tissue transplant	4	0.3%	11	0.5%	15	0.4%
Mother-to-child transmission	10	0.7%	2	0.1%	12	0.3%
Other personal services ⁴	9	0.6%	3	0.1%	12	0.3%
Dialysis	6	0.4%	4	0.2%	10	0.3%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Note 1: Cases may report more than one risk factor or exposure setting; Risk factors and/or exposures were reported by 84% of cases in 2009.

Note 2: Includes travel to, living in or receiving medical care in an endemic area.

Note 3: Cases reported only sexual contact as their only risk factor.

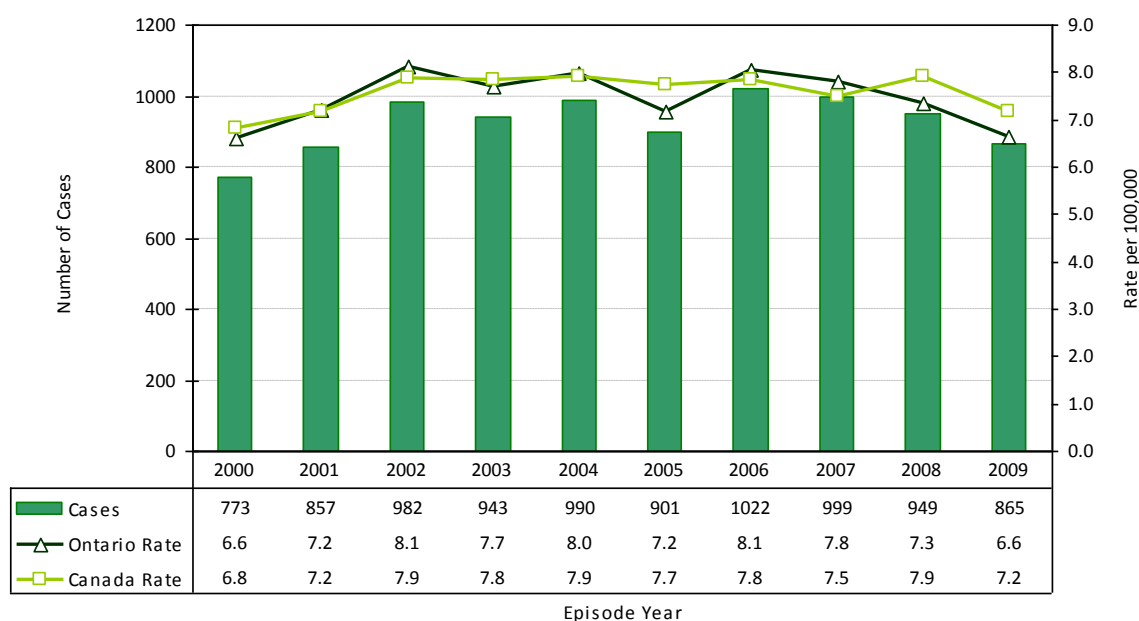
Note 4: Includes services such as micro-pigmentation, nails, invasive facials, waxing, electrolysis, ear piercing where the exact service delivered is unknown

Note 5: Total includes cases where gender is specified as "unknown", "transgender" and "other" and may not be equal to the sum of males and females.

3.6 HIV/AIDS

- In 2009, 865 newly diagnosed cases of HIV were reported in Ontario. This figure represents a rate of 6.6 cases per 100,000 population and is 13% lower than the number of cases reported in 2007 (999 cases), and 9% lower than the number of cases reported in 2008 (949 cases) (Table 3.6.1).
- The rate of HIV in Ontario was relatively stable over the past ten years with rates fluctuating between 6.6 to 8.1 cases per 100,000 population (Figure 3.6.1).
- Since 2000, the rate of newly diagnosed cases of HIV in Ontario has been similar to the corresponding national rates (Figure 3.6.1).
- Between 2008 and 2009, the number of AIDS diagnoses in Ontario dropped by 27% likely due to access to HIV treatment that slows progression to AIDS. Over the past 10 years, rates in Ontario have decreased at a slightly slower pace than the corresponding national AIDS rates (Figure 3.6.2).
- Although the rate of HIV among males in Ontario continued to decrease, the rate among males remained higher - almost four times the rate for females in 2009. The rate of HIV among males declined by 6% from the 2008 rate of 11.3 cases to 10.6 cases per 100,000 population in 2009. The corresponding rate among females also decreased but by 18% from 3.4 cases per 100,000 population in 2008 to 2.8 cases per 100,000 in 2009 (Figure 3.6.3, Table 3.6.1).
- Males in the age groups from 20 to 54 years reported rates of HIV that were higher than the provincial rate of 6.6 cases per 100,000 population; women in the age groups from 25 to 39 years also reported rates of HIV that were higher than the provincial rate (Figure 3.6.3).
- The rate of HIV was highest in Toronto at 20 cases per 100,000 population, City of Ottawa at 8 cases per 100,000 population and Sudbury and District at 7 cases per 100,000 population (Map 3.6.2 and Table 3.6.3). Toronto also reported the largest number of AIDS cases at 57, followed by Ottawa with 17; all other health units reported 6 or fewer cases in 2009 (Map 3.6.1 and Table 3.6.3).
- As in 2008, the most common risk groups for HIV in 2009 were: men who have sex with men (50%), immigration from HIV endemic countries (17%) and heterosexual transmission (10%), (Table 3.6.4). The corresponding rates in 2008 for these risks were 49%, 14% and 16%, respectively.
- Twenty-three percent of HIV cases reported in Ontario in 2009 were born in other countries. The top places of origin were Africa (39%), Latin America (15%) and the Caribbean (13%).
- Four cases of mother-to-child transmission of HIV were reported in 2009, including two cases who were born outside of Canada.
- Eleven percent (98/865) of HIV cases that were reported in 2009 had a concurrent AIDS diagnosis in 2009. The HIV status of 73% (83/113) of AIDS cases diagnosed in 2009 became known to public health for the first time in 2009 and 2010. The other 27% of cases were reported as HIV positive in earlier years.

Figure 3.6.1: Reported Number and Rate of HIV Diagnoses in Ontario and Canada: 2000-2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

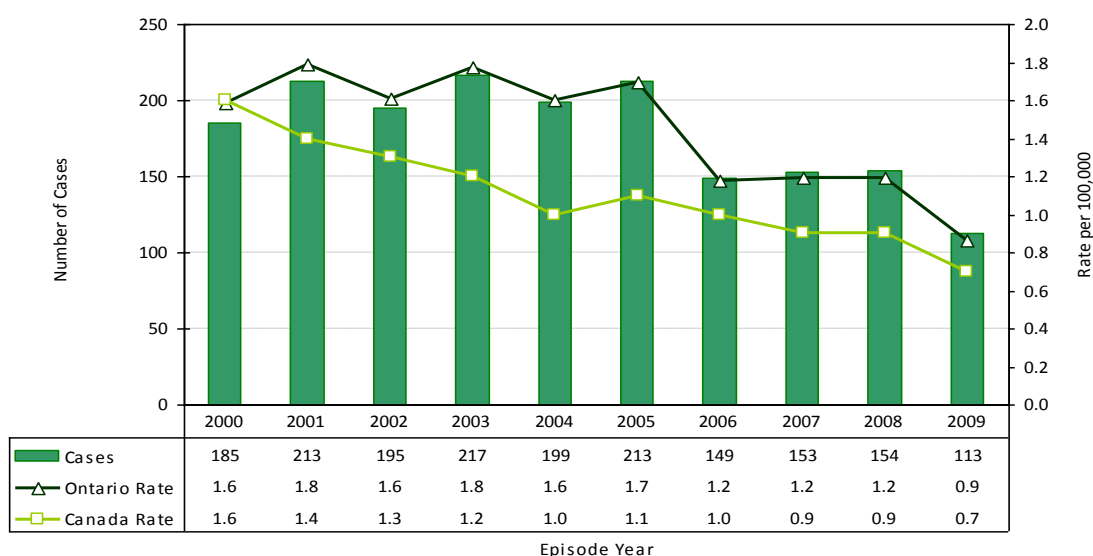
Canadian Rate: Public Health Agency of Canada. *HIV and AIDS in Canada: Surveillance Report to December 31, 2009* Available online: <http://www.phac-aspc.gc.ca/aids-sida/publication/index-eng.php#surveillance>.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Canadian Population: <http://www.statcan.gc.ca/pub/91-215-x/2010000/t002-eng.pdf>, extracted [01/08/2009] for 2000-2005 and [30/05/2010] for 2006-2009.

Note: Ontario data reflects cases reported to public health. Canadian rates are based on the number of positive HIV tests per 100,000 population.

Figure 3.6.2: Reported Number and Rate of AIDS Diagnoses in Ontario and Canada: 2000-2009



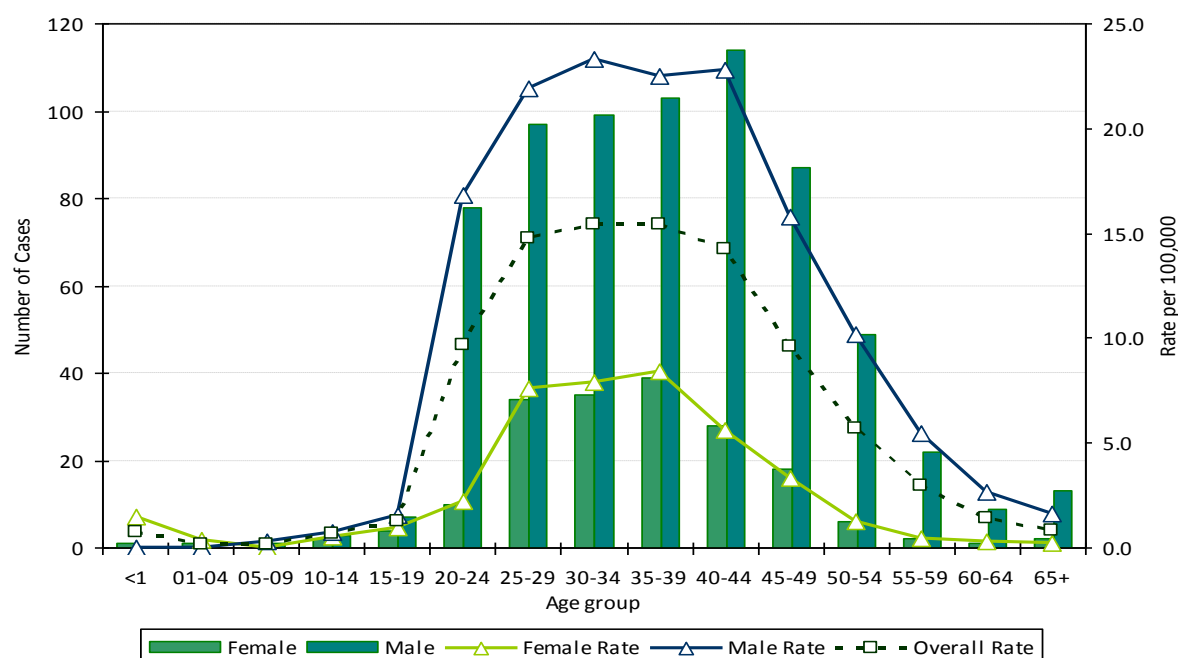
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

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

Canadian Population: <http://www.statcan.gc.ca/pub/91-215-x/2010000/t002-eng.pdf>, extracted [01/08/2009] for 2000-2005 and [30/05/2010] for 2006-2009

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Figure 3.6.3: Reported Number and Rates of HIV Diagnoses by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

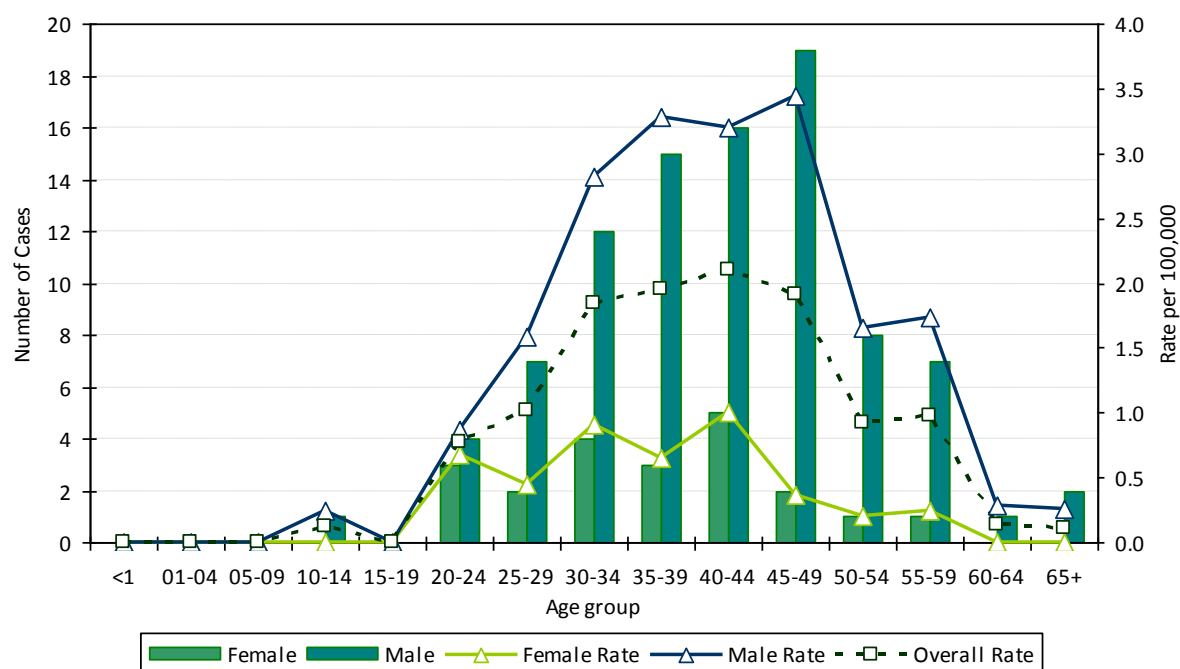
Table 3.6.1: Reported Number and Rates of HIV Diagnoses by Age and Sex: Ontario, 2009

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	1	1.5	0	0.0	1	0.7
1-4	1	0.4	0	0.0	1	0.2
5-9	0	0.0	1	0.3	1	0.1
10-14	2	0.5	3	0.7	5	0.6
15-19	4	0.9	7	1.5	11	1.2
20-24	10	2.2	78	16.8	88	9.7
25-29	34	7.6	97	21.9	131	14.7
30-34	35	7.9	99	23.3	134	15.4
35-39	39	8.4	103	22.5	142	15.4
40-44	28	5.6	114	22.8	142	14.2
45-49	18	3.3	87	15.8	105	9.6
50-54	6	1.2	49	10.2	55	5.7
55-59	2	0.5	22	5.5	24	2.9
60-64	1	0.3	9	2.6	10	1.4
65+	2	0.2	13	1.7	15	0.8
Total	183	2.8	682	10.6	865	6.6

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Figure 3.6.4: Reported Number and Rate of AIDS Diagnoses by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

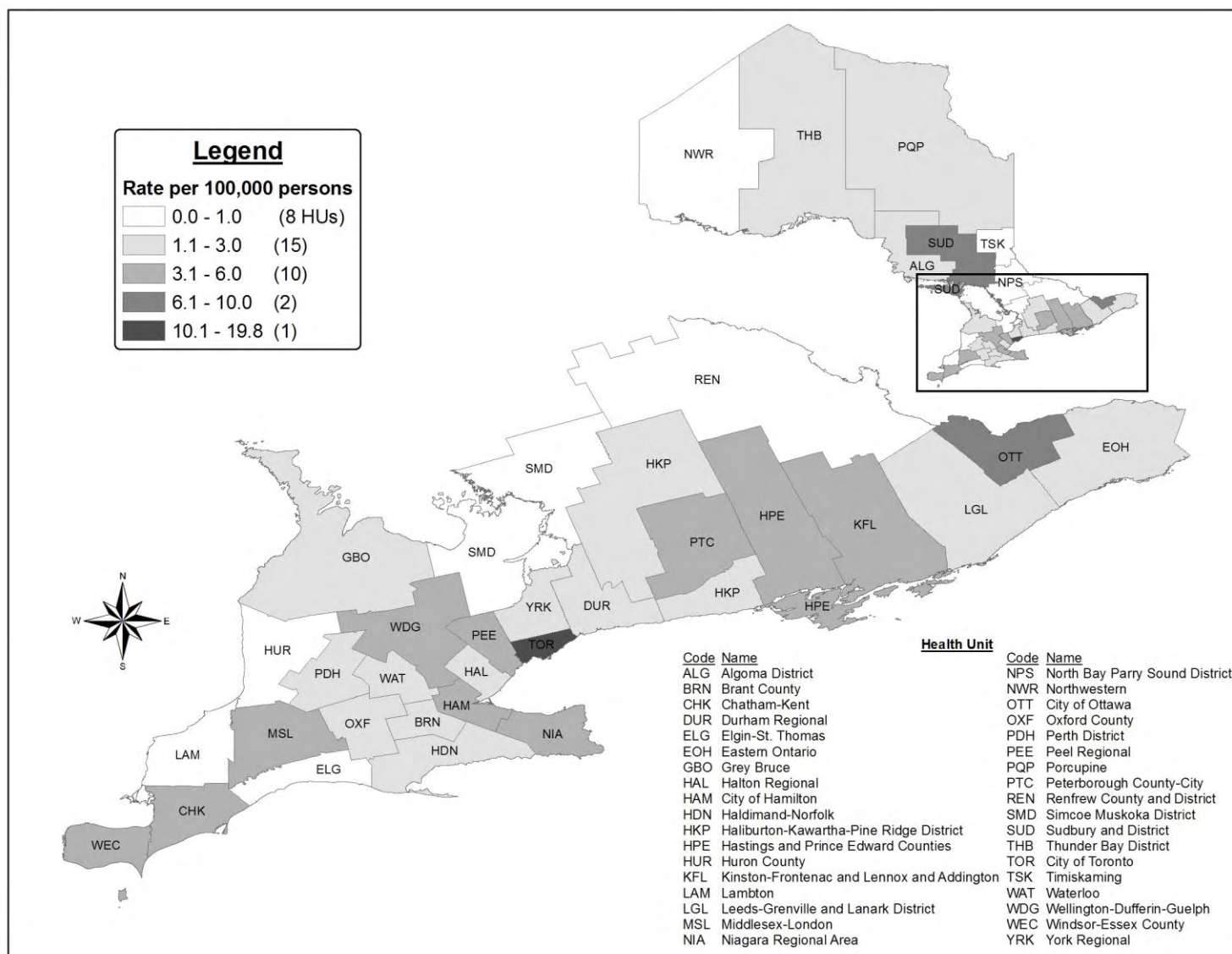
Table 3.6.2: Reported Number and Rates of AIDS Diagnoses by Age and Sex: Ontario, 2009

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	0	0.0	0	0.0
5-9	0	0.0	0	0.0	0	0.0
10-14	0	0.0	1	0.2	1	0.1
15-19	0	0.0	0	0.0	0	0.0
20-24	3	0.7	4	0.9	7	0.8
25-29	2	0.4	7	1.6	9	1.0
30-34	4	0.9	12	2.8	16	1.8
35-39	3	0.6	15	3.3	18	2.0
40-44	5	1.0	16	3.2	21	2.1
45-49	2	0.4	19	3.4	21	1.9
50-54	1	0.2	8	1.7	9	0.9
55-59	1	0.2	7	1.7	8	1.0
60-64	0	0.0	1	0.3	1	0.1
65+	0	0.0	2	0.3	2	0.1
Total	21	0.3	92	1.4	113	0.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 3.6.1: Rates of HIV Diagnoses by Public Health Unit: Ontario, 2009

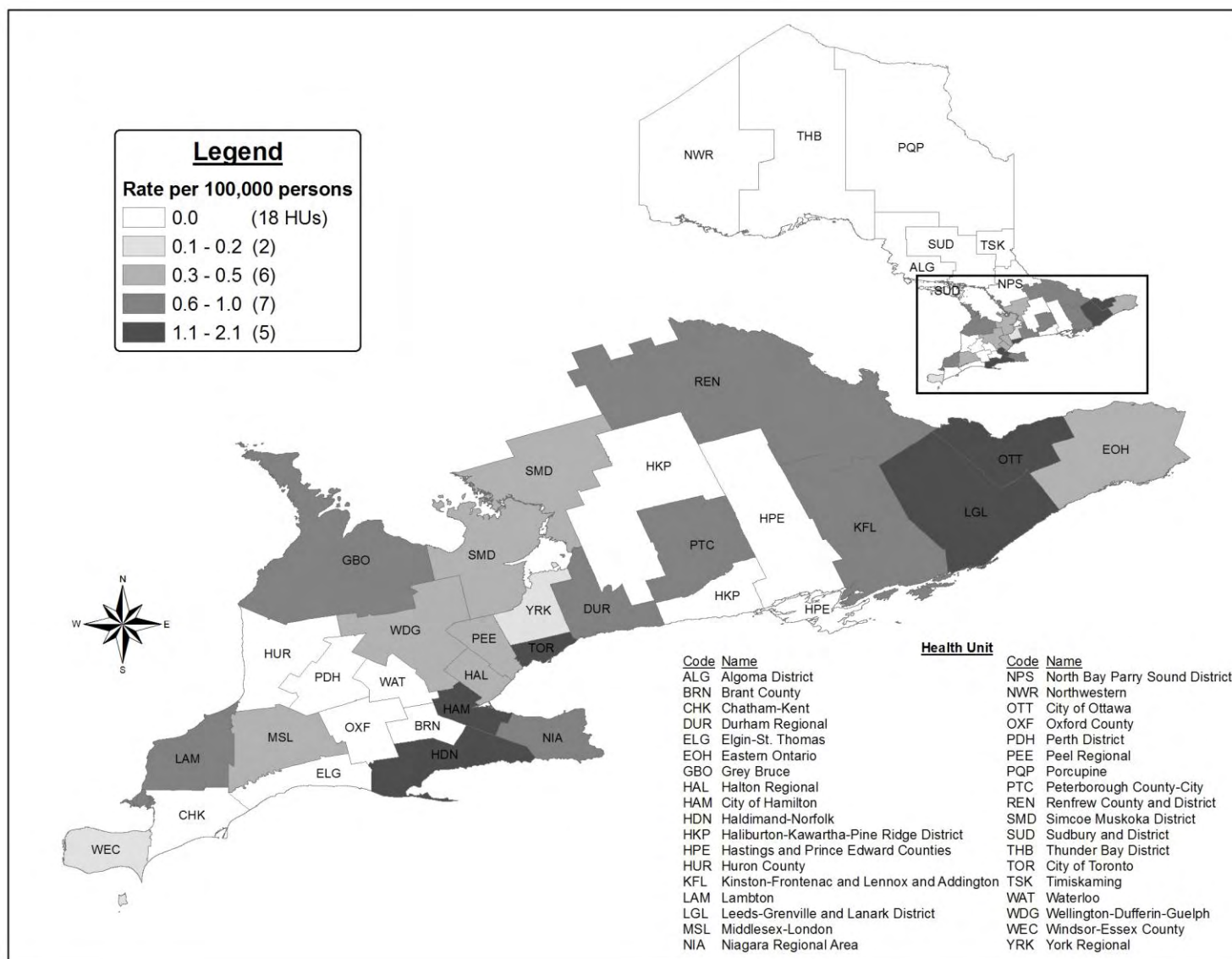


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	HIV		AIDS	
	Number of cases	Rate/100,000 population	Number of cases	Rate/100,000 population
Toronto	530	19.8	57	2.1
Ottawa, City of	67	7.6	17	1.9
Sudbury and District	14	7.0	0	0.0
Hamilton, City of	27	5.1	6	1.1
Middlesex-London	23	5.1	2	0.4
Windsor-Essex County	20	5.0	1	0.2
Kingston, Frontenac, Lennox & Addington	9	4.6	2	1.0
Chatham-Kent	5	4.5	0	0.0
Niagara Region	19	4.3	3	0.7
Peel Region	54	4.1	5	0.4
Peterborough County-City	5	3.6	1	0.7
Wellington-Dufferin-Guelph	9	3.3	1	0.4
Hastings & Prince Edward Counties	5	3.1	0	0.0
Oxford County	3	2.8	0	0.0
Thunder Bay District	4	2.6	0	0.0
Algoma District	3	2.5	0	0.0
Halton Region	12	2.4	2	0.4
Leeds, Grenville and Lanark District	4	2.4	2	1.2
Porcupine	2	2.3	0	0.0
Haldimand-Norfolk	2	1.8	2	1.8
Haliburton, Kawartha, Pine Ridge	3	1.7	0	0.0
Waterloo Region	9	1.7	0	0.0
Eastern Ontario	3	1.5	1	0.5
Brant County	2	1.4	0	0.0
Durham Region	8	1.3	4	0.7
Perth District	1	1.3	0	0.0
York Region	13	1.3	2	0.2
Grey Bruce	2	1.2	1	0.6
Renfrew County and District	1	1.0	1	1.0
Lambton County	1	0.8	1	0.8
North Bay Parry Sound District	1	0.8	0	0.0
Simcoe Muskoka District	4	0.8	2	0.4
Elgin-St. Thomas	0	0.0	0	0.0
Huron County	0	0.0	0	0.0
Northwestern	0	0.0	0	0.0
Timiskaming	0	0.0	0	0.0
Ontario	865	6.6	113	0.9

