

February 2014

Monthly Infectious Diseases Surveillance Report

Volume 3, Issue 2

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](#).

Infectious Disease in Focus.....	1
Significant Reportable Disease Activity.....	6
Infectious Disease Activity in Other Jurisdictions	8
Enhanced Surveillance Directives (ESD) Discontinued in January.....	10
References	11
Appendix – Reportable Diseases.....	13

INFECTIOUS DISEASE IN FOCUS

LISTERIOSIS

Listeria monocytogenes is a Gram-positive bacillus that can cause an array of enteric and systemic infections of varying severity. Invasive disease caused by *L. monocytogenes*, or invasive listeriosis, is characterized by meningoenitis (infection of the brain and membrane lining the brain) or septicemia (infection of the blood). Non-invasive listeriosis infection often manifests as an acute gastroenteritis with symptoms that may include fever,

muscle ache, diarrhea, nausea, vomiting, abdominal cramps, and severe headache. The incubation period of listeriosis can range from 24 hours to 70 days.^{1,3} The majority of infections are caused by serotypes 1/2a, 1/2b, 1/2c, and 4.^{1,3}

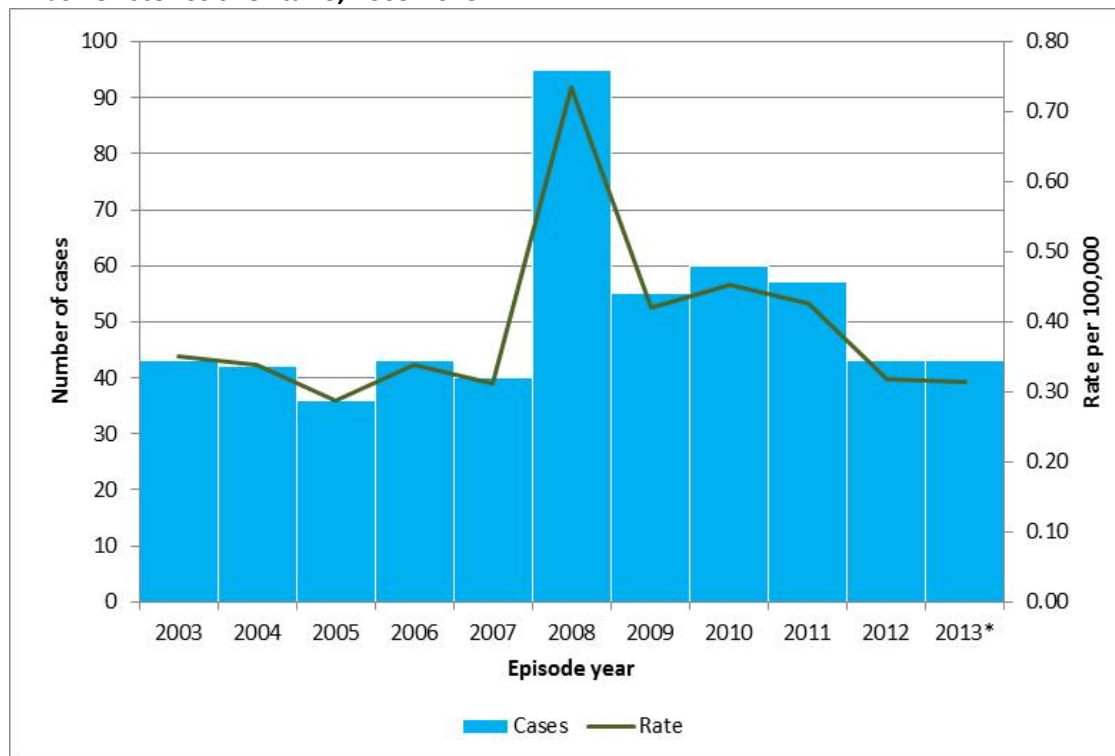
Listeriosis has been found in soil, dust, vegetation, water, sewage, and animal reservoirs, including domesticated mammals and humans.² About five percent of healthy adults may be asymptotically colonized with *L. monocytogenes*.² Listeriosis is usually acquired through the consumption of contaminated food or beverages. Processed meats (such as deli meats, hot dogs, sausages, and pâté), soft cheese (including Brie, Camembert, Roquefort, and blue cheese), lettuce, unpasteurized milk, smoked fish, and cantaloupe have been associated with outbreaks caused by *L. monocytogenes*.^{4,5,6,7} *L. monocytogenes* can survive and grow in a range of temperatures, including refrigeration temperatures.¹

