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Monthly Infectious Diseases Surveillance Report

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The Monthly Infectious Diseases Surveillance Report is produced by Public Health Ontario (PHO) for the public health community of Ontario. This is the first issue of the report in its new format, which includes changes to the Significant Reportable Disease Activity section and the Appendix. We welcome feedback by email to: SurveillanceServices@oahpp.ca.

Past issues and additional information on the Monthly Infectious Diseases Surveillance Report are available online at: http://www.oahpp.ca/resources/monthly-infectious-diseases-surveillance-report.html.

In this issue:

Infectious Disease in Focus

BRUCELLOSIS

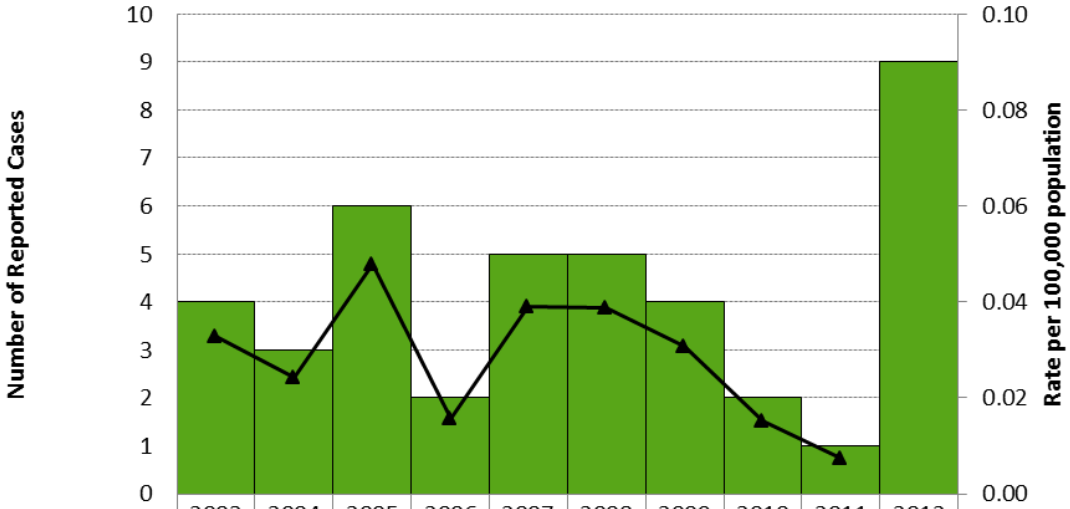
Brucellosis was first recognized as Malta fever during the Crimean War in the 1850s, when British soldiers became ill after consuming raw goat milk.[1] It is an acute and systemic infection that is transmitted mainly from animals to humans. The disease is caused by several species of *Brucella* bacteria, of which *B. abortus*, *B. melitensis, B. suis* and *B. canis* are most frequently associated with infections in humans. Other newly identified *Brucella* species, although rare, have also been known to cause illness in humans.[2] Animal reservoirs of *Brucella* vary depending on the species, with cattle, elk and bison serving as reservoirs for *B. abortus*, goats and sheep for *B. melitensis*, feral swine and caribou for *B. suis*, canines for *B. canis*, and marine mammals for other newly identified *Brucella* species.[2,3] Canadian cattle were certified brucellosis-free in 1985; however, reservoirs remain in free-ranging wildlife such as bison in northern Alberta and caribou in the Canadian subarctic.[4] In Ontario, risk of illness is mainly restricted to people traveling to endemic areas, and is also predominantly considered an occupational disease among those who handle infected animals and their tissue (e.g. hunters, veterinarians, lab personnel).