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 3.6.4: Risk Factors and Risk Settings for HIV: Ontario, 2009

Risk Factors and Settings	Females		Males		Total	
	Cases (n=183)	Percent (%)	Cases (n=682)	Percent (%)	Cases (n=865)	Percent (%)
Men who have sex with men (MSM)	n/a	n/a	429	62.9%	429	49.6%
HIV Endemic Country	87	47.5%	58	8.5%	145	16.8%
Heterosexual transmission	42	23.0%	44	6.5%	86	9.9%
Illicit drug use (IDU)	17	9.3%	30	4.4%	47	5.4%
MSM/IDU	0	0.0%	24	3.5%	24	2.8%
Mother to child	2	1.1%	2	0.3%	4	0.5%
Transfusion	0	0.0%	1	0.1%	1	0.1%
Occupational exposure	0	0.0%	1	0.1%	1	0.1%
No Indicated Risk Factor	35	19.1%	93	13.6%	128	14.8%

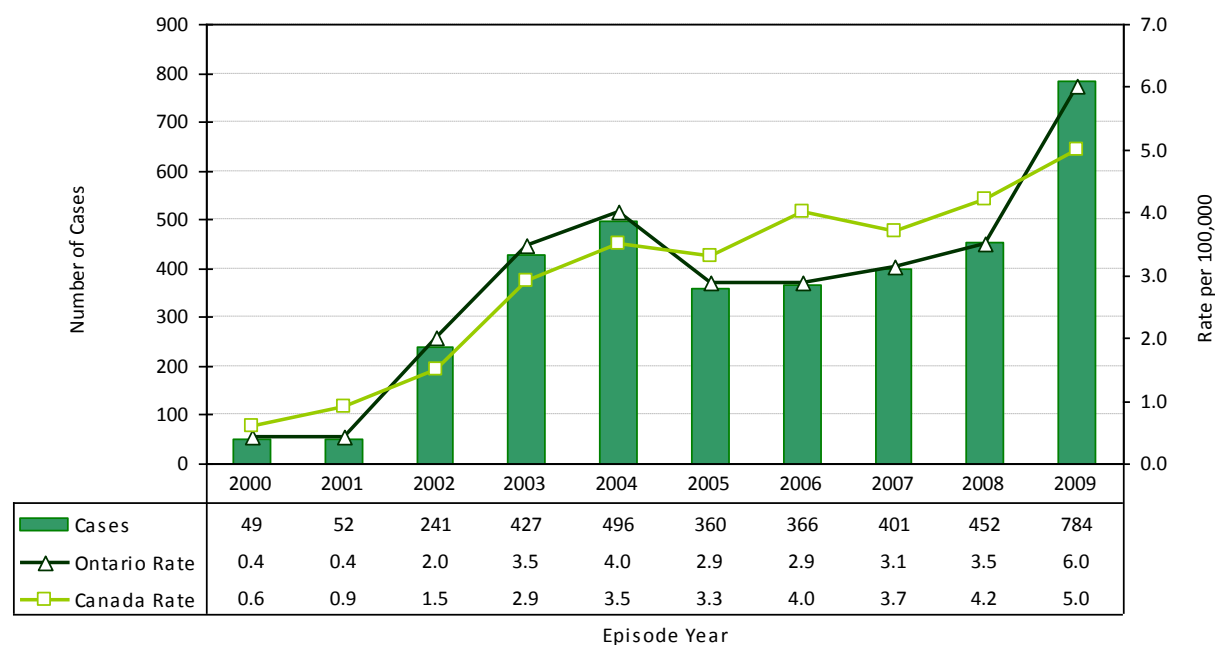
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/21].

Notes: One risk factor category was determined for each case based on a hierarchy of most likely risk.

3.7 INFECTIOUS SYPHILIS

- Ontario reported 784 confirmed cases of syphilis in 2009, which corresponds to an incidence rate of 6.0 cases per 100,000 population, an increase of 1,400% from 0.4 cases per 100,000 population in 2000 (Figure 3.7.1).
- The incidence of syphilis in Ontario over the past 10 years was marked by a rapid increase between 2001 and 2004 and a period of relative stability from 2005 to 2007. This was followed by notable increases in 2008 and 2009. The increases in cases in the early 2000s, and then again in 2008 and 2009 were linked to outbreaks among men who have sex with men (MSM) primarily in Toronto and Ottawa (Figure 3.7.1).
- Canada experienced a similar increase in the incidence of syphilis beginning in 2001 with incidence rates remaining higher than Ontario from 2005 through to 2008. In 2009, the incidence rate for syphilis was 20% higher in Ontario than it was at the national level: Canada reported 5.0 cases per 100,000 population compared to Ontario's 6.0 cases per 100,000 population (Figure 3.7.1).
- The national trend from 2002 to 2009 was driven in part by the increase in syphilis cases in Ontario.
- In 2009, males accounted for 97% of reported cases of syphilis. The incidence rate of syphilis among males was 30 times higher than that of females at 11.8 cases per 100,000 population compared to 0.4 cases per 100,000 (Table 3.7.1).
- The provincial incidence rate of syphilis in 2009 was driven primarily by males aged 20-49 years. Incidence rates within this age span ranged from 18 cases per 100,000 population in the 20-24 and 45-49 age groups to a high of 30 cases per 100,000 population in the 40-44 age category (Figure 3.7.2).
- The cities of Toronto (74%) and Ottawa (6%) accounted for 80% of syphilis cases reported in Ontario in 2009. With 29 cases, Hamilton accounted for the third highest incidence of syphilis in Ontario. Eleven public health units did not report any cases of syphilis in 2009 (Map 3.7.1, Table 3.7.2).
- Same-sex sexual contact among males (84%), failure to use a condom (61%), and having multiple sex partners in the last 6 months (36%) were the most frequently reported risk factors for acquisition of syphilis among syphilis cases in 2009 that reported at least one risk factor (Table 3.7.3).
- Forty-four percent (346/784) of syphilis cases reported in Ontario in 2009 had an HIV diagnosis prior to or during 2009. In 2008, the corresponding figure was 41%.

Figure 3.7.1: Incidence of Infectious Syphilis in Ontario and Canada: 2000-2009

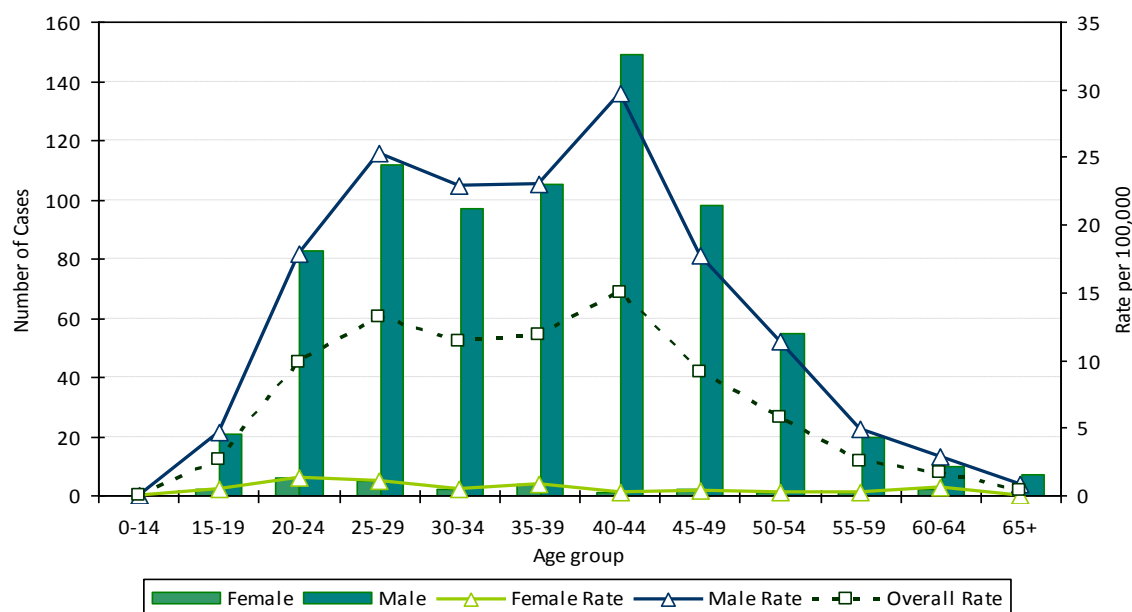


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Figure 3.7.2: Incidence of Infectious Syphilis by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex and/or age were reported as unknown.

Table 3.7.1: Incidence of Infectious Syphilis by Age and Sex: Ontario, 2009

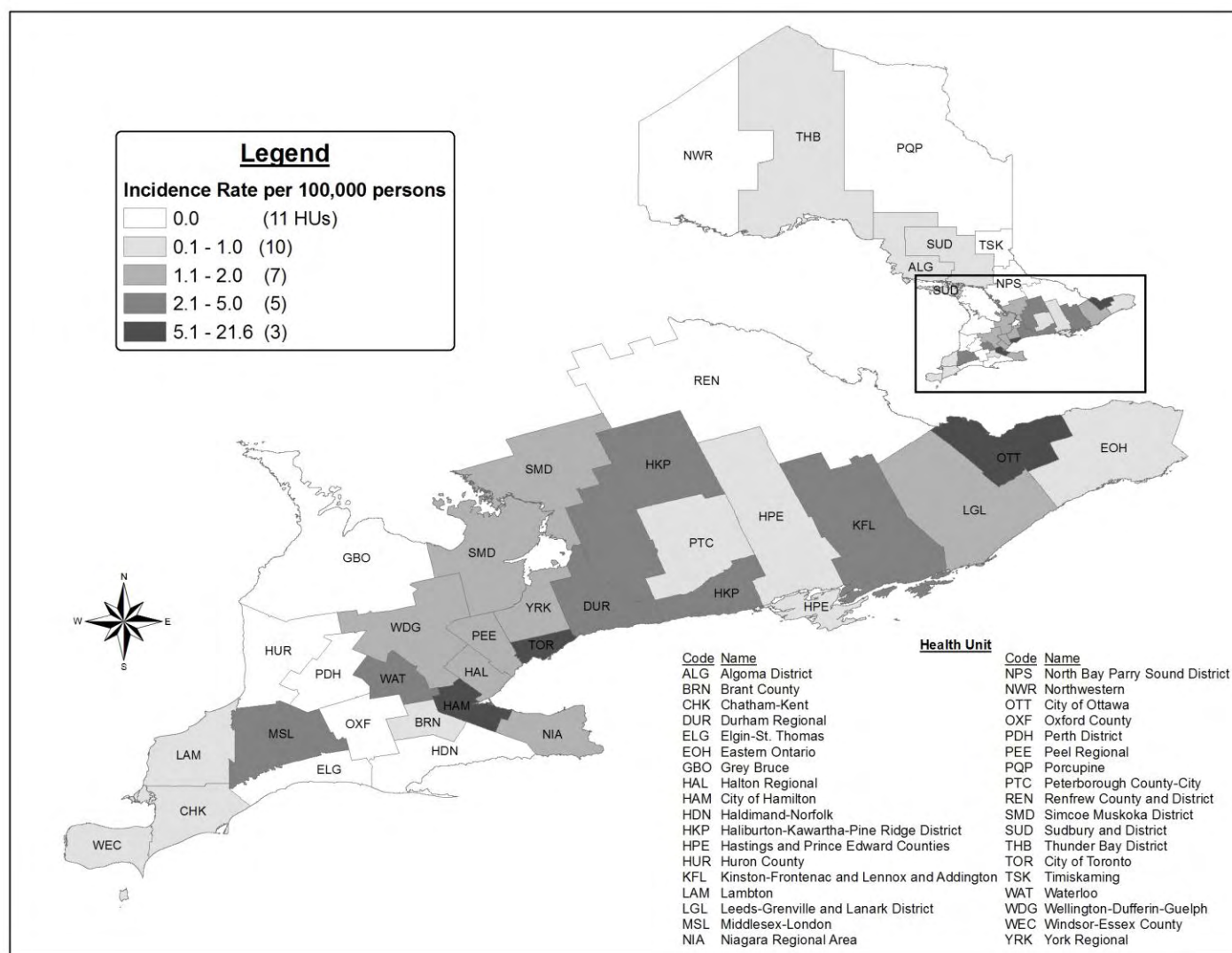
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-14	0	0.0	0	0.0	0	0.0
15-19	2	0.5	21	4.6	23	2.6
20-24	6	1.3	83	17.9	89	9.8
25-29	5	1.1	112	25.3	117	13.1
30-34	2	0.5	97	22.8	99	11.4
35-39	4	0.9	105	23.0	109	11.8
40-44	1	0.2	149	29.8	150	15.0
45-49	2	0.4	98	17.8	100	9.1
50-54	1	0.2	55	11.4	56	5.8
55-59	1	0.2	20	5.0	21	2.6
60-64	2	0.6	10	2.9	12	1.7
65+	0	0.0	7	1.0	7	0.4
Total	26	0.4	757	11.8	783	6.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 1 case for which sex and/or age were reported as unknown.

Map 3.7.1: Incidence of Infectious Syphilis by Public Health Unit: Ontario, 2009



Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Toronto	578	21.6
Ottawa	50	5.7
Hamilton	29	5.5
Middlesex-London	12	2.7
Waterloo Region	13	2.5
Haliburton, Kawartha, Pine Ridge	4	2.3
Durham Region	13	2.1
Kingston, Frontenac, Lennox & Addington	4	2.1
Niagara Region	9	2.0
York Region	19	1.9
Leeds, Grenville and Lanark District	3	1.8
Simcoe Muskoka District	8	1.6
Peel Region	20	1.5
Wellington-Dufferin-Guelph	4	1.5
Halton Region	6	1.2
Chatham-Kent	1	0.9
Algoma District	1	0.8
Lambton County	1	0.8
Windsor-Essex County	3	0.7
Peterborough County-City	1	0.7
Brant County	1	0.7
Thunder Bay District	1	0.6
Hastings & Prince Edward Counties	1	0.6
Eastern Ontario	1	0.5
Sudbury and District	1	0.5
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
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
Timiskaming	0	0.0
Ontario	784	6.0

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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, 2009

Risk Factors and Settings ¹	Females		Males		Total	
	Cases (n=23)	Percent (%)	Cases (n=717)	Percent (%)	Cases (n=740)	Percent (%)
MSM	n/a	n/a	604	84.2%	604	81.6%
No condom used	17	73.9%	436	60.8%	453	61.2%
Multiple sex partners In last 6 months	5	21.7%	258	36.0%	263	35.5%
New partner in past 2 months	3	13.0%	68	9.5%	71	9.6%
Partner with multiple sex partners	3	13.0%	79	11.0%	82	11.1%
Bath house encounter	0	0.0%	55	7.7%	55	7.4%
Judgment impaired by alcohol/drugs	5	21.7%	38	5.3%	43	5.8%
Partner is HIV positive	0	0.0%	11	1.5%	11	1.5%
Other ²	10	43.5%	53	7.4%	63	8.5%

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/20].

Note 1: Cases may report more than 1 risk factor; Risk factors were reported by ~ 94% of reported cases in 2009.

Note 2: Other includes (but is not limited to) the following risk factors: casual encounters, sex with sex trade worker, sex trade worker, shared sex toys, being homeless and had sex for drugs.

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 2000 and 2009 the incidence rate of TB in Ontario decreased steadily from 6.0 to 4.8 cases per 100,000 population. With the exception of 2008, Ontario's annual incidence rates for TB consistently exceeded the national rates (Figure 4.4.1).
- Four percent (26/628) of TB cases reported in 2009 were co-infected with HIV.
- Eighty-six percent of TB cases reported in Ontario between 2000 and 2009 were born outside of Canada, 10% were born in Canada and 3% had an unknown country of origin (Figure 4.4.4).
- In 2009, 10% of TB cases (n=60) demonstrated resistance to at least one TB drug and 2% (n=11) demonstrated multiple drug resistance (MDR) (Table 4.4.7).
- From 2004-2009, the incidence of iGAS in Ontario increased by 57%. The incidence rate peaked at 4.0 cases per 100,000 population in 2008 and then declined by 10% to 3.6 cases per 100,000 population in 2009. (Figure 4.1.1).
- The incidence of legionellosis declined by 12% from the 10 year high of 81 cases in 2008 to 71 cases in 2009. (Figure 4.3.1).
- The incidence of influenza in the 2009/2010 season was higher than all previous non-pandemic seasons with 7,622 confirmed cases. This increase was attributed to the occurrence of the second wave of the H1N1 influenza pandemic.
- In 2009, the incidence rates for iGAS, legionellosis and tuberculosis were highest among cases age 65 years and older (Tables 4.1.3, 4.3.3 and 4.4.3). For influenza, the highest incidence rate occurred among cases under the age of one year and was significantly lower than expected for cases aged 65 years and older (Table 4.2.1).
- While Toronto accounted for the highest proportions of iGAS and influenza cases in 2009, the highest incidence rates for these diseases were reported by Thunder Bay and Timiskaming health units, respectively. Peel Region accounted for the highest proportion of Legionellosis cases while Algoma District reported the highest incidence rate. For TB, Toronto reported the highest proportion of cases and incidence rate in 2009 (Tables 4.1.2, 4.2.2, 4.3.2 and 4.4.2).

Table 4.1: Incidence of Diseases Transmitted by Direct Contact and Respiratory Routes; Ontario, 2000-2009

Diseases Transmitted by Direct Contact or Respiratory Routes	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
	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	409	3.5	328	2.8	385	3.2	409	3.3	288	2.3	392	3.1	465	3.7	501	3.9	512	4.0	467	3.6
Influenza ^{2,3}	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	8,243	63.8	7,622	58.3
Legionellosis	41	0.4	21	0.2	24	0.2	32	0.3	11	0.1	75	0.6	69	0.5	58	0.5	81	0.6	71	0.5
Tuberculosis	700	6.0	699	5.9	716	5.9	693	5.7	661	5.3	654	5.2	691	5.4	680	5.3	603	4.7	628	4.8

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Incidence rate per 100,000 population.

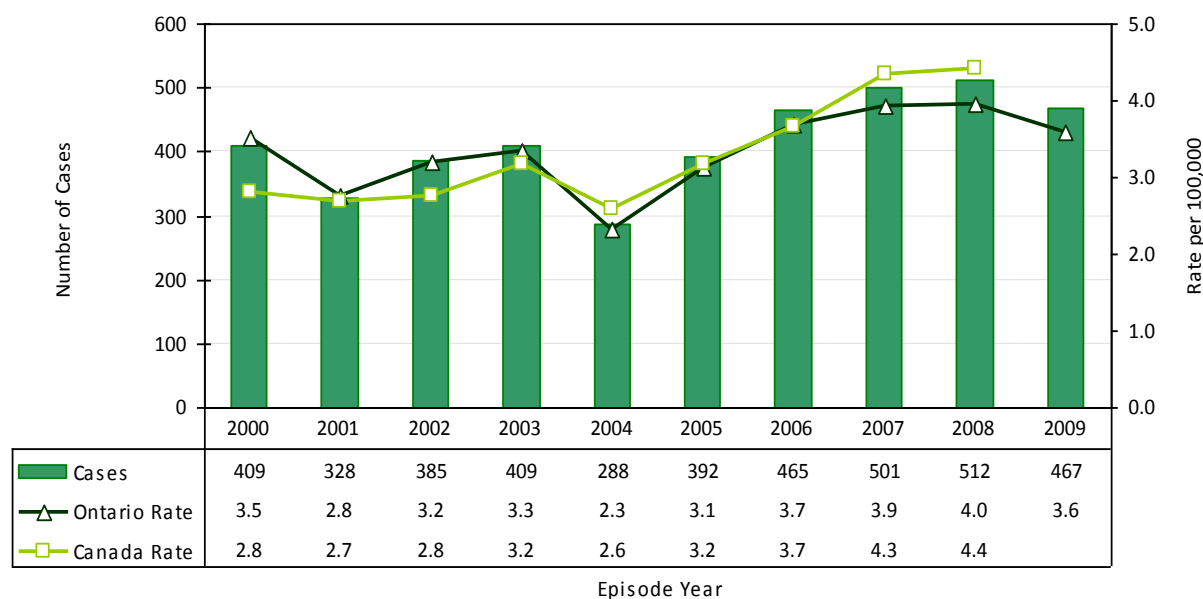
Note 2: Influenza counts and rates are based on seasons that run from September 1 to August 31 of the following year; e.g. 2009 in the table above represents the 2009/2010 influenza season.

Note 3: Non-pandemic influenza data does not include cases routinely reported in aggregate. However pandemic H1N1 influenza cases reported in aggregate are included.

4.1 INVASIVE GROUP A STREPTOCOCCUS DISEASE

- In 2009, Ontario reported 467 cases of invasive group A streptococcus disease (iGAS), representing an incidence rate of 3.6 cases per 100,000 population. This incidence rate was a 10% decrease from the 10-year high of 4.0 cases per 100,000 population in 2008, and the first decrease in incidence since 2004 (Table 4.1).
- From 2003 to 2006, Ontario and Canada reported comparable rates of incidence for iGAS. However, starting in 2007, a notable difference emerged with the national incidence rates exceeding those of Ontario by 10% each year (Figure 4.1.1).
- iGAS cases occurs throughout the year, with most cases occurring in the cooler seasons. In 2009, the number of iGAS cases dropped to their lowest in August (21 cases) and September (20 cases) (Figure 4.1.2).
- Males accounted for 56% (259 cases) of iGAS cases reported in 2009 and had an incidence rate of 4.0 cases per 100,000 population. Females accounted for the remaining 44% (207 cases) of cases and had an incidence rate of 3.1 cases per 100,000 population (Figure 4.1.3, Table 4.1.1).
- Persons in the 0-4, 40-49, 60-64 and 65+ age groups had iGAS incidence rates that were equal to or higher than the overall incidence rate of 3.6 cases per 100,000 population. The incidence rate was highest for males in the 65 and older age group (10.3 per 100,000) - double that of females in the same age group (4.7 cases per 100,000), and almost 3 times higher than the overall incidence rate. With the exception of the 20-29 and 50-59 age groups, males also had higher age-specific incidence rates than females (Figure 4.1.3, Table 4.1.1).
- For the second year in a row, the North West health region, comprised of Thunder Bay District Health Unit and Northwestern Health Unit, reported the highest incidence rates for iGAS in the province. For Thunder Bay (18.5 cases per 100,000), the incidence rate for iGAS was more than 5 times higher than the overall incidence rate for Ontario, and in the case of Northwestern (14.7 cases per 100,000), more than 4 times higher. The higher incidence of iGAS in this health region was attributed mainly to an increase in Thunder Bay District that started in 2007 (Map 4.1.1 and Table 4.1.2).

Figure 4.1.1: Incidence of Invasive Group A Streptococcal Disease in Ontario and Canada: 2000-2009



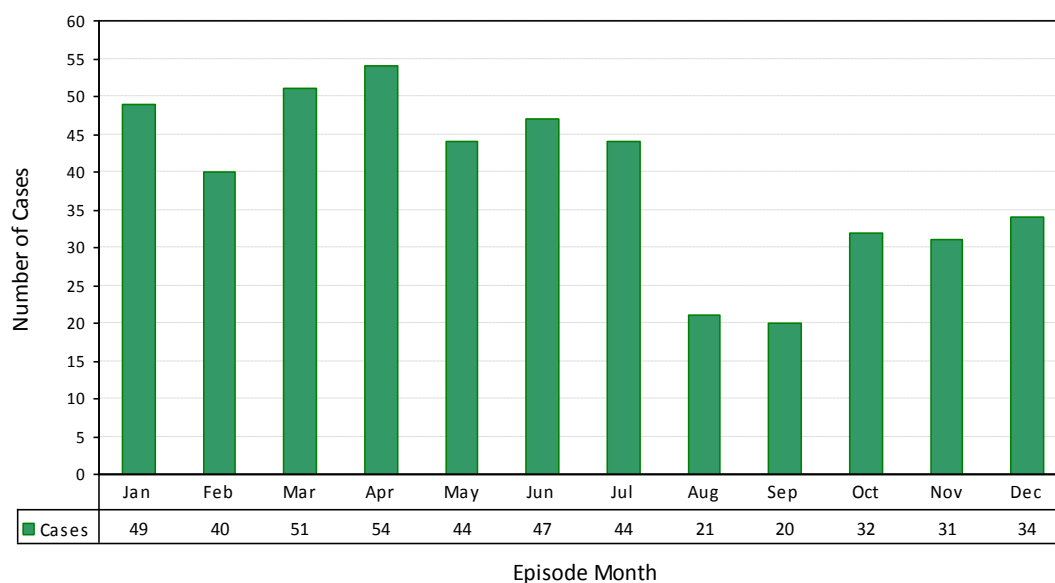
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rates available up to 2008.