Populations at high risk of serious illness due to invasive listeriosis include pregnant women, neonates, the elderly, and the immunocompromised.^{1,3} The incidence of listeriosis is 20 times higher among pregnant women than in the general population.³ Furthermore, there are pregnancy-associated outcomes due to *L. monocytogenes*'s ability to cross the placental barrier, resulting in in utero infection and complications for the fetus leading to premature delivery, fetal death, stillbirth, and spontaneous abortion. Laboratory testing available for the detection of invasive listeriosis includes routine cultures of blood, cerebrospinal fluid (CSF), and cultures from other sterile sites such as joint fluid, cord blood, and placental tissue. Please refer to PHOL's [Listeria monocytogenes Testing Specimen Collection for Foodborne Illness](#) for further information on laboratory testing.⁹

In 2013, a total of 43 confirmed cases of invasive listeriosis were reported in Ontario, which corresponds to an incidence rate of 0.31 cases per 100,000 population. The number of cases reported in 2013 may be an under-estimate as cases reported at the end of the year may not have been entered at the time of data extraction. Provincial incidence rates of invasive listeriosis remained relatively stable from 2003 to 2012, with the exception of 2008, when a large national outbreak occurred associated with ready-to-eat deli meats (Figure 1). The 2008 outbreak resulted in 56 confirmed cases of invasive listeriosis being reported nationally, 41 of which occurred in Ontario.¹⁰

Seasonal increases in invasive listeriosis are typically observed in the warmer months, with the majority of cases in 2013 occurring in July (21%) and August (35%) (Figure 2). While a seasonal increase is expected in the summer, case counts for July (n = 9) and August (n = 15) of 2013 were higher than expected. The observed increase was partially explained by a national outbreak that included six confirmed cases of invasive listeriosis, two of which occurred in Ontario. A source for the cluster was not identified in the multi-jurisdictional investigation.

Figure 1. Reported number of cases and incidence rate (per 100,000 population) of confirmed cases of invasive listeriosis: Ontario, 2003-2013