Brucellosis is primarily an animal disease and is rarely transmitted from person-to-person. Transmission to humans occurs through three primary routes.[3] Foodborne transmission is the most common way in which people become infected, and results from the consumption of unpasteurized milk or milk products and raw or undercooked meat from infected animals. Transmission also occurs through direct contact between broken skin and infected animal tissue, and through inhalation of aerosolized bacteria in settings such as abattoirs and laboratories. *Brucella* species are ideal bioterrorism agents because of the small number of bacteria required to cause illness, and the ease with which they can be aerosolized and inhaled.[3,5]

In humans, brucellosis causes a febrile illness with an acute onset of symptoms that usually occurs from five to 60 days after exposure to the bacteria. Symptoms typically include intermittent fever, headache, weakness, profuse sweating, chills, joint and body pain, depression and weight loss. The severity and duration of disease varies, and can last from several days to over one year.[3] In severe cases, infection and inflammation of the spleen or liver can occur; chronic bone and joint complications occur in 20% to 60% of infected persons and genitourinary complications affect up to 20% of infected persons.[3,6] The case-fatality rate for untreated brucellosis is approximately two percent, with most fatalities attributed to heart conditions induced by *B. melitensis* infections.[3] Brucellosis occurs worldwide, with approximately 500,000 new cases reported annually.[7] In Canada and the United States, annual incidence rates of brucellosis are relatively low with less than one case per 100,000 population. In comparison, annual incidence rates of brucellosis in endemic countries such as Mexico, Peru, Syria, Turkey and Albania range from three to 160 cases per 100,000 population.[7]

Brucellosis is a reportable disease in Ontario. A total of 41 confirmed cases were reported in Ontario over the ten year period from 2003 to 2012. With the exception of 2012 when a high of nine cases were reported, annual counts of brucellosis have ranged from one to six cases, with corresponding incidence rates ranging from 0.01 to 0.05 cases per 100,000 population (Figure 1). Of cases reported from 2003 to 2012, 44% (18/41) were attributable to *B. melitensis* and 7% (3/41) to *B. abortus*. Of the remaining cases, 10% (4/41) were caused by other *Brucella* species and 39% (16/41) did not specify the *Brucella* species.

Figure 1. Number of confirmed cases and incidence rates of brucellosis: Ontario, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Ontario Count	4	3	6	2	5	5	4	2	1	9
Ontario Rate	0.03	0.02	0.05	0.02	0.04	0.04	0.03	0.02	0.01	

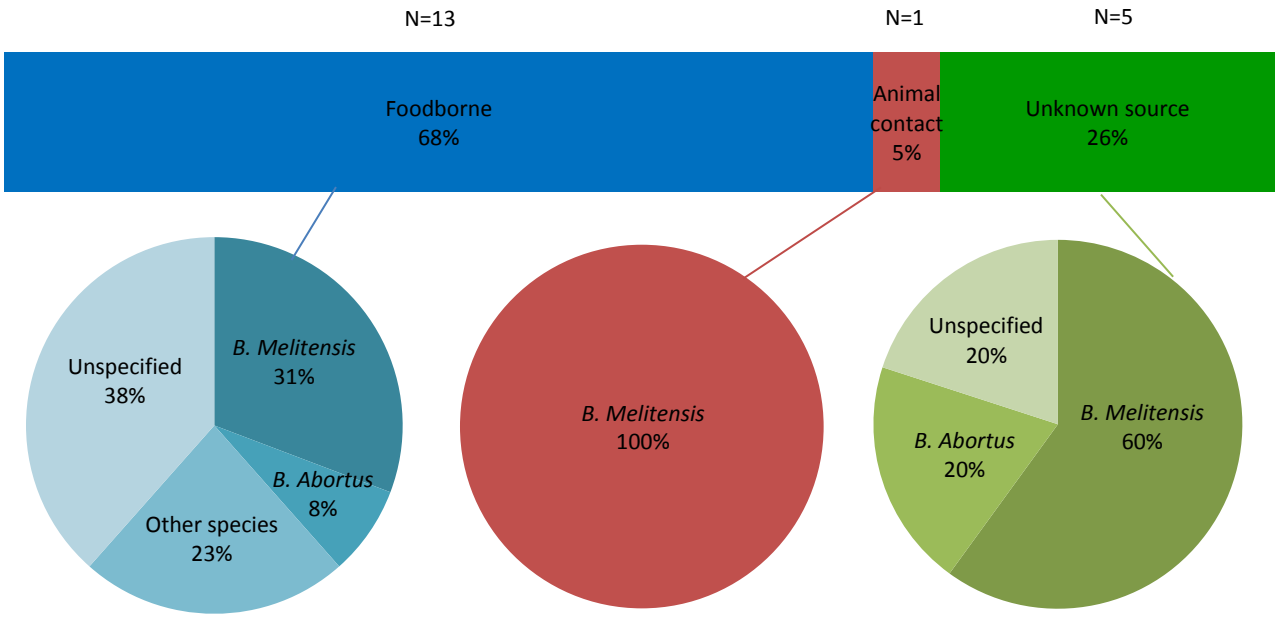
Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/04/03].
Ontario population: Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2012/10/15].

