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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 anticipate that the report will evolve over time according to our users' needs. 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

INVASIVE GROUP A STREPTOCOCCAL (iGAS) INFECTIONS

Group A *Streptococcus* (GAS, also known as *Streptococcus pyogenes*) is a bacterium responsible for a variety of illnesses in humans. Some individuals may carry GAS strains in their throat and/or skin (i.e. colonized) but have no symptoms; this is thought to be the main reservoir for the organism.[1,2] Most GAS infections result in relatively mild illnesses, such as strep throat. When GAS bacteria are isolated from normally sterile sites (e.g. blood or muscle), or from non-sterile sites when the individual is severely ill, the term *invasive* Group A streptococcal disease (iGAS) is used.[3] Invasive disease can result in more severe illnesses such as life-threatening necrotizing fasciitis ("flesh-eating disease"), although only a small proportion of GAS infections will develop into invasive disease.[1,4] In Ontario, only the invasive form of the disease is reportable.[3]

The incubation period for GAS is relatively short (one to three days), with a period of communicability between ten and 21 days,[1] although individuals colonized with GAS may have an extended incubation period of up to 14 days.[5] Transmission of GAS occurs through large

respiratory droplets or direct contact with infected respiratory secretions and/or skin lesions, or the sharing of contaminated needles. The greatest risk of contracting GAS is close contact with a GAS case or individual colonized with GAS.[1,2]

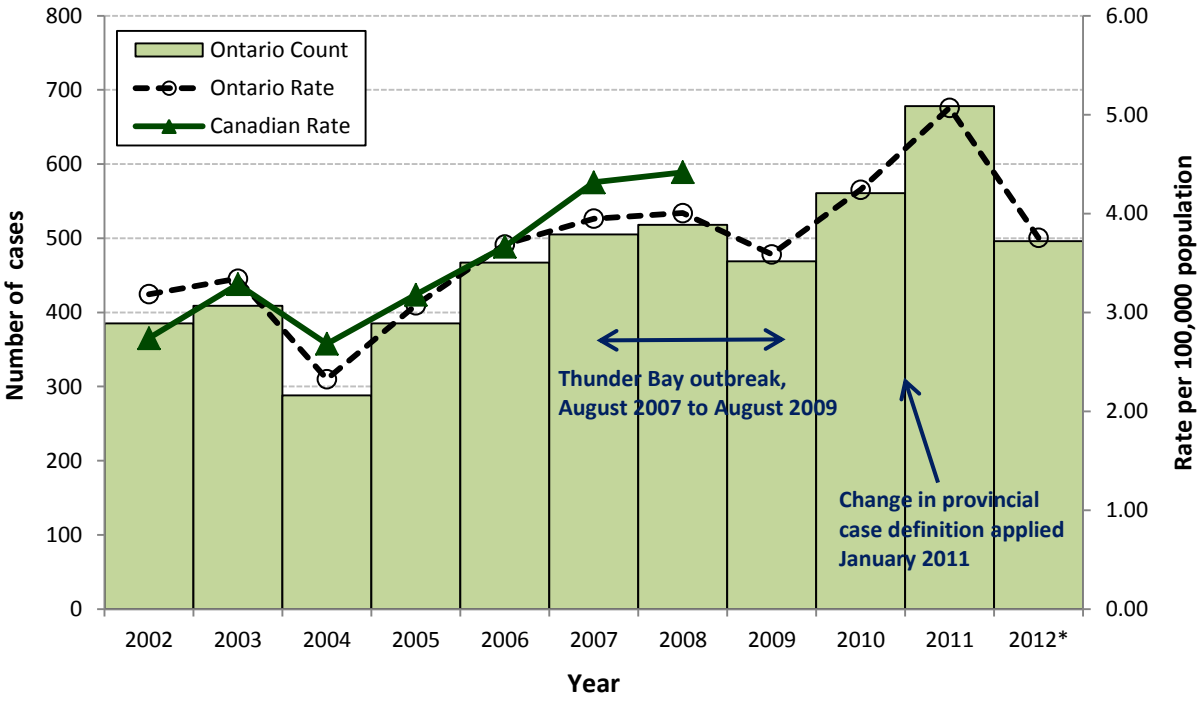
Symptoms of iGAS vary and may include pain, swelling, fever, influenza-like-illness, generalized macular rash, nausea, vomiting, diarrhea, malaise and joint pain.[1] The clinical presentations of iGAS also vary, and may include bacteraemia, streptococcal toxic-shock syndrome, soft tissue infections (e.g. necrotizing fasciitis, myositis, and gangrene), pneumonia, and meningitis.[1-3]