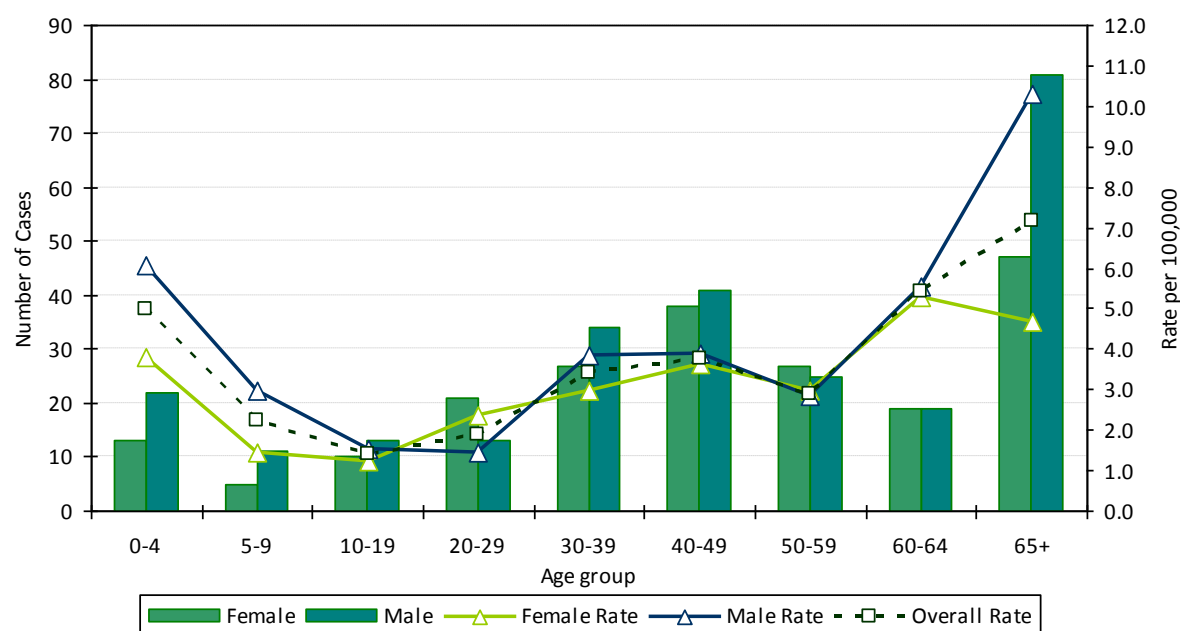
Figure 4.1.2: Incidence of Invasive Group A Streptococcal Disease by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include one case for which sex and/or age was reported as unknown.

Table 4.1.1: Incidence of Invasive Group A Streptococcal Disease by Age and Sex: Ontario, 2009

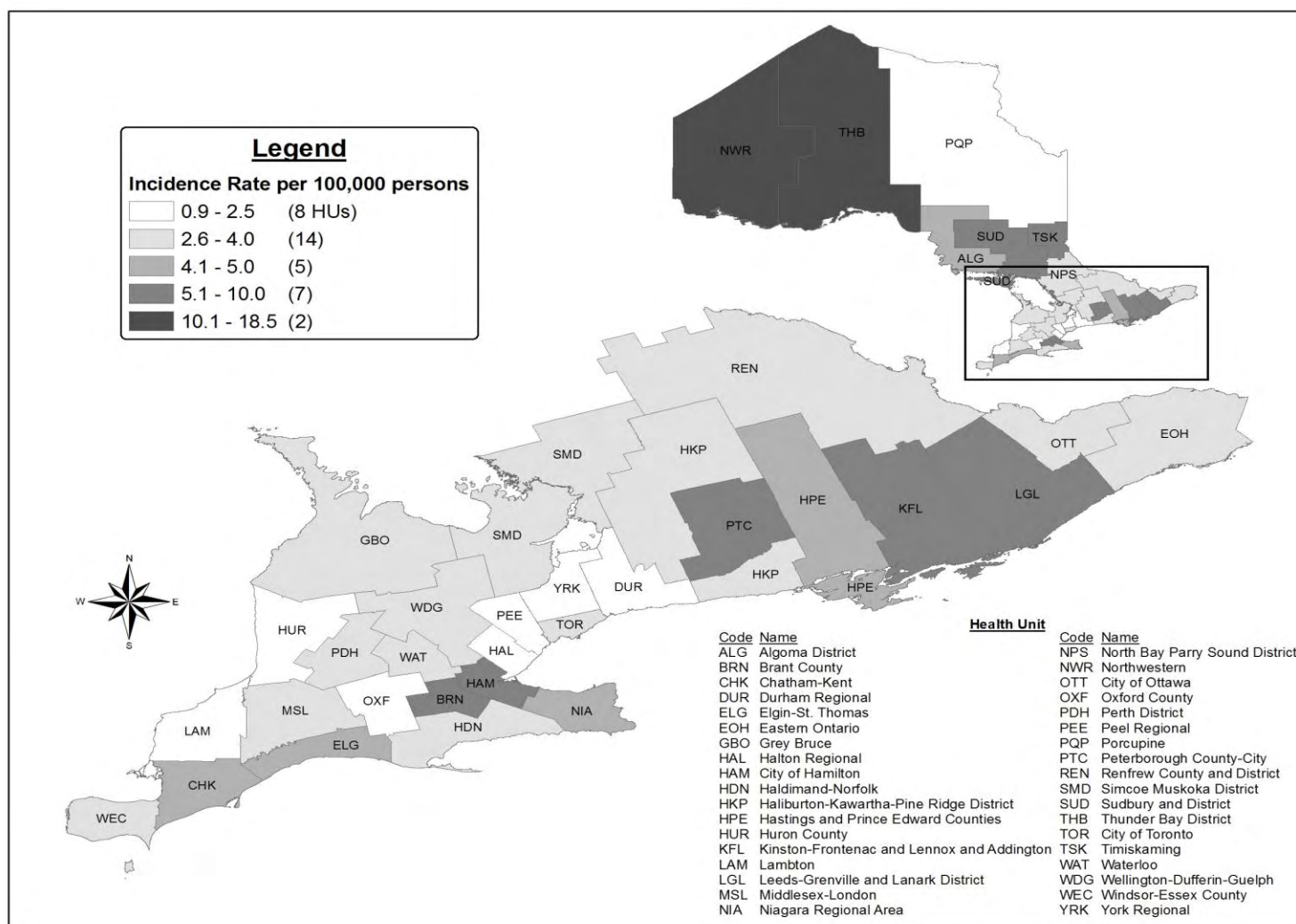
Age group (years)	Females		Males		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	13	3.8	22	6.1	35	5.0
5-9	5	1.4	11	3.0	16	2.2
10-19	10	1.2	13	1.5	23	1.4
20-29	21	2.4	13	1.4	34	1.9
30-39	27	3.0	34	3.9	61	3.4
40-49	38	3.6	41	3.9	79	3.8
50-59	27	3.0	25	2.8	52	2.9
60-64	19	5.3	19	5.5	38	5.4
65+	47	4.7	81	10.3	128	7.2
Total	207	3.1	259	4.0	466	3.6

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include one case for which sex and/or age was reported as unknown.

Map 4.1.1: Incidence of Invasive Group A Streptococcal Disease by Diagnosing Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers to 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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Thunder Bay District	29	18.5
Northwestern	12	14.7
Peterborough County-City	9	6.5
Sudbury and District	12	6.0
Leeds, Grenville and Lanark District	10	5.9
Brant County	8	5.8
Timiskaming	2	5.7
Kingston, Frontenac, Lennox & Addington	10	5.1
Hamilton, City of	27	5.1
Hastings & Prince Edward Counties	8	4.9
Chatham-Kent	5	4.5
Elgin-St. Thomas	4	4.4
Algoma District	5	4.2
Niagara Region	18	4.1
North Bay Parry Sound District	5	4.0
Perth District	3	3.9
Ottawa, City of	34	3.9
Wellington-Dufferin-Guelph	10	3.7
Waterloo Region	19	3.7
Toronto	96	3.6
Haliburton, Kawartha, Pine Ridge	6	3.4
Middlesex-London	15	3.3
Simcoe Muskoka District	16	3.1
Grey Bruce	5	3.1
Eastern Ontario	6	3.0
Renfrew County and District	3	2.9
Windsor-Essex County	11	2.7
Haldimand-Norfolk	3	2.7
York Region	25	2.5
Porcupine	2	2.3
Peel Region	30	2.3
Huron County	1	1.6
Durham Region	10	1.6
Lambton County	2	1.5
Halton Region	5	1.0
Oxford County	1	0.9
Ontario	467	3.6

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

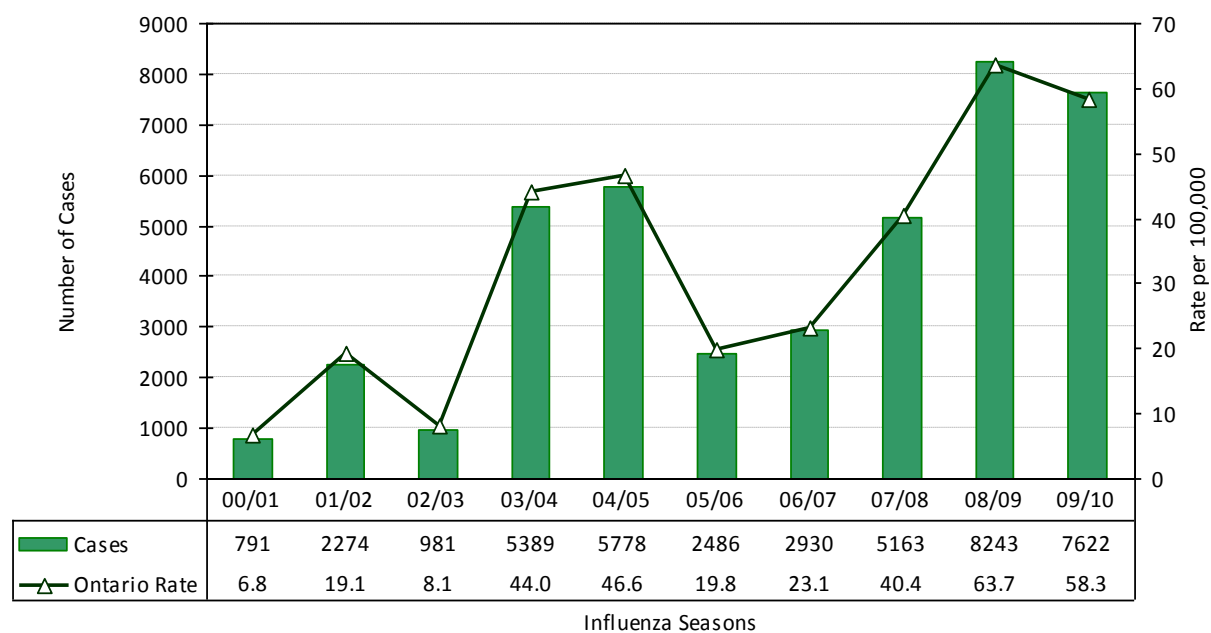
Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases.

4.2 INFLUENZA

- A total of 7,622 confirmed cases of influenza were reported in Ontario in the 2009/2010 influenza season which ran from September 1, 2009 to August 31, 2010. This figure represents an incidence rate of 58.3 cases per 100,000 population (Figure 4.2.1).
- The incidence of influenza in the 2009/2010 season was higher than all previous non-pandemic influenza seasons and was second only to the 2008/2009 season. The high counts in the 2008/2009 and 2009/2010 seasons was attributed to the occurrence of the H1N1 Influenza pandemic which accounted for 49% (4040/8243) and 62% (7622/4,729) of influenza cases reported in the 2008/2009 and 2009/2010 seasons, respectively (Figure 4.2.1).
- The incidence of influenza in the 2009/2010 season peaked in November 2009, which coincided with the rapid rise in disease incidence during the second wave of the pandemic. The month of November alone accounted for 4,200 cases or 55% of cases reported in the 2009/2010 season (Figure 4.2.2).
- The distribution of influenza cases in the 2009/2010 season was more compact and peaked earlier than previous non-pandemic seasons. Virtually all of the cases in the 2009/2010 season occurred in October and November before rapidly tapering off from December 2009 through to the end of the season in August 2010 (Figure 4.2.2).
- Influenza disproportionately affects individuals at both ends of the age spectrum, that is, children under the age of five years and older adults over the age of 65 years. In the 2009/2010 season, age-specific trends in incidence rate were different from past non-pandemic influenza seasons. In general, the incidence rate for influenza decreased among older age groups, with cases in the age groups between 5 and 64 years accounting for 74% of influenza cases reported in the 2009/2010 season (Figure 4.2.3 and Table 4.2.1).
- While children under the age of one year experienced the highest incidence rate of influenza (300 cases per 100,000 population), the incidence rate for cases aged 65 years and older was significantly lower than expected in comparison to cases in the age groups from 5 to 64 years (Figure 4.2.3, Table 4.2.1).
- Toronto and Peel Region reported the highest incidences of influenza with 1,261 and 633 cases, respectively. The highest incidence rates were reported by Timiskaming Health Unit with 181 cases per 100,000 population and Porcupine Health Unit with 175 cases per 100,000 population (Table 4.2.2).

Figure 4.2.1: Incidence of Influenza in Ontario: 2000/2001 - 2009/2010

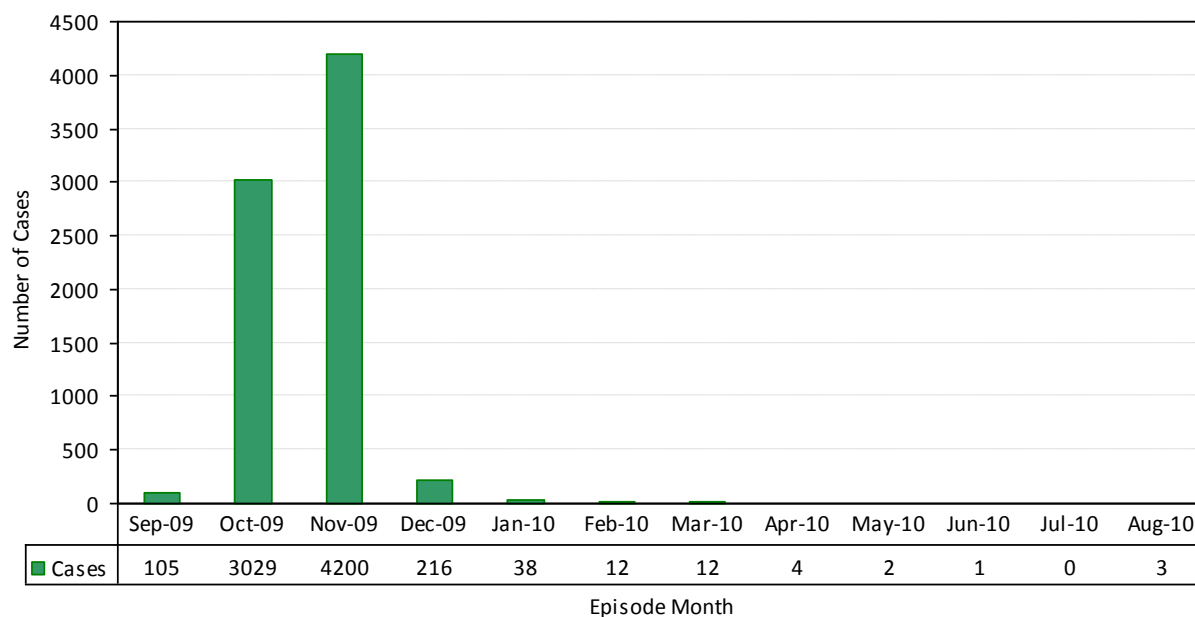


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: National rates not presented; available only by calendar year and are not directly comparable.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

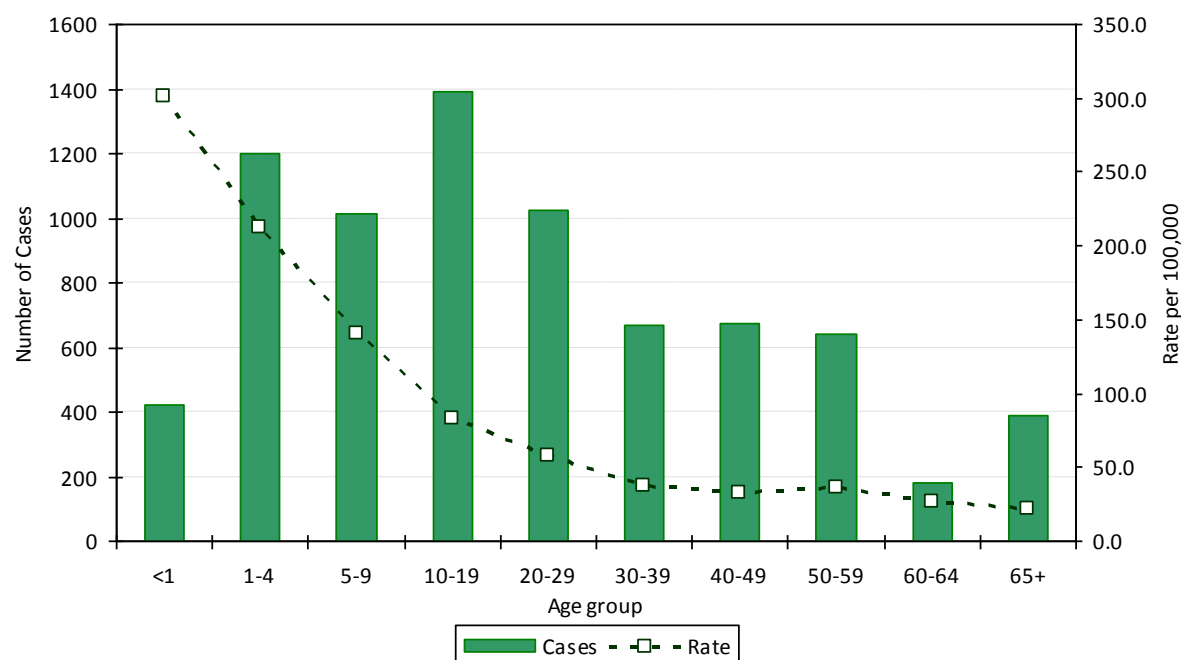
Figure 4.2.2: Incidence of Influenza by Episode Month: Ontario, 2009/2010



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/05/09].

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, 2009/2010



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/05/09].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include 18 cases for which age was reported as unknown.

Table 4.2.1: Incidence of Influenza by Age Group: Ontario, 2009/2010

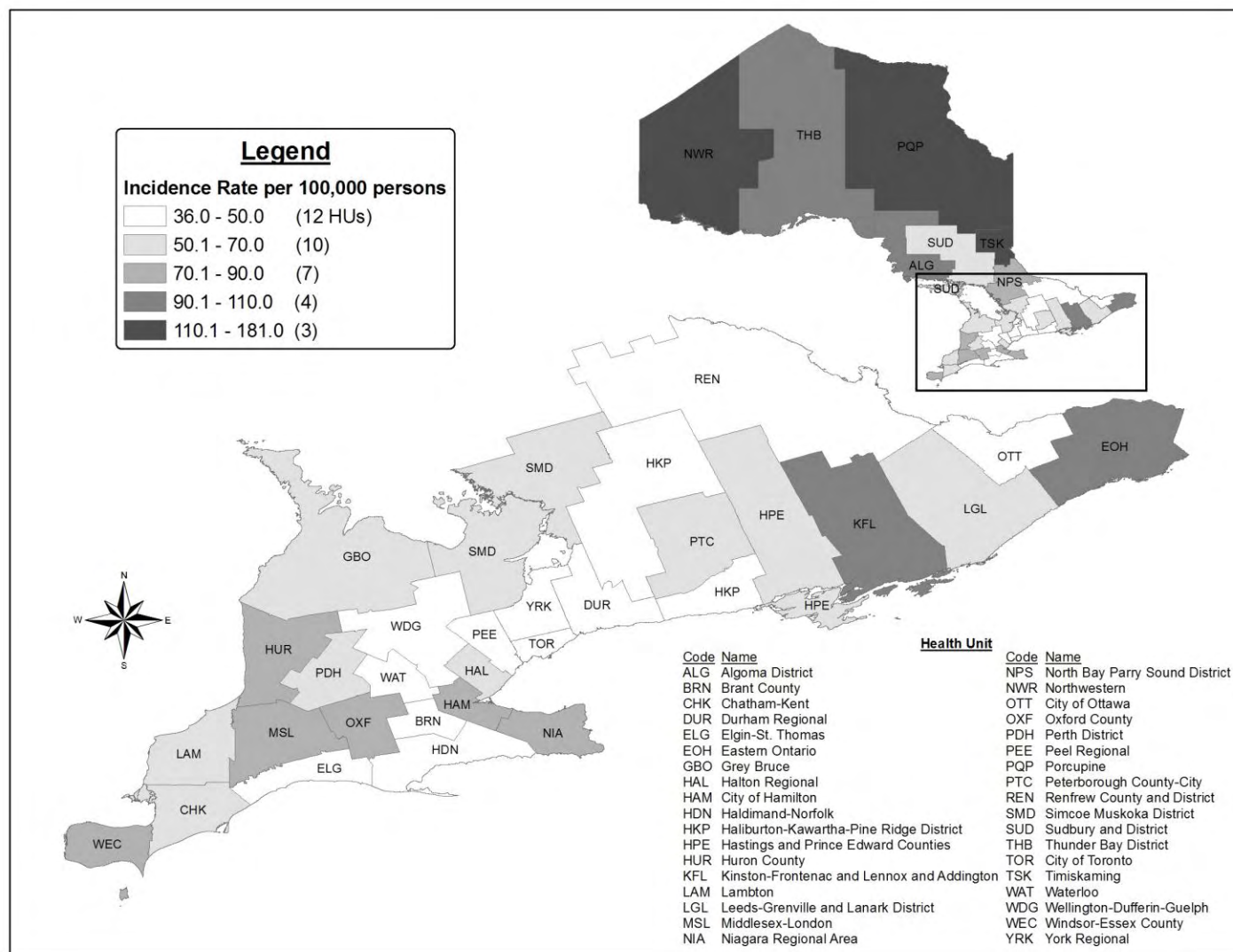
Age group (years)	Number of cases	Rate/100,000 population
<1	420	300.3
1-4	1,202	212.5
5-9	1,011	140.5
10-19	1,391	83.1
20-29	1,025	57.0
30-39	671	37.5
40-49	672	32.0
50-59	639	35.6
60-64	183	26.0
65+	390	21.8
Total	7,604	58.2

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/05/09].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include 18 cases for which age was reported as unknown.

Map 4.2.1: Incidence of Influenza by Public Health Unit: Ontario, 2009/2010



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/05/09].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers the health unit where the case resided at the time of disease identification; Includes travel-related cases.

Table 4.2.2: Incidence of Influenza by Public Health Unit: Ontario, 2009/2010

Public Health Unit¹	Number of cases	Rate/100,000 population
Timiskaming	63	181.0
Porcupine	153	174.7
Northwestern	132	161.5
Eastern Ontario	201	101.0
Thunder Bay District	155	99.0
Kingston, Frontenac, Lennox & Addington	181	93.2
Algoma District	108	90.8
North Bay Parry Sound District	110	87.1
Windsor-Essex County	348	86.2
Oxford County	92	86.1
Huron County	52	85.8
Hamilton	429	80.9
Niagara Region	355	80.2
Middlesex-London	341	75.4
Leeds, Grenville and Lanark District	114	67.7
Perth District	51	66.4
Grey Bruce	108	66.2
Hastings & Prince Edward Counties	104	63.9
Simcoe Muskoka District	315	61.3
Halton Region	299	60.7
Lambton County	80	60.5
Peterborough County-City	83	59.9
Sudbury and District	111	55.4
Chatham-Kent	60	54.4
Elgin-St. Thomas	45	50.0
Haliburton, Kawartha, Pine Ridge	86	48.5
Ottawa	426	48.3
Peel Region	633	48.2
Haldimand-Norfolk	53	47.8
Toronto	1,261	47.1
Renfrew County and District	48	46.7
Waterloo Region	238	45.9
Durham Region	261	42.5
Wellington-Dufferin-Guelph	110	40.4
York Region	366	36.0
Brant County	50	36.0
Ontario	7,622	58.3

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/05/09].