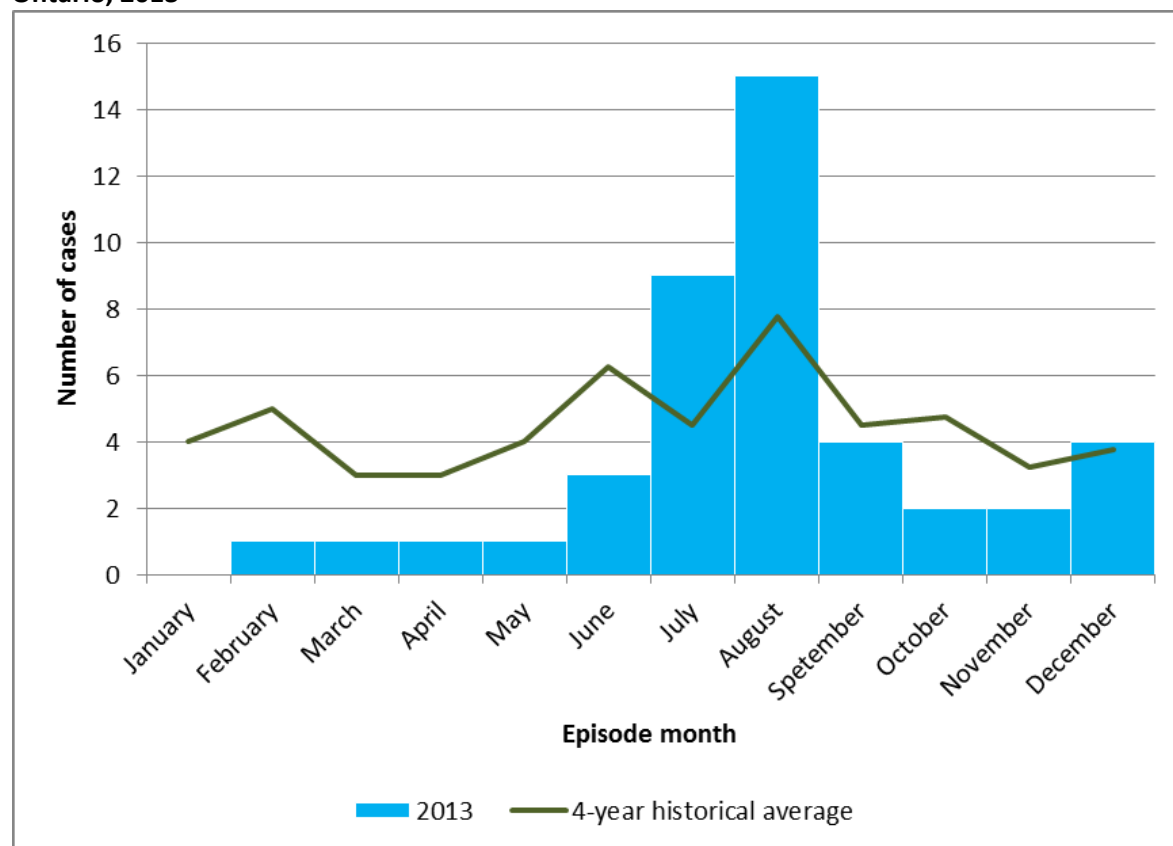


Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/01/02].

Ontario population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2013/09/16].

* Population projections were used to calculate rates for 2013.

Figure 2. Annual number and four-year historical average of confirmed cases of invasive listeriosis: Ontario, 2013



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/01/02].

Of the 43 confirmed cases of invasive listeriosis reported in 2013, 24 (56%) were female. Cases ranged in age from less than one year to 97 years of age, with a median age of 69 years. Age-specific incidence rates were highest among older adults 80 years of age and older ($n = 13$, 2.4 cases per 100,000 population). The next highest rate was observed among children less than one year of age ($n = 2$, 1.4 cases per 100,000 population). Higher rates among these age groups are expected as older adults and neonates are known to be among those at high risk of listeriosis.¹ Among all health units, the highest number of cases were reported in Toronto ($n = 7$), Peel Region ($n = 5$), and Waterloo Region ($n = 5$). All other health units reported three or fewer cases. Thirty-three cases (77%) reported hospitalization and two (5%) cases reported listeriosis as contributing to or the underlying cause of death.

Of the 30 cases of invasive listeriosis reporting risk factors, the most commonly reported risk factors among cases were consumption of soft cheese (11/30, 37%) and ready-to-eat deli meats (16/30, 53%). One case reported pregnancy as a medical risk factor. The majority of listeriosis cases are domestically-acquired. Of the 43 confirmed invasive listeriosis cases reported in Ontario in 2013, 9 (4/43) reported travel as a risk factor in the 70 days prior to disease onset. However, cases can report multiple risk factors thus local risk factors can not be ruled out for the four cases reporting travel. Given the large

proportion of cases attributed to domestically-acquired sources and information gaps identified as a result of the 2008 outbreak, the Public Health Agency of Canada (PHAC) implemented a national enhanced surveillance program for invasive listeriosis. This program was piloted in 2010 and implemented as an ongoing surveillance program in 2012. The program uses standardized questionnaires to collect case-level information including demographics, laboratory data, and food consumption for invasive listeriosis infections in Canada. The database of questionnaires can also be considered for use as a source of comparator cases in the event of an outbreak, since the population at risk for invasive listeriosis is a small subgroup of the general population. Food consumption data for Ontario cases was available through PHAC's enhanced surveillance program for 84% (36/43) of cases reported in 2013. With the exception of cases associated with the national investigation, no commonalities in food item consumption and pulse field gel electrophoresis (PFGE) results were identified among cases reported in 2013.

Listeriosis can be prevented by avoiding high risk foods, such as processed meats, soft cheeses, smoked fish, and unpasteurized dairy products. Avoidance of these foods, as well as practicing safe food handling at home, is particularly important for high risk groups such as pregnant women, the elderly, and immunocompromised persons. Safe food handling practices include cooking and reheating food thoroughly to the appropriate temperature, and thoroughly washing of produce. Please refer to '[Food Safety: Cook](#)' and '[Diseases: Listeria](#)' for further details on safe food handling.^{11,12} Educational materials targeted to high risk groups, such as '[Food Safety for Pregnant women](#)', can also help reduce the burden of listeriosis when delivered in partnership with health care providers.¹³

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 significant increases in reportable disease incidence: Ontario, January 1 to December 31, 2013

