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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 on the Monthly Infectious Diseases Surveillance Report are available online.

In this issue:

Infectious Disease in Focus

HEPATITIS B

Hepatitis B is a blood borne infection caused by the hepatitis B virus (HBV) that infects the liver. Compared to other blood borne infections such as human immunodeficiency virus and hepatitis C virus, HBV is more infectious and can survive longer outside the body, for up to seven days.[1] HBV is transmitted through percutaneous contact (i.e. through punctured skin) or mucosal contact with HBV infected blood and body fluids including vaginal and anal secretions, semen, and saliva.[2, 3] Transmission typically occurs through sexual contact, sharing of injection drug use equipment, exposure to contaminated sharp instruments (e.g. occupational needle stick injuries), or transmission from infected mothers to their newborns.[4] Transmission between household contacts can also occur. However, one third of those with HBV infection in Canada have no identified risk factors.[5]

Initial infection with HBV (acute infection) is often asymptomatic, with half of adults and up to 90% of children demonstrating no symptoms.[6] Clinical signs and symptoms may be non-specific and include jaundice, abdominal discomfort, nausea, vomiting, decreased appetite, fatigue, rash, and joint pain.[2,4] Individuals with acute hepatitis B may progress to chronic HBV infection and remain infectious carriers for life. The younger the age of infection, the more likely a person is to become a chronic HBV carrier.[2] Cirrhosis and/or chronic liver failure develops in approximately one third of those with chronic hepatitis B, and hepatocellular carcinoma (liver cancer) develops in approximately 5% of cases.[5,7] Up to 25% of chronic HBV cases will die from HBV-associated sequelae.[2] Antiviral treatment for chronic hepatitis B is now

recommended for selected individuals who have the potential to benefit from early detection, monitoring, and access to antiviral medications.[7]

HBV diagnosis involves the identification of antibodies against HBV, hepatitis B antigens, and/or the detection of HBV DNA. In most cases, acute and chronic infections can be differentiated based on different serological responses over time, or different combinations of these test results at a single point in time.[2, 8] *Table 1* in the Hepatitis B Infections chapter of the Canadian Guidelines on Sexually Transmitted Infections provides a summary on serologic markers for hepatitis B.[4]

The Ontario Burden of Infectious Disease Study (ONBOIDS) identified HBV as the fourth most burdensome infectious disease in Ontario, due to its associated morbidity and mortality.[9] However, estimates of the prevalence of HBV infection in Ontario have been limited in their generalizability to the province as a whole.[10-15] The prevalence of hepatitis B in the general Canadian population has been estimated to range from 0.5% to 1%,[16] but estimates are higher in some groups. The Public Health Agency of Canada provides a comprehensive list of individuals at high risk of hepatitis B.[4]

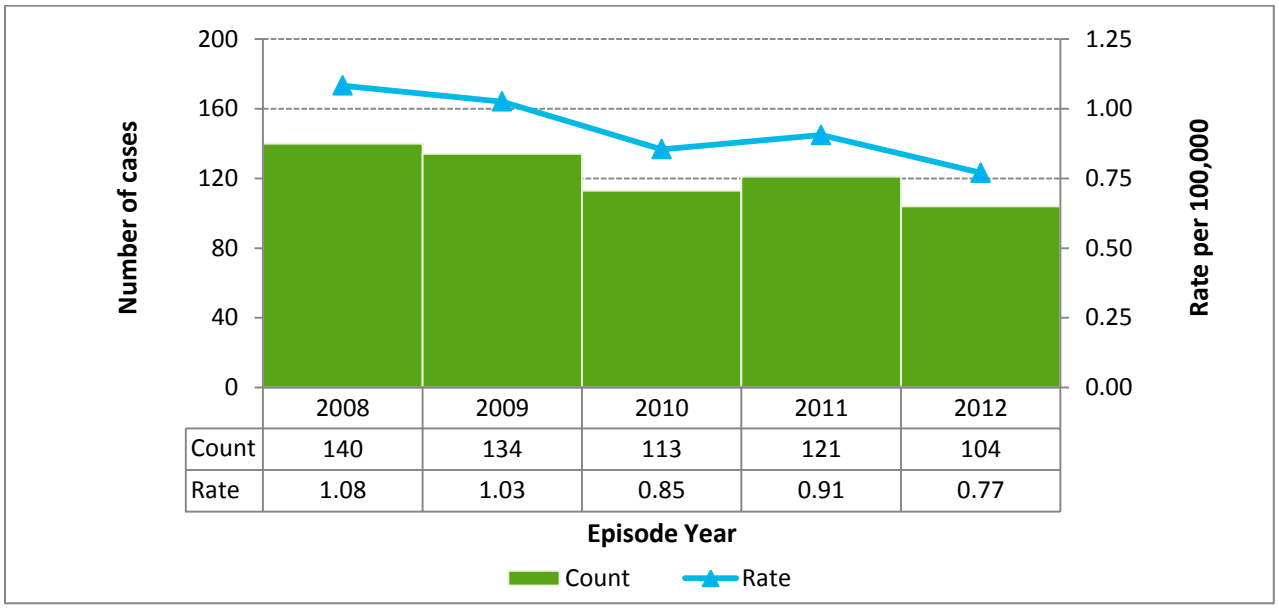
HBV infections can be successfully prevented through immunization. Ontario offers a publicly funded school-based HBV immunization program for grade seven students and individuals in high risk groups. The grade seven HBV program was first implemented in 1994/1995, with a catch-up program in 1996/1997 targeting high school students. For the 2011/2012 school year, vaccine coverage for Ontario's school-based program was 86.6%.[17] The eligibility criteria for Ontario's hepatitis B vaccination program targeting those at high risk can be found in section five: management, drug and vaccine supply distribution of the Sexual Health and Sexually Transmitted Infections Prevention and Control Protocol, 2013.[18]