The gender distribution of brucellosis cases in Ontario between 2003 and 2012 was approximately equal, with males accounting for 54% (22/41) of cases. The ages of cases ranged from five to 83 years, with a median age of 46 years. Symptoms were reported by 90% (37/41) of cases, with the most frequently reported symptoms being fever (62%), anorexia (30%), malaise (27%), chills (22%) and headache (19%). Twenty percent (8/41) of cases were reported as hospitalized and none of the cases were fatal.

Eleven of Ontario's 36 health units reported at least one confirmed case of brucellosis from 2003 to 2012. Over half of these cases were reported in Toronto (13/41) and Peel Region (10/41); Waterloo Region reported the third highest number of cases (4/41). Even though brucellosis is a zoonotic disease that can be transmitted from animals to humans, higher disease counts were not observed in rural parts of the province where contact with wildlife is more likely. This higher concentration of cases in urban centres is suggestive of exposures that are more likely to occur during travel outside of the province.

Given Canada's brucellosis-free status for cattle, most human cases in Ontario are related to importations from or travel to endemic countries in the Mediterranean region, the Middle East, South Asia, Africa, and Central and South America. From 2003 to 2012, 49% (20/41) of cases were reported in the summer months of June and July, which is peak travel time for many Ontarians. Exposures were reported by 96% (25/26) of brucellosis cases reported from 2007 to 2012. Travel outside Canada was the most frequently reported exposure among these cases (76%, 19/25) and the remaining cases that specified an exposure (6/25) reported that the exposure was unknown. Overall, 68% (13/19) of the travel-associated cases reported consumption of unpasteurized dairy products while abroad (Figure 2).

Figure 2. Travel-associated brucellosis cases by exposure type and species (n=19): Ontario, 2007-2012



Ontario cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/04/03].
Note 1: Most likely exposure was selected for cases reporting more than one exposure; travel exposures were selected for cases reporting both travel and domestic exposures. Travel refers to travel outside Canada.
Note 2: Does not include cases reporting exposures reported as "unknown" (five cases) or cases with missing exposure (one case) information.

The *Brucella* species was reported for 10 of 19 travel-associated cases, which included eight *B. melitensis* cases and two *B. abortus* cases. Travel to either South Asia, the Middle East, or the Mediterranean region was reported for all eight *B. melitensis* cases, with consumption of unpasteurized dairy products being the

most frequently reported source of exposure for these cases. For the two *B. abortus* cases, travel to Mexico was reported, with one of the cases reporting a food exposure. This finding of distinct geographic variation of exposures by *Brucella* species is characteristic of brucellosis and is consistent with known regions of endemicity.[3]

In endemic countries, prevention of brucellosis in humans depends on management of the disease in animal reservoirs and their by-products, including milk. While the risk of acquiring brucellosis in Ontario, especially from cattle, is low, preventive measures are necessary for everyone including travelers and animal handlers (e.g., hunters, veterinarians, farmers, abattoir workers and laboratory personnel). General practices for reducing the risk of acquiring brucellosis while in Canada can also be employed while travelling abroad. Individuals can prevent brucellosis by consuming only pasteurized dairy products and meat products that have been thoroughly cooked, and by avoiding direct contact with animal tissue and fluids through the use of protective clothing and gloves.[3]

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.