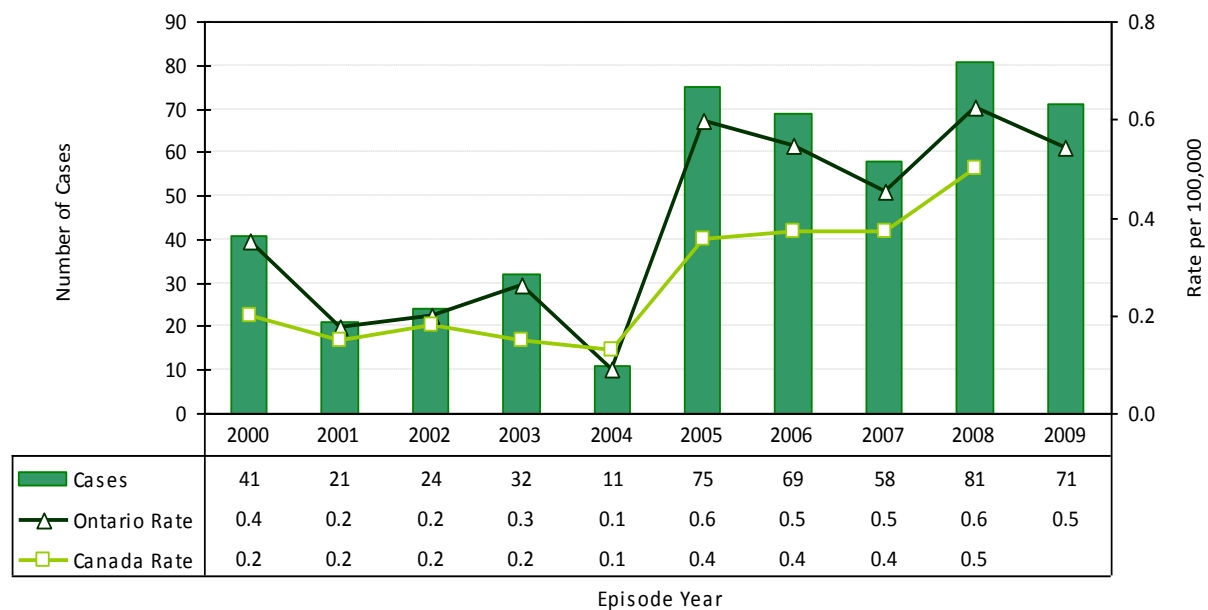
Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

4.3 LEGIONELLOSIS

- In 2009, Ontario reported 71 cases of legionellosis, which represents an incidence rate of 0.5 cases per 100,000 population. The incidence of legionellosis in 2009 declined by 14% from the 10 year high of 81 cases in 2008 (Table 4.3.1).
- During the period 2000 to 2004, the incidence of legionellosis in Ontario declined by 74% with a low of 11 cases in 2004. In 2005, the incidence of legionellosis increased, due mainly to a large outbreak in Toronto. Since then, the incidence of legionellosis has remained higher than 2000-2004 levels. (Figure 4.3.1).
- During the period 2000 to 2004, a decline in the incidence rate for legionellosis also occurred at the national level with a 35% decrease in incidence from 0.20 cases per 100,000 population in 2000 to 0.13 cases per 100,000 population in 2004. Starting in 2005, annual incidence rates for legionellosis at the national level increased sharply but continued to remain below those of Ontario (Figure 4.3.1).
- In Ontario, legionellosis typically demonstrates a seasonal pattern, with most cases occurring late summer to early fall. However in 2009, legionellosis cases peaked earlier in the summer and into the fall and was followed by a second peak in December (Figure 4.3.2).
- The incidence of legionellosis increased with increasing age, with 97% (69/71) of cases occurring in individuals aged 40 years and older in 2009 (Figure 4.3.3, Table 4.3.1).
- In 2009, females accounted for 32% (23 cases) of reported cases of legionellosis for an incidence rate of 0.3 cases per 100,000 population. Males accounted for the remaining 68% (48 cases) of cases for an incidence rate of 0.7 cases per 100,000 population (Figure 4.3.3, Table 4.3.1).
- Incidence rates for legionellosis peaked in the 65+ age group for both genders. However, the incidence rate for men in this age group was three times higher than that of women in the same age group, and six times higher than the overall incidence rate for the province. For women in this age group, the incidence rate was two times higher than the overall incidence rate for the province (Figure 4.3.3, Table 4.3.1).
- Over half (19/36, 53%) of Ontario health units reported no cases of legionellosis in 2009. Of those reporting, 71% (12/17) reported incidence rates that were higher than the overall provincial incidence rate of 0.5 cases per 100,000 population. Algoma reported 2 cases but had the highest incidence rate of legionellosis at 1.7 cases per 100,000 population; Peel region was among the health units with the highest number of reported cases (18 cases) as well as among those with the highest incidence rates (1.4 cases per 100,000 population) (Table 4.3.1).

Figure 4.3.1: Incidence of Legionellosis in Ontario and Canada: 2000-2009



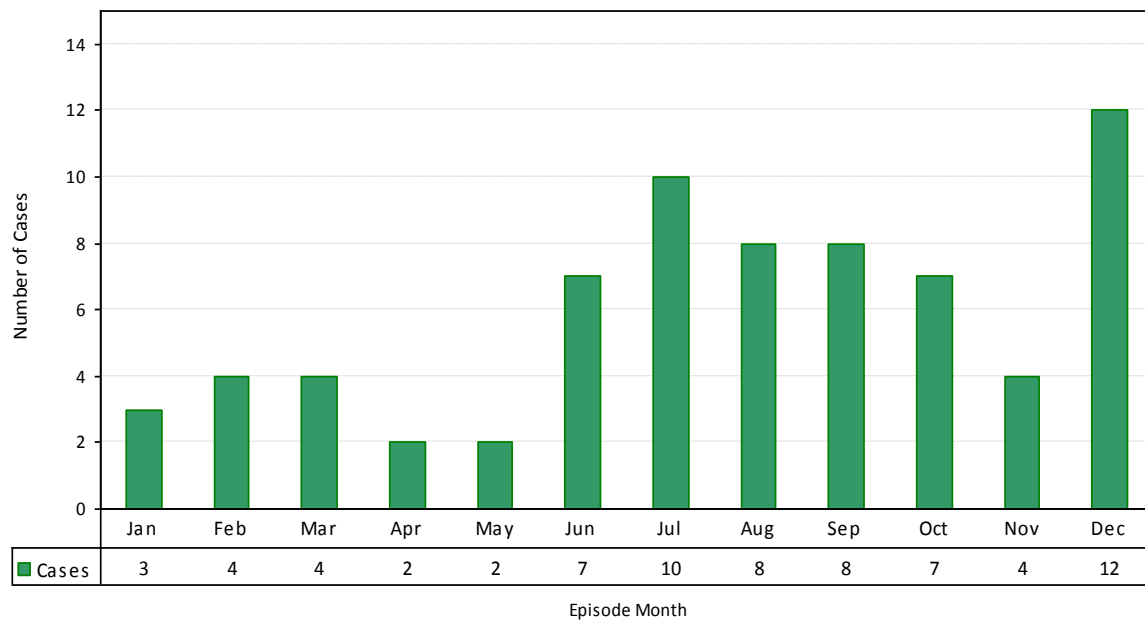
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

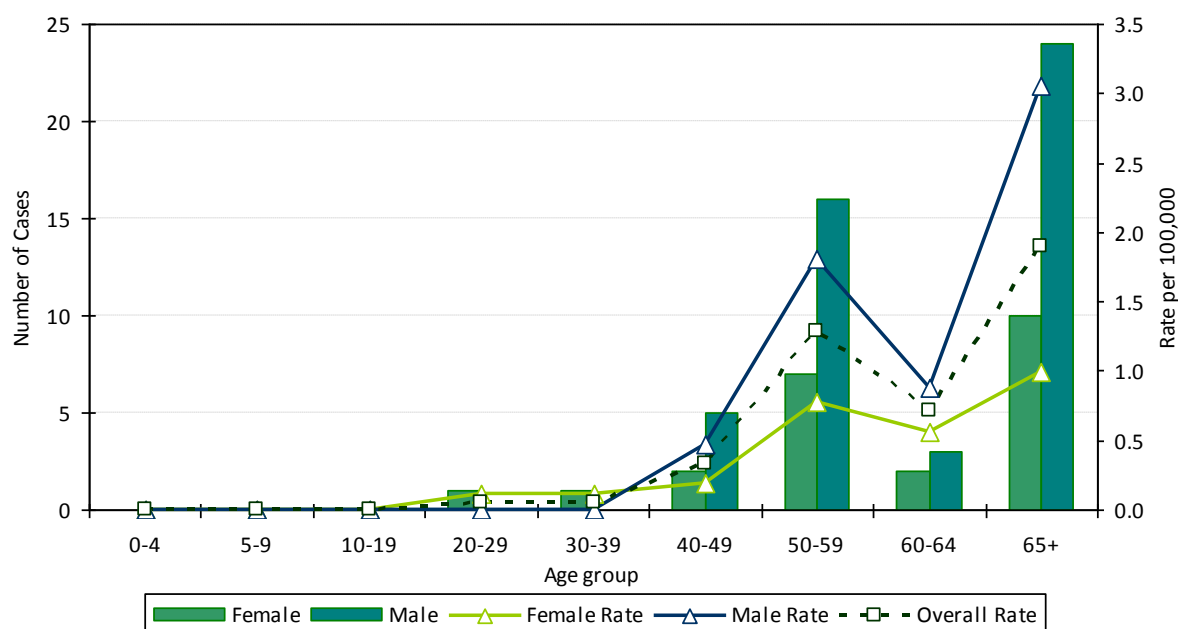
Figure 4.3.2: Incidence of Legionellosis by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

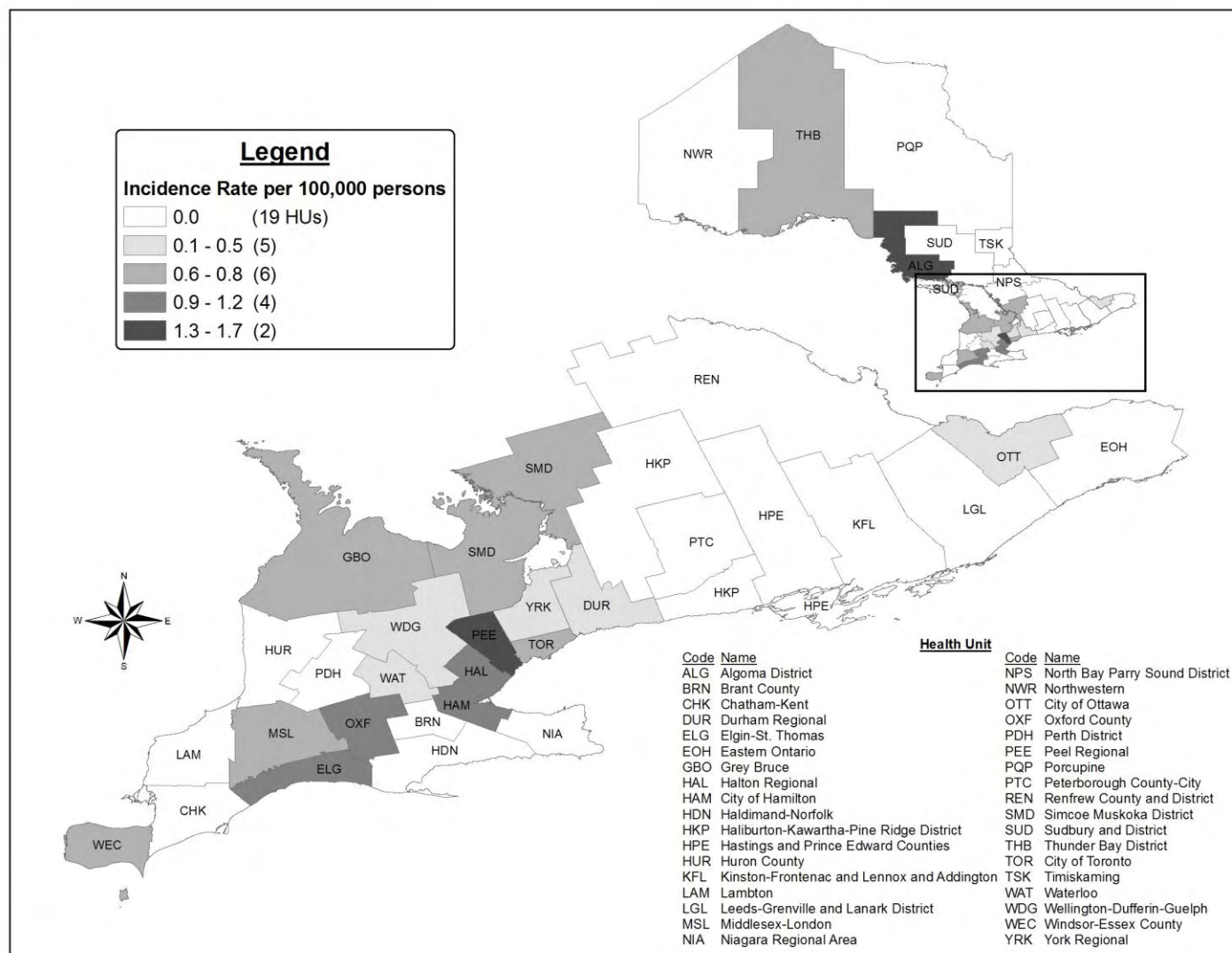
Table 4.3.1: Incidence of Legionellosis by Age and Sex: Ontario, 2009

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	0	0.0	0	0.0	0	0.0
5-9	0	0.0	0	0.0	0	0.0
10-19	0	0.0	0	0.0	0	0.0
20-29	1	0.1	0	0.0	1	0.1
30-39	1	0.1	0	0.0	1	0.1
40-49	2	0.2	5	0.5	7	0.3
50-59	7	0.8	16	1.8	23	1.3
60-64	2	0.6	3	0.9	5	0.7
65+	10	1.0	24	3.1	34	1.9
Total	23	0.3	48	0.7	71	0.5

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Map 4.3.1: Incidence of Legionellosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers to 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, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Algoma District	2	1.7
Peel Region	18	1.4
Halton Region	6	1.2
Elgin-St. Thomas	1	1.1
Hamilton	6	1.1
Oxford County	1	0.9
Simcoe Muskoka District	4	0.8
Middlesex-London	3	0.7
Windsor-Essex County	3	0.7
Grey Bruce	1	0.6
Thunder Bay District	1	0.6
Toronto	15	0.6
Durham Region	3	0.5
Waterloo Region	2	0.4
Wellington-Dufferin-Guelph	1	0.4
York Region	3	0.3
Ottawa	1	0.1
Brant County	0	0.0
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton, Kawartha, Pine Ridge	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 and Lanark District	0	0.0
Niagara Region	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Ontario	71	0.5

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

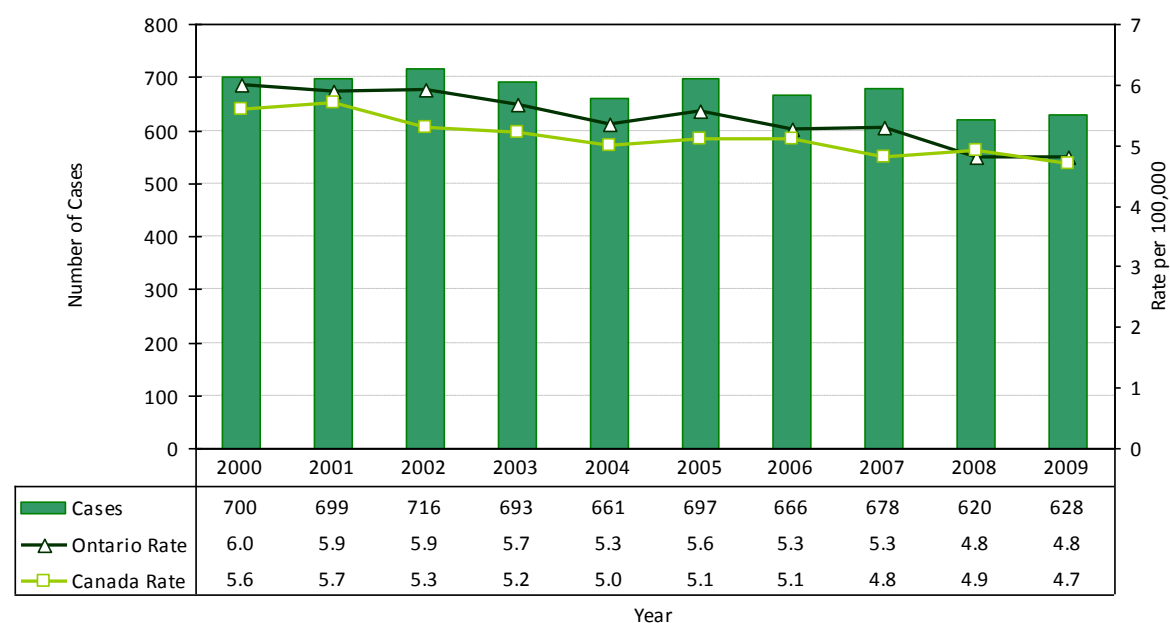
Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

4.4 TUBERCULOSIS

- In 2009, 628 persons were diagnosed with tuberculosis (TB) in Ontario, which represents an incidence rate of 4.8 cases per 100,000 population (Figure 4.4.1).
- Between 2000 and 2009, the incidence rate of TB in Ontario decreased steadily from 6.0 to 4.8 cases per 100,000 population. With the exception of 2008, Ontario's annual incidence rates for TB consistently exceeded the national rates during this period (Figure 4.4.1).
- In 2009, the incidence rate for TB among males was 5.3 cases per 100,000 population compared to 4.3 cases per 100,000 population for females. Age-specific rates were highest among the 20-29, 30-39 and 65 and older age groups. These rates were 42% to 67% higher than the overall incidence rate for the province at 6.8, 6.8 and 8.0 cases per 100,000 population, respectively (Figure 4.4.3, Table 4.4.1).
- For the second consecutive year, Toronto, Peel Region and Northwestern reported the highest incidence rates for TB in Ontario. The incidence rate for TB in 2009 was 10.3 cases per 100,000 population for Toronto, 9.2 cases per 100,000 population for Peel Region and 7.3 cases per 100,000 population for Northwestern (Table 4.4.2).
- Residence in a TB endemic country (481), abnormal x-ray (186), travel to an endemic country (98) and being a close contact of a TB case (88) were the most commonly reported risk factors for acquiring TB in 2009 among TB cases who reported at least one risk factor (Table 4.4.3).
- Among TB cases reported in 2009, 26 tested positive for HIV, for an overall co-infection rate of 4%.
- Of the 6,730 individuals who contracted TB between 2000 and 2009, 5,794 (86%) were born outside Canada, and 706 (10%) were born within Canada. Country of birth was unknown or missing for 3% (230) of these cases (Table 4.4.4).
- The top five countries of birth for TB cases diagnosed with active infections and who were born outside of Canada between 2000 and 2009 were India (19%), the Philippines (12%), China (11%), Vietnam (7%) and Pakistan (5.0%) (Table 4.4.4).
- Among active TB cases that died in 2009 (n=50), TB was classified as an underlying cause of death for 22%, a contributing cause of death for 36% and unrelated to cause of death for 30%.
- In 2009, 10% of TB cases (n=60) demonstrated resistance to at least one TB drug and 2% (n=11) demonstrated multiple drug resistance (MDR) (Table 4.4.7).

Figure 4.4.1: Incidence of Tuberculosis in Ontario and Canada: 2000-2009



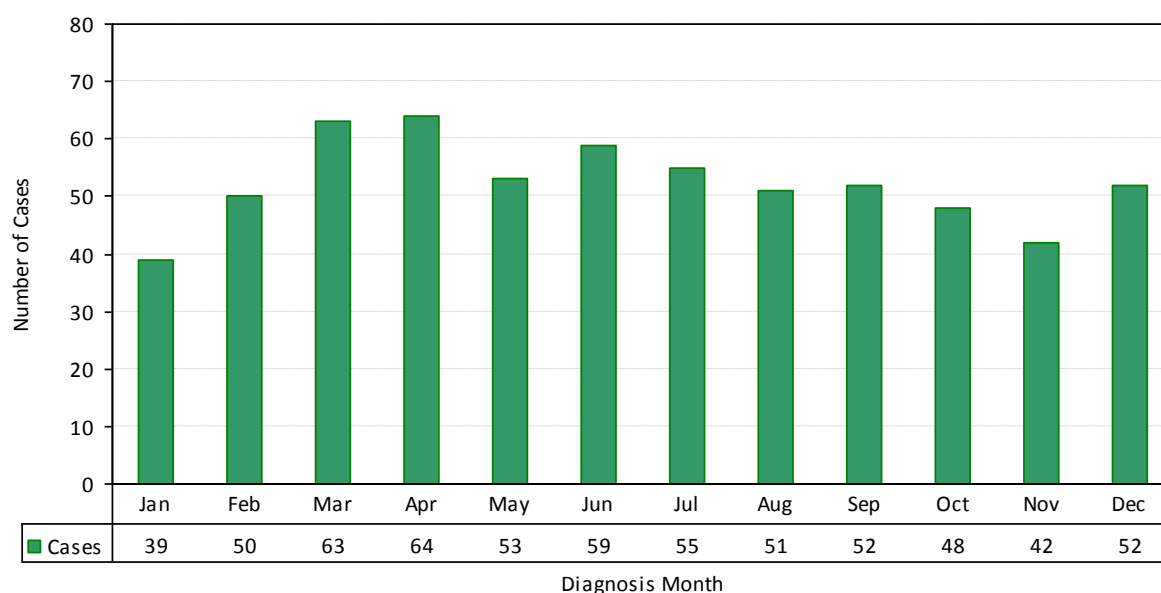
Ontario Cases: Ontario Ministry of Health and Long-Term Care, Reportable Disease Information System (RDIS) database (for 2000-2004) and integrated Public Health Information System (iPHIS) database (for 2005-2009).

Canadian Rate: Public Health Agency of Canada. Tuberculosis in Canada 2008 (pre-release). Ottawa (Canada): Minister of Public Works & Government Services Canada, 2009. Available online: <http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan09pre/pdf/tbcan2009pre-eng.pdf>.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: 2000-2004 Ontario counts and rates are based on episode date, while 2005-2009 Ontario counts and rates are based on TB diagnosis date. It is possible that some cases counted via diagnosis date after 2005 may have been counted by episode date before 2005.

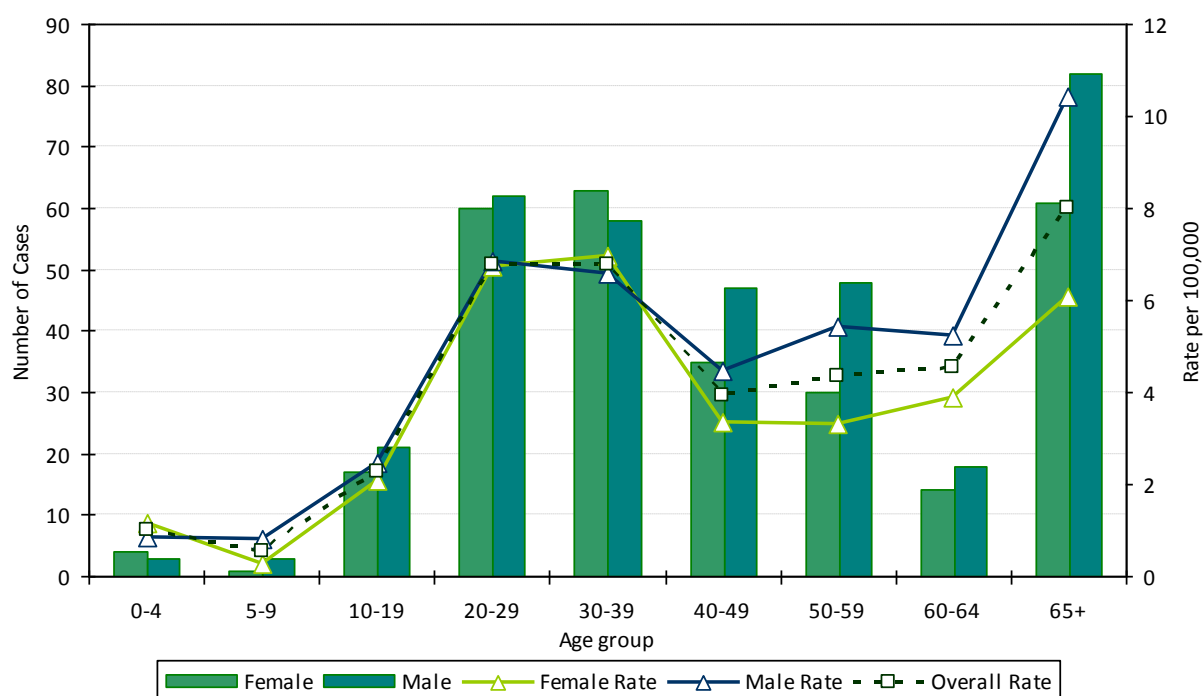
Figure 4.4.2: Number of reported cases of Tuberculosis by month, Ontario 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

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

Figure 4.4.3: Incidence of Tuberculosis by Age and Sex: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Does not include one case for which age and sex were reported as unknown.