In addition to primary prevention through immunization, other measures to prevent and control HBV transmission include universal prenatal HBV screening, provision of harm reduction services, HBV screening for high risk individuals, and education and counselling of newly diagnosed cases and their contacts. Post-exposure prophylaxis can also reduce the risk of HBV infection for infants born to HBV positive mothers. Other HBV-susceptible individuals with percutaneous or mucosal exposure (i.e. through needle stick injury, or sexual or household contact) to HBV positive or high risk sources can also benefit from post-exposure prophylaxis. Through timely administration of the hepatitis B vaccine and hepatitis B immunoglobulin (HBIG), active and passive protection against HBV is provided to these individuals.[1,2, 4,6]

In Ontario, acute and chronic HBV infections are reported through the integrated Public Health Information System (iPHIS). The reported incidence of acute HBV infection in Ontario declined between 2008 and 2012 (Figure 1). In the first half of 2013, there have been 47 cases reported to the end of June, resulting in an annualized rate of 0.7 cases per 100,000 for 2013.

The median age of acute cases reported from January 1, 2008 to December 31, 2012, was 43 (range: one month to 85 years). The average sex-specific incidence rates over this timeframe were 1.2 male and 0.7 female cases per 100,000 population per year. While the incidence rate of acute cases varied by age group from 2008 to 2012, the highest average incidence rate was observed in 35 to 39 year olds at 1.7 cases per 100,000 population per year (Figure 2). Many of these individuals were never eligible for the school-based vaccination program. Of particular note is the average incidence rate of 0.7 per 100,000 population per year observed among children under the age of one year in Ontario, despite recommendations for universal HBV prenatal screening and post-exposure prophylaxis protocols for babies born to HBV-infected mothers. Moreover, this is likely an underestimate given the asymptomatic nature of most infections in this age group. Variation in incidence rate by health unit was observed each year.

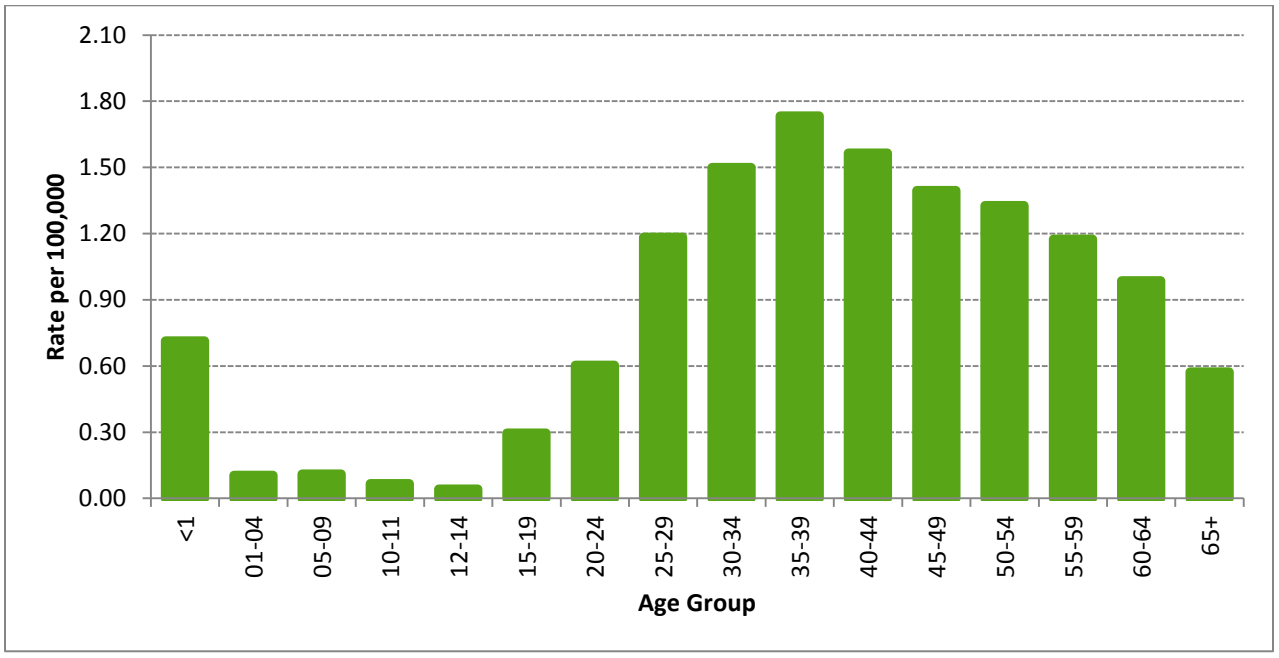
Figure 1. Reported number of cases and incidence rate of confirmed acute HBV infections: Ontario, 2008 to 2012



