Public Health Ontario
PARTNERS FOR HEALTH

Santé publique Ontario
PARTENAIRES POUR LA SANTÉ

April 2015

Monthly Infectious Diseases Surveillance Report

Volume 4, Issue 4

The Monthly Infectious Diseases Surveillance Report is produced by Public Health Ontario (PHO) for the public health community of Ontario. We welcome feedback by email to: SurveillanceServices@oahpp.ca. Past issues and additional information are available online.

In Focus **1**

Significant Reportable Disease Activity **7**

Infectious Disease Activity in Other Jurisdictions **9**

Recently Discontinued Enhanced Surveillance Directives **11**

Appendix – Reportable Diseases **12**

IN FOCUS

Celebrating National Immunization Awareness Week – Immunization surveillance in Ontario

Vaccines are among the most powerful and cost-effective of all health interventions [1-3] and are widely recognized as one of the greatest public health achievements of the twentieth century.[4] Their success also warrants celebration in the twenty-first century. This year, in Canada, National Immunization Awareness Week (NIAW) takes place from April 25 to May 2, 2015, and coincides with Vaccination Week in the Americas and World Immunization Week.[5-7] NIAW provides an opportunity to reflect on the enormous success of immunization programs and focus attention on the importance of immunization for all ages.[5] The NIAW 2015 theme "Boost your power! Get vaccinated!"

Ontario
Agency for Health Protection and Promotion
Agence de protection et de promotion de la santé

highlights how vaccines boost the power of the immune system to fight diseases and encourages everyone, including parents and health care providers, to ensure that people of all ages are immunized on time and receive all recommended vaccines to protect them from serious diseases.

The objectives of immunization programs are to prevent, control, eliminate, or eradicate vaccine-preventable diseases (VPDs), depending on the epidemiology of the diseases, efficacy of available vaccines, and the ability to reach the target populations. Significant progress towards these objectives has been achieved over the last several decades. The implementation of universal, routine immunization programs has led to dramatic reductions in morbidity and mortality from a number of VPDs, including the eradication of smallpox, which was officially declared in 1980[8], significant progress towards global poliomyelitis eradication[9], and measles and rubella elimination from Canada.[10] Today, vaccines protect against 25 preventable diseases and prevent between 2 and 3 million deaths every year worldwide.[7]

In order to ensure the continued success of immunization programs, strong surveillance to inform program planning and evaluation is essential. The three core components of surveillance within immunization programs are:

- **VPD surveillance** to assess the effectiveness of immunization programs and the epidemiology of VPDs over time;
- **Routine immunization coverage assessment** to determine the proportion of individuals appropriately immunized and therefore protected, by vaccine; and
- **Adverse events following immunization (AEFI) surveillance** to monitor the safety of administered vaccines and maintain confidence in immunizations.

In Ontario, provincial surveillance of VPDs, AEFIs, and immunization coverage is led by PHO in close collaboration with public health units (PHUs) and the Ministry of Health and Long-Term Care (MOHLTC). PHUs have a central role in investigating, assessing, and documenting information from primary reporters (e.g., health professionals). MOHLTC is responsible for public health legislation and standards, which enable the reporting and collection of information required for provincial surveillance, as well as immunization program policy development and ensuring vaccine supply. PHO routinely analyzes, interprets, and disseminates VPD, AEFI, and immunization coverage data obtained from provincial surveillance systems to support public health decision-making. PHO also operates provincial public health laboratories, which have a critical role in VPD testing, clinical consultation, surveillance, and outbreak investigation. In addition, PHO participates in special projects with regard to VPD surveillance such as the influenza vaccine effectiveness study. See Appendix 1 for additional detail about surveillance systems to support immunization programs.