Reportable disease	2013				Historical comparisons						5-year avg annual count (2008-2012)
	Dec	Dec rate ‡	YTM	YTM rate ‡	Current month 5-year avg (2008-2012)	Current month 5-year avg (2008-2012) rate ‡	% difference in rates (current month minus 5-year avg)†	YTM 5-year avg (2008-2012)	YTM 5-year avg (2008-2012) rate ‡	% difference in rates (YTM 2013 minus YTM 5-year avg)†	
Campylobacter Enteritis ¹	195	14.2	3,908	285.5	184	13.9	2.3	3,566	269.7	5.8	3,566
Chlamydial Infections ¹	2,319	169.4	34,502	2520.2	2,362	178.7	-5.2	32,302	2443.5	3.1	32,302
Gonorrhoea (All Types) ^{1,2}	372	27.2	4,498	328.6	287	21.7	25.1	3,936	297.8	10.3	3,936
Legionellosis ¹	8	0.6	264	19.3	10	0.7	-21.2	124	9.4	105.6	124
Lyme Disease ¹	2	0.1	311	22.7	1	0.1	60.9	128	9.7	135.4	128

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/01/22].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted by Public Health Ontario [2013/09/16].

‡ 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 to December 2013) compared to the five-year historical average (January to December 2008-2012).

² Statistically significant difference ($p < 0.05$) in incidence reported in current month (December 2013) compared to the five-year historical average (December 2008-2012).

CAMPYLOBACTER ENTERITIS

The YTM incidence rate of *Campylobacter* enteritis from January 1 to December 31, 2013 was significantly higher than the historical five-year (2008-2012) average YTM rate for the same period. A significantly higher YTM rate was also noted up to the end of November 2013 (see [January 2014](#) issue). No definitive cause for the increase has been identified; however, it is not unusual for the incidence of enteric diseases to fluctuate over time. No *Campylobacter* enteritis outbreaks were reported in Ontario in 2013. Over the past five years, the YTM rate of *Campylobacter* enteritis for the period from January to December has ranged from 248 cases to 294 cases per 1,000,000 population. The current YTM incidence rate is slightly lower than the rate for the same YTM period in 2012 (288 cases per 1,000,000 population). *Campylobacter* enteritis incidence, as well as exposure information reported for cases, will continue to be monitored.

CHLAMYDIAL INFECTIONS

The YTM incidence rate of reported laboratory-confirmed chlamydial infections for January 1 to December 31, 2013 was significantly higher than the historical five-year (2008-2012) average YTM rate for the same period. The significantly higher YTM rate has been noted since March 2013, as reported in each issue since [May 2013](#). The rate may be higher than the historical five-year average in part due to increased screening for chlamydial infections in recent years, as summarized in the [May 2013](#) issue. The [July 2012](#) issue further describes the epidemiology of chlamydia in Ontario.

While the YTM incidence rate of chlamydia is higher compared to the five-year historical average (2008-2012), it is lower than the same reported YTM incidence for 2012 (data not shown). The reasons for this decrease are unclear, and further analysis will be required to determine whether the epidemiology of chlamydia infections in Ontario has changed.

GONORRHOEA (ALL TYPES)

The YTM (January 1 to December 31) and December 2013 incidence rates of reported laboratory-confirmed gonorrhea cases were significantly higher than the corresponding historical five-year (2008-2012) average rates for the same periods. The number of cases was higher than expected in a number of public health units, and among men between the ages of 20 and 34 years. While definitive reasons for the increase are not yet known, increased diagnostic testing may be partly responsible.

Reduced susceptibility to gonorrhea treatment regimens is a growing concern, and may also play a role in greater disease transmission. New [guidelines for testing and treatment of gonorrhea in Ontario](#) were released in April 2013 and evaluation of their impact will be ongoing. The [November 2012](#) issue describes the epidemiology of gonorrhea in Ontario. Further analysis of the current increase will be required to determine whether the epidemiology of gonorrhea in Ontario has changed.

LEGIONELLOSIS

The YTM incidence rate of reported laboratory-confirmed legionellosis for January 1 to December 31, 2013 was significantly higher than the corresponding historical five-year (2008-2012) average YTM rate. The significantly higher YTM rate has been noted since March 2013, as reported in each issue since [May 2013](#).

The number of confirmed cases of legionellosis reported each year has been increasing in Ontario in recent years. The 2013 seasonal increase of legionellosis in Ontario occurred earlier than usual, with the largest number of cases reported in July. Monthly case counts for legionellosis were significantly higher than expected in June and July 2013, and gradually decreased to baseline from August to December 2013. An Enhanced Surveillance Directive was issued on June 28, 2013 and discontinued on November 1, 2013. A brief summary of the 2013 legionellosis season is available in the [December 2013](#) issue.