	2008	2009	2010	2011	2012
Count	140	134	113	121	104
Rate	1.08	1.03	0.85	0.91	0.77

Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/08/27].
Ontario population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2013/09/19].

Figure 2. Average annual reported incidence rate of confirmed acute HBV infections by age group: Ontario, 2008 to 2012



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/08/27].
Ontario population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2013/09/19].

A provincial surveillance case definition for chronic HBV infections has been in effect since January 1, 2012.[19] In 2012, there were 2,194 chronic cases reported, which corresponds to an incidence rate of 16.2 cases per 100,000 population. There were 14.2 and 18.3 female and male cases per 100,000 population, respectively. The median age of the cases was 39 (range: 10 months to 93 years). The highest reported incidence rate was among 30 to 34 year olds, with 34.9 cases reported per 100,000 population. The health units with the highest reported incidence rates of chronic HBV infection were Peel Region, Toronto, and York Region with 16.8, 40.0, and 35.6 cases per 100,000 population, respectively. The high rates in these health units are not unexpected, given that estimates of HBV prevalence in Canada tend to be higher among immigrants from parts of the world where HBV infections are considered to be endemic,[4,20-23] many of whom settle in and around Toronto.

This brief review suggests that opportunities exist to further explore and strengthen existing surveillance and research to better understand the epidemiology of hepatitis B in Ontario and its implications for public health action. Future directions for hepatitis B prevention and programs in Ontario, including the optimal age to target routine HBV vaccination, will rely on further characterization of the morbidity and mortality associated with HBV infection in the province and the affected groups. Using surveillance data from iPHIS alone, one cannot determine the prevalence of HBV infection in the province because asymptomatic cases may not be tested and therefore may be missed. Surveillance data also cannot help determine long term outcomes associated with HBV infection in Ontario. In addition to a more detailed analysis of iPHIS data, PHO aims to further explore the epidemiology of hepatitis B and its sequelae in the Ontario population and subgroups within it through two projects in collaboration with Cancer Care Ontario and the Institute for Clinical Evaluative Studies, respectively.

Significant Reportable Disease Activity

Table 1 provides a list of reportable diseases for which incidence in 2013 was significantly higher than expected compared to the five-year historical average (2008-2012). Both monthly and year-to-month (YTM) comparisons were made for each of the reportable diseases listed in Appendix 1.

Table 1. Summary of statistically significant increases in reportable disease incidence: Ontario, January 1 to August 31, 2013

Reportable disease	2013				Historical comparisons						5-year avg annual count (2008-2012)
	Aug	Aug rate ŧ	YTM	YTM rate ŧ	Current month 5-year avg (2008-2012)	Current month 5-year avg (2008-2012) rate ŧ	% difference in rates (current month minus 5-year avg)†	YTM 5-year avg (2008-2012)	YTM 5-year avg (2008-2012) rate ŧ	% difference in rates (YTM 2013 minus YTM 5-year avg)†	
Chlamydial Infections*	2,761	201.7	22,993	1679.5	2,728	206.2	-2	21,286	1609.1	4	32,297
Legionellosis*	33	2.4	173	12.6	31	2.4	2	68	5.2	144	124
Lyme Disease*	27	2.0	204	14.9	19	1.4	39	104	7.9	90	125
Food Poisoning, All Causes**	77	5.6	101	7.4	19	1.4	296	98	7.4	-1	123
Group A Streptococcal Disease, Invasive**	56	4.1	415	30.3	28	2.1	95	404	30.5	-1	565

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/09/18].
Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2012/10/15].
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.
* Statistically significant difference ($p<0.05$) in incidence reported in year-to-month (January to August 2013) compared to the five-year historical average (January to August 2008-2012).
** Statistically significant difference ($p<0.05$) in incidence reported in current month (August 2013) compared to the monthly five-year historical average (August 2008-2012).