The incidence of iGAS is highest in late winter and spring.[1] Incidence is highest in those over 60 and under one year of age. Risk factors for iGAS include being immunocompromised, having a chronic illness or recent varicella (chickenpox) infection.[1,2] Based on data from the United States, the case fatality rate for iGAS is estimated to range from 11% to 15%.[1]

In Ontario, iGAS isolates are forwarded from hospital and private laboratories to Public Health Ontario Laboratories (PHOL). All iGAS isolates are subsequently referred to the National Microbiology Laboratory (NML) for molecular typing. Each isolate is designated an *emm* type and a T-type. Molecular typing assists with provincial and national surveillance of circulating strains causing invasive disease, and is useful for detecting the emergence of new GAS *emm* or T types with more severe illness and/or epidemic potential; these data are summarized in annual reports by the NML.[6] *Emm* typing has resulted in the identification of more than 130 *emm* GAS types worldwide.[1] PHOL also conducts pulsed-field gel electrophoresis on outbreak-associated GAS isolates, which may discriminate better between individual strains than *emm* and T-typing, facilitating identification of genetically-related clusters.

The provincial incidence of iGAS has increased 118% in recent years from a rate of 2.32 cases per 100,000 population in 2004 to 5.07 cases per 100,000 population in 2011 (Figure 1). Where comparison data are available, national incidence rates display a similar trend to Ontario.[7] From August 2007 to August 2009, an increase of cases was identified in relation to an outbreak in Thunder Bay. Many of the outbreak cases were aboriginal, intravenous drug users, and/or hepatitis C positive; also, geographic clusters were identified within the city center, known drug houses, and shelters.[8] The reasons for the overall increase in iGAS incidence in Ontario over this timeframe are not fully understood at this time, although improved awareness of the disease leading to more complete reporting of individual cases over the years may be a contributing factor. The incidence in 2012 overall is expected to be lower than in 2011 based on case counts reported to date.

Figure 1. Incidence of iGAS by year: Ontario and Canada, January 1, 2002 to October 31, 2012



Data sources: Ontario case counts – Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2012/11/27]. Ontario population data – Ontario Ministry of Health and Long-Term Care, intelliHEALTH Ontario, extracted [2012/03/18]. Canadian incidence – Public Health Agency of Canada, Canadian Notifiable Disease Section, received by Public Health Ontario [2012/09/21].[7]
* 2012 includes data from January 1 to October 31 only.

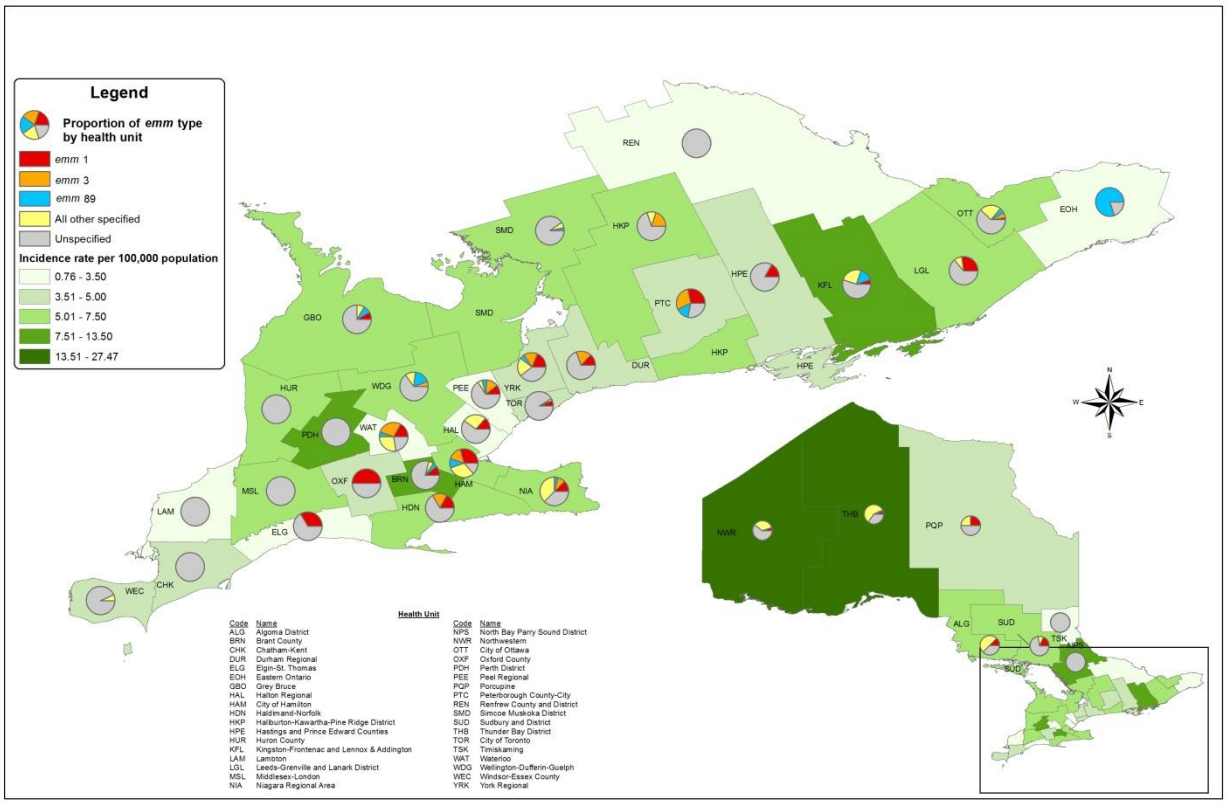
In 2011, 678 confirmed cases of iGAS were reported in Ontario. Over the course of that year, the highest number of cases occurred in the winter months and peaked in March. Incidence was slightly higher among males than females (54%; 364/678). The highest incidence rate (12.54 cases per 100,000 population) was reported among older adults aged 70 and above, followed by infants less than one year of age and adults between 60 and 69 years of age (7.63 and 7.43 cases per 100,000 population, respectively). These trends are consistent with the Ontario and Canadian experience in recent years.[9,10]