Table 4.4.1: Incidence of Tuberculosis by Age and Sex: Ontario, 2009

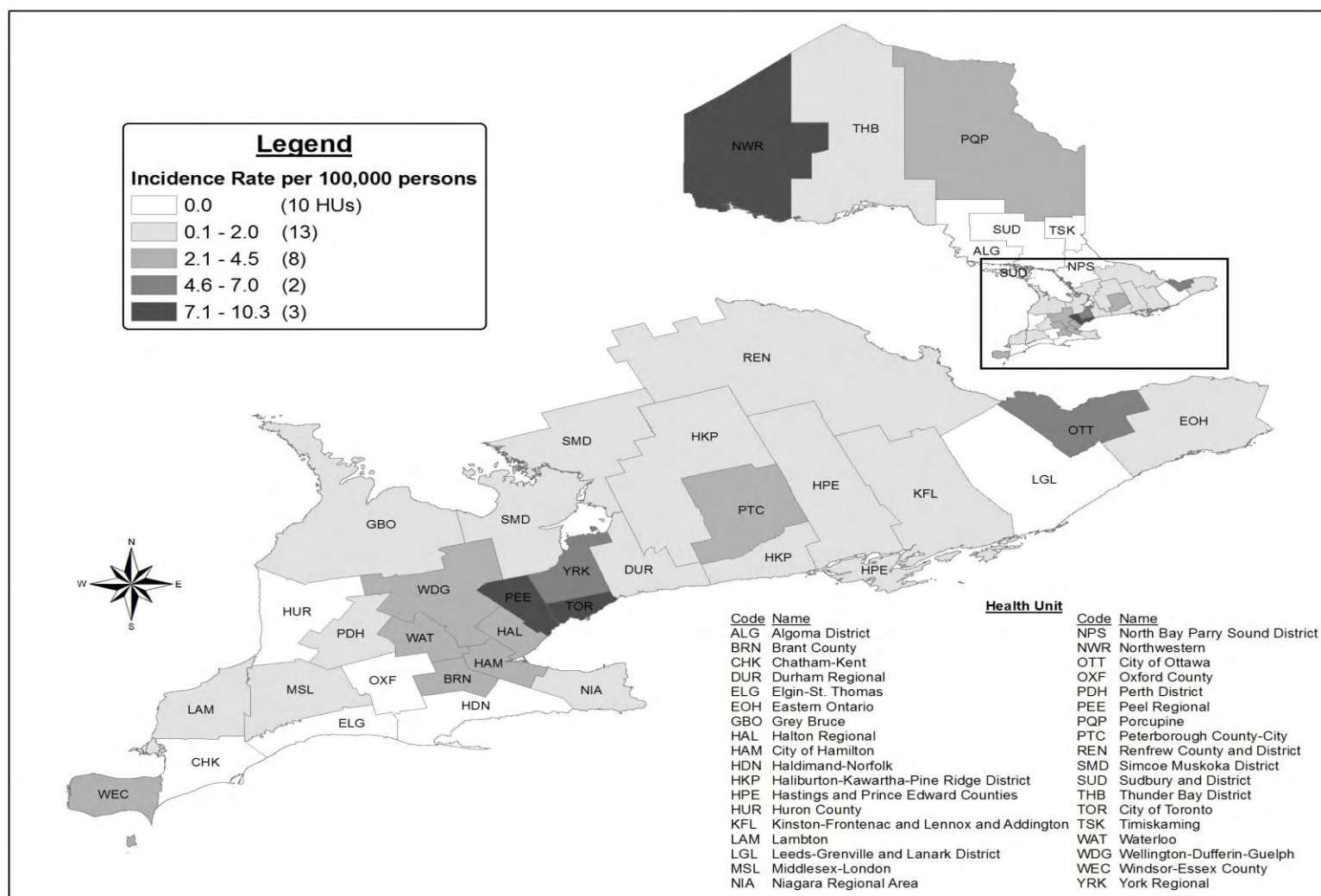
Age group (years)	Females		Males		Total	
	Number of Cases	Rate/ 100,000 population	Number of Cases	Rate/ 100,000 population	Number of Cases	Rate/ 100,000 population
0-4	4	1.2	3	0.8	7	1.0
5-9	1	0.3	3	0.8	4	0.6
10-19	17	2.1	21	2.5	38	2.3
20-29	60	6.7	62	6.8	122	6.8
30-39	63	6.9	58	6.6	121	6.8
40-49	35	3.3	47	4.5	82	3.9
50-59	30	3.3	48	5.4	78	4.4
60-64	14	3.9	18	5.2	32	4.5
65+	61	6.1	82	10.4	143	8.0
Total	285	4.3	342	5.3	627	4.8

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Ontario Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Total does not include one case for which age and sex were reported as unknown.

Map 4.4.1: Incidence Rate of Tuberculosis by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/02/2010].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Tuberculosis by Public Health Unit: Ontario, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Toronto	273	10.3
Peel Region	118	9.2
Northwestern	6	7.3
York Region	60	6.1
Ottawa	48	5.5
Porcupine	4	4.5
Windsor-Essex County	15	3.7
Hamilton	19	3.6
Waterloo Region	17	3.3
Halton Region	14	2.9
Brant County	4	2.9
Wellington-Dufferin-Guelph	7	2.6
Peterborough County-City	3	2.2
Eastern Ontario	4	2.0
Durham Region	11	1.8
Middlesex-London	8	1.8
Kingston, Frontenac, Lennox & Addington	3	1.6
Perth District	1	1.3
Renfrew County and District	1	1.0
Simcoe Muskoka District	4	0.8
Lambton County	1	0.8
Niagara Region	3	0.7
Thunder Bay District	1	0.6
Grey Bruce	1	0.6
Hastings & Prince Edward Counties	1	0.6
Haliburton, Kawartha, Pine Ridge	1	0.6
Algoma District	0	0.0
Chatham-Kent	0	0.0
Elgin-St. Thomas	0	0.0
Haldimand-Norfolk	0	0.0
Huron County	0	0.0
Leeds, Grenville and Lanark District	0	0.0
North Bay Parry Sound District	0	0.0
Oxford County	0	0.0
Sudbury and District	0	0.0
Timiskaming	0	0.0
Ontario	628	4.8

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 4.4.3: Exposure Settings and Risk Factors for Tuberculosis, Ontario: 2009

Risk Factors and Exposure Setting		Number of Cases Reporting (n=628)
Social/ Behavioural Risk Factors	Close contact of a TB case	88
	None	61
	Injection substance abuse	22
	Low income	18
	Other ¹	5
	Smoker	7
	Under-housed / homeless	8
	Unknown ²	2
Exposure Settings	Lived in an endemic country	481
	Travelled to an endemic country	98
	Resident of an institution	25
	Other ³	13
	Unknown ²	15
	Lived in a First Nation community	6
	Lived in a shelter	7
Medical Risk Factor	Abnormal X-ray	186
	Diabetes mellitus	48
	Inadequate nutrition	17
	Inadequate treatment	15
	No medical risk factors	15
	Previous history of TB	10
	Age (< 5yrs when infected)	7
	Other medical risk factors ⁴	5
	Pregnant	3
	Other underlying medical conditions ⁵	80
	Cancer	24
	Immuno compromised	20
	Chronic renal failure / haemodialysis	13
	Blood borne Infections	10
	Cardiovascular disease	9
	Other respiratory diseases	7
	Autoimmune	6
	Asthma	1

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: "Other" includes factors such as new to Canada and refugee. Risk factors in this category may not be specific to the acquisition of TB.

Note 2: Unknown or value missing.

Note 3: Includes factors such as TB was endemic in Canada at the time of exposure and refugee camp

Note 4: Includes factors such as personal stress and mental health condition

Note 5: In addition to the medical conditions reported in the table, other underlying medical conditions include factors such as; Crohns, ulcers, Graves disease and hypothyroidism. Cases can report more than one underlying medical condition, thus the total number of other underlying medical conditions does not equal the sum of the subset of medical conditions specified.

Table 4.4.4: Tuberculosis by Country of Origin: Ontario, 2000-2009¹

Country of Origin	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Born Outside Canada											
India	86	95	101	115	115	118	114	110	105	121	1,080
Philippines	70	58	69	73	67	60	76	70	88	87	718
China	66	56	72	63	52	64	78	72	59	57	639
Vietnam	47	44	53	48	56	36	37	31	37	28	417
Pakistan	26	36	30	25	29	24	36	38	27	17	288
Somalia	38	21	26	27	22	29	20	19	26	20	248
Sri Lanka	18	18	14	23	21	24	21	29	22	12	202
Hong Kong	40	24	27	27	12	9	14	19	13	13	198
Ethiopia	16	13	16	25	18	24	23	12	10	15	172
South Korea	16	19	12	7	11	8	11	14	4	8	110
Other	166	185	198	172	173	171	153	186	154	164	1,722
Unspecified country ²	--	--	--	--	--	17	5	0	5	1	28
Sub-Total	589	569	618	605	576	584	588	600	550	543	5,794
Born in Canada											
Non-Aboriginal	73	83	67	56	45	47	51	48	52	70	592
Registered/ Status Indian ³	12	18	13	8	17	6	7	13	6	9	109
Inuit	0	0	1	0	0	1	0	1	2	0	5
Sub-Total	85	101	81	64	62	54	58	62	60	79	706
Unknown ^{4, 5}	26	29	17	24	23	59	20	16	10	6	230
TOTAL	700	699	716	693	661	697	666	678	620	628	6,730

Ontario Cases: Ontario Ministry of Health and Long-Term Care, Reportable Disease Information System (RDIS) database (for 2000-2004) and integrated Public Health Information System (iPHIS) database, extracted [2011/04/15] (for 2005-2009).

Note 1: 2000-2004 Ontario counts and rates are based on episode date, while 2005-2009 Ontario counts and rates are based on TB diagnosis date. It is possible that some cases counted via diagnosis date after 2005 may have been counted by episode date before 2005.

Note 2: Includes cases who reported being born outside of Canada, but birth country was missing or unknown.

Note 3: Registered / Status Indian may include cases that are classified as 'Other Aboriginal'.

Note 4: For cases from 2000 to 2004, includes cases with a missing birth country, i.e. possible birth outside of Canada but country of birth is unknown.

Note 5: For cases from 2005 to 2009, both birth country and origin, is missing or is unknown.

Table 4.4.5: Detection Method for Tuberculosis Cases: Ontario, 2009

Method of Detection ¹	Number of cases	Percentage of Total (n=628)
Symptom presentation	507	80.7%
Immigration screening	33	5.6%
Other ²	22	3.5%
Contact tracing	20	3.2%
Routine screening	19	3.0%
Unknown	19	3.0%
Targeted screening	8	1.3%
Total	628	100%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: Method of detection refers to the means through which the case of Tuberculosis was initially identified.

Note 2: Other includes post-mortem detection.

Table 4.4.6: Tuberculosis Cases by Diagnostic Site: Ontario, 2009

Diagnostic Site ¹	Number of cases	Percentage of Total (n=628)
Respiratory System	419	60.2%
Lymphatic System	109	15.7%
Pleurisy	40	5.7%
Gastrointestinal System	28	4.0%
Nervous System	25	3.6%
Bones and Joints System	22	3.2%
Miliary	13	1.9%
Genitourinary System	10	1.4%
Integumentary System	8	1.1%
Other	22	3.2%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: TB may be diagnosed at more than one body site. In all, 696 disease sites were identified among 628 cases.

Table 4.4.7: Drug Resistance among Tuberculosis Cases: Ontario, 2005- 2009

Level of Resistance ⁴	2005		2006		2007		2008		2009	
	n ²	% ³	n ²	% ³	n ²	% ³	n ²	% ³	n ²	% ³
Any Drug Resistance	76	10.9%	60	9.0%	61	9.0%	52	8.4%	60	9.6%
MDR ¹	9	1.3%	12	1.8%	7	1.0%	9	1.5%	11	1.8%
XDR ¹	0	0.0%	0	0.0%	0	0.0%	1	0.2%	0	0.0%
XXDR ¹	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total TB Cases	697	n/a	666	n/a	678	n/a	620	n/a	628	n/a

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: Multiple drug resistant (MDR), extensively drug resistant (XDR), extremely drug resistant (XXDR); see Technical Notes for full definitions.

Note 2: Number of cases exhibiting resistance.

Note 3: Percentage of total number of TB cases reported that year.

Note 4: Cases may have more than one level of resistance as resistance is based on the line of drugs resistant to.

Table 4.4.8: Compliance with Prescribed Treatment by Tuberculosis Cases: Ontario, 2005-2009

Year	Number of cases	At Least 80% Compliance Level Achieved ¹ (n)	At Least 80% Compliance Level Achieved ¹ (%)
2005	697	459	65.9%
2006	666	550	82.6%
2007	678	548	80.8%
2008	620	537	86.6%
2009	628	538	85.7%

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: Compliance is an estimate of the amount of medication taken by a case over their treatment period.

Table 4.4.9: Major Modes of Tuberculosis Treatment and Compliance: Ontario, 2009

Mode of Treatment	Compliance Level ¹						Number of cases
	100%	80-99%	50-79%	<50%	0%	Unknown	
Daily- Self Administered	7	27	1	1	0	2	38
Directly observed therapy (DOT)	74	256	22	1	1	27	381
Self-Administered	14	147	10	0	0	3	174
Other	2	10	0	1	0	1	14
Unknown	0	1	0	0	0	20	21
Total	97	441	33	3	1	53	628

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/04/15].

Note 1: Compliance is an estimate of the amount of medication taken by a case over their treatment period.

Chapter 5: VECTOR-BORNE DISEASES

- Malaria, Lyme disease and West Nile virus (WNV) illness are the three vector-borne diseases of public health significance in Ontario. Both Lyme disease and WNV illness are endemic in Ontario.
- From 2000 through 2009, the incidence of Lyme disease increased steadily from 46 cases in 2000 to approximately 100 cases in both 2008 and 2009.
- In 2009 the proportion of non-travel related Lyme disease cases decreased to 53% after steadily increasing from 31% in 2005 to 63% in 2008. Conversely, the proportion of travel related cases increased in 2009 to 47% following a period of rapid decline from 69% in 2005 to 37% in 2008.
- The incidence of WNV illness has declined sharply in Ontario since first being reported in 2002. In that year, Ontario reported 394 confirmed and probable cases. Ontario reported a record low of four cases in both 2008 and 2009, which represents an annual incidence rate of less than 0.1 cases per 100,000 population.
- The incidence of malaria in Ontario has remained stable over the past ten years, with an average yearly count of 176 cases.
- Malaria is not endemic in Ontario and its incidence reflects travel to, or recent immigration from, malaria-endemic countries. No cases acquired malaria in Ontario between 2000 and 2009.
- Of malaria cases in 2009 that reported an exposure, travel to or recent immigration from endemic countries in Africa and continental south Asia accounted for 92% of exposures. The remaining exposures reported travel to the Caribbean and Latin-American region (7%), South-East Asia (1%) and other destinations (1%).

Table 5.1: Incidence of Vector-borne Diseases; Ontario, 2000-2009

Vector-borne Diseases	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
	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	46	0.4	24	0.2	28	0.2	26	0.2	33	0.3	41	0.3	48	0.4	69	0.5	109	0.8	100	0.8
Malaria	184	1.6	162	1.4	154	1.3	167	1.4	181	1.5	187	1.5	188	1.5	176	1.4	181	1.4	180	1.4
West Nile virus (WNV)	Nr	nr	nr	nr	394	3.3	89	0.7	14	0.1	101	0.8	42	0.3	17	0.1	4	0.0	4	0.0

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Ontario population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note 1: Incidence rate per 100,000 population.

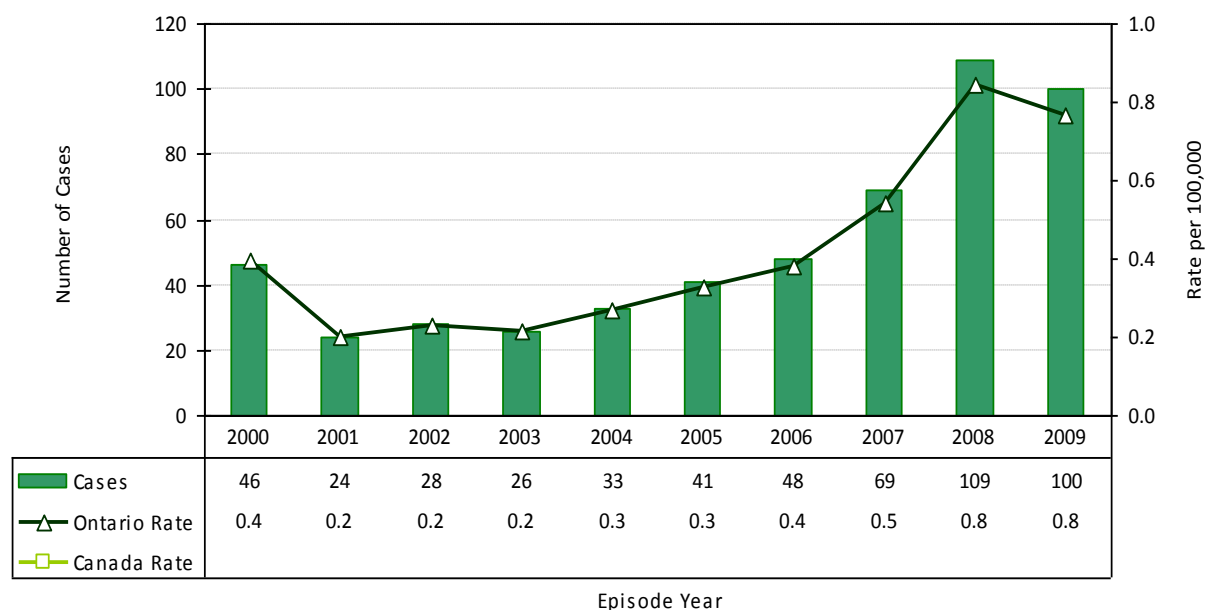
Note 2: No cases were reported for the following vector-borne diseases in Ontario during the period 2000-2009: yellow fever.

Note 3: Nr - not reportable. WNV illness became reportable in Ontario in 2002.

5.1 LYME DISEASE

- In 2009, 100 cases of Lyme disease were reported in Ontario. This represents an incidence rate of 0.8 cases per 100,000 population (Figure 5.1.1).
- From 2000 through 2008, the incidence of Lyme disease increased steadily from 23 reported cases in 1999 to 109 cases in 2008 (Figure 5.1.1). The incidence of Lyme disease in 2009 dropped by 8% in comparison to the 2008 incidence.
- Lyme disease cases are reported throughout most of the year, but with a notable peak in the warmer months. The months from May to August accounted for 75% of total cases reported in 2009 (Figure 5.1.2).
- In 2009, the number of reported cases of Lyme disease was higher among females (54 cases or 0.8 case per 100,000 population) compared to their male counterparts (46 cases or 0.7 cases per 100,000 population) (Figure 5.1.3 and Table 5.1.1).
- The proportion of travel related cases of Lyme disease decreased 46% from a high of 69% of cases with a reported exposure in 2005 to a record low of 37% in 2008. This proportion rebounded to 47% in 2009, an increase of 30% over 2008.
- Conversely, the proportion of non-travel related cases increased 103% from 31% of all cases with a reported exposure in 2005 to 63% in 2008. In 2009, this proportion decreased to 53%. Non-travel related Lyme disease refers to Lyme disease cases where no travel outside of Ontario was reported during the 30 days before the onset of symptoms.
- Of the non-travel related Lyme disease cases that occurred in Ontario in 2009 (43 cases), 21 (49%) likely acquired their illness through exposures in non-endemic areas of Ontario and 18 (42%) through exposures to endemic areas in Ontario; 4 (9%) cases were attributed to exposures in unspecified locations in Ontario (Figure 5.1.5).
- Almost half of non-travel related cases (49%) reported no exposures to established Lyme disease endemic areas in Ontario, suggesting an increase in the range of exposure locations for the acquisition of Lyme disease in Ontario.
- Leeds, Grenville and Lanark District (7.7 cases per 100,000 population), Northwestern (6.1 cases per 100,000 population) and Haldimand-Norfolk (3.6 cases per 100,000 population) reported the highest incidence rates of Lyme disease in 2009 (Map 5.1.1, Table 5.1.3).

Figure 5.1.1: Incidence of Lyme Disease in Ontario: 2000-2009

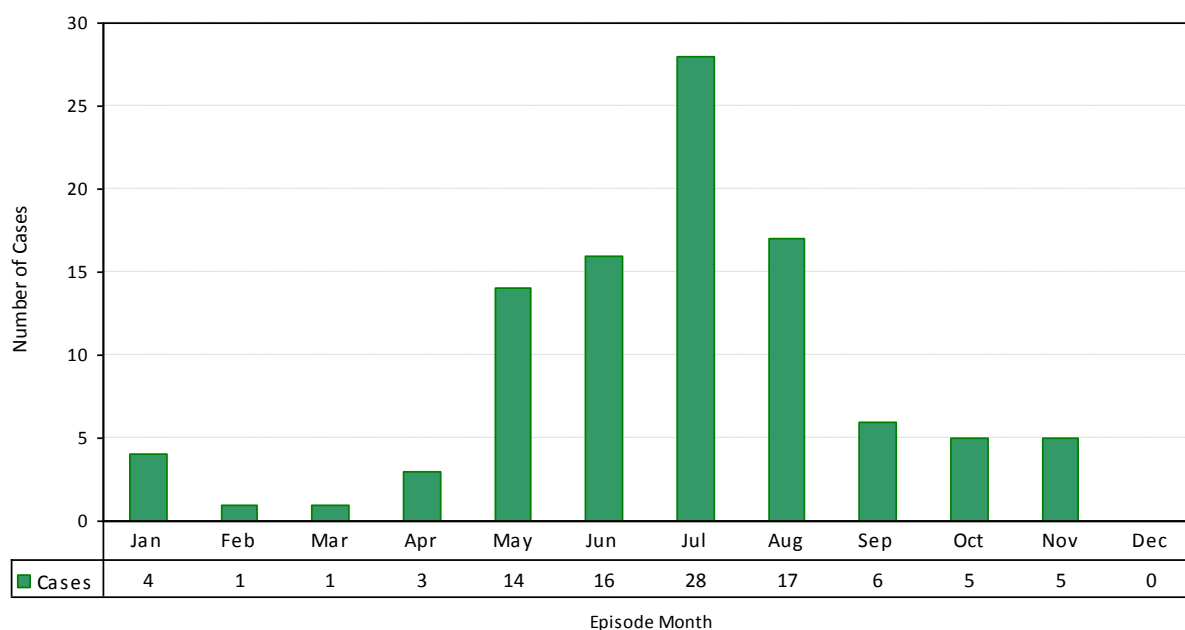


Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Lyme disease became nationally reportable in December 2009.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

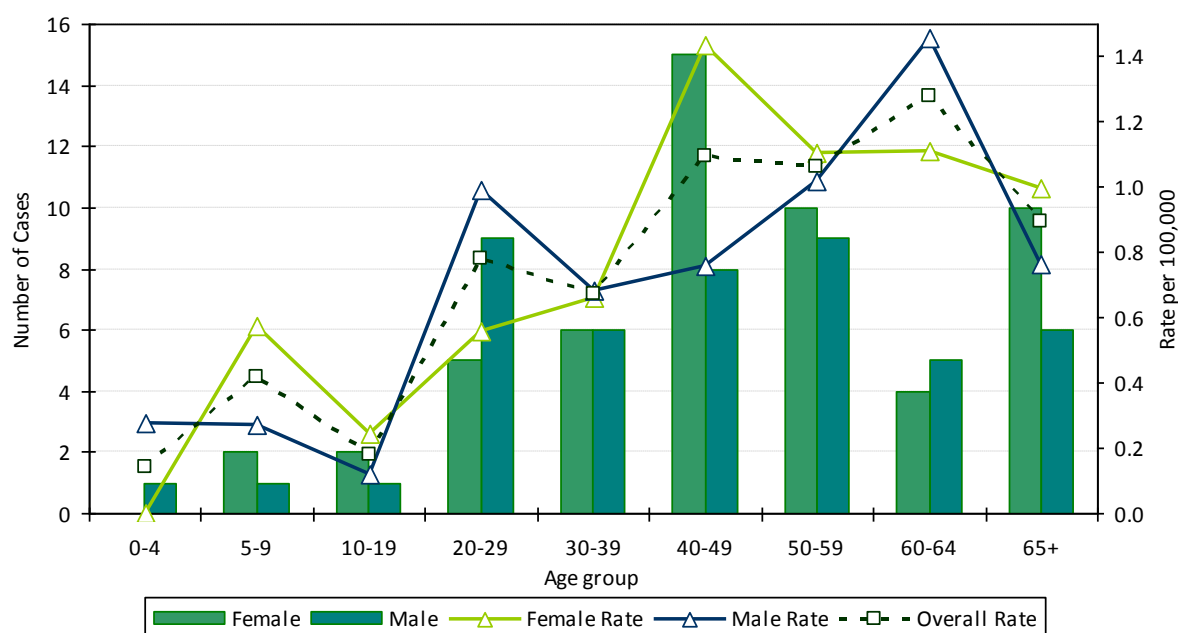
Figure 5.1.2: Incidence of Lyme Disease by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18]

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [2011/01/18].