Immunization surveillance data in action: Conjugate meningococcal vaccines

Since 2004, a conjugated meningococcal vaccine against serogroup C (Men C-C) has been publicly funded for one-year-olds in Ontario. This was followed by a school-based Men C-C program for grade

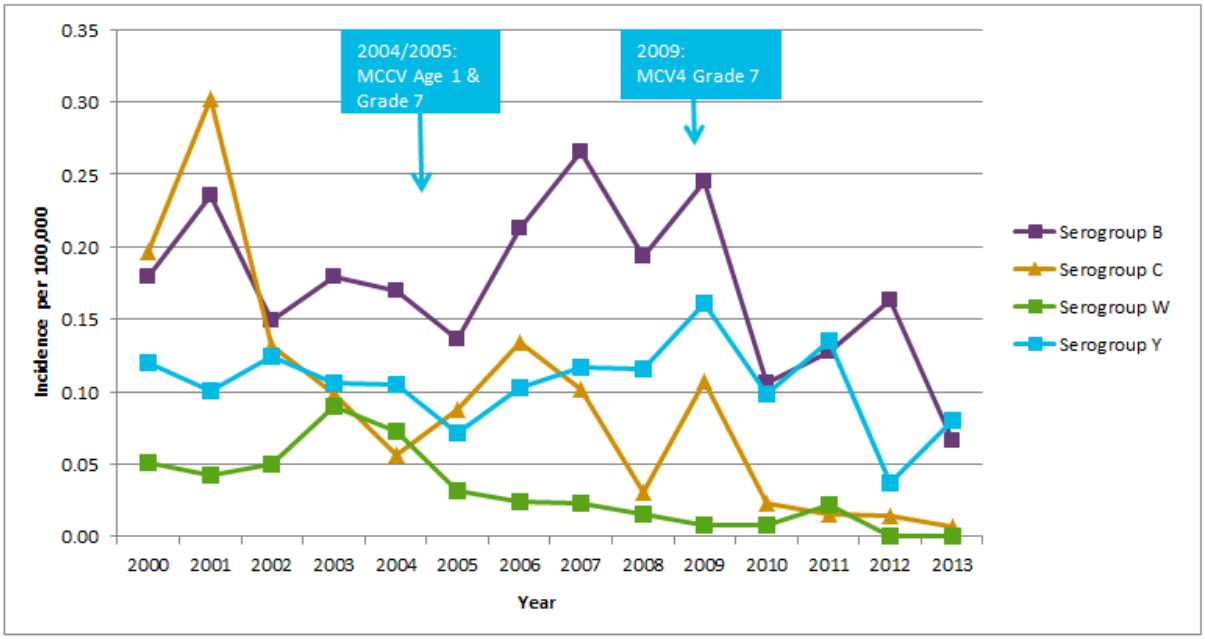
seven students in 2005, which was replaced with a quadrivalent conjugated vaccine against serogroups A, C, Y, and W-135 (Men-C-ACWY) in 2009.

Provincial meningococcal vaccine uptake was assessed by looking at immunization coverage for the 2012-13 school year for meningococcal vaccines. This analysis showed that when assessed at 7 years of age, 81.5% of children had received Men C-C vaccine. Vaccine coverage for grade 7 students, reflecting the school-based program (currently Men-C-ACWY), was 89.4%, just below the national coverage target of 90%.[11]

Surveillance of invasive meningococcal disease (IMD) has been useful to monitor the impact of the program, particularly on disease attributed to specific serogroups (Figure 1). The reduction in serogroup C IMD incidence suggests publicly-funded vaccination programs have had an impact on disease incidence, while the decrease in incidence of serogroup Y since 2009 suggests early program effects of the switch to quadrivalent vaccine.

With respect to vaccine safety, the most recent provincial surveillance report found that there was a low overall AEFI reporting rate in Ontario following all vaccines used in publicly funded programs. Most reported events were mild (i.e., injection site reactions) and resolved completely. Serious reports were rarely reported and most often related to known but rare events following vaccination. The reporting rates of AEFIs following Men-C-C and Men-C-ACWY (15.5 and 31.0 per 100 000 doses distributed, respectively)[12] are comparable to the other vaccines administered around the same age as these two vaccines.

Figure 1. Annual incidence of invasive meningococcal disease (IMD) by serogroup: Ontario, 2000-2013 (n=709)*



Data sources:

Ontario Cases: Ministry of Health and Long-Term Care (MOHLTC), integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/07/16]. Public Health Ontario Laboratories (PHOL), as of 2014/04/25.
Ontario Population: Population Estimates [2000-2013], Statistics Canada, distributed by MOHLTC, received [2014/07/03].
Notes:
*4 serogroup A, 1 serogroup Z, 86 non-groupable, and 15 cases with unknown serogroups excluded.
MCCV – Meningococcal conjugate serogroup C vaccine.
MCV4 – Meningococcal conjugate quadrivalent vaccine.