CHLAMYDIA

The YTM incidence rate of reported laboratory-confirmed chlamydial infections for January 1 to August 31, 2013 was significantly higher than the historical five-year (2008-2012) average YTM rate for the same period. This increase may in part be due to increased screening for chlamydial infections in recent years, as summarized in the May 2013 (Volume 2, Issue 5) edition of the Monthly Infectious Diseases Surveillance Report. An increase in the current YTM rate in comparison to historical five-year average YTM rates was also noted in the June, July, August, and September editions (Volume 2, Issues 6-9).

The monthly incidence rate of chlamydia in August 2013 was lower compared to the historical five-year monthly rate for August, and there has been a decreasing trend in monthly incidence of chlamydia in 2013. The reasons for this decrease are unclear and PHO continues to investigate potential reasons for the decline. The July 2012 (Volume 1, Issue 8) edition further describes the epidemiology of chlamydia in Ontario.

LEGIONELLOSIS

The YTM incidence rate of legionellosis for January 1 to August 31, 2013 is significantly higher than the historical five-year (2008-2012) average YTM rate for the same period. Monthly case counts for legionellosis were significantly higher than expected in June and July, but were close to the historical five-year (2008-2012) monthly average for August. The 2013 seasonal increase of legionellosis in Ontario occurred earlier than usual, with the largest number of cases reported in July. The majority of cases continue to be reported from health units in and around the Golden Horseshoe area, which is similar to where cases have been reported in previous years. A geographic cluster was identified involving six cases in a single health unit in late August. A common source exposure was identified for two cases in a northern health unit; however, no other common exposures have been identified among reported cases. Of those individuals tested for *Legionella* by Public Health Ontario Laboratories in August 2013, only 4.3% had positive results. This was lower than June and July 2013, and considerably lower compared to the percentage of positive test results in August of previous years (average: 7.2% for 2010 to 2012).

The Enhanced Surveillance Directive issued on June 28, 2013 remains in effect. Significant disease activity associated with legionellosis has been described in each edition of the Monthly Infectious Diseases Surveillance Report since May 2013 (Volume 2, Issues 5-9).

LYME DISEASE

From January 1 to August 31, 2013, the case count for Lyme disease was significantly higher than expected compared to the five-year average count for the same period from 2008 to 2012. As with past years in Ontario, Lyme disease activity to date in 2013 has demonstrated a seasonal pattern, with the majority of cases reported in the summer months. Of the 204 confirmed and probable cases reported between January and August 2013, 86% (175 cases) were reported in the months of June (52 case), July (96 cases), and August (27 cases). The geographic distribution of cases to date in 2013 has also remained consistent with past years in that the highest incidence of Lyme disease has occurred in Eastern Region health units including Leeds, Grenville and Lanark District; Kingston-Frontenac, Lennox and Addington; Eastern Ontario; Hastings and Prince Edward Counties; and the City of Ottawa. Lyme disease has been present in Ontario for many years, but the prevalence and geographical range of the tick vector, *Ixodes scapularis* or blacklegged tick, continues to expand, especially in the Eastern Region of the province. The increasing incidence may also be partially explained by greater awareness of the disease among the general public and health care providers, as well as factors related to improved surveillance of Lyme disease. In February 2012, Public Health Ontario released a Technical Report: Update on Lyme Disease Prevention and Control, which contains information on human and tick surveillance, as well as a discussion on diagnosis and laboratory testing. The Lyme disease in Focus article in the September 2013 (Volume 2, Issue 9) edition of this report contains a detailed summary of the epidemiology of Lyme disease in Ontario, as does the Vector-Borne Disease 2012 Summary Report.

FOOD POISONING, ALL CAUSES

In August 2013, the number of reported cases of food poisoning was significantly higher than expected compared to the five-year average (2008-2012) for the month of August. The increase was driven by a foodborne outbreak of *Staphylococcus aureus*, which was investigated by Toronto Public Health (TPH). Outbreak-related cases from nine health units including TPH accounted for 99% of food poisoning cases reported in Ontario in August 2013. These cases were linked to the consumption of contaminated maple bacon jam topping on a specialty burger purchased at a food kiosk from August 16 to August 20 at the 2013 Canadian National Exhibition (CNE).

GROUP A STREPTOCOCCAL DISEASE, INVASIVE

There was a significant increase in the incidence of laboratory-confirmed invasive Group A *Streptococcus* (iGAS) cases reported in Ontario in August 2013 compared to the historical five-year monthly average (2008-2012) for August. However, the YTM incidence for 2013 is very close to the historical five-year YTM average. The annual incidence of iGAS reported in Ontario has been gradually increasing, with an average increase of five percent per year over the past five years. The reason for the overall increase in iGAS in Ontario over this period is not fully understood.