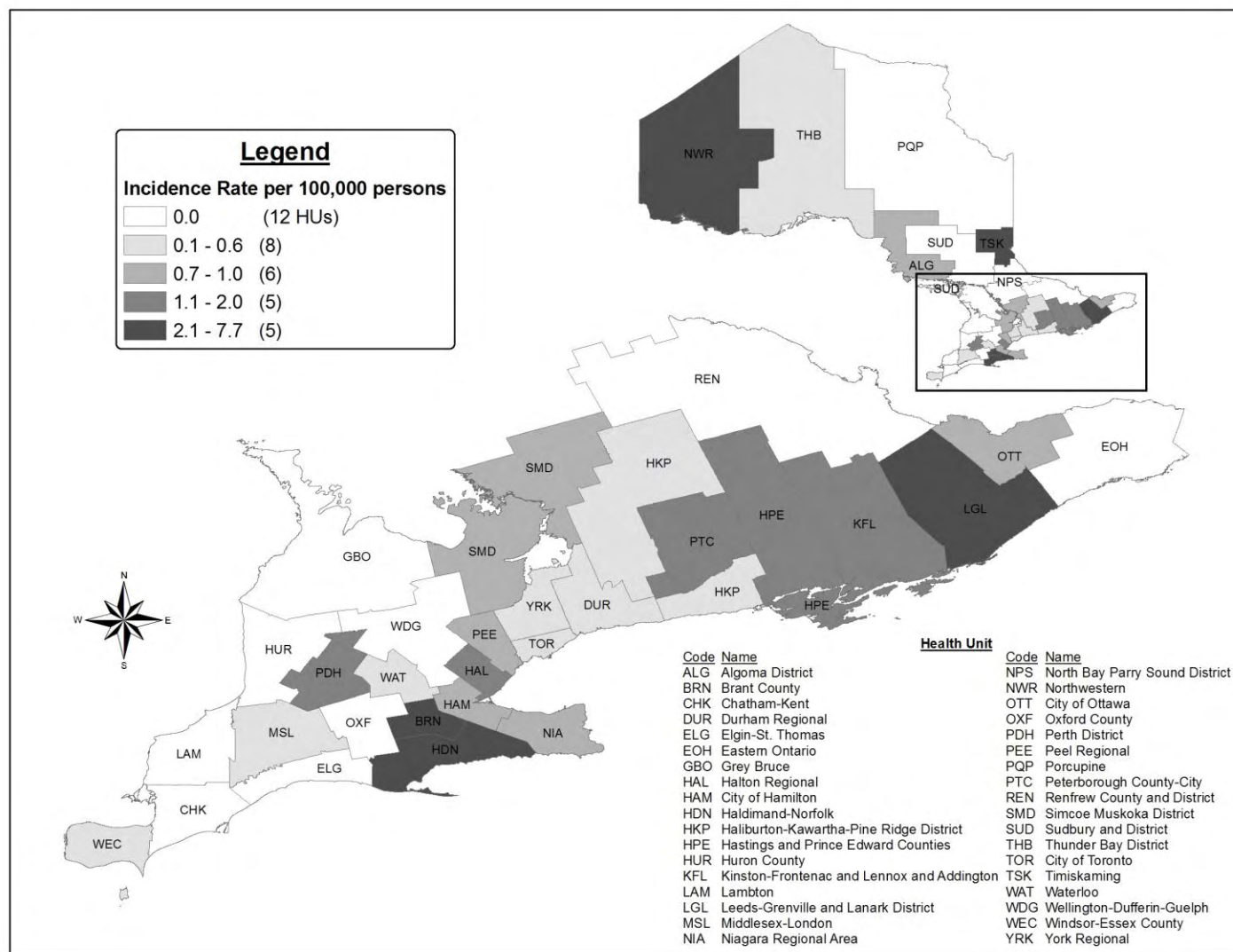
Table 5.1.1: Incidence of Lyme Disease by Age and Sex: Ontario, 2008

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	1	0.3	1	0.1
5-9	2	0.6	1	0.3	3	0.4
10-19	2	0.2	1	0.1	3	0.2
20-29	5	0.6	9	1.0	14	0.8
30-39	6	0.7	6	0.7	12	0.7
40-49	15	1.4	8	0.8	23	1.1
50-59	10	1.1	9	1.0	19	1.1
60-64	4	1.1	5	1.5	9	1.3
65+	10	1.0	6	0.8	16	0.9
Total	54	0.8	46	0.7	100	0.8

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHealth Ontario, extracted [2011/01/18].

Map 5.1.1: Incidence Rates of Lyme Disease by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification and not necessarily the place of exposure.

Table 5.1.3: Incidence of Lyme Disease by Public Health Unit: Ontario, 2009

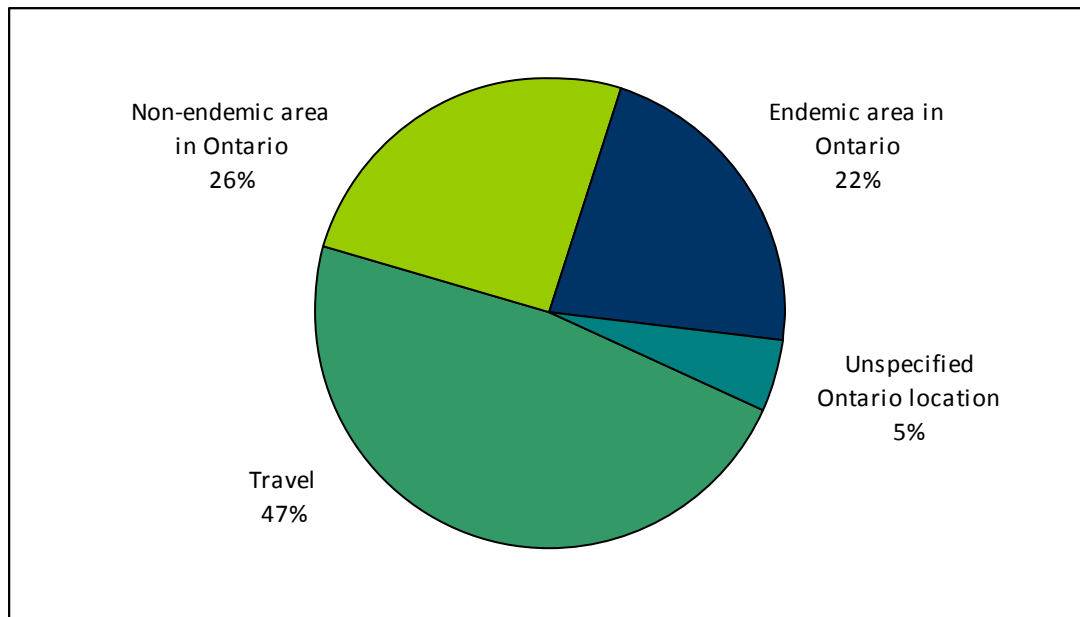
Public Health Unit	Number of cases	Rate/100,000 population
Leeds, Grenville and Lanark District	13	7.7
Northwestern	5	6.1
Haldimand-Norfolk	4	3.6
Timiskaming	1	2.9
Brant County	3	2.2
Halton Region	9	1.8
Hastings & Prince Edward Counties	3	1.8
Kingston, Frontenac, Lennox & Addington	3	1.5
Peterborough County-City	2	1.4
Perth District	1	1.3
Peel Region	13	1.0
Simcoe Muskoka District	5	1.0
Niagara Region	4	0.9
Algoma District	1	0.8
Hamilton	4	0.8
Ottawa	6	0.7
Haliburton, Kawartha, Pine Ridge	1	0.6
Thunder Bay District	1	0.6
Waterloo Region	3	0.6
Toronto	12	0.4
York Region	3	0.3
Durham Region	1	0.2
Middlesex-London	1	0.2
Windsor-Essex County	1	0.2
Chatham-Kent	0	0.0
Eastern Ontario	0	0.0
Elgin-St. Thomas	0	0.0
Grey Bruce	0	0.0
Huron County	0	0.0
Lambton County	0	0.0
North Bay Parry Sound District	0	0.0
Oxford County	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Sudbury and District	0	0.0
Wellington-Dufferin-Guelph	0	0.0
Ontario	100	0.8

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

Note: Health unit refers to the diagnosing health unit, i.e. the health unit where the case resided at the time of identification and not necessarily the place of exposure.

Figure 5.1.4: Most Likely Exposure Settings for Cases of Lyme Disease: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

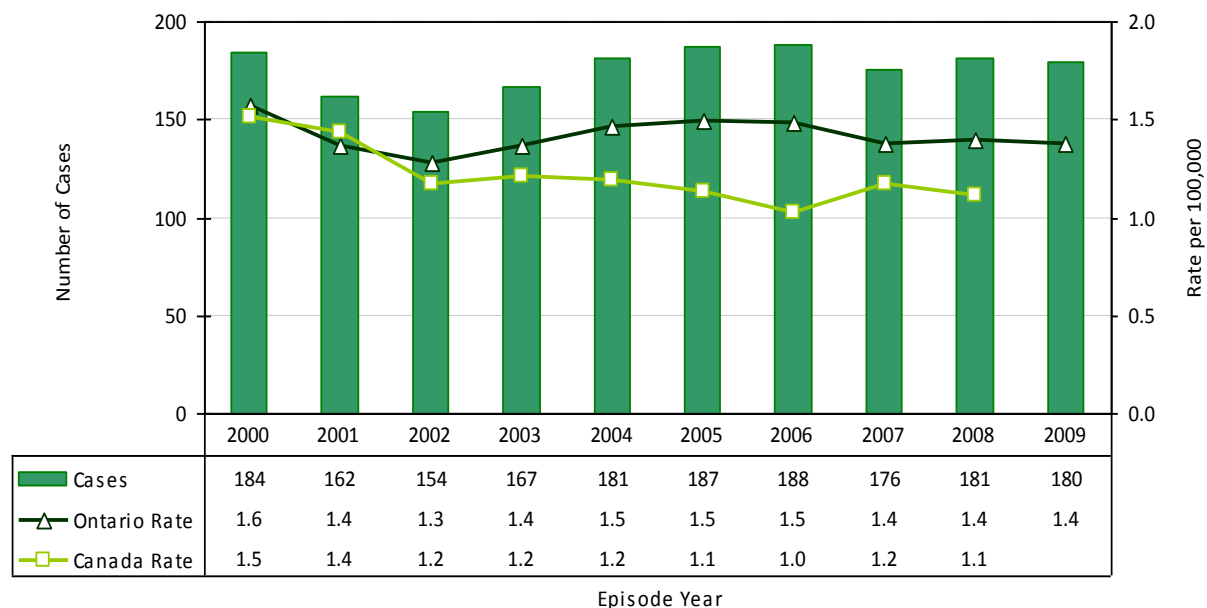
Note 1: The most likely exposure was selected for cases reporting more than 1 exposure.

Note 2: Exposure details were not reported for 18% of cases; these cases were excluded.

5.2 MALARIA

- In 2009, Ontario reported 1.4 cases of malaria per 100,000 population, which is equivalent to 180 cases, a decrease of one case from the 2008 total of 181 cases. (Figure 5.2.1).
- During the period 2000-2009, the incidence of malaria in Ontario remained stable with an average of 176 cases per year. This is equivalent to an average incidence rate of 1.4 cases per 100,000 population (Figure 5.2.1).
- Since 2002, the annual incidence of malaria for Canada has remained relatively stable, ranging from 1.0 to 1.2 cases per 100,000 population (Figure 5.2.1).
- The seasonal clustering of cases of malaria in Ontario in the summer months is due likely to increased travel to malaria-endemic countries during these months. In 2009, the highest number of cases were reported in June (9.4%), July (14.4 %), August (12.2%) and September (10.0%). These four months accounted for the same proportion (46%) of cases in 2008. (Figure 5.2.2).
- In 2009, males accounted for 64% of all confirmed cases of malaria with an incidence rate of 1.8 cases per 100,000 population, while females accounted for 36% of cases with an incidence rate of 1.0 cases per 100,000 population (Figure 5.2.3 and Table 5.2.1).
- Males in the 20-29 and 40-49 age groups had the highest incidence rates of malaria in 2009. For males in these age groups, the incidence rate of malaria (2.4 cases per 100,000 population) was 33% higher than the overall rate for males. Conversely, females in the 20-29 age group had the highest incidence rate of malaria at 1.5 cases per 100,000 population, which is 50% higher than the overall rate for females (Figure 5.2.3 and Table 5.2.1).
- In 2009, Peel Region and Toronto reported the highest incidence rates of malaria at 3.1 and 3.0 cases per 100,000 population, respectively (Table 5.2.2).
- In 2009, *Plasmodium falciparum* was the etiologic agent for two thirds (67%) of reported cases of malaria that specified an etiologic agent. Other etiologic agents, *P. vivax* (28%), *P. ovale* (3%) and *P. malariae* (2%), accounted for the remaining cases.
- Malaria is not endemic in Ontario and its incidence reflects travel to or recent immigration from malaria endemic countries. Of malaria cases in 2009 that reported an exposure, travel to or recent immigration from endemic countries in Africa and continental south Asia accounted for 92% of exposures. The remaining cases reported travel to the Caribbean and Latin-American region (7%), South-East Asia (1%) and China (1%).
- *P. falciparum* (88%) and *P. vivax* (84%) were most frequently associated with travel to Africa and continental south Asia, respectively. For *P. malariae* and *P. ovale*, the association with specific regions of travel was less evident.

Figure 5.2.1: Incidence of Malaria in Ontario and Canada: 2000-2009



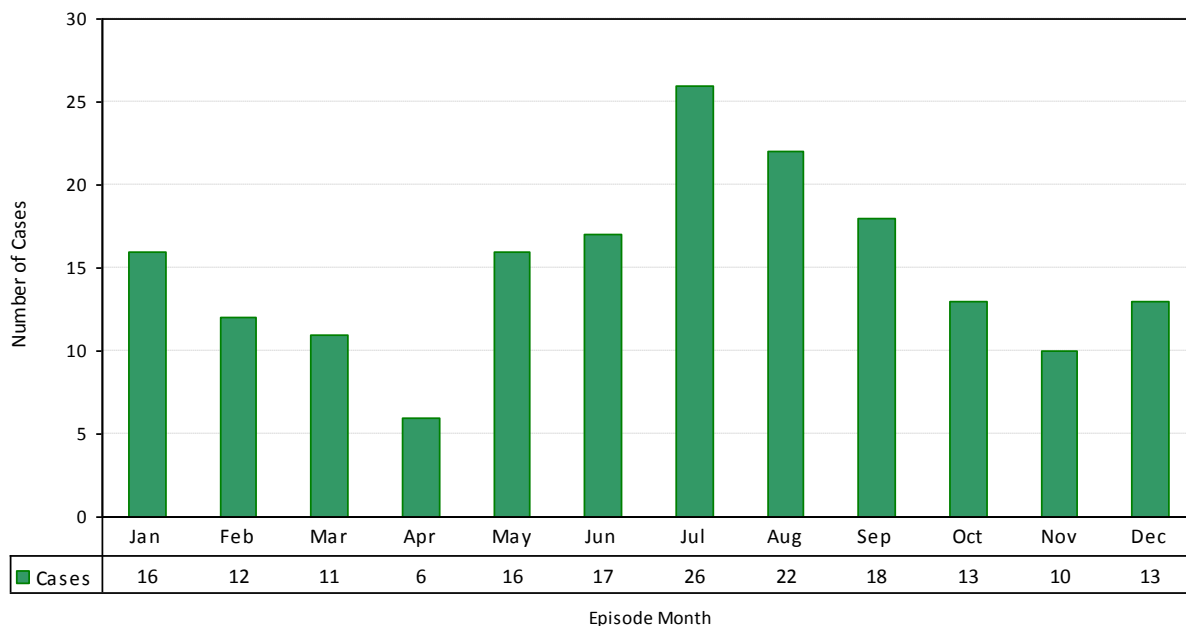
Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Canadian Rate: Public Health Agency of Canada, Canadian Notifiable Disease Section, Surveillance and Risk Assessment Division, Centre for Communicable Diseases and Infection Control.

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Canadian rate not available for 2009.

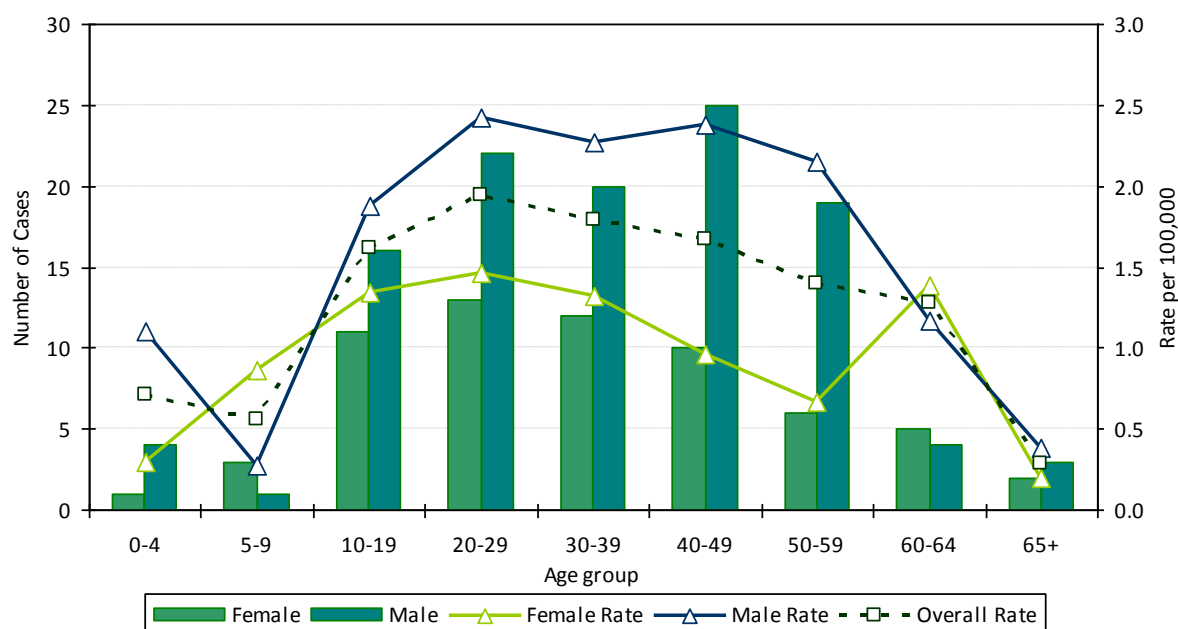
Figure 5.2.2: Incidence of Malaria by Episode Month: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

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, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Table 5.2.1: Incidence of Malaria by Age and Sex: Ontario, 2009

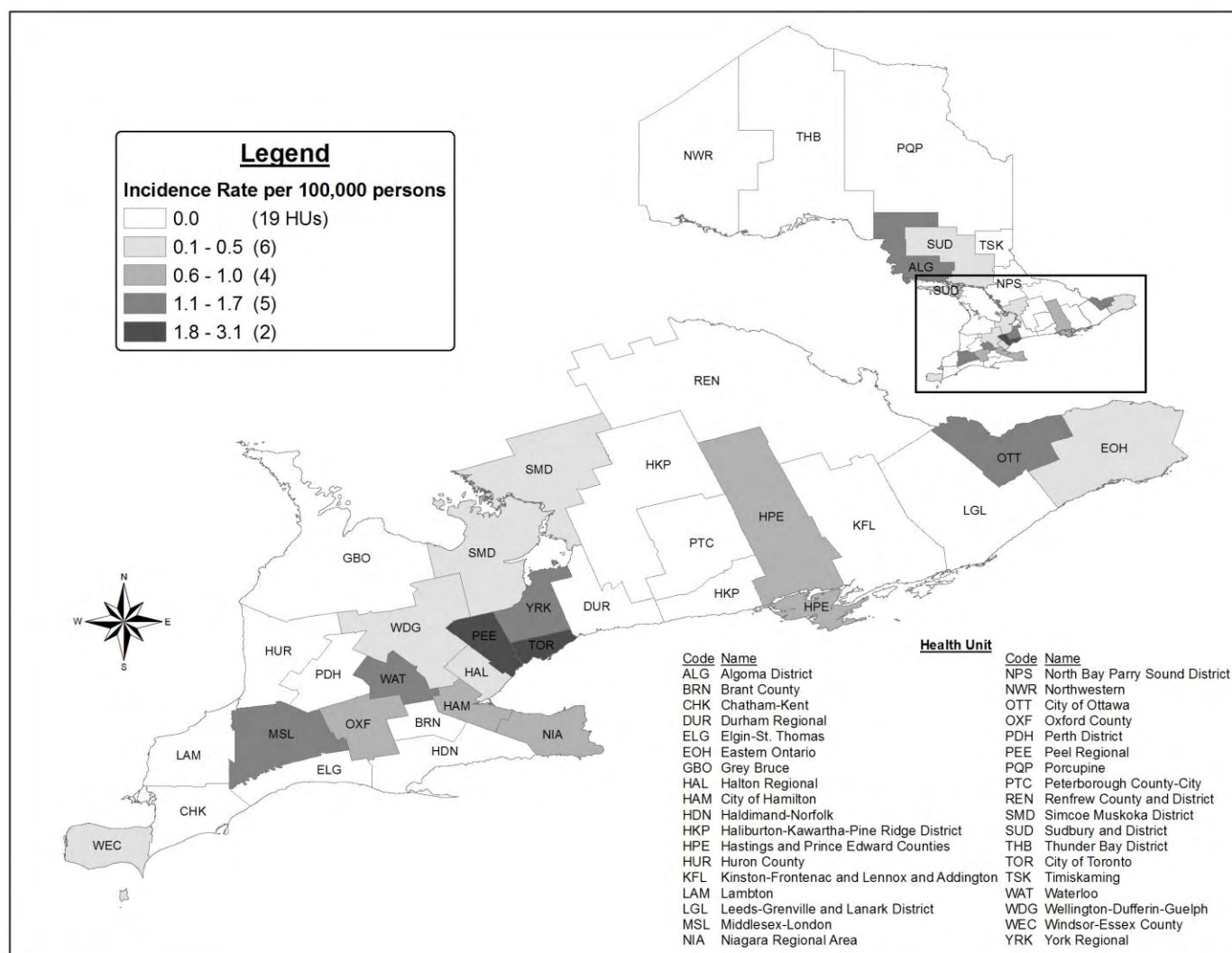
Age group (years)	Female		Male		Total	
	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population	Number of cases	Rate/ 100,000 population
0-4	1	0.3	4	1.1	5	0.7
5-9	3	0.9	1	0.3	4	0.6
10-19	11	1.3	16	1.9	27	1.6
20-29	13	1.5	22	2.4	35	1.9
30-39	12	1.3	20	2.3	32	1.8
40-49	10	1.0	25	2.4	35	1.7
50-59	6	0.7	19	2.1	25	1.4
60-64	5	1.4	4	1.2	9	1.3
65+	2	0.2	3	0.4	5	0.3
Total	63	1.0	114	1.8	177	1.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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

Map 5.2.1: Incidence Rates of Malaria by Public Health Unit: Ontario, 2009



Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 Public Health Unit: Ontario, 2009

Public Health Unit	Number of cases	Rate/100,000 population
Peel Region	41	3.1
Toronto	81	3.0
Algoma District	2	1.7
Ottawa	15	1.7
Waterloo Region	8	1.5
York Region	12	1.2
Middlesex-London	5	1.1
Oxford County	1	0.9
Niagara Region	3	0.7
Hamilton	3	0.6
Hastings & Prince Edward Counties	1	0.6
Eastern Ontario	1	0.5
Sudbury and District	1	0.5
Windsor-Essex County	2	0.5
Simcoe Muskoka District	2	0.4
Wellington-Dufferin-Guelph	1	0.4
Halton Region	1	0.2
Brant County	0	0.0
Chatham-Kent	0	0.0
Durham Region	0	0.0
Elgin-St. Thomas	0	0.0
Grey Bruce	0	0.0
Haldimand-Norfolk	0	0.0
Haliburton, Kawartha, Pine Ridge	0	0.0
Huron County	0	0.0
Kingston, Frontenac, Lennox & Addington	0	0.0
Lambton County	0	0.0
Leeds, Grenville and Lanark District	0	0.0
North Bay Parry Sound District	0	0.0
Northwestern	0	0.0
Perth District	0	0.0
Peterborough County-City	0	0.0
Porcupine	0	0.0
Renfrew County and District	0	0.0
Thunder Bay District	0	0.0
Timiskaming	0	0.0
Ontario	180	1.4

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted [2011/01/18].

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 5.2.4: Incidence of Malaria by Region of Travel and Aetiologic Agent: Ontario, 2009

Region of Travel	<i>Plasmodium</i> species					Row Total	
	<i>Falciparum</i>	<i>Malariae</i>	<i>Ovale</i>	<i>Vivax</i>	Unspecified	Cases (n)	Percent (%)
Africa	76	1	2	2	11	92	51%
Caribbean/L. America	4	0	0	4	2	10	6%
S.E. Asia	2	0	0	0	0	2	1%
Continental south Asia	4	0	0	31	7	42	23%
China	0	1	0	0	0	1	1%
Unknown Region	17	1	3	6	6	33	18%
Column Total (n)	103	3	5	43	26	180	100%
Column Percent (%)	57%	2%	3%	24%	14%	100%	-

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2011/03/18].

Note: Continental south Asia includes India and Pakistan; S.E. Asia includes Thailand.