In addition to the ongoing, core functions of surveillance, evaluation to assess performance is also essential to ensure that surveillance systems are effectively and efficiently informing immunization programs. As a result, and in consultation with PHUs, PHO has recently implemented initiatives to improve the quality and completeness of VPD and AEFI data. These include revised iPHIS user guides, new surveillance forms for AEFI reporting, and VPD case report forms and guidance documents. In order to support improved dissemination and communication with public health stakeholders, new surveillance products have been developed. Annual provincial reports on VPDs, immunization coverage assessment, and vaccine safety are available on the PHO website, in addition to interactive reports and an interactive query tool for infectious diseases (including VPDs), the Ontario Respiratory Virus Bulletin, and the PHO Laboratory-Based Respiratory Pathogen Surveillance Report (which provide weekly or biweekly information on influenza and other respiratory pathogens in Ontario), and a graphic overview of AEFI surveillance data designed specifically for front-line providers. The PHO website also now includes comprehensive landing pages for both vaccine safety and measles, with more VPD-specific pages to be added in the coming months. Looking to the future, PHO's recently launched Infectious Disease Surveillance Framework provides a platform for continuing to improve surveillance data to support immunization programs and strengthen surveillance capacity and collaboration across Ontario.[13]

This month's NIAW is a time to celebrate and reflect on the achievements of immunization programs in reducing morbidity and mortality from VPDs, and an opportunity to acknowledge the critical role of the public health community in these achievements. It is through the dedication and efforts of Ontario's 36 PHUs working in close collaboration with PHO, MOHLTC, and the broader health sector that immunization programs continue to improve the health of Ontarians.

Appendix 1. Provincial surveillance for routine immunization programs in Ontario

Surveillance system	Reportable vaccine-preventable diseases/events under surveillance	Public health legislation/standards	Information system	Reporting
VPDs	• Varicella (chickenpox) • Diphtheria • *Haemophilus influenzae* type b disease (Hib) • Hepatitis A, B • Influenza • Invasive meningococcal disease (IMD) • Measles • Mumps • Pertussis (Whooping Cough) • Poliomyelitis, acute • Pneumococcal disease, invasive (IPD) • Rubella • Congenital rubella syndrome (CRS) • Tetanus	*Health Protection and Promotion Act* (HPPA) Ontario Regulation 569/91 Ontario Public Health Standards, Infectious Diseases Program Standards, Vaccine-Preventable Diseases Infectious Diseases Protocol and Appendices	iPHIS	Reportable Disease Trends in Ontario Infectious Diseases Query Ontario Respiratory Virus Bulletin PHO Laboratories Respiratory Pathogen Surveillance Reports
AEFIs	Any reported event in a vaccine recipient which follows immunization which cannot be clearly attributed to other causes. Categories of events include: • Local reactions at the injection site • Systemic reactions • Allergic reactions • Neurologic events • Other events of interest A causal relationship with the administration of the vaccine does not need to be proven.	*Health Protection and Promotion Act* (HPPA) Ontario Regulation 569 Ontario Public Health Standards, Infectious Diseases Program Standards, Vaccine Preventable Diseases Infectious Diseases Protocol, Appendix B, Case definitions, Adverse Events Following Immunization (AEFIs)	iPHIS	Annual Report on Vaccine Safety in Ontario Overview for Immunizers
Immunization coverage	Immunization according to the provincial schedule for the following diseases for all children attending school between the ages of four and 17 years. • Diphtheria • Tetanus • Poliomyelitis • Hib • Measles • Mumps • Rubella • Meningococcal disease* • Pertussis (whooping cough)* • Varicella (chickenpox)* • Pneumococcal disease# • Hepatitis B# • Human papillomavirus HPV#	*Immunization of School Pupils Act* (ISPA) Ontario Regulation 645 Ontario Public Health Standards, Infectious Diseases Program Standards, Vaccine Preventable Diseases Immunization Management Protocol	Panorama (formerly Immunization Records Information System (IRIS))	Immunization coverage report for school pupils, 2012-13 school year

* NEW requirement for 2014/15 school year; for varicella, applies to children born in 2010 or later
# Non-ISPA immunizations