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.

LYME DISEASE

Summary:
The United States Centers for Disease Control and Prevention (CDC) released new estimates of the number of Lyme disease cases that occur annually in the U.S. The new estimates were released at the August 2013 International Conference on Lyme Borreliosis and Other Tick-Borne Diseases. They indicate that the number of Americans diagnosed with Lyme disease each year is roughly ten times higher than the actual number of cases reported each year. This translates into approximately 300,000 cases per annum. The estimates were derived from a consortium of three separate studies that used medical claims, a survey of clinical laboratories, and self-reported Lyme disease.

Implications:
In 2012, 162 confirmed and probable cases of Lyme disease were reported in Ontario for an incidence rate of 1.2 cases per 100,000 population. In 2013, 204 confirmed and probable cases were reported between January and August 2013. The incidence of Lyme disease for the period 2002 to 2013 demonstrated an increase with the majority of cases and reported exposures occurring in the southeastern section of the province. Similar to other passive surveillance systems, the incidence of Lyme disease in Ontario is likely under-reported. However, the degree of under-reporting is not known and the U.S. estimates cannot be broadly applied due to differences including Ontario's health care system and local tick and *Borellia burgdorferi* prevalence.

Lyme disease is the most frequently reported among all vector-borne diseases in North America. Information on the transmission, symptoms, prevention and epidemiology of Lyme disease in Ontario can be found in last month's edition of the Monthly Infectious Diseases Surveillance Report starting on page one.

http://www.cdc.gov/media/releases/2013/p0819-lyme-disease.html
http://www.cdc.gov/lyme/stats/chartstables/reportedcases_statelocality.html

MEASLES

Summary:

Several countries are currently experiencing outbreaks of measles among religious communities who oppose immunization. In the Netherlands, a large outbreak starting in May 2013 has predominantly affected the orthodox Protestant community, where 97% of cases were unimmunized. As of August 28, 1,226 cases including 82 hospitalizations have been reported; however, it is believed this represents less than 10% of all cases due to significant underreporting.

Several outbreaks have been reported in orthodox Jewish communities across Europe and Israel. In the United Kingdom (U.K.), an outbreak within a large European community based in London resulted in 62 cases between December 2012 and March 2013. The index case was an unvaccinated infant who attended a nursery while infectious. Cases ranged in age from seven months to 27 years; 87% were unvaccinated and three hospitalizations were reported.

In the United States, the largest outbreak of measles since 1996 was associated with an unvaccinated traveler to the U.K. A total of 58 cases were identified among members of an orthodox Jewish community in Brooklyn, New York between March and June, 2013. None of the cases were immunized; while 21% were too young to be immunized, 67% of cases who were eligible rejected immunization on religious and philosophical grounds.

Implications:
Canada is currently documenting the elimination of measles under the guidance of the Pan American Health Organization. While the last endemic case of measles in Canada occurred in 1997, importation of cases from endemic areas of the world continues to occur and unimmunized individuals remain at risk from this highly communicable disease. In addition, there exist communities within Ontario that are at increased risk of subsequent transmission due to the rejection of immunization on religious grounds. The continuing outbreak in the Netherlands presents a particular concern due to the presence of several Dutch reformed communities in Ontario and frequent travel by its members between both countries. Recently, a Dutch resident with epidemiological links to the outbreak travelled and became ill while visiting Ontario. To ensure Ontario maintains its elimination status, continued vigilance is required.

http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20580
http://wwwnc.cdc.gov/eid/article/19/10/13-0258_article.htm
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6236a5.htm?s_cid=mm6236a5_w

Enhanced Surveillance Directives (ESD) Discontinued in September

Cyclosporiasis

The Public Health Agency of Canada (PHAC), in collaboration with Public Health Ontario, and other public health partners, jointly investigated an increase in non-travel related cases of cyclosporiasis. A national Outbreak Investigation Coordinating Committee (OICC) led by PHAC was established on August 1, 2013 to determine the source of illnesses. A total of 17 non-travel related cases of cyclosporiasis were identified in Ontario between June 1 and October 8. Symptom onset dates for the cases from Ontario ranged from June 2 to September 12, 2013. The cases ranged in age from 24 to 88 years, and 11 were female. No definitive source of illness was identified and no links were established to a concurrent outbreak of non-travel related cases of cyclosporiasis in the U.S Midwest. The Ontario Enhanced Surveillance Directive (ESD) was discontinued on September 20 and the national investigation was terminated on September 30.