CHLAMYDIA INFECTIONS

Compared to the average number of cases of chlamydia reported for January 1 to March 31 from 2008 to 2012, there was a significant increase in the number of chlamydia cases reported in 2013. Chlamydia in Ontario has demonstrated a gradually increasing trend over the past decade. While the cause of this increase is not fully known, potential explanations include increased screening. Canadian guidelines have recommended routine screening of high risk groups, which in turn has led to increased testing. In addition, testing methods are now more sensitive, simpler, less invasive and more acceptable to patients, which also may have resulted in an increase in testing. The degree to which the increase in testing and an increase in disease transmission have contributed to the overall increase is not yet known. The July 2012 edition of the Monthly Infectious Diseases Surveillance Report (Volume 1, Issue 8) further describes the epidemiology of chlamydia in Ontario.

LEGIONELLOSIS

From January 1 to March 31, 2013, case counts for legionellosis were significantly higher than expected compared to the five-year average YTM counts for 2008 to 2012. The majority of cases were reported by health units in central Ontario (Central West, Toronto and Central East), which is similar to previous years for the same time period (January to March). Seventy percent (16/23) of cases were male and cases had a median age of 62 years (range 44 to 82). Exposure information was reported for 91% (21/23) of cases, of which 71% (15/21) reported an unknown exposure. Three cases with known exposures were travel-related, with two cases reporting travel to Florida and one case reporting travel to Mexico prior to becoming ill. Domestic exposures included a humidifier at a private residence (one case), a grocery store (one case), and a drive-through car wash (one case). Percent positivity of specimens tested for *Legionella* at Public Health Ontario Laboratory from January to March 2013 was higher compared to specimens tested from January to March in previous years (2010-2012). Based on information available at this time, there is no conclusive evidence to support any unusual cluster activity. Legionellosis follows a seasonal trend with most cases occurring between July and October each year.

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

Reportable disease	2013			Historical comparisons						5-year avg annual count (2008-2012)
	Mar	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	2,784	8,657	632.4*	2,763	208.9	-3	8,024	606.6*	4	32,283
Legionellosis	6	23	1.7*	3	0.2	93	10	0.8*	114	124

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/04/17].
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 2013 compared to the five-year historical average (2008-2012).

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.

MEASLES ACTIVITY IN THE UNITED KINGDOM

Summary: Despite elimination in the Americas, measles outbreaks continue to occur throughout the world. In the United Kingdom (UK), 2,016 confirmed cases of measles were reported to the Health Protection Agency in 2012, representing the highest annual total since 1994. Within Wales, 1,170 cases of measles were reported between November 1, 2012 and May 1, 2013. Presently, there is no evidence of a decline in the number of cases, particularly among ten to 18 year olds. Over 80 people have been hospitalized, including a report of death in a 25 year old male. England continues to experience high rates of measles as a result of prolonged outbreaks in Merseyside and Sussex, as well as in travelling communities. Approximately 600 cases were reported between January and March 2013, with a predominance of cases among ten to 14 year olds, demonstrating the impact of the decline in measles, mumps and rubella (MMR) vaccine coverage in the late 1990s and early 2000s. One hundred and eight cases (approximately 18%) have been hospitalized, among whom 15 experienced complications including pneumonia, meningitis and gastroenteritis.