References

1. Ehreth J. The global value of vaccination. Vaccine. 2003 Jan 30;21(7-8):596-600.

2. State of the World's Immunization. 3rd Edition. Geneva: World Health Organization; 2010 May 5 [cited 2015 March 30]. Available from: http://www.who.int/immunization/sowvi/en/

3. Bloom DE. The value of vaccination. Adv Exp Med Biol. 2011;697:1-8.

4. Ten Great Public Health Achievements of the 20th Century. Atlanta: Centres for Disease Control and Prevention; 2013 April 26 [cited 2015 March 30]. Available from: http://www.cdc.gov/about/history/tengpha.htm

5. National Immunization Awareness Week 2015. Ottawa: Immunize Canada; 2015 March [cited 2015 March 30]. Available from: http://www.immunize.ca/en/events/niaw.aspx

6. Vaccination Week in the Americas, 25 April - 2 May 2015. Washington, DC: Pan American Health Organization; 2015 [cited 2015 March 30]. Available from: http://www.paho.org/vwa/

7. World Immunization Week 2015 - Close the Gap. Geneva: World Health Organization; 2015 [cited 2015 March 30]. Available from: http://www.who.int/campaigns/immunization-week/2015/en/

8. The Smallpox Eradication Program - SEP (1966-1980). Geneva: World Health Organization; 2010 [cited 2015 March 30]. Available from: http://www.who.int/features/2010/smallpox/en/

9. History of Polio. Geneva: Global Polio Eradication Initiative; 2010 [cited 2015 March 30]. Available from: http://www.polioeradication.org/Polioandprevention/Historyofpolio.aspx

10. Shane A, Hiebert J, Sherrard L, Deehan H. Measles surveillance in Canada: Trends for 2013. CCDR. 2014;40(12):219.

11. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Immunization coverage report for school pupils: 2012-13 school year. Toronto, ON: Queen's Printer for Ontario; 2014.

12. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Annual report on vaccine safety in Ontario, 2013. Toronto, ON: Queen's Printer for Ontario; 2015.

13. Infectious Disease Surveillance Framework: Better Data for Better Action 2014-2019. Toronto: Ontario Agency for Health Protection and Promotion; 2015 [cited 2015 March 31]. Available from: http://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/Pages/IDS-Framework.aspx#.VR07uPzF9KY

SIGNIFICANT REPORTABLE DISEASE ACTIVITY

Table 1 provides a list of reportable diseases for which incidence in 2015 was found to be significantly higher ($p<0.05$) than expected compared to the five-year historical average (2010-2014). Both monthly and year-to-month (YTM) comparisons were made for each of the reportable diseases listed in Appendix 2, with the exception of influenza, measles, rubella, and congenital rubella syndrome. Influenza surveillance data are regularly reported through the Ontario Respiratory Virus Bulletin and the Laboratory-based Respiratory Pathogen Surveillance Report. Measles, rubella, and congenital rubella syndrome have been eliminated in Canada, although cases continue to occur related to travel importations. Statistical comparisons are no longer included for these diseases.

Table 1. Summary of statistically significant increases in reportable disease incidence: Ontario, January 1 to February 28, 2015

Reportable disease	2015				Historical comparisons						5-year avg annual count (2010-2014)
	Feb	Feb rate ŧ	YTM	YTM rate ŧ	Current month 5-year avg (2010-2014)	Current month 5-year avg (2010-2014) rate ŧ	% difference in rates (current month minus 5-year avg)†	YTM 5-year avg (2010-2014)	YTM 5-year avg (2010-2014) rate ŧ	% difference in rates (YTM 2015 minus YTM 5-year avg)†	
Gonorrhoea (All Types)[1,2]	425	30.4	898	64.1	314	23.4	29.7	715	53.2	20.6	4530

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2015/03/11].

Ontario Population: Population Estimates [2010-2013]: Statistics Canada, distributed by Ministry of Health and Long-Term Care, received [2014/07/03]. Population Projections [2014-2015]: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted by PHO [2014/04/11].

ŧ Rates listed are cases per 1,000,000 population.

† Percent (%) difference is calculated using unrounded rates; numbers displayed in these columns may vary from calculations using rounded rates.

[1] Statistically significant difference ($p<0.05$) in incidence reported in year-to-month (January 1 to February 28, 2015) compared to the five-year historical average (January 1 to February 28, 2010-2014), using a likelihood ratio test.

