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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. We welcome feedback by email to:

SurveillanceServices@oahpp.ca. Past issues and additional information are available [online](#).

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IN FOCUS

Tuberculosis and Diabetes

Mycobacterium tuberculosis infection is acquired by the inhalation of bacilli-containing droplet nuclei from a person with active, infectious pulmonary tuberculosis (TB). These nuclei must reach the alveoli in order to cause infection. In some people, the bacteria can be eradicated but in others the bacteria are able to replicate and cause latent TB infection (LTBI).¹ Without treatment, about five percent of people with recent LTBI will develop active TB disease within two to six months; another five percent will develop active TB later in their lifetime.¹

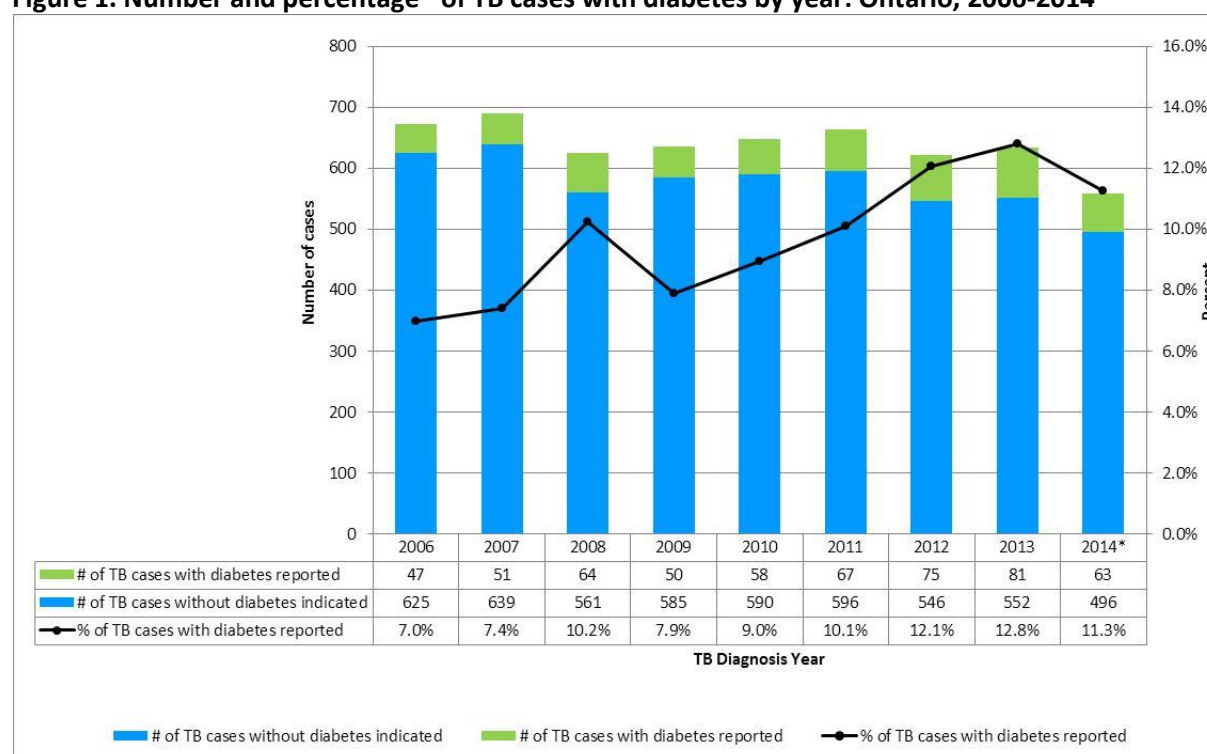
There are specific risk factors known to increase the risk of progression from LTBI to active TB disease, such as HIV infection, chronic renal failure requiring dialysis, recent TB infection, treatment with glucocorticoids, alcohol overuse, and diabetes.^{1,2} Diabetes increases a person's risk of progression from LTBI to active TB by about three times compared to those without diabetes. People with tuberculosis who also have diabetes do not respond as well to TB treatment, which puts them at a higher risk for treatment failure, relapse after cure, and death.³ Tuberculosis can also worsen glycaemic control and complicate the clinical management of diabetes.²

Over the last 30 years, the prevalence of diabetes has increased by about 20%, worldwide.² It is increasing most significantly in low and mid-income countries where TB is already one of the primary causes of death. A high prevalence of LTBI in these countries, when coupled with increasing rates of diabetes, could lead to further increases in the overall burden of TB. It is thought that the rate of diabetes will increase even more if risk factors, such as obesity, for this disease are not overcome.² Worldwide, the country estimated to have the most cases of TB associated with diabetes is India followed by China.² In India diabetes is estimated to have increased the number of TB cases by 46%.⁴ This burden of disease could impact the epidemiology of TB in Ontario due to high immigration levels from TB endemic countries, which include India, the Philippines, and China.⁵ These are also the top three countries of birth for TB cases born outside of Ontario.⁶ This article presents data on the incidence and characteristics of TB cases with diabetes in Ontario.