Implications: Indigenous measles has been eliminated from Canada; the last endemic case of measles was reported in 1997. Under the guidance of the Pan American Health Organization, countries of the Americas including Canada are currently documenting the elimination of measles and rubella. As the disease remains endemic in parts of the world, importation of cases continues to occur. To ensure Canada's elimination status is maintained, it is essential to maintain high MMR vaccine coverage among the population and to assess and document the vaccination status and travel history for every confirmed case of measles.

http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138802384
http://www.wales.nhs.uk/sitesplus/888/page/66389#a
http://www.phac-aspc.gc.ca/im/vpd-mev/measles-rougeole-mrer-eng.php
http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=16739&Itemid

Enhanced Surveillance Directives (ESD) Discontinued in April

MEASLES LINKED TO RESORT IN MEXICO

PHO issued an ESD on March 11 following notification from the Public Health Agency of Canada of an international outbreak of measles with exposure to a resort in Mexico (Azul Fives Hotel, Playa del Carmen). The index case for this outbreak was from the UK, which is currently experiencing measles outbreaks in several jurisdictions (as described above), and was infectious from January 31 to February 10. A laboratory confirmed case in an adult with exposure during this time frame at the resort was identified in Ontario; three confirmed cases from New Brunswick (NB) were also identified. Measles genotyping results confirmed the linkage between the cases from the UK, Ontario and NB. The elimination of measles is currently being documented in the Americas and enhanced surveillance to document elimination of this disease is ongoing. This enhanced surveillance resulted in the identification of a large number of Ontario residents with a history of travel to this resort in Mexico during a time frame of possible exposure to measles. Consequently, 32 health units were provided with the names of persons potentially exposed to measles in their jurisdiction. An outbreak number (#0000-2013-004) was created to link these individuals to the confirmed Ontario case. In addition, an outbreak case definition was created, which included the genotype information. No further Ontario cases were identified during the period of investigation and the ESD was discontinued on April 5, 2013.

References

Infectious Disease in Focus – Brucellosis

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Appendix – Reportable Diseases