[2] Statistically significant difference ($p<0.05$) in incidence reported in current month (February 2015) compared to the five-year historical average (February 2010-2014), using a likelihood ratio test.

GONORRHEA (ALL TYPES)

Compared to the same time period in 2014, there was a slight increase in both the monthly and YTM incidence rate of laboratory-confirmed gonorrhea reported between January 1 and February 28, 2015. For February 2015, the monthly incidence rate (per 1,000,000) increased by 8.6% (from 28.0 to 30.4) compared to February 2014. The YTM incidence rate, however, increased by only 1.9% (from 62.9 to 64.1) – due largely in part to an observed decrease of 4.0% in the monthly incidence reported in January 2015, compared to January 2014 (from 34.7 to 33.3 per 1,000,000).

With respect to the five-year historical averages, there was a 29.7% increase in the monthly incidence of laboratory-confirmed gonorrhea reported in February 2015, compared to the monthly averages for February 2010-2014 (30.4 vs. 23.4, respectively). The YTM incidence rate for January 1 to Feburary 28,

2015 increased by 20.6% compared to the five-year average for the same time period (64.1 vs. 53.2, respectively).

With the exception of January 2015, Ontario has experienced a statistically significant increase in the monthly and YTM incidence of gonorrhea, compared to five-year historical averages, since September 2013. In 2014, an increased incidence was observed each month and, subsequently, the total number of cases reported (n=5,825) was the highest annual total in more than a decade. The cause of this ongoing provincial increase in reported gonorrhea cases is not yet well understood and is likely multifactorial. For a summary of the analyses conducted to-date, please refer to the Infectious Disease In Focus section of the February 2015 issue of this report.

INFECTIOUS DISEASE ACTIVITY IN OTHER JURISDICTIONS

This section of the report provides a snapshot of current activity related to infectious diseases across Canada and/or globally. The items included in this section are selected based on ongoing or potential implications for public health in Ontario.

HEPATITIS E IN THE UNITED KINGDOM

Summary

Hepatitis E virus (HEV) is a spherical non-enveloped RNA virus and is a major cause of enteric disease worldwide. Transmission occurs via the fecal-oral route through drinking contaminated water, which is the main route of transmission in developing countries; spread has also been shown to occur via food as well as potentially through other routes such as person-to-person, blood-borne, and perinatally. Humans are the natural host and the virus has also been found in animals such as pigs, sheep, goats, cows, deer, and boars.[1,2]

While it is often asymptomatic, hepatitis E can lead to acute symptoms of jaundice, pale stool, and dark urine, similar to hepatitis A. Severe infection can result in pregnant women. Although generally a self-limited infection, chronic infection, where viremia persists for three months or longer, has been reported, particularly in immunosuppressed individuals and can lead to chronic liver inflammation.[3]

Historically, HEV infection occurred primarily in developing countries; in these countries, it spreads via the waterborne route due to lack of appropriate water treatment.[1] However, over the past decade, reports of infection have been increasing in some developed countries, likely from foodborne sources or contact with animals. In the United Kingdom (UK), the number of reported cases of HEV infection rose from 124 in 2003 to 691 in 2013 and, in Germany, the number of reported HEV infection cases increased from less than 50 cases to over 450 cases annually over the same time period.[3,4]

A recent survey conducted by scientists in the UK found that one in ten pork sausages were contaminated with HEV. This finding generated much attention in the media, with reminders from health officials to ensure that sausages are cooked thoroughly before consumption.[5]

Implications

There is a high prevalence of HEV in pig farms in Canada, the United States (US), and Europe. It is estimated that 80% of Ontario commercial swine are seropositive for HEV.[6,7]

The seroprevalence of HEV in humans was previously considered to be less than 1% in developed countries. However, this rate is said to have increased to 2% in Europe and 1-3% in the (US). In some high risk groups, it is believed to be as high as 20%.[8] A study conducted in 2013 by Canadian Blood Services found antibodies to HEV in 241 of 4,104 Canadian blood donors (5.9%), indicating past exposure to HEV virus in these individuals.[9]

These findings suggest that further considerations should be given to HEV in Canada. The Provincial Infectious Diseases Advisory Committee on Communicable Diseases (PIDAC-CD) is considering whether HEV infection should be made reportable in Ontario. HEV infection is already reportable in other provincial jurisdictions including British Columbia and Alberta.