There was some geographic variation in *emm* types reported across Ontario in 2011 (Figure 2); however, these observations are limited by the small proportion of cases for which an *emm* type was available (38%; 259/678). In 2011, the three most common *emm* types reported in the province were *emm* 1 (9.1%; 62/678), *emm* 3 (5.5%; 37/678) and *emm* 89 (4.3%; 29/678). *Emm* type 59, which was associated with numerous cases in the 2007-09 outbreak in Thunder Bay District and was the most common *emm* type identified among iGAS cases in Canada in 2008,[8,9] is now much less commonly reported in Ontario than previous years;[10] it was identified in only five cases (0.7%) in three health units in 2011.

While a large proportion of iGAS cases in 2011 were reported in large urban areas, health units with large urban areas had relatively lower incidence rates (Figure 2). The highest incidence rates were observed in Thunder Bay District (27.47 cases per 100,000 population) and Northwestern (21.97 cases per 100,000 population). While iGAS cases in the North West region reported a higher proportion of many risk factors compared to the province overall, the difference may reflect variations in reporting practices across health units. In Ontario overall, common risk factors reported among cases were: alcohol abuse, being underhoused/homeless, close contact with another case, injection drug use, chronic illnesses (e.g. diabetes), being immunocompromised, having broken skin and recent non-invasive GAS infection.

In Ontario in 2011, reported cases of iGAS commonly presented with bacteremia, soft tissue/wound infection, streptococcal toxic shock syndrome, septicemia, or pneumonia. Sixty-seven percent (455/678) of iGAS cases in 2011 were reported as hospitalized and 9% (61/678) of cases that died had iGAS identified as the underlying or contributing cause of death.

Figure 2. Proportion of iGAS cases by *emm* type and health unit: Ontario, January 1 to December 31, 2011



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2012/11/27].

Appropriate and early treatment of GAS infection is necessary to minimize the incidence of invasive disease. Public health should ensure that iGAS cases are educated about how to reduce the risk of transmission to others. GAS can be transmitted through contact with mucous membranes; therefore, cases should avoid sharing items that have come in contact with mucous membranes of the nose and throat (e.g. toothbrushes, cups, cigarettes, and water bottles). Close contacts of iGAS cases also should avoid contact with any infected wounds or sores.[11]

Prevention measures include education to prevent transmission as described above, and varicella immunization for children to reduce the risk of iGAS.[2,12] For injection drug users, access to needle exchange programs and outreach are important to provide education about the risks of iGAS and to reduce the risk of transmission through the use of sterile equipment.[12,13] With appropriate infection prevention and control measures, the incidence of iGAS can be reduced.