In Ontario, the prevalence of diabetes increased by 69% between 1995 and 2005.⁷ The prevalence of diabetes in adults living in Ontario was 9.6% on average, as of March 2011.⁸ Among these individuals, two-thirds reside in major urban centres and approximately half of all cases are in the Greater Toronto Area.⁸ Recent immigrants to Ontario who were born in South Asia, which includes countries such as Afghanistan, India, Pakistan, and Sri Lanka, had a higher prevalence of diabetes than recent immigrants born in other regions of the world and long-term residents of Ontario.⁹

In Ontario, between January 1, 2006 and December 31, 2014, there were 639 new cases of TB reported per year on average. The percentage of TB cases reporting diabetes was lowest in 2006 (7.0%) and highest in 2013 (12.8%)(Figure 1). In 2011, 10.1% of TB cases had diabetes listed as a risk factor, which is similar to the diabetes prevalence of 9.6% among adults living in Ontario for that year.⁸ The proportion of TB cases among males with diabetes was higher than the proportion of cases without diabetes (62.8% vs. 52.1%; $p < 0.0001$). The average age of TB cases with diabetes (63.3 years) was also significantly higher than the average age of cases without diabetes (45.3 years) ($p < 0.0001$). The data represent information recorded as part of public health surveillance. Some cases may not have been assessed for the presence of diabetes or the data may not have been reported. Over time, efforts to improve risk factor reporting have been made, which may result in more accurate and complete data in more recent years. The data must be interpreted with these caveats in consideration.

Figure 1. Number and percentage* of TB cases with diabetes by year: Ontario, 2006-2014



Data Sources:

Ontario Cases: Ontario Ministry of Health and Long-Term Care (MOHLTC), integrated Public Health Information System (iPHIS) database, extracted [2015/02/02].

Notes:

Data for 2014 were extracted prior to the annual TB data clean-up initiative; therefore, 2014 data can be expected to differ in subsequent data extraction dates.

*Among all cases of TB regardless of whether risk factor data were entered or not.

From 2006 to 2014, 90.7% (5,213/5,746) of TB cases had at least one risk factor reported in iPHIS. The following results refer to this subset of TB cases, among whom 10.7% (556/5,213) had diabetes reported as a risk factor (Table 1). The majority of TB cases in Ontario with diabetes reported as a risk factor were born outside of Canada. Overall, 11.0% (513/4,669) of the TB cases among the foreign born also had diabetes. Of the 556 cases with both TB and diabetes between 2006 and 2014, 130 (23.4%) were from the Philippines, 128 (23.0%) were from India, and 36 (6.5%) were from China. Among the ten countries where the most TB cases with diabetes in Ontario were born, the percentage of TB cases with diabetes was highest in people born in Portugal (24.2%), Sri Lanka (18.5%), and the Philippines (17.5%). The percentage of TB cases with diabetes was also high in people born in other South Asian countries (e.g. Afghanistan, India, and Pakistan) (Table 1).

Only 5.6% (31/556) of TB cases with diabetes reported as a risk factor were born in Canada. Among the Canadian born, 6.8% (31/457) of TB cases with any risk factor information reported were identified as having diabetes, whereas 21.1% of TB cases that were identified as Registered Status Indian, Other Aboriginal were reported to have diabetes (Table 1).

Table 1. TB cases by diabetes risk factor status in iPHIS* and country of birth: Ontario, 2006-2014

	Diabetes	Diabetes not indicated**	Percentage of TB cases with diabetes	Total
Born in Canada				
Non-Aboriginal, Born in Canada	23	385	5.6%	408
Registered Status Indian, Other Aboriginal	8	30	21.1%	38
Inuit	0	11	0.0%	11
<i>Subtotal</i>	31	426	6.8%	457
Born outside of Canada				
Philippines	130	611	17.5%	741
India	128	860	13.0%	988
China	36	469	7.1%	505
Sri Lanka	29	128	18.5%	157
Pakistan	29	197	12.8%	226
Viet Nam	24	258	8.5%	282
Somalia	20	141	12.4%	161
Afghanistan	11	56	16.4%	67
Portugal	8	25	24.2%	33
Bangladesh	8	84	8.7%	92
Other	88	1,311	6.3%	1,399
Unknown	2	16	11.1%	18
<i>Subtotal</i>	513	4,156	11.0%	4,669
No birth information available	12	75	13.8%	87
Total	556	4,657	10.7%	5,213

Data Sources:

Ontario Cases: Ontario Ministry of Health and Long-Term Care (MOHLTC), integrated Public Health Information System (iPHIS) database, extracted [2015/02/02].