LYME DISEASE

The YTM incidence rate of Lyme disease from January 1 to December 31, 2013 was significantly higher than the historical five-year (2008-2012) average YTM rate for the same period. An increase in the current YTM rate in comparison to the historical average YTM rate was first noted in the [October 2013](#) issue. Consistent with the expected seasonality of Lyme disease, 75% (234/311) of cases in 2013 were reported from June to August. The highest incidence rates in 2013 were observed in Eastern health region public 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. The Lyme disease in focus article in the [September 2013](#) issue and the [Vector-Borne Disease 2012 Summary Report](#) contain detailed descriptions of the epidemiology of Lyme disease in Ontario, including factors associated with the increasing trend in activity. In February 2012, PHO released the [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.

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.

***E. COLI* OUTBREAK IN QUEBEC, CANADA**

Summary:

In December 2013, seven individuals were infected with *E. coli* after consuming a raw meat dish (tartare) at a restaurant in Montréal. All cases were exposed at the same restaurant. Two cases were reported to be hospitalized, one with hemolytic uremic syndrome (HUS). Investigations were conducted jointly by Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (the agriculture, fisheries and food ministry of Quebec) and the Canadian Food Inspection Agency. Multiple specimens (food and environment) were taken at the restaurant, all of which tested negative for *E. coli*. No major food safety was observed in the restaurant. However, according to a representative from the Quebec Food Inspection Agency, the situation is believed to be under control. The last case reported to public health had onset of symptoms on December 15, 2013.

Implications:

PHO notifies public health authorities outside Ontario about *E. coli* cases that report notable exposures in their jurisdiction during the incubation period. Among the seven ill individuals in this outbreak, one case is a resident of Ontario. The Ontario case traveled to Montréal prior to illness and reported exposure to the same restaurant and consumption of beef tartare. This information was provided to

Quebec health authorities and the local health unit assisted in the investigation by providing additional information.

Sources:

1. International Society for Infectious Diseases [homepage on the Internet]. E. Coli EHEC- Canada: (Quebec) Beef Tartare, RFI; 2014 Jan 16 [cited 2014 Jan 24]. Available from: <http://www.promedmail.org/direct.php?id=20140116.2175436>
2. CTV News [homepage on the Internet]. Montréal. Nurse in critical condition, six others sick, after eating beef tartare; 2014 Jan 16 [cited 2015 Jan 24]. Available from: <http://Montréal.ctvnews.ca/nurse-in-critical-condition-six-others-sick-after-eating-beef-tartare-1.1640352>

NOROVIRUS OUTBREAKS ON CRUISE SHIPS

Summary:

Norovirus is a highly contagious virus that is transmitted through the fecal-oral route.¹ It causes acute gastroenteritis in people of all age groups, with common symptoms including diarrhea, vomiting, nausea, and abdominal pain. Norovirus causes over 90% of diarrheal disease outbreaks on cruise ships departing the United States.² Prevention and control of diarrheal diseases on cruise ships is especially challenging due to close living spaces, common dining areas, and rapid turnover of passengers. The Centers for Disease Control and Prevention (CDC) in the United States has a Vessel Sanitation Program that requires participating cruise ships to report the total number of gastrointestinal illness cases upon docking at a U.S. port when arriving from a foreign port.³ When gastrointestinal illness exceeds 2% of the total number of passengers or crew onboard, a separate notification is required.

In one of the largest norovirus cruise outbreaks over the past 20 years, a ship from a major cruise line that sailed from the United States to the Caribbean in late January this year experienced a large norovirus outbreak that sickened 20.6% of passengers and 4.7% of crew members.^{4,5} During the same time period, a ship from another major cruise line sailing the Caribbean also reported a norovirus outbreak that caused illness among 5.8% of passengers and 0.96% of crew members⁶. Both cruise ships ended their journeys early due to the norovirus outbreaks.

Implications:

Cruise ship vacations are a popular holiday choice among Ontarians. Travellers on cruise ships are at risk of acquiring norovirus and are advised to practice proper hand hygiene during their vacation. Ill travellers should avoid preparing food or returning to work if symptoms are still present, especially those who work in high-risk settings (e.g. long-term care homes, day cares centres).

Sources:

1. Public Health Agency of Canada [homepage on the Internet]. Fact sheet- Norovirus; 2012 Jul 19 [cited 2014 Feb 3]. Available from: <http://www.phac-aspc.gc.ca/fs-sa/fs-fi/norovirus-eng.php>.