References

1. Centers for Diseases Control and Prevention (December 17, 2010). Sexually transmitted diseases treatment guidelines, 2010. Morbidity and Mortality Weekly Report 12(59), 1-109. Available from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5912a1.htm.

2. Heymann DL, editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.

3. Centers for Disease Control and Prevention. Hepatitis B information for health professionals. 2012. [cited 2013 Oct 1]. Available from: http://www.cdc.gov/hepatitis/HBV/HBVfaq.htm.

4. Public Health Agency of Canada. Canadian Guidelines on Sexually Transmitted Infections. Her Majesty the Queen in Right of Canada; 2008 [cited 2013 Sep 12]. Available from: http://www.phac-aspc.gc.ca/std-mts/sti-its/pdf/507hepb-eng.pdf.

5. World Health Organization. Global alert and response: Hepatitis B. 2013 [cited 2013 Oct 2]. Available from: http://www.who.int/csr/disease/hepatitis/whocdscsrlyo20022/en/index3.html.

6. Public Health Agency of Canada. Canadian Immunization Guide: Hepatitis B Vaccine. 2012 [cited 2013 October 2]. Available from: http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-hepb-eng.php.

7. Coffin CS, Fung SK, Ma MM. Management of chronic hepatitis B: Canadian Association for the Study of the Liver consensus guidelines. Can J Gastroenterol 2012;26(12):917-938.

8. Krajden, M., McNabb, G., and Petric, M. The laboratory diagnosis of hepatitis B virus. Can J Infect Dis Med Microbiol. 2005; 16(2): 65 – 72. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2095015/.

9. Kwong JC, Crowcroft NS, Campitelli MA, Ratnasingham S, Daneman N, Deeks SL, Manuel DG. Ontario Burden of Infectious Disease Study Advisory Group; Ontario Burden of Infectious Disease Study (ONBOIDS): An OAHPP/ICES Report. Toronto: Ontario Agency for Health Protection and Promotion, Institute for Clinical Evaluative Sciences; 2010.

10. Glasgow KW, Schabas R, Williams DC, Wallace E, Nalezyty LA. A population-based hepatitis B seroprevalence and risk factor study in a northern Ontario town. Can J Public Health. 1997 [cited 2013 Sep 12]; 88(2):87-90. Available from: http://journal.cpha.ca/index.php/cjph/article/view/978/978.

11. Yuan L, Robinson G. Hepatitis B vaccination and screening for markers at a sexually transmitted disease clinic for men. Can J Public Health. 1994; 85(5):338-41.

12. Louie M, Low DE, Feinman SV, McLaughlin B, Simor AE. Prevalence of bloodborne infective agents among people admitted to a Canadian hospital. CMAJ. 1992[cited 2013 Sep 12]; 146(8):1331-4. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1488539/pdf/cmaj00297-0071.pdf.

13. Simor AE, Gordon M, Bishai FR. Prevalence of hepatitis B surface antigen, hepatitis C antibody, and HIV-1 antibody among residents of a long-term-care facility. J Am Geriatr Soc. 1992; 40(3):218-20.

14. King SM, Jarvis DA, Shaw J, Shannon HS, Middleton PJ, Gold R, *et al.* Prevalence of hepatitis B surface antigen and antibody (hepatitis B virus markers) in personnel at a children's hospital. Am J Epidemiol. 1987;126(3):480-3.

15. Strickler AC, Bradshaw ED. Prevalence of hepatitis B markers in occupational health nurses. J Occup Med. 1987;29(8):685-7.

16. Zhang J, Zou S, Giulivi A. Epidemiology of hepatitis B in Canada. Can J Infect Dis. 2001;12(6): 345-350. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2094839/.

17. Lim, GH., McIntyre, MA., Wilson., S. Immunization coverage and exemptions among Ontario's school pupils for 2011–12: Findings and implications for future information systems. August 20, 2013 Public Health Ontario Grand Rounds presentation. [cited 2013 September 13]. Available from: http://www.publichealthontario.ca/en/LearningAndDevelopment/Events/Documents/Immunization_Coverage_exemptions_2013.pdf.

18. Ministry of Health and Long-Term Care, Public Health Division. Sexual health and sexually transmitted infections prevention and control protocol. Toronto, ON: Queen's Printer for Ontario; 2013.

19. Ministry of Health and Long-Term Care. Infectious diseases protocol, 2013 - Appendix B: Provincial Case Definitions (Hepatitis B). Toronto: Queen's Printer for Ontario; 2013 [cited 2013 September 18]. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/hep_b_cd.pdf.

20. Rossi C, Shrier I, Marshall L, Cnossen S, Schwartzman K, Klein M, *et al.* Seroprevalence of Chronic Hepatitis B Virus Infection and Prior Immunity in Immigrants and Refugees: A Systematic Review and Meta-Analysis. PLoS ONE. 2012 [cited 2013 Sep 12] 7(9):e44611. Available from: http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0044611.