Sources

1. Public Health Agency of Canada [homepage on the Internet]. Fact sheet - Hepatitis E; 2010 August [cited 2015 Jan 9]. Available from: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/hepe-eng.php

2. American Public Health Association. Hepatitis, viral. In: Heymann DL, ed. *Control of communicable diseases manual.* 19th ed. Washington, D.C.: American Public Health Association; 2008:280.

3. Poulter S., ed. *Hidden risk in one in ten sausages: Hepatitis E in pork could be making tens of thousands ill, say government experts.* The Daily Mail ed. Associated Newspapers Ltd; 2014 Mar 29.

4. Pischke S, Behrendt P, Bock CT, Jilg W, Manns MP, Wedemeyer H. Hepatitis E in Germany --an under-reported infectious disease. *Dtsch Arztebl Int*. 2014;111(35-36):577-583.

5. Stevens, P., ed. *One in 10 sausages 'carries risk of hepatitis E virus'.* BBC News; 2014 Nov 20. Available from: http://www.bbc.com/news/health-30006977

6. Yoo D, Willson P, Pei Y, et al. Prevalence of hepatitis E virus antibodies in Canadian swine herds and identification of a novel variant of swine hepatitis E virus. *Clin Diagn Lab Immunol*. 2001;8(6):1213-1219.

7. Ward P, Muller P, Letellier A, et al. Molecular characterization of hepatitis E virus detected in swine farms in the province of Quebec. *Can J Vet Res*. 2008;72(1):27-31.

8. Rodriguez S, Carey WD, eds. *Hepatitis E – an evolving disease.* Cleveland, OH: The Cleveland Clinic Foundation; 2013.

9. Fearon M, Scalia V, O'Brien SF, et al. Seroprevalence of babesia and hepatitis E in Canadian blood donors. *Transfusion*. 2014;54:27A.

RECENTLY DISCONTINUED ENHANCED SURVEILLANCE DIRECTIVES

SALMONELLA ENTERITIDIS

PHO and MOHLTC, in collaboration with affected PHUs, coordinated an investigation into an increase in non-travel related *S.* Enteritidis cases reported since September 1, 2014. A Public Health Alert was initially issued by PHO on September 10, 2014 to inform Ontario investigators of the observed increase in the number of non-travel cases of *S.* Enteritidis cases. On November 14, 2014 an Ontario Outbreak Investigation Coordinating Committee (ON-OICC) was established and an Enhanced Surveillance Directive (ESD) was issued to assist with the timely collection of information for Ontario cases. Between September 1, 2014 and February 18, 2015 (the date of last analysis), 453 confirmed *S.* Enteritidis cases were reported in Ontario. Of the 417 cases with phage type (PT) results available, 37% (156 cases) were PT8 and 16% (66 cases) were PT13. In order to identify a possible source of the outbreak, a single interviewer approach was implemented by PHO. Frozen, breaded, processed breaded chicken that is purchased raw was identified as a contributing source of the increase in *S.* Enteritidis. While the ESD was discontinued on February 27, 2015, the ON-OICC remains active as the food safety portion of the investigation is ongoing.

Appendix – Reportable Diseases

Appendix 2. Confirmed cases of reportable diseases, and probable cases of select reportable diseases, by month: Ontario, 2010-2015*