2. Centers for Disease Control and Prevention [homepage on the Internet]. Atlanta: CDC. Surveillance for Norovirus outbreaks; 2013 Oct 31 [cited 2014 Feb 3]. Available from: <http://www.cdc.gov/features/dsnorovirus/>.
3. Centers for Disease Control and Prevention [homepage on the Internet]. Atlanta: CDC. Vessel Sanitation Program- Outbreak updates for international cruise ships; 2014 Jan 31 [cited 2014 Feb 3]. Available from: <http://www.cdc.gov/nceh/vsp/surv/qilist.htm>.
4. Centers for Disease Control and Prevention [homepage on the Internet]. Atlanta: CDC. Investigation update on the *Explorer of the Seas*; 2014 Jan 31 [cited 2014 Feb 3]. Available from: http://www.cdc.gov/nceh/vsp/surv/outbreak/2014/january21_explorer_seas.htm.
5. NBC News [homepage on the Internet]. Cruise virus outbreak one of worst in 20 years, CDC says; 2014 Jan 31 [cited 2014 Feb 3]. Available from: <http://www.nbcnews.com/health/more-170-sick-leave-second-illness-plagued-cruise-ship-2D12031684#more-170-sick-leave-second-illness-plagued-cruise-ship-2D12031684>.
6. Centers for Disease Control and Prevention [homepage on the Internet]. Atlanta: CDC. Investigation update on the *Caribbean Princess*; 2014 Jan 31 [cited 2014 Feb 3]. Available from: http://www.cdc.gov/nceh/vsp/surv/outbreak/2014/january25_caribbean_princess.htm.

ENHANCED SURVEILLANCE DIRECTIVES (ESD) DISCONTINUED IN JANUARY

SALMONELLA ENTERITIDIS

A significant increase in *S. Enteritidis* case counts above expected was detected through provincial monitoring by PHO and the National Enteric Surveillance Program (NESP) in mid-December 2013. Between November 10 and December 14, 2013, 95 confirmed cases of *S. Enteritidis* were reported in Ontario compared to a five-year historical average of 61 confirmed cases for this period. Cases originated from 22 public health units, including Toronto (26 cases), Peel Region (10 cases), Durham Region (eight cases), and Waterloo Region (eight cases). Exposure or risk factor information is available for 92% (87/95) of cases, of which 32% (28/87) were travel-related. No common source was identified to account for the increase, which was comprised of cases representing 12 different phage types of *S. Enteritidis*. Eleven percent (10/95) of cases were reported as hospitalized. The ESD was discontinued on January 10, 2014 following a return to expected counts that was sustained for four weeks, including throughout the holiday period.

References

In Focus – Listeriosis

1. Heymann DL, editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.
2. Public Health Agency of Canada. Ottawa: PHAC; c2012. Listeria; 2012 July 9 [cited 2014 Jan 15]. Available from <http://www.phac-aspc.gc.ca/fs-sa/fs-fi/listerios-eng.php>.
3. Pickering LK, Baker CJ, Long SS, McMillan JA, editors. Red book: 2012 report of the Committee on Infectious Diseases. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2012. Section 3, Summaries of infectious diseases; p. 471-474.
4. U. S. Centers for Disease control and Prevention. Atlanta, GA: US CDC; c 2012. Multistate Outbreak of Listeriosis Linked to Whole Cantaloupes from Jensens Farms, Colorado. 2012 Aug 27 [cited 2014 Jan 15]. Available from <http://www.cdc.gov/listeria/outbreaks/cantaloupes-jensen-farms/index.html>.
5. Miettinen MK, Siitonen A, Heiskanen P, Haajanen H, Bjorkroth KJ, Korkeala HJ. Molecular Epidemiology of an Outbreak of Febrile Gastroenteritis Caused by *Listeria monocytogenes* in Cold-Smoked Rainbow Trout. J Clin Microbiol. 1999; 37(7), 2358-60.
6. Southwick FS, Purich DL. Intracellular pathogenesis of listeriosis. N Engl J Med. 1996;334:770–776.
7. Vrbova L, Johnson, K, Whitfield Y, Middleton D. A descriptive study of reportable gastrointestinal illnesses in Ontario, Canada, from 2007 to 2009. BMC Public Health. 2012 [cited 2014 Jan 15]; 12:970. Available from <http://www.biomedcentral.com/content/pdf/1471-2458-12-970.pdf>.
8. Ooi ST, Lorber B. Gastroenteritis Due to *Listeria monocytogenes*. Clin Infect Dis. 2005; 40 (9); 1327-1332. Available from <http://cid.oxfordjournals.org/content/40/9/1327.full.pdf+html>.
9. Public Health Ontario. Toronto: Queen's Printer for Ontario; c2013. Labstract: *Listeria monocytogenes* Testing Specimen Collection for Foodborne Illness; 2010 Mar 15 [cited 2014 Jan 31]. Available from http://www.publichealthontario.ca/en/eRepository/LAB_SD_043_Listeria_monocytogenes_specimen_collection.pdf.
10. Ministry of Health and Long-Term Care. Toronto: Queen's Printer for Ontario. Chief Medical Officer of Health's report on the management of the 2008 Listeriosis outbreak in Ontario; 2009 April [cited 2014 Jan 15]. Available from: http://www.health.gov.on.ca/en/public/publications/disease/listeria_2008.aspx.
11. Ontario Ministry of Health and Long-Term Care. Toronto: Queen's Printer for Ontario; c2011. Food Safety: Cook; 2011 Dec 8 [cited 2014 Jan 15]. Available from <http://www.health.gov.on.ca/en/public/programs/publichealth/foodsafety/cook.aspx#4>.