APPENDICES

Appendix 1: TECHNICAL NOTES

These technical notes outline data limitations specific to this report and provide an analysis of the impact of the 2009 revision of the provincial surveillance case definitions. The limitations inherent in the data presented in this report should be taken into account when comparing data over time and when interpreting or extrapolating observations. 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 main 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 are 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, the 2009 data for this report were extracted from iPHIS in April 2011 (exact dates cited below each figure or table). Disease data for the years 2000 to 2007 were extracted from iPHIS in January 2009, and in May 2010 for 2008. TB data for 2000-2004 were extracted from the Reportable Disease Information System (RDIS), which was replaced by iPHIS.

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

intelliHEALTH Ontario (a repository of health related data that describes the population and delivery of healthcare services in Ontario) was the main source of population data for this report. Population data for Ontario were extracted from intelliHEALTH Ontario in January 2011. 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, between Ontario and Canada, and between sub-groups are absolute and do not imply statistical significance. The crude incidence rate is based on the following formula:

$$\left\{ \frac{\text{Number of cases in specified time period and population}}{\text{Total number of people in that population}} \times 100,000 \right\}$$

Throughout the report, the term “incidence rate” signifies a rate (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 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](#). Other data (2005-2008) were obtained directly from the Public Health Agency of Canada, Canadian Notifiable Disease Section.

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 2009. Trend data in this report cover the period from 2000 to 2009. Apart from situations requiring active surveillance, passive surveillance systems such as iPHIS can generally accommodate the entry of several dates with which the best estimate of disease onset date can be determined. In some situations, this results in episode dates that are later than the date of actual onset of symptoms.

With the exception of HIV, AIDS and TB, 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 - the date a case became known to public health.

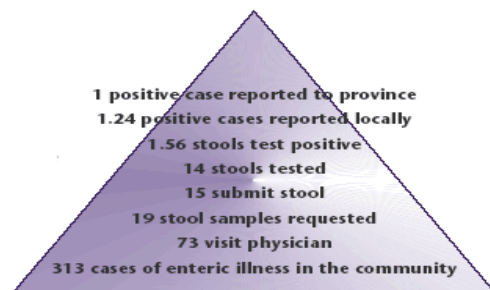
AIDS incident case count is based on the diagnosis date, which is the date of a case's AIDS diagnosis.

TB case counts for 2000-2004 are based on episode date, while 2005-2009 counts are based on diagnosis date, which is the earliest date of a case's TB diagnosis. Due to the difference in counting cases, counts since 2005 (based on diagnosis date) may also be included in counts for 2004 and earlier (based on episode date). For example, a case with symptom onset in

December 2004 that was not diagnosed by a healthcare provider until January 2005 would be counted as a case in 2004 based on the episode date (Dec. 2004) and again in 2005 based on the diagnosis date (Jan. 2005).

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 health.¹ 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

Case Ascertainment Criteria

This report includes all reports of infectious disease made through iPHIS with an episode date in 2009, 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 case definition (see Table A-2 for reportable case classifications);
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. As an example, 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- Enteric and Vectorborne Diseases

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.

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 tuberculosis and sexually transmitted and bloodborne infections (STI/BBI). Cases of STI/BBI and TB 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. For Hepatitis B and C, risk was determined using a combination of reported risk factors and exposures.

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 medications.⁴

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>

Duplicates

The possibility of duplicates exists because duplicate sets were not identified and excluded unless they were resolved prior to data extraction either at the local or provincial level.

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.
4. Following extraction from iPHIS, two new exposure categories were computed for all cases including those with incomplete exposures using data reported in the other exposure fields (e.g. exposure comments, exposure source and exposure name).

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.

Diagnosing health units - The health unit where a case was residing when they became known to public health for the confirmed/probable/suspect reportable disease episode.

Case Definitions

In 2009, the Ontario Ministry of Health and Long-Term Care revised the provincial case definitions for reportable diseases. The revisions reflect the changing epidemiology of infectious diseases and the use of more current laboratory diagnostic practices and technology. The revised case definitions came into effect on April 28, 2009. They are published in Appendix B of the Infectious Diseases Protocol (2009) pursuant to the Ontario Public Health Standards and can be accessed online at http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdi_spro.html. Prior to the revisions, the case definitions outlined in Appendix B of the iPHIS Manual (version 04/11/2005) were in effect. Case counts prior to 2009 in this report are based on the old surveillance case definitions.

⁴ Migliori GB, Lodenkemper 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.

The revisions to the provincial case definitions have impacted the classification of cases for several diseases. These changes should be considered to ensure valid interpretations and comparisons to historical incidence. Overall, the changes to the case definitions resulted in the addition of a probable case classification for all enteric and some vaccine preventable diseases and the requirement for laboratory confirmation for most sexually transmitted diseases. Only cases that met the reportable case classifications as specified in Table A-2 are included in this report. Table A-1 below categorizes the major changes to the provincial case definitions into groups and identifies the impacted reportable diseases.

Table A-1: Major Changes to the Surveillance Case Definitions

iPHIS Manual (version 04/11/2005) - Appendix B: Case Definitions	Infectious Diseases Protocol (2009) – Appendix B: Provincial Case Definitions for Reportable Diseases	Reportable diseases impacted by case definition changes	Expected and Observed Impacts
Individuals with signs and symptoms and an epidemiologic link to a laboratory confirmed case (or source) are classified as confirmed cases.	Individuals with signs and symptoms and an epidemiologic link to a laboratory confirmed case are classified as probable cases.	- Amebiasis - Botulism - Campylobacteriosis - Chancroid - Cryptosporidiosis - Cyclosporiasis - Food Poisoning - Giardiasis - Hepatitis A - Salmonellosis - Shigellosis - Smallpox - Trichinosis - VTEC (<i>E. coli</i>) - Yersiniosis	Very minimal to no impact expected. In this report, confirmed and probable cases are included in the 2009 total. As a result, year over year and direct comparisons are likely to be valid. Probable cases accounted for 0% to 2.7% of most reportable diseases and had a moderate impact of 6% to 13% on a smaller number of diseases. The impact was much larger and less reliable for a few others due largely to small case counts.
Individuals with signs and symptoms and laboratory confirmation are classified as confirmed cases.	Laboratory confirmation alone is required for an individual to be classified as a confirmed case.	- Amebiasis - Botulism - Campylobacteriosis - Chancroid - Cryptosporidiosis - Cyclosporiasis - Hepatitis B - Malaria - Paratyphoid Fever - Salmonellosis - Shigellosis - Typhoid Fever - VTEC (<i>E. coli</i>) - Yersiniosis	Negligible decrease expected. All diseases in this category now have a new probable case classification which is included in the 2009 total. This classification captures symptomatic cases with epidemiologic links to a confirmed case. The only exception is Hepatitis B which has a probable classification that is not reportable and therefore not included in the 2009 total. The associated impact is negligible.

iPHIS Manual (version 04/11/2005) - Appendix B: Case Definitions	Infectious Diseases Protocol (2009) – Appendix B: Provincial Case Definitions for Reportable Diseases	Reportable diseases impacted by case definition changes	Expected and Observed Impacts
Individuals with signs and symptoms and an epidemiologic link to a laboratory confirmed case are classified as confirmed cases.	Signs/symptoms and an epidemiologic link to a laboratory confirmed case are not required for any reportable case classification.	- Chlamydia - Chancroid - Gonorrhoea - Pneumococcal disease, invasive	Expected decrease in the number of reported cases. In general, most cases that are reported to the MOHLTC are based on laboratory confirmation. For this reason, the impact on diseases in this category is likely minimal, however, caution is advised when interpreting trends.
An epidemiologic link to a laboratory confirmed case is not a criterion for any reportable case classification.	Individuals with an epidemiologic link to a laboratory confirmed case meets the criteria for the reportable case classification noted in parentheses.	- Anthrax (S) - Brucellosis (P) - Cholera (P) - Diphtheria (P) - Group A Streptococcal disease, invasive (P) - Hemorrhagic Fever (P) - Hepatitis B (P) - Lassa Fever (P) - Leprosy (P) - Listeriosis (P) - Paratyphoid Fever (P) - Poliomyelitis, acute (C) - Psittacosis/Ornithosis (P) - Q Fever (P) - Typhoid Fever (P) Cell key: suspect (S), confirmed (C) and probable (P) cases	Expected increase in the number of total cases reported, however, small overall impact is expected. The total for most diseases in this category includes probable case counts, which as noted above, constitutes a low proportion of total cases for the majority of diseases where the probable case classification is reportable. Excluding Hepatitis B, the probable case classification is included in total counts for diseases in this category.

Table A-2: Reportable Diseases and Reportable Case Classifications

Disease	Case Classifications Reported				Reportable Case Classifications		
	Confirmed	Probable	Suspect	Total	Confirmed	Probable	Suspect
Enteric Diseases							
Amebiasis ¹	571	250	0	821	✓	✓	✗
Botulism	2	0	0	2	✓	✓	✓
Campylobacteriosis	3,241	23	0	3,264	✓	✓	✗
Cholera	1	0	0	1	✓	✓	✗
Cryptosporidiosis	306	4	1	311	✓	✓	✗
Cyclosporiasis	143	4	0	147	✓	✓	✗
Giardiasis	1,499	4	0	1,503	✓	✓	✗
Hepatitis A	120	0	0	120	✓	✓	✗
Listeriosis	55	1	0	56	✓	✓	✗
Paratyphoid fever	43	0	0	43	✓	✓	✗
Salmonellosis	2,311	39	2	2,352	✓	✓	✗
Shigellosis	254	1	0	255	✓	✓	✗
Typhoid fever	77	0	0	77	✓	✓	✗
Verotoxin producing E. Coli, including HUS	166	1	0	167	✓	✓	✗
Yersiniosis	243	0	0	243	✓	✓	✗
Zoonotic Diseases							
Brucellosis	3	3	0	6	✓	✓	✗
Psittacosis/Ornithosis	0	0	0	0	✓	✓	✗
Q-fever	6	0	0	6	✓	✓	✗
Trichinosis	0	0	0	0	✓	✓	✗
Tularemia	0	0	0	0	✓	✓	✗
Respiratory & Direct Contact Diseases							
Group A Streptococcal disease, invasive	467	0	0	467	✓	✓	✗
Influenza ²	7,622	0	0	7,622	✓	✗	✗
Legionellosis	70	1	0	71	✓	✓	✗
Tuberculosis ³	628	0	0	628	✓	✗	✗
Vaccine Preventable Diseases							
Diphtheria	0	0	0	0	✓	✓	✗
Haemophilus Influenzae B disease, invasive	3	1	0	4	✓	✓	✗
Measles	7	1	0	8	✓	✓	✗
Meningococcal disease, invasive	70	1	0	71	✓	✓	✗
Mumps	95	14	3	112	✓	✓	✗
Pertussis (whooping cough)	373	32	5	410	✓	✓	✗
Rubella	3	0	0	3	✓	✓	✗
Rubella, congenital syndrome	1	0	0	1	✓	✗	✗
Streptococcus Pneumoniae, invasive	1,258	0	0	1,258	✓	✗	✗
Tetanus	2	0	0	2	✓	✗	✗

Table A-2 continued

Disease	Case Classifications				Reportable Classifications		
	Confirmed	Probable	Suspect	Total	Confirmed	Probable	Suspect
Vectorborne Diseases							
Lyme disease	80	20	7	107	✓	✓	×
Malaria	180	0	0	180	✓	✓	×
West Nile Virus illness	2	2	1	5	✓	✓	×
Sexual & Bloodborne Infections							
AIDS	113	0	0	113	✓	×	×
Chlamydial infections	28,820	10	5	28,835	✓	×	×
Cytomegalovirus infection, congenital	9	0	1	10	✓	✓	×
Gonorrhoea, all types	3,547	2	1	3,550	✓	×	×
Group B Streptococcal disease, neonatal	47	3	2	52	✓	✓	×
Hepatitis B	151	2	0	153	✓	×	×
Hepatitis C	4,586	4	10	4,600	✓	×	×
Hepatitis D	3	0	0	3	✓	×	×
Herpes, neonatal	6	0	0	6	✓	×	×
HIV	865	0	0	866	✓	×	×
Syphilis, infections ⁴	784	1	1	786	✓	×	×
Ophthalmia Neonatorum	1	0	0	1	✓	✓	×
Other Diseases							
Creutzfeldt-Jakob disease, all types	3	7	7	17	✓	✓	✓
Leprosy	3	1	0	4	✓	✓	×

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Note 1: *Amebiasis histolytica/dispar* cases are no longer reportable under the confirmed classification and are instead reported under the new probable classification.

Note 2: Influenza counts based on season – Sept 1 2009 to Aug 31, 2010 – and not calendar year. Influenza has a suspect classification as per the current case definition but cases in this classification are not generally included in case counts

Note 3: Suspect cases of TB are reportable as per the current case definition but are generally not included in case counts. Case counts for TB for all years exclude atypical TB.

Note 4: Infectious neurosyphilis is included in the 2009 case counts for infectious syphilis. It was not previously included. Very few cases are reported in this category, but this has potential to increase the total confirmed case count for infectious syphilis.

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)	• Other viral causes
Amebiasis	Hepatitis A
Anthrax	Hepatitis B
Botulism	Hepatitis C
Brucellosis	Hepatitis D (Delta Hepatitis)
Campylobacter enteritis	Herpes, neonatal
Chancroid	Influenza
*Chickenpox (Varicella)	Lassa fever
Chlamydia	Legionellosis
Cholera	Leprosy
*Clostridium difficile associated disease	Listeriosis
Cryptosporidiosis	Lyme disease
Cyclosporiasis	Malaria
Cytomegalovirus infection, congenital	Measles
Diphtheria	*Meningitis, acute
*Encephalitis, including:	• Bacterial
• Primary, viral	• Viral
• Post-infectious	• Other
• Vaccine-related	Meningococcal disease, invasive
• Subacute sclerosing panencephalitis	Mumps
• Unspecified	Ophthalmia neonatorum
*Food poisoning, all causes	Paratyphoid fever
*Gastroenteritis, institutional outbreaks	Pertussis (whooping cough)
Giardiasis	Plague
Gonorrhea	Pneumococcal disease, invasive
Group A Streptococcal infections, invasive	*Poliomyelitis, acute
Group B Streptococcal infections, neonatal	Psittacosis/ornithosis
Haemophilus influenzae b disease, invasive	Q fever
Hantavirus pulmonary syndrome	*Rabies
Hemorrhagic fevers	Respiratory infection outbreaks in institutions
• Ebola virus disease	Rubella
• Marburg virus disease	Rubella, congenital syndrome
	Salmonellosis
	*Severe acute respiratory syndrome (SARS)
	Shigellosis

*Smallpox

Syphilis

Tetanus

Transmissible spongiform
encephalopathy

- Creutzfeldt-Jakob disease, all types
- Gerstmann-Sträussler-Scheinker syndrome
- Fatal Familial Insomnia
- Kuru

Trichinosis

Tuberculosis

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, 2000-2009

Disease Categories	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
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	925	7.9	851	7.2	825	6.8	771	6.3	678	5.5	772	6.1	659	5.2	815	6.4	764	5.9	821	6.3
Campylobacteriosis	5061	43.3	5033	42.3	4612	38.1	4127	33.7	3991	32.1	3796	30.2	3870	30.5	3873	30.2	3786	29.3	3264	25.0
Cryptosporidiosis	235	2.0	250	2.1	231	1.9	277	2.3	303	2.4	266	2.1	402	3.2	405	3.2	334	2.6	310	2.4
Cyclosporiasis	9	0.1	23	0.2	52	0.4	39	0.3	95	0.8	132	1.1	92	0.7	94	0.7	104	0.8	147	1.1
Giardiasis	2007	17.2	2060	17.3	1921	15.9	1633	13.3	1592	12.8	1626	12.9	1582	12.5	1623	12.7	1599	12.4	1503	11.5
Hepatitis A	157	1.3	175	1.5	151	1.2	143	1.2	185	1.5	150	1.2	206	1.6	121	0.9	114	0.9	120	0.9
Listeriosis	37	0.3	37	0.3	43	0.4	43	0.4	42	0.3	37	0.3	42	0.3	40	0.3	95	0.7	56	0.4
Paratyphoid Fever	12	0.1	12	0.1	27	0.2	21	0.2	47	0.4	55	0.4	51	0.4	47	0.4	58	0.4	43	0.3
Salmonellosis	2389	20.4	2564	21.6	2476	20.5	2008	16.4	2119	17.1	2956	23.5	2395	18.9	2820	22.0	2373	18.4	2351	18.0
Shigellosis	288	2.5	234	2.0	847	7.0	283	2.3	286	2.3	337	2.7	206	1.6	232	1.8	239	1.8	255	2.0
Typhoid Fever	53	0.5	62	0.5	60	0.5	50	0.4	69	0.6	68	0.5	92	0.7	86	0.7	95	0.7	77	0.6
<i>E. coli</i> , verotoxin producing	1746	14.7	358	3.0	394	3.3	462	3.8	318	2.6	259	2.1	343	2.7	365	2.9	279	2.2	167	1.3
Yersiniosis	338	2.9	314	2.6	383	3.2	329	2.7	297	2.4	354	2.8	364	2.9	269	2.1	260	2.0	243	1.9
Botulism	0	0.0	0	0.0	1	0.0	2	0.0	2	0.0	1	0.0	5	0.0	4	0.0	2	0.0	2	0.0
Brucellosis	2	0.1	3	0.1	5	0.1	4	0.0	3	0.1	6	0.0	2	0.0	5	0.0	5	0.0	1	0.0
Cholera	0	0	3	0.0	1	0.0	2	0.0	0	0	1	0.0	1	0.0	1	0.0	3	0.0	1	0.0
Brucellosis	2	0.1	3	0.1	5	0.1	4	0.0	3	0.1	6	0.0	2	0.0	5	0.0	5	0.0	6	0.0
Psittacosis/Ornithosis	2	0.0	0	0	2	0.0	1	0.0	0	0.0	0	0	0	0.0	0	0.0	0	0.0	0	0.0
Q-fever	12	0.1	12	0.1	1	0.1	8	0.0	6	0.1	2	0.0	4	0.0	3	0.0	4	0.0	6	0.0
Trichinosis	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tularemia	1	0.0	0	0.0	0	0.0	2	0.0	2	0.0	1	0.0	0	0.0	0	0.0	1	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	11	0.1	7	0.1	7	0.1	9	0.1	9	0.1	8	0.1	12	0.1	6	0.0	7	0.1	4	0.0
Measles	9	0.1	6	0.1	1	0.0	11	0.1	6	0.0	4	0.0	5	0.0	0	0.0	58	0.5	8	0.1
Meningococcal disease	82	0.7	106	0.9	59	0.5	58	0.5	55	0.4	43	0.3	67	0.5	62	0.5	48	0.4	71	0.5
Mumps	33	0.3	18	0.2	14	0.1	13	0.1	23	0.2	17	0.1	10	0.1	53	0.4	336	2.6	108	0.8
Pertussis	716	6.1	463	3.9	532	4.4	353	2.9	633	5.1	646	5.1	1265	10.0	933	7.3	831	6.4	405	3.1
Rubella	9	0.0	17	0.0	2	0.0	9	0.0	5	0.0	313	0.0	5	0.0	2	0.0	2	0.0	3	0.0
Rubella, congenital	1	0.0	0	0.0	1	0.0	1	0.0	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0
<i>S. pneumoniae</i>	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	1062	8.2	1258	9.6
Tetanus	1	0.0	3	0.0	2	0.0	0	0.0	0	0.0	1	0.0	1	0.0	1	0.0	0	0.0	2	0.0

Disease Categories	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009	
Sexually Transmitted and Blood-borne Infections	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹	Case	Rate¹
AIDS	172	1.5	204	1.7	186	1.5	213	1.7	189	1.5	196	1.6	131	1.0	129	1.0	133	1.0	113	0.9
Chlamydia	14805	126.7	16360	137.5	18363	151.7	19478	158.8	20801	167.5	21931	174.6	22542	177.7	23275	181.8	26200	202.6	28820	220.5
Gonorrhea	2858	24	2954	24.8	3085	25.5	3360	27.4	3513	28.3	3325	26.5	3860	30.4	3954	30.9	3868	29.9	3547	27.1
Group B Streptococcus	53	0.5	64	0.5	69	0.6	65	0.5	55	0.4	52	0.4	55	0.4	46	0.3	54	0.4	50	0.4
Hepatitis B, acute	148	1.3	123	1.0	152	1.3	172	1.4	168	1.4	161	1.3	187	1.5	182	1.4	144	1.1	151	1.2
Hepatitis C, acute	6009	51.4	5572	46.8	5479	45.3	5491	44.8	5418	43.6	4616	36.8	3999	31.5	4512	35.4	4695	36.1	4586	35.1
HIV	773	6.6	857	7.2	982	8.1	943	7.7	990	8.0	901	7.2	983	7.7	946	7.4	948	7.3	865	6.6
Syphilis, infectious	49	0.4	52	0.4	241	2.0	427	3.5	496	4.0	360	2.9	366	2.9	401	3.1	452	3.5	784	6.0
Cytomegalovirus, congenital	8	0.1	4	0.0	6	0.0	8	0.1	7	0.1	7	0.1	8	0.1	4	0.0	3	0.0	9	0.1
Hepatitis D	10	0.1	8	0.1	9	0.1	2	0.0	2	0.0	9	0.1	4	0.0	2	0.0	5	0.0	3	0.0
Herpes, neonatal	1	0.0	4	0.0	5	0.0	2	0.0	11	0.1	5	0.0	5	0.0	3	0.0	8	0.1	6	0.0
Ophthalmia neonatorum	11	0.1	7	0.1	3	0.0	4	0.0	6	0.0	6	0.0	3	0.0	3	0.0	3	0.0	1	0.0
Diseases Transmitted by Direct Contact and Respiratory Routes																				
Invasive Group A Streptococcus	409	3.5	328	2.8	385	3.2	409	3.3	288	2.3	392	3.1	465	3.7	501	3.9	512	4.0	467	3.6
Influenza	791	6.6	2274	18.8	981	8.0	5389	43.4	5778	46.0	2486	19.6	2930	22.9	5163	40.3	8243	63.8	7622	58.3
Legionellosis	41	0.4	21	0.2	24	0.2	32	0.3	11	0.1	75	0.6	69	0.5	58	0.5	81	0.6	71	0.5
Tuberculosis	700	6.0	699	5.9	716	5.9	693	5.7	661	5.3	654	5.2	691	5.4	680	5.3	603	4.7	628	4.8
Vectorborne Diseases³																				
Lyme Disease	46	0.4	24	0.2	28	0.2	26	0.2	33	0.3	41	0.3	48	0.4	69	0.5	109	0.8	100	0.8
Malaria	184	1.6	162	1.4	154	1.3	167	1.4	181	1.5	187	1.5	188	1.5	176	1.4	181	1.4	180	1.4
West Nile Virus (WNV) ²	nr	nr	nr	nr	394	3.3	89	0.7	14	0.1	101	0.8	42	0.3	17	0.1	4	0.0	4	0.0
Other Diseases																				
Creutzfeldt-Jakob Disease, all	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	4	0.0	5	0.0	5	0.0	5	0.0	17	0.1
Leprosy	5	0.0	3	0.0	2	0.0	4	0.0	2	0.0	3	0.0	0	0.0	2	0.0	1	0.0	4	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