Reportable disease	2015														Historical comparisons						5-year avg (2010-2014) annual count
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTM	YTM rate ŧ	Current month 5-year avg (2010-2014)	Current month 5-year avg (2010-2014) rate ŧ	% difference rates (current month minus 5-year avg)†	YTM 5-year avg (2010-2014)	YTM 5-year avg (2010-2014) rate ŧ	% difference rates (YTM 2015 minus YTM 5-year avg)†	
Acute Flaccid Paralysis	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AIDS	1	7	-	-	-	-	-	-	-	-	-	-	**8**	0.6	6	0.5	5	19	1.4	-59	99
Amebiasis	44	41	-	-	-	-	-	-	-	-	-	-	**85**	6.1	63	4.7	-38	133	9.9	-39	790
Botulism	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	0	0.0	-	2
Brucellosis	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-100	1	0.0	-100	5
Campylobacter enteritis	177	145	-	-	-	-	-	-	-	-	-	-	**322**	23.0	192	14.3	-27	393	29.2	-21	3,700
Chlamydial Infections	3,188	2,793	-	-	-	-	-	-	-	-	-	-	**5,981**	427.1	2,754	204.9	-3	5,837	434.3	-2	35,411
Cholera	1	0	-	-	-	-	-	-	-	-	-	-	**1**	0.1	0	0.0	-	0	0.0	-	0
Cryptosporidiosis	15	13	-	-	-	-	-	-	-	-	-	-	**28**	2.0	14	1.0	-10	28	2.1	-3	321
Cyclosporiasis	1	5	-	-	-	-	-	-	-	-	-	-	**6**	0.4	3	0.2	85	5	0.4	7	117
Encephalitis	1	3	-	-	-	-	-	-	-	-	-	-	**4**	0.3	1	0.1	140	3	0.3	13	18
Encephalitis/Meningitis	10	11	-	-	-	-	-	-	-	-	-	-	**21**	1.5	8	0.6	26	16	1.2	28	149
Food Poisoning, All Causes	6	0	-	-	-	-	-	-	-	-	-	-	**6**	0.4	3	0.2	-100	13	1.0	-55	86
Giardiasis	83	73	-	-	-	-	-	-	-	-	-	-	**156**	11.1	103	7.6	-32	211	15.7	-29	1,337
Gonorrhoea (All Types)	473	425	-	-	-	-	-	-	-	-	-	-	**898**	64.1	314	23.4	30	715	53.2	21	4,530
Group A Streptococcal Disease, Invasive	71	40	-	-	-	-	-	-	-	-	-	-	**111**	7.9	68	5.1	-44	135	10.1	-21	637
Group B Streptococcal Disease, Neonatal	0	2	-	-	-	-	-	-	-	-	-	-	**2**	0.1	5	0.3	-58	9	0.7	-79	55
Haemophilus Influenzae B Disease, Invasive	0	1	-	-	-	-	-	-	-	-	-	-	**1**	0.1	0	0.0	-	0	0.0	380	4
Hepatitis A	12	4	-	-	-	-	-	-	-	-	-	-	**16**	1.1	11	0.8	-66	20	1.5	-22	110
Hepatitis B (Acute)	3	4	-	-	-	-	-	-	-	-	-	-	**7**	0.5	10	0.7	-60	20	1.5	-66	110
Hepatitis B (Chronic)	63	42	-	-	-	-	-	-	-	-	-	-	**105**	7.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hepatitis C	345	275	-	-	-	-	-	-	-	-	-	-	**620**	44.3	323	24.1	-18	691	51.4	-14	4,262
HIV	55	55	-	-	-	-	-	-	-	-	-	-	**110**	7.9	57	4.3	-8	119	8.9	-11	789
Influenza	4,575	1,966	-	-	-	-	-	-	-	-	-	-	**6,541**	467.1	792	58.9	138	2,554	190.1	146	6,718
Legionellosis	5	3	-	-	-	-	-	-	-	-	-	-	**8**	0.6	5	0.3	-37	10	0.7	-23	172
Leprosy	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	1	0.1	-100	3
Listeriosis	2	2	-	-	-	-	-	-	-	-	-	-	**4**	0.3	4	0.3	-54	7	0.5	-47	51
Lyme Disease	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	1	0.1	-100	4	0.3	-100	201
Malaria	9	6	-	-	-	-	-	-	-	-	-	-	**15**	1.1	10	0.8	-45	26	2.0	-45	222
Measles α	7	11	-	-	-	-	-	-	-	-	-	-	**18**	1.3	#	#	#	#	#	#	#
Meningitis	2	2	-	-	-	-	-	-	-	-	-	-	**4**	0.3	5	0.4	-60	11	0.8	-66	117
Meningococcal Disease, Invasive	5	0	-	-	-	-	-	-	-	-	-	-	**5**	0.4	3	0.2	-100	7	0.5	-29	32
Mumps	3	1	-	-	-	-	-	-	-	-	-	-	**4**	0.3	5	0.3	-79	14	1.0	-72	48
Ophthalmia Neonatorum	1	0	-	-	-	-	-	-	-	-	-	-	**1**	0.1	1	0.0	-100	1	0.0	60	3
Paralytic Shellfish Poisoning	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paratyphoid Fever	3	5	-	-	-	-	-	-	-	-	-	-	**8**	0.6	4	0.3	14	11	0.8	-30	45
Pertussis (Whooping Cough)	14	16	-	-	-	-	-	-	-	-	-	-	**30**	2.1	13	1.0	18	38	2.8	-24	400
Q Fever	1	0	-	-	-	-	-	-	-	-	-	-	**1**	0.1	0	0.0	-100	2	0.1	-47	15
Rabies	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	0	0.0	-	0
Rubella	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	#	#	#	#	#	#	#
Rubella, Congenital Syndrome	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	#	#	#	#	#	#	#
Salmonellosis	173	148	-	-	-	-	-	-	-	-	-	-	**321**	22.9	212	15.8	-33	409	30.4	-25	2,776
Shigellosis	17	16	-	-	-	-	-	-	-	-	-	-	**33**	2.4	20	1.5	-23	44	3.3	-28	263
Streptococcus Pneumoniae, Invasive	101	75	-	-	-	-	-	-	-	-	-	-	**176**	12.6	106	7.9	-32	235	17.5	-28	1,172
Syphilis, Early Congenital	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	0	0.0	-	1
Syphilis, Infectious	43	32	-	-	-	-	-	-	-	-	-	-	**75**	5.4	59	4.4	-48	133	9.9	-46	790
Syphilis, Other	37	25	-	-	-	-	-	-	-	-	-	-	**62**	4.4	55	4.1	-57	116	8.7	-49	685
Tetanus	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-100	1	0.0	-100	2
Tuberculosis	38	26	-	-	-	-	-	-	-	-	-	-	**64**	4.6	48	3.6	-48	92	6.8	-33	625
Tularemia	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	0	0.0	-	1
Typhoid Fever	4	3	-	-	-	-	-	-	-	-	-	-	**7**	0.5	10	0.7	-71	20	1.5	-66	81
Verotoxin Producing E. coli Including HUS	6	4	-	-	-	-	-	-	-	-	-	-	**10**	0.7	5	0.4	-20	14	1.0	-30	173
West Nile Virus Illness	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-	0	0.0	-	86
Yellow Fever	0	0	-	-	-	-	-	-	-	-	-	-	**0**	0.0	0	0.0	-100	0	0.0	-100	1
Yersiniosis	12	6	-	-	-	-	-	-	-	-	-	-	**18**	1.3	14	1.1	-59	31	2.3	-44	180