12. Ontario Ministry of Health and Long-Term Care. Toronto: Queen's Printer for Ontario; c 2012. Diseases: Listeria; 2012 Jun 28 [cited 2014 Jan 15]. Available from <http://www.health.gov.on.ca/en/public/publications/disease/listeria.aspx>.
13. Government of Canada. Toronto: Queen's Printer for Ontario; c 2013. Food Safety for Pregnant Women; 2013 Aug 7 [cited 2014 Jan 15]. Available from <http://healthycanadians.gc.ca/eating-nutrition/safety-salubrite/pregnant-enceintes-eng.php>.

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						5-year avg (2008-2012) annual count
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTM	YTM rate ‡	Current month 5-year avg (2008-2012)	Current month 5-year avg (2008-2012)	% difference rates (current month minus 5-year avg)†	YTM 5-year avg (2008-2012)	YTM 5-year avg (2008-2012) rate ‡	% difference rates (YTM 2013 minus YTM 5-year avg)†	
AIDS	13	6	12	4	13	8	4	6	4	7	3	4	84	6.1	8	0.6	-54	120	9.1	-32	120
Amebiasis	65	68	63	95	65	69	84	82	56	58	59	33	797	58.2	58	4.4	-45	797	60.3	-3	797
Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-100	3	0.2	-100	3
Brucellosis	0	1	0	1	1	1	3	2	0	0	1	0	10	0.7	0	0.0	-	4	0.3	130	4
Campylobacter Enteritis	155	201	248	218	306	423	508	601	384	375	294	195	3,908	285.5	184	13.9	2	3,566	269.7	6	3,566
Chlamydial Infections	3,149	2,755	2,874	3,119	2,847	2,739	2,796	2,873	3,025	3,114	2,892	2,319	34,502	2,520.2	2,362	178.7	-5	32,302	2,443.5	3	32,302
Cholera	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-100	1	0.1	-100	1
Cryptosporidiosis	12	15	19	12	6	16	58	66	47	23	14	15	303	22.1	13	1.0	-10	317	24.0	-8	317
Cyclosporiasis	1	3	5	15	13	17	19	4	6	2	2	2	89	6.5	3	0.3	-43	119	9.0	-28	119
Cytomegalovirus Infection, Congenital	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Encephalitis	1	2	4	0	0	1	0	1	1	6	0	4	20	1.5	1	0.1	286	18	1.4	7	18
Encephalitis/Meningitis	4	14	7	7	8	18	24	26	16	29	18	11	182	13.3	10	0.8	6	153	11.6	15	153
Food Poisoning, All Causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Giardiasis	127	108	90	81	101	95	121	158	163	115	91	53	1,303	95.2	105	7.9	-51	1,437	108.7	-12	1,437
Gonorrhoea (All Types)	448	296	339	348	316	336	375	373	435	453	407	372	4,498	328.6	287	21.7	25	3,936	297.8	10	3,936
Group A Streptococcal Disease, Invasive	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Group B Streptococcal Disease, Neonatal	5	3	7	5	4	6	5	3	5	9	3	4	59	4.3	5	0.4	-26	55	4.1	4	55
Haemophilus Influenzae B Disease, Invasive	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Hepatitis A	16	6	8	5	16	10	7	7	7	10	4	2	98	7.2	12	0.9	-83	120	9.1	-21	120
Hepatitis B	10	9	9	10	8	6	12	10	6	12	11	6	109	8.0	8	0.6	-24	122	9.2	-14	122
Hepatitis C	330	285	352	366	376	332	366	343	325	361	352	298	4,086	298.5	305	23.1	-6	4,447	336.4	-11	4,447
Hepatitis D	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Herpes, Neonatal	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