Notes:

Data for 2014 were extracted prior to the annual TB data clean-up initiative; therefore, 2014 data can be expected to differ in subsequent data extraction dates.

*Among those with any risk factor data reported. **Diabetes was considered as not indicated if 'Diabetes' was not checked off as a risk factor in iPHIS.

The prevalence of diabetes in Ontario has been increasing.^{7,8} Given that diabetes increases the risk of progression from LTBI to active TB disease,¹ Ontario health care providers should be encouraged to assess a diabetic person's potential risk for LTBI, assessing them on an individualized basis. LTBI screening and treatment should be considered for diabetic patients under 65 years of age who are a part of a population with increased prevalence of LTBI.¹ The overall percentage of TB cases with diabetes in Ontario is similar to recent provincial diabetes prevalence estimates.⁸ However, the percentage of TB cases with diabetes is higher in persons born outside of Canada and those identified as Registered Status Indian, Other Aboriginal compared to non-Aboriginal people born in Canada. PHO will continue to monitor these data to remain informed about and identify changes in the epidemiology of TB and diabetes in Ontario.

References

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SIGNIFICANT REPORTABLE DISEASE ACTIVITY

For January 2015, there were no 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 1](#), 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.

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.

Current high profile infectious disease activity in other jurisdictions has been described in recent issues of this report. Please refer to the [August 2014](#) issue for a review of the ebola outbreak in West Africa, and the [October 2014](#) issue for a review of enterovirus D68.

RECENTLY DISCONTINUED ENHANCED SURVEILLANCE DIRECTIVES

There have been no recently discontinued Enhanced Surveillance Directives.