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 2a: Frequently Reported Enteric Diseases: Ontario, 2009	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	16	13.5	2	1.7	0	0.0	17	14.3	0	0.0	0	0.0	0	0.0	16	13.5	0	0.0	0	0.0	2	1.7	1	0.8
Brant County	5	3.6	24	17.3	2	1.4	1	0.7	8	5.8	1	0.7	1	0.2	0	0.0	10	7.2	1	0.7	0	0.0	0	0.0	2	1.4
Chatham-Kent	3	2.7	17	15.4	3	2.7	0	0.0	3	2.7	0	0.0	0	0.0	0	0.0	5	4.5	0	0.0	0	0.0	1	0.9	1	0.9
Durham Region	12	2.0	145	23.6	7	1.3	2	0.4	46	8.7	3	0.6	0	0.0	0	0.0	76	14.3	6	1.1	0	0.0	6	1.1	6	1.1
Eastern Ontario	4	2.0	62	31.1	21	2.4	15	1.7	149	16.9	7	0.8	6	4.3	0	0.0	149	16.9	16	1.8	0	0.0	9	1.0	15	1.7
Elgin-St. Thomas	0	0.0	13	14.4	4	0.7	3	0.5	54	8.8	3	0.5	1	1.6	0	0.0	111	18.1	8	1.3	0	0.0	8	1.3	7	1.1
Grey-Bruce	0	0.0	70	42.9	6	3.0	1	0.5	14	7.0	0	0.0	0	0.0	0	0.0	28	14.1	1	0.5	0	0.0	0	0.0	2	1.0
Haldimand-Norfolk	0	0.0	43	38.8	8	8.9	0	0.0	6	6.7	0	0.0	1	0.6	0	0.0	11	12.2	1	1.1	0	0.0	2	2.2	0	0.0
Haliburton-Kawartha-Pine Ridge	6	3.4	49	27.6	8	4.9	1	0.6	11	6.7	2	1.2	1	1.1	0	0.0	37	22.7	0	0.0	0	0.0	3	1.8	2	1.2
Halton Region	20	4.1	117	23.8	3	2.7	0	0.0	14	12.6	1	0.9	0	0.0	0	0.0	13	11.7	0	0.0	1	0.2	1	0.9	0	0.0
Hamilton, City of	43	8.1	84	15.8	9	5.1	1	0.6	31	17.5	0	0.0	0	0.0	2	0.4	26	14.7	1	0.6	4	0.8	2	1.1	0	0.0
Hastings Prince Edward Counties	3	1.8	28	17.2	11	2.2	4	0.8	55	11.2	7	1.4	1	0.6	0	0.0	94	19.1	7	1.4	0	0.0	2	0.4	8	1.6
Huron County	0	0.0	34	56.1	3	1.8	0	0.0	16	9.8	0	0.0	0	0.0	0	0.0	21	12.9	0	0.0	0	0.0	1	0.6	3	1.8
Kingston-Frontenac & Lennox & Addington	4	2.1	45	23.2	8	13.2	0	0.0	5	8.2	2	3.3	0	0.0	0	0.0	11	18.1	0	0.0	0	0.0	2	3.3	0	0.0
Lambton County	0	0.0	20	15.1	2	1.0	2	1.0	26	13.4	1	0.5	1	0.6	1	0.8	29	14.9	5	2.6	0	0.0	1	0.5	0	0.0
Leeds-Grenville and Lanark District	3	1.8	20	11.9	2	1.5	0	0.0	6	4.5	1	0.8	1	0.6	0	0.0	16	12.1	4	3.0	0	0.0	1	0.8	0	0.0
Middlesex-London	13	2.9	116	25.7	3	1.8	2	1.2	6	3.6	0	0.0	0	0.0	0	0.0	28	16.6	2	1.2	1	0.2	3	1.8	1	0.6
Niagara Region	8	1.8	128	28.9	12	2.7	6	1.3	41	9.1	2	0.4	3	2.3	0	0.0	64	14.2	5	1.1	0	0.0	13	2.9	5	1.1
North Bay Parry Sound District	0	0.0	16	12.7	7	1.6	7	1.6	25	5.6	6	1.4	0	0.0	0	0.0	69	15.6	4	0.9	0	0.0	7	1.6	5	1.1
Northwestern	0	0.0	14	17.1	2	1.6	2	1.6	18	14.2	1	0.8	0	0.0	0	0.0	16	12.7	2	1.6	0	0.0	1	0.8	0	0.0
Ottawa, City of	78	8.8	221	25.0	0	0.0	0	0.0	4	4.9	0	0.0	0	0.0	1	0.1	20	24.5	0	0.0	3	0.3	1	1.2	0	0.0
Oxford County	1	0.9	29	27.1	9	8.4	0	0.0	5	4.7	0	0.0	0	0.0	0	0.0	10	9.4	0	0.0	0	0.0	4	3.7	2	1.9
Peel Region	99	7.5	310	23.6	20	1.5	17	1.3	172	13.1	21	1.6	5	2.5	19	1.4	234	17.8	37	2.8	35	2.7	13	1.0	42	3.2
Perth District	1	1.3	34	44.3	10	13.0	0	0.0	4	5.2	0	0.0	1	0.2	0	0.0	11	14.3	3	3.9	1	1.3	3	3.9	0	0.0
Peterborough County	3	2.2	35	25.3	2	1.4	1	0.7	12	8.7	1	0.7	2	0.3	0	0.0	25	18.0	1	0.7	0	0.0	0	0.0	0	0.0
Porcupine	7	8.0	9	10.3	1	1.1	3	3.4	4	4.6	3	3.4	0	0.0	0	0.0	7	8.0	0	0.0	0	0.0	0	0.0	0	0.0
Renfrew County and District	0	0.0	21	20.4	3	2.9	1	1.0	8	7.8	0	0.0	0	0.0	0	0.0	16	15.6	0	0.0	0	0.0	2	1.9	0	0.0
Simcoe Muskoka District	8	1.6	81	15.8	13	2.5	17	3.3	48	9.3	0	0.0	3	1.5	0	0.0	63	12.3	2	0.4	0	0.0	3	0.6	2	0.4
Sudbury and District	0	0.0	26	13.0	2	1.0	0	0.0	10	5.0	1	0.5	0	0.0	0	0.0	25	12.5	0	0.0	0	0.0	2	1.0	0	0.0
Thunder Bay District	1	0.6	25	16.0	4	2.6	2	1.3	21	13.4	2	1.3	0	0.0	0	0.0	54	34.5	0	0.0	0	0.0	1	0.6	0	0.0
Timiskaming	0	0.0	4	11.5	1	2.9	0	0.0	2	5.7	0	0.0	0	0.0	0	0.0	10	28.7	0	0.0	0	0.0	0	0.0	0	0.0
Toronto	429	16.0	768	28.7	59	2.2	43	1.6	455	17.0	36	1.3	18	15.1	17	0.6	557	20.8	113	4.2	23	0.9	35	1.3	77	2.9
Waterloo Region	26	5.0	116	22.4	20	3.9	4	0.8	68	13.1	6	1.2	1	0.9	0	0.0	115	22.2	9	1.7	2	0.4	10	1.9	7	1.4
Wellington-Dufferin-Guelph	6	2.2	84	30.8	16	5.9	4	1.5	30	11.0	4	1.5	3	2.7	0	0.0	47	17.3	5	1.8	0	0.0	10	3.7	2	0.7
Windsor-Essex County	0	0.0	141	34.9	4	1.0	1	0.2	38	9.4	4	1.0	2	0.2	0	0.0	79	19.6	3	0.7	2	0.5	10	2.5	12	3.0
York Region	38	3.7	299	29.4	23	2.3	7	0.7	71	7.0	5	0.5	5	0.9	3	0.3	248	24.4	19	1.9	5	0.5	8	0.8	41	4.0
Ontario	821	6.3	3264	25.0	310	2.4	147	1.1	1503	11.5	120	0.9	56	0.4	43	0.3	2351	18.0	255	2.0	77	0.6	167	1.3	243	1.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario

Note: Rate is incidence per 100,000 population

Data Table 2b: Other Enteric Diseases and Zoonotic/Vectorborne Diseases: Ontario, 2009	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	1	0.8	2	1.7	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	3	2.2	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	0	0.0	0	0.0
Durham Region	0	0.0	0	0.0	0	0.0	0	0.0	1	0.16	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
Eastern Ontario	0	0.0	0	0.0	1	0.50	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.5	0	0.0
Elgin-St. Thomas	0	0.0	1	1.11	0	0.0	0	0.0	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	0	0.0	0	0.0	1	0.61	0	0.0	0	0.0	0	0.0	0	0.0	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	4	3.6	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	1	0.6	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	9	1.8	1	0.2	0	0.0
Hamilton, City of	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.8	3	0.6	0	0.0
Hastings Prince Edward Counties	0	0.0	0	0.0	2	1.23	0	0.0	1	0.61	0	0.0	0	0.0	3	1.8	1	0.6	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	0.0	0	0.0
Kingston-Frontenac & Lennox & Addington	0	0.0	0	0.0	0	0.0	0	0.0	1	0.51	0	0.0	0	0.0	3	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	0	0.0	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	13	7.7	0	0.0	1	0.59
Middlesex-London	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	5	1.1	0	0.0
Niagara Region	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.9	3	0.7	1	0.23
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	0	0.0	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	5	6.1	0	0.0	0	0.0
Ottawa, City of	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	6	0.7	15	1.7	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	0	0.0	1	0.9	0	0.0
Peel Region	0	0.0	0	0.0	2	0.15	0	0.0	0	0.0	0	0.0	0	0.0	13	1.0	41	3.1	0	0.0
Perth District	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3	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	2	1.4	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	0	0.0	0	0.0	0	0.0
Simcoe Muskoka District	0	0.0	0	0.0	0	0.0	0	0.0	1	0.19	0	0.0	0	0.0	5	1.0	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	1	0.5	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	1	0.6	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	1	2.9	0	0.0	0	0.0
Toronto	1	0.04	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	12	0.4	81	3.0	0	0.0
Waterloo Region	0	0.0	0	0.0	0	0.0	0	0.0	1	0.19	0	0.0	0	0.0	3	0.6	8	1.5	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	1	0.25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	2	0.5	2	0.50
York Region	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	0.3	12	1.2	0	0.0
Ontario	2	0.0	1	0.0	6	0.1	0	0.0	6	0.1	0	0.0	0	0.0	100	0.8	180	1.4	4	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Rate is incidence per 100,000 population

Data Table 2c: Vaccine Preventable Diseases: Ontario, 2009	Diphtheria		Haemophilus Influenzae		Measles		Meningococcal disease		Mumps		Pertussis		Rubella		Rubella, congenital		S. pneumoniae		Tetanus	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	0	0.0	0	0.0	0	0.0	2	1.7	0	0.0	1	0.8	0	0.0	0	0.0	14	11.8	0	0.0
Brant County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	8	5.8	0	0.0	0	0.0	23	16.5	0	0.0
Chatham-Kent	0	0.0	0	0.0	0	0.0	0	0.0	2	1.8	1	0.9	0	0.0	0	0.0	19	17.2	0	0.0
Durham Region	0	0.0	0	0.0	0	0.0	5	0.9	0	0.0	6	1.1	0	0.0	0	0.0	50	9.4	1	0.16
Eastern Ontario	0	0.0	0	0.50	0	0.0	7	0.8	2	0.2	9	1.0	0	0.0	0	0.0	96	10.9	0	0.0
Elgin-St. Thomas	0	0.0	0	0.0	0	0.0	5	0.8	2	0.3	8	1.3	0	0.0	0	0.0	51	8.3	0	0.0
Grey-Bruce	0	0.0	0	0.61	0	0.0	0	0.0	0	0.0	2	1.0	0	0.0	0	0.0	23	11.6	0	0.0
Haldimand-Norfolk	0	0.0	0	0.0	0	0.0	0	0.0	1	1.1	2	2.2	0	0.0	0	0.0	11	12.2	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0	0	0.0	0	0.0	2	1.2	0	0.0	12	7.4	0	0.0	0	0.0	21	12.9	0	0.0
Halton Region	0	0.0	0	0.0	0	0.0	0	0.0	1	0.9	5	4.5	0	0.0	0	0.0	14	12.6	0	0.0
Hamilton, City of	0	0.0	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0	18	10.1	0	0.0
Hastings Prince Edward Counties	0	0.0	0	0.0	0	0.0	2	0.4	1	0.2	10	2.0	0	0.0	0	0.0	42	8.5	0	0.0
Huron County	0	0.0	0	0.0	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0	0	0.0	14	8.6	0	0.0
Kingston-Frontenac & Lennox & Addington	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	12	19.8	0	0.0
Lambton County	0	0.0	0	0.0	0	0.0	2	1.0	1	0.5	2	1.0	0	0.0	0	0.0	28	14.4	0	0.0
Leeds-Grenville and Lanark District	0	0.0	0	0.0	0	0.0	2	1.5	0	0.0	5	3.8	0	0.0	0	0.0	11	8.3	0	0.0
Middlesex-London	0	0.0	0	0.22	0	0.0	1	0.6	1	0.6	2	1.2	0	0.0	0	0.0	15	8.9	0	0.0
Niagara Region	0	0.0	0	0.0	0	0.0	7	1.5	0	0.0	4	0.9	0	0.0	0	0.0	41	9.1	0	0.0
North Bay Parry Sound District	0	0.0	0	0.0	0	0.0	0	0.0	3	0.7	11	2.5	0	0.0	0	0.0	44	9.9	0	0.0
Northwestern	0	0.0	0	0.0	0	0.0	4	3.2	23	18.2	0	0.0	1	1.22	0	0.0	13	10.3	0	0.0
Ottawa, City of	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	17	20.8	0	0.0
Oxford County	0	0.0	0	0.0	0	0.0	1	0.9	1	0.9	107	100.2	0	0.0	0	0.0	8	7.5	0	0.0
Peel Region	0	0.0	0	0.0	0	0.0	2	0.2	2	0.2	19	1.4	0	0.0	0	0.0	92	7.0	0	0.0
Perth District	0	0.0	0	0.0	0	0.0	1	1.3	0	0.0	0	0.0	0	0.0	0	0.0	9	11.7	0	0.0
Peterborough County	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7	0	0.0	0	0.0	21	15.2	0	0.0
Porcupine	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	3	3.4	0	0.0	0	0.0	3	3.4	0	0.0
Renfrew County and District	0	0.0	0	0.0	0	0.0	2	1.9	0	0.0	0	0.0	0	0.0	0	0.0	8	7.8	0	0.0
Simcoe Muskoka District	0	0.0	0	0.0	0	0.0	4	0.8	7	1.4	3	0.6	0	0.0	0	0.0	50	9.7	0	0.0
Sudbury and District	0	0.0	0	0.0	0	0.0	2	1.0	2	1.0	1	0.5	0	0.0	0	0.0	30	15.0	0	0.0
Thunder Bay District	0	0.0	0	0.0	0	0.0	2	1.3	1	0.6	0	0.0	0	0.0	0	0.0	34	21.7	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	0	0.0	0	0.0	1	0.04	9	0.3	33	1.2	126	4.7	1	0.04	1	0.04	255	9.5	1	0.04
Waterloo Region	0	0.0	1	0.19	7	1.35	3	0.6	12	2.3	8	1.5	0	0.0	0	0.0	60	11.6	0	0.0
Wellington-Dufferin-Guelph	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	28	10.3	0	0.0	0	0.0	30	11.0	0	0.0
Windsor-Essex County	0	0.0	0	0.0	0	0.0	1	0.2	1	0.2	1	0.2	0	0.0	0	0.0	25	6.2	0	0.0
York Region	0	0.0	0	0.0	0	0.0	3	0.3	11	1.1	20	2.0	1	0.10	0	0.0	56	5.5	0	0.0
Ontario	0	0.0	4	0.0	8	0.1	71	0.5	108	0.8	405	3.1	3	0.0	1	0.0	1258	9.6	2	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Rate is incidence per 100,000 population

Data Table 2d: Sexually Transmitted and Bloodborne Diseases, Ontario, 2009	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	0	0.0	391	328.7	39	32.8	1	0.8	0	0.0	64	53.8	3	2.5	1	0.8	0	0.0	0	0.0	0	0.0
Brant County	0	0.0	332	238.8	39	28.0	0	0.0	0	0.0	59	42.4	2	1.4	1	0.7	0	0.0	0	0.0	0	0.0
Chatham-Kent	0	0.0	235	213.1	14	12.7	0	0.0	0	0.0	43	39.0	5	4.5	1	0.9	0	0.0	0	0.0	0	0.0
Durham Region	4	0.7	1,278	208.3	149	24.3	1	0.2	0	0.0	174	28.4	8	1.3	13	2.1	0	0.0	2	0.33	0	0.0
Eastern Ontario	1	0.5	232	116.5	15	7.5	1	0.5	7	3.5	47	23.6	3	1.5	1	0.5	0	0.0	0	0.0	0	0.0
Elgin-St. Thomas	0	0.0	127	141.1	11	12.2	0	0.0	3	3.3	30	33.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Grey-Bruce	1	0.6	292	178.9	6	3.7	2	1.2	2	1.2	28	17.2	2	1.2	0	0.0	0	0.0	0	0.0	0	0.0
Haldimand-Norfolk	2	1.8	126	113.6	6	5.4	1	0.9	1	0.9	44	39.7	2	1.8	0	0.0	0	0.0	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	0	0.0	274	154.4	6	3.4	0	0.0	6	3.4	86	48.5	3	1.7	4	2.3	0	0.0	0	0.0	0	0.0
Halton Region	2	0.4	682	138.5	61	12.4	3	0.6	2	0.4	105	21.3	12	2.4	6	1.2	0	0.0	0	0.0	0	0.0
Hamilton, City of	6	1.1	1,234	232.6	137	25.8	1	0.2	9	1.7	215	40.5	27	5.1	29	5.5	0	0.0	0	0.0	0	0.0
Hastings Prince Edward Counties	0	0.0	254	156.1	8	4.9	0	0.0	1	0.6	43	26.4	5	3.1	1	0.6	0	0.0	0	0.0	0	0.0
Huron County	0	0.0	67	110.5	5	8.2	0	0.0	4	6.6	2	3.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Kingston-Frontenac & Lennox & Addington	2	1.0	644	331.7	24	12.4	1	0.5	15	7.7	194	99.9	9	4.6	4	2.1	0	0.0	0	0.0	0	0.0
Lambton County	1	0.8	180	136.2	20	15.1	1	0.8	3	2.3	45	34.1	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0
Leeds-Grenville and Lanark District	2	1.2	204	121.2	14	8.3	0	0.0	7	4.2	77	45.7	4	2.4	3	1.8	1	0.59	1	0.59	0	0.0
Middlesex-London	2	0.4	1,308	289.2	209	46.2	3	0.7	3	0.7	248	54.8	23	5.1	12	2.7	0	0.0	0	0.0	0	0.0
Niagara Region	3	0.7	750	169.3	51	11.5	1	0.2	0	0.0	195	44.0	19	4.3	9	2.0	0	0.0	1	0.23	0	0.0
North Bay Parry Sound District	0	0.0	276	218.5	9	7.1	0	0.0	1	0.8	46	36.4	1	0.8	0	0.0	0	0.0	0	0.0	1	0.79
Northwestern	0	0.0	473	578.7	80	97.9	0	0.0	3	3.7	27	33.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.22
Ottawa, City of	17	1.9	2,025	229.5	218	24.7	4	0.5	3	0.3	305	34.6	67	7.6	50	5.7	0	0.0	0	0.0	1	0.11
Oxford County	0	0.0	130	121.7	5	4.7	0	0.0	0	0.0	46	43.1	3	2.8	0	0.0	0	0.0	0	0.0	0	0.0
Peel Region	5	0.4	2,939	223.7	426	32.4	8	0.6	12	0.9	399	30.4	54	4.1	20	1.5	0	0.0	0	0.08	0	0.0
Perth District	0	0.0	85	110.7	2	2.6	0	0.0	0	0.0	16	20.8	1	1.3	0	0.0	0	0.0	0	0.0	0	0.0
Peterborough County	1	0.7	369	266.3	19	13.7	0	0.0	3	2.2	52	37.5	5	3.6	1	0.7	0	0.0	0	0.0	0	0.0
Porcupine	0	0.0	401	458.0	103	117.6	0	0.0	2	2.3	32	36.5	2	2.3	0	0.0	0	0.0	0	0.0	0	0.0
Renfrew County and District	1	1.0	170	165.4	6	5.8	0	0.0	3	2.9	28	27.2	1	1.0	0	0.0	0	0.0	0	0.0	0	0.0
Simcoe Muskoka District	2	0.4	759	147.7	48	9.3	2	0.4	1	0.2	173	33.7	4	0.8	8	1.6	0	0.0	0	0.0	1	0.19
Sudbury and District	0	0.0	442	220.7	34	17.0	1	0.5	6	3.0	98	48.9	14	7.0	1	0.5	0	0.0	0	0.0	0	0.0
Thunder Bay District	0	0.00	602	384.6	49	31.3	0	0.0	1	0.64	121	77.31	4	2.6	1	0.6	0	0.0	0	0.0	0	0.0
Timiskaming	0	0.0	52	149.4	0	0.0	0	0.0	0	0.0	27	77.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Toronto	57	2.1	7,953	297.0	1476	55.1	15	0.6	33	1.2	959	35.8	530	19.8	578	21.6	0	0.0	2	0.07	2	0.07
Waterloo Region	0	0.0	1,018	196.4	87	16.8	0	0.0	7	1.4	116	22.4	9	1.7	13	2.5	0	0.0	1	0.19	0	0.0
Wellington-Dufferin-Guelph	1	0.4	466	171.1	12	4.4	0	0.0	6	2.2	62	22.8	9	3.3	4	1.5	0	0.0	0	0.0	0	0.0
Windsor-Essex County	1	0.2	566	140.2	54	13.4	2	0.5	0	0.0	153	37.9	20	5.0	3	0.7	0	0.0	0	0.0	0	0.0
York Region	2	0.2	1,484	146.0	105	10.3	2	0.2	7	0.7	227	22.3	13	1.3	19	1.9	0	0.0	1	0.10	0	0.0
Ontario	113	0.9	28820	220.5	3547	27.1	50	0.4	151	1.2	4586	35.1	865	6.6	784	6.0	1	0.0	9	0.1	6	0.1

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario

Note: Rate is incidence per 100,000 population

Data Table 2e: Diseases Transmitted by Direct Contact or Respiratory Routes: Ontario, 2009	Invasive Group A Streptococcus disease		Influenza		Legionellosis		Tuberculosis	
	#	Rate	#	Rate	#	Rate	#	Rate
Algoma District	5	4.2	108	90.8	2	1.7	0	0.0
Brant County	8	5.8	50	36.0	0	0.0	4	2.9
Chatham-Kent	5	4.5	60	54.4	0	0.0	0	0.0
Durham Region	10	1.6	429	80.9	3	0.5	11	1.8
Eastern Ontario	6	3.0	426	48.3		0.0	4	2.0
Elgin-St. Thomas	4	4.4	261	42.5	1	1.1	0	0.0
Grey-Bruce	5	3.1	201	101.0	1	0.6	1	0.6
Haldimand-Norfolk	3	2.7	45	50.0	0	0.0	0	0.0
Haliburton-Kawartha-Pine Ridge District	6	3.4	108	66.2	0	0.0	1	0.6
Halton Region	5	1.0	53	47.8	6	1.2	14	2.9
Hamilton, City of	27	5.1	86	48.5	6	1.1	19	3.6
Hastings Prince Edward Counties	8	4.9	299	60.7	0	0.0	1	0.6
Huron County	1	1.6	104	63.9	0	0.0	0	0.0
Kingston-Frontenac & Lennox & Addington	10	5.1	52	85.8	0	0.0	3	1.6
Lambton County	2	1.5	181	93.2	0	0.0	1	0.8
Leeds-Grenville and Lanark District	10	5.9	80	60.5	0	0.0	0	0.0
Middlesex-London	15	3.3	114	67.7	3	0.7	8	1.8
Niagara Region	18	4.1	341	75.4	0	0.0	3	0.7
North Bay Parry Sound District	5	4.0	355	80.2	0	0.0	0	0.0
Northwestern	12	14.7	110	87.1	0	0.0	6	7.3
Ottawa, City of	34	3.9	132	161.5	1	0.1	48	5.5
Oxford County	1	0.9	92	86.1	1	0.9	0	0.0
Peel Region	30	2.3	633	48.2	18	1.4	118	9.2
Perth District	3	3.9	51	66.4	0	0.0	1	1.3
Peterborough County	9	6.5	83	59.9	0	0.0	3	2.2
Porcupine	2	2.3	153	174.7	0	0.0	4	4.5
Renfrew County and District	3	2.9	48	46.7	0	0.0	1	1.0
Simcoe Muskoka District	16	3.1	315	61.3	4	0.8	4	0.8
Sudbury and District	12	6.0	111	55.4	0	0.0	0	0.0
Thunder Bay District	29	18.5	155	99.0	1	0.6	1	0.6
Timiskaming	2	5.7	63	181.0	0	0.0	0	0.0
Toronto	96	3.6	1261	47.1	15	0.6	273	10.3
Waterloo Region	19	3.7	238	45.9	2	0.4	17	3.3
Wellington-Dufferin-Guelph	10	3.7	110	40.4	1	0.4	7	2.6
Windsor-Essex County	11	2.7	348	86.2	3	0.7	15	3.7
York Region	25	2.5	366	36.0	3	0.3	60	6.1
Ontario	467	3.6	7622	58.3	71	0.5	628	4.9

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Rate is incidence per 100,000 population

Data Table 2f: Other Diseases: Ontario, 2009	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	2	1.00	0	0.0
Elgin-St. Thomas	0	0.0	1	1.11
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	1	0.19	0	0.0
Hastings Prince Edward Counties	0	0.0	0	0.0
Huron County	1	1.65	0	0.0
Kingston-Frontenac & Lennox & Addington	0	0.0	0	0.0
Lambton County	1	0.76	0	0.0
Leeds-Grenville and Lanark District	0	0.0	0	0.0
Middlesex-London	0	0.0	0	0.0
Niagara Region	0	0.0	0	0.0
North Bay Parry Sound District	1	0.79	0	0.0
Northwestern	1	1.22	0	0.0
Ottawa, City of	1	0.11	0	0.0
Oxford County	0	0.0	0	0.0
Peel Region	0	0.0	2	0.15
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	1	0.97	0	0.0
Simcoe Muskoka District	1	0.19	0	0.0
Sudbury and District	0	0.0	0	0.0
Thunder Bay District	1	0.64	0	0.0
Timiskaming	0	0.0	0	0.0
Toronto	3	0.11	1	0.04
Waterloo Region	1	0.19	0	0.0
Wellington-Dufferin-Guelph	0	0.0	0	0.0
Windsor-Essex County	0	0.0	0	0.0
York Region	2	0.20	0	0.0
Ontario	17	0.1	4	0.0

Data Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database.

Population Data: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario.

Note: Rate is incidence per 100,000 population