HIV	50	41	55	65	66	69	52	60	65	66	60	41	690	50.4	68	5.1	-41	859	65.0	-22	859
Influenza	3,333	801	512	359	116	14	4	8	6	34	151	1,730	7,068	516.3	1,195	90.4	40	6,845	517.8	0	6,845
Legionellosis	9	9	7	6	10	33	67	37	36	30	12	8	264	19.3	10	0.7	-21	124	9.4	106	124
Leprosy	0	0	0	1	0	0	0	0	0	0	0	1	2	0.1	0	0.0	141	3	0.2	-36	3
Listeriosis	0	1	1	1	1	3	9	15	4	2	2	4	43	3.1	3	0.3	14	62	4.7	-33	62
Lyme Disease	2	0	3	4	23	60	125	49	22	14	7	2	311	22.7	1	0.1	61	128	9.7	135	128
Malaria	14	10	11	16	16	33	27	24	18	15	14	12	210	15.3	15	1.1	-24	214	16.2	-5	214
Measles	1	1	5	1	0	4	2	1	0	0	0	0	15	1.1	1	0.1	-100	17	1.3	-15	17
Meningitis	8	4	10	10	4	15	12	12	10	14	8	4	111	8.1	7	0.6	-48	119	9.0	-10	119
Meningococcal Disease, Invasive	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Mumps	2	1	1	2	2	0	0	6	3	0	1	2	20	1.5	8	0.6	-76	130	9.9	-85	130
Ophthalmia Neonatorum	0	1	0	0	0	0	0	0	1	0	0	0	2	0.1	0	0.0	-100	3	0.2	-31	3
Paratyphoid Fever	3	9	9	5	2	0	2	5	3	1	0	1	40	2.9	4	0.3	-76	52	3.9	-25	52
Pertussis (Whooping Cough)	19	17	14	13	23	25	32	47	23	24	13	12	262	19.1	40	3.1	-71	535	40.5	-53	535
Q Fever	1	0	0	4	2	0	2	1	1	0	2	0	13	0.9	0	0.0	-100	11	0.9	10	11
Rabies	0	0	0	0	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	0	0	0	0	1	0.1	0	0.0	-100	1	0.1	-20	1
Rubella, Congenital Syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Salmonellosis	151	186	214	186	198	196	326	287	215	184	178	141	2,462	179.8	158	11.9	-14	2,613	197.6	-9	2,613
Shigellosis	21	23	28	22	28	16	28	22	11	11	20	18	248	18.1	16	1.2	9	254	19.2	-6	254
Streptococcus Pneumoniae, Invasive	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	0	0.0	-	0
Syphilis, Early Congenital	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-100	1	0.1	-100	1
Syphilis, Infectious	71	53	48	51	76	60	53	44	48	51	33	25	613	44.8	55	4.2	-56	722	54.6	-18	722
Syphilis, Other	56	48	48	52	40	44	45	35	34	45	31	23	501	36.6	62	4.7	-64	884	66.9	-45	884
Tetanus	1	1	0	0	0	0	0	0	0	0	0	0	2	0.1	0	0.0	-	1	0.1	93	1
Tuberculosis	40	47	50	66	54	38	66	48	56	46	40	34	585	42.7	50	3.8	-35	637	48.2	-11	637
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0.0	-	1	0.0	-100	1
Typhoid Fever	6	7	7	5	5	1	2	9	2	4	2	6	56	4.1	6	0.4	3	90	6.8	-40	90
Verotoxin Producing E. Coli Including HUS	15	2	8	20	9	10	26	13	19	6	7	8	143	10.4	9	0.7	-16	208	15.7	-34	208
West Nile Virus Illness	0	0	0	0	0	1	11	18	25	1	0	0	56	4.1	1	0.0	-100	74	5.6	-27	74
Yellow Fever	0	0	0	0	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	12	8	20	17	9	14	11	173	12.6	13	1.0	-20	217	16.4	-23	217

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/01/22].

Ontario Population: Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, extracted by Public Health Ontario [2013/09/16].

* 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.

‡ 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 15 measles cases in 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.