Appendix 1. Confirmed cases of 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 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)†	
AIDS	11	1	3										**15**	1.1	11	0.8	-73	33	2.5	-56	113
Amebiasis	8	12	6										**26**	1.9	40	3.0	-85	110	8.3	-77	397
Botulism	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-100	3
Brucellosis	0	0	0										**0**	0.0	0	0.0	-100	1	0.1	-100	4
Campylobacter Enteritis	148	183	208										**539**	39.4	215	16.2	-6	606	45.8	-14	3,556
Chlamydial Infections	3,137	2,736	2,784										**8,657**	632.4	2,763	208.9	-3	8,024	606.6	4	32,283
Cholera	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-100	1
Cryptosporidiosis	10	13	16										**39**	2.8	21	1.6	-28	51	3.9	-26	316
Cyclosporiasis	1	1	3										**5**	0.4	5	0.4	-44	12	0.9	-59	120
Cytomegalovirus Infection, Congenital	2	1	1										**4**	0.3	0	0.0	-	1	0.1	222	6
Encephalitis	1	1	1										**3**	0.2	1	0.1	-19	4	0.3	-24	18
Encephalitis/Meningitis	4	12	8										**24**	1.8	10	0.8	-23	29	2.2	-19	157
Food Poisoning, All Causes	6	2	3										**11**	0.8	18	1.4	-84	47	3.6	-78	120
Giardiasis	113	84	74										**271**	19.8	117	8.9	-39	338	25.5	-22	1,428
Gonorrhoea (All Types)	447	294	324										**1,065**	77.8	319	24.1	-2	947	71.6	9	3,935
Group A Streptococcal Disease, Invasive	48	60	46										**154**	11.2	64	4.8	-30	185	14.0	-20	564
Group B Streptococcal Disease, Neonatal	4	3	7										**14**	1.0	4	0.3	78	12	0.9	17	54
Haemophilus Influenzae B Disease, Invasive	2	0	1										**3**	0.2	1	0.0	61	1	0.1	142	5
Hepatitis A	15	4	6										**25**	1.8	9	0.7	-34	30	2.3	-19	120
Hepatitis B	5	8	6										**19**	1.4	12	0.9	-53	30	2.3	-38	122
Hepatitis C	323	279	300										**902**	65.9	388	29.3	-25	1,147	86.7	-24	4,432
Hepatitis D	0	0	0										**0**	0.0	0	0.0	-100	1	0.1	-100	3
Herpes, Neonatal	0	0	0										**0**	0.0	1	0.1	-100	2	0.2	-100	7
HIV	46	38	47										**131**	9.6	75	5.7	-40	222	16.8	-43	861
Influenza	3,335	795	471										**4,601**	336.1	1,000	75.6	-54	2,498	188.8	78	6,833
Legionellosis	10	7	6										**23**	1.7	3	0.2	93	10	0.8	114	124
Leprosy	0	0	1										**1**	0.1	0	0.0	-	1	0.0	61	3
Listeriosis	0	1	0										**1**	0.1	3	0.3	-100	11	0.8	-91	62
Lyme Disease	0	0	0										**0**	0.0	1	0.1	-100	3	0.3	-100	89
Malaria	14	10	7										**31**	2.3	12	0.9	-42	38	2.9	-22	214
Measles	1	1	5										**7**	0.5	2	0.1	168	2	0.2	207	17
Meningitis	8	3	6										**17**	1.2	9	0.7	-34	23	1.7	-28	116
Meningococcal Disease, Invasive	3	2	0										**5**	0.4	6	0.4	-100	15	1.2	-69	45
Mumps	1	0	0										**1**	0.1	4	0.3	-100	16	1.2	-94	115
Ophthalmia Neonatorum	0	2	0										**2**	0.1	0	0.0	-100	0	0.0	383	3
Paratyphoid Fever	3	6	10										**19**	1.4	5	0.4	79	18	1.4	1	52
Pertussis (Whooping Cough)	15	9	7										**31**	2.3	31	2.4	-78	105	8.0	-72	467
Q Fever	1	1	0										**2**	0.1	0	0.0	-100	2	0.1	7	11
Rabies	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-	0
Rubella	0	0**	0										**0**	0.0	0	0.0	-	1	0.0	-100	1
Rubella, Congenital Syndrome	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-	0
Salmonellosis	147	168	181										**496**	36.2	217	16.4	-19	599	45.3	-20	2,608
Shigellosis	21	21	19										**61**	4.5	17	1.3	8	58	4.4	2	254
Streptococcus Pneumoniae, Invasive	143	86	84										**313**	22.9	130	9.9	-38	357	27.0	-15	1,210
Syphilis, Early Congenital	0	0	0										**0**	0.0	0	0.0	-100	0	0.0	-100	1
Syphilis, Infectious	57	38	14										**109**	8.0	68	5.2	-80	182	13.8	-42	715
Syphilis, Other	51	26	16										**93**	6.8	82	6.2	-81	223	16.9	-60	877
Tetanus	1	1	0										**2**	0.1	0	0.0	-	0	0.0	866	1
Tuberculosis	38	44	43										**125**	9.1	56	4.2	-26	151	11.4	-20	632
Tularemia	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-	1
Typhoid Fever	7	5	8										**20**	1.5	10	0.8	-26	31	2.4	-38	90
Verotoxin Producing E. Coli Including HUS	15	2	3										**20**	1.5	7	0.5	-59	20	1.5	-1	208
West Nile Virus Illness	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-	61
Yellow Fever	0	0	0										**0**	0.0	0	0.0	-	0	0.0	-100	0
Yersiniosis	14	17	10										**41**	3.0	26	2.0	-63	67	5.1	-41	216

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/04/17].

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.

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 measles cases reported in January and February 2013 did not have travel history noted. ** There was one confirmed case of rubella reported in February 2013 that has since been reclassified as not meeting the provincial case definition; the numbers in the table above reflect this update.
Note 5: Statistical tests comparing rates were not performed when the YTM rate in previous years was zero.