Significant Reportable Disease Activity

From January 1 to November 30, 2012, case counts for brucellosis, campylobacteriosis, pertussis, salmonellosis, and West Nile Virus (WNV) illness were significantly higher than expected compared to the year-to-month (YTM) counts for 2010 and 2011. The increase in pertussis was previously described in Volume 1, Issues 2-11 of this report and was also the subject of the *In Focus* article in the October 2012 report. The increases in brucellosis, salmonellosis and WNV were described in a previous issue of this report (Volume 1, Issue 12), as well as campylobacteriosis (Volume 1, Issue 13). Appendix 1 provides additional details on the YTM confirmed counts for these and other reportable diseases for 2012 with comparisons to 2011 and 2010.

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 impact on public health in Ontario.

AN ONGOING OUTBREAK OF PERTUSSIS IN ENGLAND AND WALES SINCE MID-2011

There has been an ongoing pertussis outbreak in the United Kingdom. The Health Protection Agency (HPA) reported a decrease in the number of pertussis cases from October (1631 cases) to November (1080 cases) 2012, but cautioned that the decline did not represent an end to the current outbreak in England and Wales, which began in mid-2011. From January to November 2012, HPA reported 8819 laboratory confirmed cases of pertussis in England and Wales and 13 deaths among infants 12 months or younger, who are most susceptible. The HPA reported no deaths in November 2012.

- http://www.hpa.org.uk/NewsCentre/NationalPressReleases/2012PressReleases/121221Whoopingcoughcasesremainhigh/
- http://www.cdc.gov/pertussis/outbreaks.html
- http://news.ontario.ca/mohltc/en/2012/07/ontarians-reminded-to-get-fully-immunized-against-whooping-cough.html
- http://www.hps.scot.nhs.uk/ewr/article.aspx

Editor's Note: Ontario has been experiencing an outbreak of pertussis since November 2011, along with other regions in Canada, including British Columbia, southern Alberta and New Brunswick, as well as in the United States, particularly in Washington, D.C. In Ontario, the number of confirmed pertussis cases increased from 101 cases in 2011 to 759 cases in 2012 (as of December 14, 2012). Pertussis, also known as whooping cough, is a highly contagious bacterial disease that can spread through coughing or sneezing. Pertussis incidence follows a cyclical trend, with peaks every two to five years. The best defense against pertussis is immunization, which is publicly funded in Ontario.

NOROVIRUS

In many countries, including Japan, Australia, New Zealand, France, the United States and the United Kingdom (UK), the number of reported cases of norovirus is above expected this winter season. Much of the increased activity is being attributed to a new strain, GII.4 Sydney 2012, which was first reported in Australia in March 2012. In the UK, one of the most heavily affected areas globally, the latest figures indicate a 72% increase in cases compared to last winter. Norovirus is highly contagious, with symptoms that include sudden onset of vomiting and/or diarrhea. The illness usually resolves in one or two days and there are no long-term effects.

- http://www.hpa.org.uk/NewsCentre/NationalPressReleases/2013PressReleases/130102HPAupdateonseasonalnorovirusactivity/
- http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20345
- http://www.bccdc.ca/resourcematerials/newsandalerts/healthalerts/New+norovirus+strain+found+in+British+Columbia.htm

Editor's Note: Many areas of Canada are experiencing increased norovirus activity this winter. In recent weeks, the National Enteric Surveillance Program (NESP) identified increased activity in Alberta, British Columbia (BC), New Brunswick, Newfoundland, Nova Scotia, Saskatchewan and Quebec. The presence of the recently emerged GII.4 Sydney 2012 strain in BC is being associated with the highest incidence of gastroenteritis outbreaks in the province since 2006. GII.4 Sydney 2012 was detected in Ontario in January 2013 from a selection of outbreaks reported from December 2012 to January 2013 through characterization of outbreak-associated norovirus-positive specimens. Of 15 gastroenteritis outbreaks with specimens characterized at the National Microbiology Laboratory, five (33%) were determined to be GII.4 Sydney 2012. New strains of norovirus typically emerge every few years and lead to increased activity, presumably due to lack of immunity. Frequent and careful hand hygiene, for example, before eating and handling food, and staying at home while ill are the best methods to prevent norovirus infections.