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2015/03/11].

Ontario Population: Population Estimates [2010-2013]: Statistics Canada, distributed by Ministry of Health and Long-Term Care, received [2014/07/03]. Population Projections [2014-2015]: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted by PHO [2014/04/11].

Column or row-specific notes:

***** Appendix 1 is not an exhaustive list of all reportable diseases in Ontario. Case counts for amebiasis, Lyme disease, mumps, pertussis, and West Nile Virus illness are based on the sum of confirmed and probable cases as reported in iPHIS.

ŧ Rates listed are cases per 1,000,000 population.

† Percent (%) difference is calculated using unrounded rates; numbers displayed in these columns may vary from hand calculations using rounded rates.

α Please refer to the measles epidemiologic summary for the most recent number of confirmed cases.

Historical comparison data are not provided for measles, rubella, and congenital rubella syndrome because these diseases have been eliminated in Canada. However, as these diseases remain endemic in other countries, imported and import-related cases continue to occur in Ontario.

n/a Acute Flaccid Paralysis and Paralytic Shellfish Poisoning became reportable in Ontario in December 2013. No historical data are available for comparisons. Also, a provincial case definition for chronic hepatitis B was released in January 2012. Please note that chronic and acute hepatitis B case counts are not mutually exclusive and should not be added to obtain a total for hepatitis B cases in Ontario. Historical comparisons are not available as cases of chronic hepatitis B may have been entered using varying criteria prior to this time.

- Does not include cases for which MOHLTC-PHD(0) was selected as the Diagnosing Health Unit or cases with a Disposition Description set to "DOES NOT MEET" or "ENTERED IN ERROR."
- Differentials in year over year comparisons are reflective of changes in disease incidence and changes in the size of the population.
- Statistical tests comparing rates were not performed when the YTM rate in previous years was zero.
- Case counts for tuberculosis and AIDS are based on diagnosis date and not episode date. HIV case counts are based on encounter date.