Appendix – Reportable Diseases

Appendix 1. 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 ‡	Current month 5-year avg (2010-2014)	Current month 5-year avg (2010-2014) rate ‡	% difference (current month minus 5-year avg)†	YTM 5-year avg (2010-2014)	YTM 5-year avg (2010-2014) rate ‡	% difference (YTM 2015 minus YTM 5-year avg)†	
Acute Flaccid Paralysis	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AIDS	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	12	0.9	-100	12	0.9	-100	98
Amebiasis	24	-	-	-	-	-	-	-	-	-	-	-	24	1.7	70	5.2	-67	70	5.2	-67	790
Botulism	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	2
Brucellosis	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-100	0	0.0	-100	5
Campylobacter enteritis	129	-	-	-	-	-	-	-	-	-	-	-	129	9.2	201	15.0	-38	201	15.0	-38	3,698
Chlamydial Infections	2,843	-	-	-	-	-	-	-	-	-	-	-	2,843	203.0	3,083	229.4	-12	3,083	229.4	-12	35,404
Cholera	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	0	0.0	-	0	0.0	-	0
Cryptosporidiosis	13	-	-	-	-	-	-	-	-	-	-	-	13	0.9	14	1.0	-11	14	1.0	-11	320
Cyclosporiasis	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	3	0.2	-66	3	0.2	-66	117
Encephalitis	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	2	0.1	-52	2	0.1	-52	18
Encephalitis/Meningitis	8	-	-	-	-	-	-	-	-	-	-	-	8	0.6	8	0.6	1	8	0.6	1	149
Food Poisoning, All Causes	6	-	-	-	-	-	-	-	-	-	-	-	6	0.4	10	0.7	-42	10	0.7	-42	85
Giardiasis	47	-	-	-	-	-	-	-	-	-	-	-	47	3.4	109	8.1	-58	109	8.1	-58	1,332
Gonorrhoea (All Types)	466	-	-	-	-	-	-	-	-	-	-	-	466	33.3	401	29.8	12	401	29.8	12	4,529
Group A Streptococcal Disease, Invasive	66	-	-	-	-	-	-	-	-	-	-	-	66	4.7	67	5.0	-6	67	5.0	-6	637
Group B Streptococcal Disease, Neonatal	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	4	0.3	-100	4	0.3	-100	54
Haemophilus Influenzae B Disease, Invasive	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-100	0	0.0	-100	4
Hepatitis A	11	-	-	-	-	-	-	-	-	-	-	-	11	0.8	9	0.6	23	9	0.6	23	110
Hepatitis B (Acute)	3	-	-	-	-	-	-	-	-	-	-	-	3	0.2	10	0.8	-72	10	0.8	-72	109
Hepatitis B (Chronic)	48	-	-	-	-	-	-	-	-	-	-	-	48	3.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hepatitis C	292	-	-	-	-	-	-	-	-	-	-	-	292	20.9	368	27.4	-24	368	27.4	-24	4,260
HIV	51	-	-	-	-	-	-	-	-	-	-	-	51	3.6	62	4.6	-21	62	4.6	-21	789
Influenza	4,416	-	-	-	-	-	-	-	-	-	-	-	4,416	315.4	1,763	131.2	140	1,763	131.2	140	6,702
Legionellosis	4	-	-	-	-	-	-	-	-	-	-	-	4	0.3	5	0.4	-29	5	0.4	-29	172
Leprosy	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	1	0.1	-100	1	0.1	-100	3
Listeriosis	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	3	0.2	-68	3	0.2	-68	51
Lyme Disease	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	3	0.2	-63	3	0.2	-63	199
Malaria	6	-	-	-	-	-	-	-	-	-	-	-	6	0.4	16	1.2	-64	16	1.2	-64	222
Measles α	6	-	-	-	-	-	-	-	-	-	-	-	6	0.4	#	#	#	#	#	#	#
Meningitis	2	-	-	-	-	-	-	-	-	-	-	-	2	0.1	7	0.5	-71	7	0.5	-71	117
Meningococcal Disease, Invasive	5	-	-	-	-	-	-	-	-	-	-	-	5	0.4	4	0.3	26	4	0.3	26	32
Mumps	4	-	-	-	-	-	-	-	-	-	-	-	4	0.3	9	0.7	-58	9	0.7	-58	48
Ophthalmia Neonatorum	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	3
Paralytic Shellfish Poisoning	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paratyphoid Fever	2	-	-	-	-	-	-	-	-	-	-	-	2	0.1	7	0.5	-72	7	0.5	-72	45
Pertussis (Whooping Cough)	10	-	-	-	-	-	-	-	-	-	-	-	10	0.7	25	1.9	-62	25	1.9	-62	399
Q Fever	1	-	-	-	-	-	-	-	-	-	-	-	1	0.1	1	0.1	-31	1	0.1	-31	15
Rabies	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	0
Rubella	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	#	#	#	#	#	#	#
Rubella, Congenital Syndrome	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	#	#	#	#	#	#	#
Salmonellosis	147	-	-	-	-	-	-	-	-	-	-	-	147	10.5	197	14.6	-28	197	14.6	-28	2,774
Shigellosis	15	-	-	-	-	-	-	-	-	-	-	-	15	1.1	24	1.8	-40	24	1.8	-40	262
Streptococcus Pneumoniae, Invasive	80	-	-	-	-	-	-	-	-	-	-	-	80	5.7	129	9.6	-41	129	9.6	-41	1,172
Syphilis, Early Congenital	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	1
Syphilis, Infectious	27	-	-	-	-	-	-	-	-	-	-	-	27	1.9	74	5.5	-65	74	5.5	-65	783
Syphilis, Other	30	-	-	-	-	-	-	-	-	-	-	-	30	2.1	61	4.5	-53	61	4.5	-53	681
Tetanus	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-100	0	0.0	-100	2
Tuberculosis	34	-	-	-	-	-	-	-	-	-	-	-	34	2.4	44	3.2	-25	44	3.2	-25	624
Tularemia	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	1
Typhoid Fever	4	-	-	-	-	-	-	-	-	-	-	-	4	0.3	10	0.7	-62	10	0.7	-62	81
Verotoxin Producing E. coli Including HUS	5	-	-	-	-	-	-	-	-	-	-	-	5	0.4	9	0.7	-47	9	0.7	-47	173
West Nile Virus Illness	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-	0	0.0	-	86
Yellow Fever	0	-	-	-	-	-	-	-	-	-	-	-	0	0.0	0	0.0	-100	0	0.0	-100	1
Yersiniosis	10	-	-	-	-	-	-	-	-	-	-	-	10	0.7	17	1.2	-42	17	1.2	-42	180

Ontario Cases: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/02/10].

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.
- ‡ 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 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.”
- 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.