21. Zhang J, Zhou S, Giulivi G. Epidemiology of hepatitis B in Canada. Can J Infect Dis. 2001[cited 2013 Sep 12]; 12(6): 345–350. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2094839/?tool=pubmed

22. Canadian Association for the Study of the Liver (CASL) Consensus Conference Rapporteur Group. The Canadian Consensus Conference on the Management of Viral Hepatitis. Can J Gastroenterol. 2000[cited 2013 Sep 12]; 14(SupplB):5B-20B. Available from: http://www.cag-acg.org/uploads/guidelines/cons_ed.pdf

23. World Health Organization. Hepatitis B, countries or areas at risk. 2012 [cited 2013 Oct 2]. Available from: http://gamapserver.who.int/mapLibrary/Files/Maps/Global_HepB_ITHRiskMap.png.

Appendix – Reportable Diseases

Appendix 1. Confirmed cases of reportable diseases, and probable cases of select reportable diseases,by month: Ontario, 2008-2013*

Reportable disease	2013														Historical comparisons						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTM	YTM rate ŧ	Current month 5-year avg (2008-2012)	Current month 5-year avg (2008-2012) rate ŧ	% difference rates (current month minus 5-year avg)†	YTM 5-year avg (2008-2012)	YTM 5-year avg (2008-2012) rate ŧ	% difference rates (YTM 2013 minus YTM 5-year avg)†	5-year avg (2008-2012) annual count
AIDS	11	4	11	2	13	7	5	5					**58**	4.2	9	0.7	-47	79	6.0	-29	114
Amebiasis	63	65	64	90	65	66	76	69					**558**	40.8	67	5.1	-1	547	41.4	-2	797
Botulism	0	0	0	0	0	0	0	0					**0**	0.0	1	0.0	-100	2	0.2	-100	3
Brucellosis	0	1	0	1	0	1	2	1					**6**	0.4	0	0.0	383	4	0.3	61	4
Campylobacter Enteritis	154	201	247	218	305	418	493	556					**2,592**	189.3	478	36.2	12	2,429	183.7	3	3,562
Chlamydial Infections	3,146	2,753	2,871	3,115	2,828	2,737	2,782	2,761					**22,993**	1679.5	2,728	206.2	-2	21,286	1,609.1	4	32,297
Cholera	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-	0	0.0	-100	1
Cryptosporidiosis	11	15	19	12	6	15	56	54					**188**	13.7	78	5.9	-33	231	17.4	-21	316
Cyclosporiasis	1	3	5	15	13	16	18	4					**75**	5.5	6	0.4	-33	102	7.7	-29	120
Cytomegalovirus Infection, Congenital	2	0	1	1	0	0	2	0					**6**	0.4	0	0.0	-100	5	0.4	21	6
Encephalitis	1	2	4	0	0	1	0	0					**8**	0.6	2	0.1	-100	12	0.9	-37	18
Encephalitis/Meningitis	4	14	7	7	8	17	24	26					**107**	7.8	22	1.6	16	100	7.5	4	154
Food Poisoning, All Causes	6	2	4	4	5	1	2	77					**101**	7.4	19	1.4	296	98	7.4	-1	123
Giardiasis	125	106	85	81	95	90	96	111					**789**	57.6	162	12.2	-34	975	73.7	-22	1,435
Gonorrhoea (All Types)	448	296	339	348	316	336	372	363					**2,818**	205.8	347	26.2	1	2,588	195.7	5	3,935
Group A Streptococcal Disease, Invasive	50	59	51	55	53	49	42	56					**415**	30.3	28	2.1	95	404	30.5	-1	565
Group B Streptococcal Disease, Neonatal	5	3	7	5	4	6	5	2					**37**	2.7	5	0.4	-64	34	2.6	4	54
Haemophilus Influenzae B Disease, Invasive	2	0	0	1	1	1	0	0					**5**	0.4	0	0.0	-	3	0.2	73	4
Hepatitis A	16	6	8	5	15	10	6	7					**73**	5.3	14	1.0	-51	79	6.0	-11	120
Hepatitis B	9	9	8	7	9	6	9	10					**67**	4.9	8	0.6	18	81	6.2	-20	122
Hepatitis C	328	283	350	370	377	324	353	322					**2,707**	197.7	366	27.7	-15	3,002	227.0	-13	4,443
Hepatitis D	0	0	0	0	0	1	1	0					**2**	0.1	0	0.0	-100	2	0.2	-3	3
Herpes, Neonatal	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-100	5	0.3	-100	7
HIV	50	40	55	63	64	67	48	55					**442**	32.3	64	4.8	-17	573	43.3	-25	860
Influenza	3,321	797	511	360	116	14	4	8					**5,131**	374.8	21	1.6	-63	4,131	312.3	20	6,844
Legionellosis	9	8	8	7	10	33	65	33					**173**	12.6	31	2.4	2	68	5.2	144	124
Leprosy	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-100	2	0.2	-100	3
Listeriosis	0	1	1	1	1	2	9	15					**30**	2.2	13	1.0	15	46	3.5	-37	62
Lyme Disease	2	0	3	4	20	52	96	27					**204**	14.9	19	1.4	39	104	7.9	90	125
Malaria	14	10	11	15	17	33	27	22					**149**	10.9	27	2.1	-22	151	11.4	-4	214
Measles	1	1	5	1	0	4	2	2					**16**	1.2	0	0.0	866	15	1.1	2	17
Meningitis	8	4	10	10	4	15	12	10					**73**	5.3	12	0.9	-21	75	5.7	-6	119
Meningococcal Disease, Invasive	3	2	0	1	1	3	2	1					**13**	0.9	2	0.2	-52	32	2.4	-61	45
Mumps	2	1	1	2	2	0	0	2					**10**	0.7	24	1.8	-92	100	7.6	-90	130
Ophthalmia Neonatorum	0	2	0	0	0	0	0	0					**2**	0.1	0	0.0	-100	2	0.2	-3	3
Paratyphoid Fever	2	8	9	6	2	0	1	5					**33**	2.4	5	0.4	1	40	3.0	-20	52
Pertussis (Whooping Cough)	19	17	14	13	24	24	30	36					**177**	12.9	54	4.1	-36	364	27.5	-53	535
Q Fever	1	0	0	4	2	1	2	0					**10**	0.7	2	0.1	-100	7	0.5	42	11
Rabies	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-	0	0.0	-100	0
Rubella	0	0	0	1	0	0	0	0					**1**	0.1	0	0.0	-	1	0.1	-3	1
Rubella, Congenital Syndrome	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-	0	0.0	-100	0
Salmonellosis	151	185	212	186	195	196	319	255					**1,699**	124.1	309	23.3	-20	1,840	139.1	-11	2,609
Shigellosis	21	22	29	22	28	14	26	23					**185**	13.5	26	2.0	-16	183	13.8	-2	254
Streptococcus Pneumoniae, Invasive	142	100	93	117	79	61	42	34					**668**	48.8	39	2.9	-16	751	56.8	-14	1,213
Syphilis, Early Congenital	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-	1	0.0	-100	1
Syphilis, Infectious	67	52	48	52	66	54	41	14					**394**	28.8	63	4.7	-78	486	36.7	-22	720
Syphilis, Other	56	44	46	45	37	40	24	22					**314**	22.9	68	5.1	-69	595	45.0	-49	882
Tetanus	1	1	0	0	0	0	0	0					**2**	0.1	0	0.0	-	1	0.1	142	1
Tuberculosis	40	46	47	65	47	35	64	48					**392**	28.6	59	4.4	-21	440	33.3	-14	636
Tularemia	0	0	0	0	0	0	1	0					**1**	0.1	0	0.0	-	0	0.0	142	1
Typhoid Fever	6	7	7	5	5	0	3	5					**38**	2.8	8	0.6	-38	64	4.9	-43	90
Verotoxin Producing E. Coli including HUS	15	2	8	19	9	10	26	13					**102**	7.5	38	2.9	-67	135	10.2	-27	208
West Nile Virus Illness	0	0	0	0	1	1	9	12					**23**	1.7	43	3.2	-73	53	4.0	-58	74
Yellow Fever	0	0	0	0	0	0	0	0					**0**	0.0	0	0.0	-	0	0.0	-100	0
Yersiniosis	15	17	12	22	16	11	7	17					**117**	8.5	25	1.9	-34	159	12.0	-29	216

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/09/18].

Ontario Population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2012/10/15].

* 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.

Note 1: Does not include cases in which the Ministry of Health and Long-Term Care was selected as the Diagnosing Health Unit or cases with a Disposition Description set to 'does not meet' or 'entered in error'.

Note 2: Case counts for tuberculosis and AIDS are based on diagnosis date and not episode date. HIV case counts are based on encounter date.

Note 3: Differentials in year over year comparisons are reflective of changes in disease incidence and changes in the size of the population.
Note 4: The one rubella case in April 2013 was related to travel and was not acquired in Ontario. Although importation status was unknown for 12 of 16 measles cases between January and August 2013, it is important to note that for all cases, documentation indicates that investigation for a source occurred despite the lack of identification.
Note 5: Statistical tests comparing rates were not performed when the YTM rate in previous years was zero.