Telehealth Report

Telehealth Ontario is a toll-free nursing helpline available to all residents of Ontario 24 hours a day, seven days a week. PHO conducts surveillance using Telehealth call data that has been categorized into three syndromes: gastrointestinal (GI), fever/Influenza-like illness (ILI), and respiratory (which includes both upper and lower respiratory symptoms). Data are used to determine whether observed call volumes are greater than statistically expected and to identify significant clusters of the targeted syndromes. Significant geo-temporal clusters (detected using SaTScan) and/or temporal aberrations (detected using the Early Aberration Reporting System [EARS]) are communicated through the Public Health Ontario Portal and directly to the affected health unit(s) when they occur. Aberrations in Telehealth data may precede future case identification and outbreak activity, serving as a potential early warning system for these phenomena.[*] More information on EARS and SatScan is provided in the Glossary.

In December 2012, one fever/ILI call cluster, two geographically distinct GI call clusters and six distinct respiratory call clusters were identified among Telehealth calls (Table 1). In addition, four fever/ILI EARS flags, eight respiratory EARS flags and five GI EARS flags, indicating statistically significant increases above the expected call volume, were identified throughout the month of December (Figures 3 to 5).

[*] Evidence on the use of Telehealth to flag outbreaks is limited; however this information is being provided in order to present full disclosure of information available to Public Health Ontario

Table 1. Significant call clusters by syndrome identified by SaTScan: Ontario, December 2012

Cluster Type	Cluster	FSA	# FSAs in the cluster	Health Units Affected	Rad (km)	Obs	Exp	Obs/ exp	p
Fever/ILI	Dec 7 to Dec 13	N5X	9	Middlesex-London	9.09	13	4.72	2.76	0.047
GI	Dec 13 to Dec 19	L4K	13	York, Toronto	8.25	42	23.41	1.79	0.013
	Dec 24 to Dec 30	L0H-4	21	Kingston-Frontenac and Lennox & Addington, Leeds-Grenville & Lanark, Hastings and Prince Edward Counties, Renfrew	75.00	32	16.38	1.95	0.030
Resp	Dec 7 to Dec 13	K0H-4	9	Kingston-Frontenac and Lennox & Addington, Leeds-Grenville & Lanark, Hastings and Prince Edward Counties	63.17	34	17.35	1.96	0.022
	Dec 11 to Dec 17	K0L-2	9	Peterborough County, Haliburton- Kawartha-Pine Ridge District	27.20	47	27.28	1.72	0.023
	Dec 11 to Dec 17	L0E-1	6	York, Simcoe-Muskoka, Durham	22.89	26	12.59	2.06	0.040
	Dec 20 to Dec 26	M6L	3	Toronto	2.29	35	17.76	1.97	0.010
	Dec 20 to Dec 26	K4B	48	Ottawa, Eastern Ontario	45.35	247	197.44	1.25	0.020
	Dec 24 to Dec 30	K1V	7	Ottawa	6.90	81	51.99	1.56	0.010

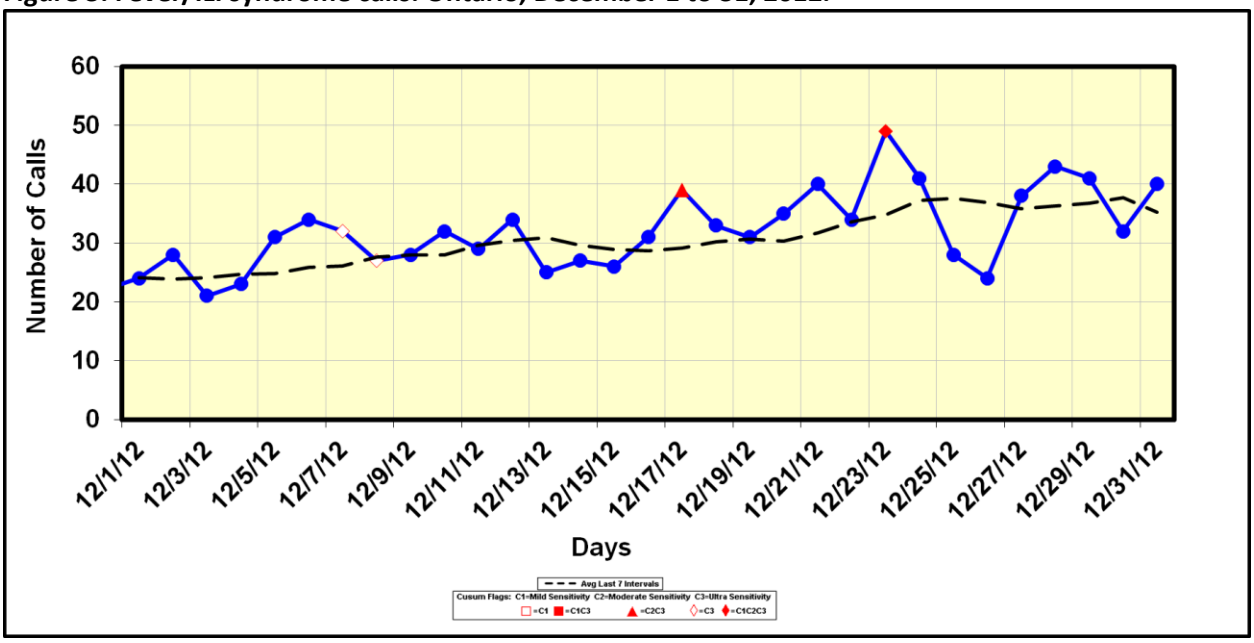
Obs = Observed count, Exp = Expected count, FSA = Forward sortation area, Km = Kilometre

Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/01/07].

TELEHEALTH CALL VOLUMES - FEVER/ILI SYNDROME

For the month of December 2012, one fever/ILI syndrome call cluster was detected (Table 1). The cluster was identified among calls made from December 7 to 13 in Middlesex-London health unit. There were also four fever/ILI EARS flags generated on December 7, 8, 13 and 23 indicating statistically significant increases above the expected call volume in early to mid-December 2012 (Figure 3).

Figure 3. Fever/ILI syndrome calls: Ontario, December 1 to 31, 2012.

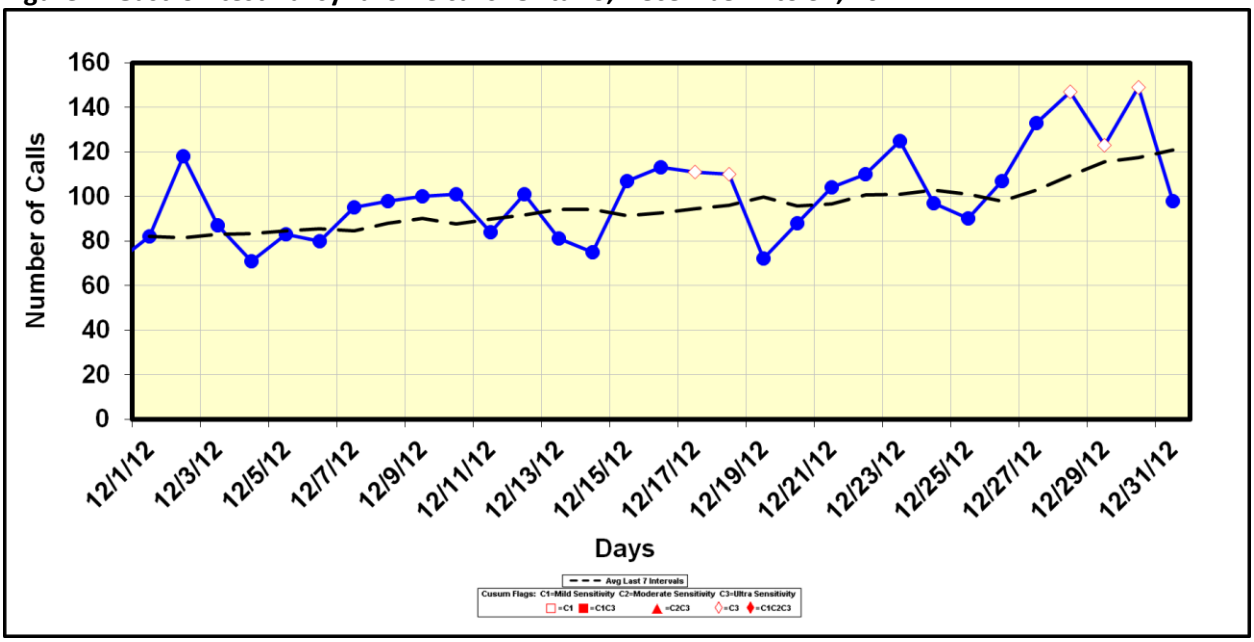


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/01/07].

TELEHEALTH CALL VOLUMES - GI SYNDROME

Two distinct GI syndrome call clusters were identified in December 2012. The first cluster was identified among calls made from December 13 to 19 in York Region and Toronto health units. The second cluster was identified among calls made from December 24 to 30 in Kingston, Frontenac, Lennox & Addington; Leeds, Grenville and Lanark; Hastings and Prince Edward Counties; and Renfrew County and District health units. Additionally, five GI EARS flags were detected on December 17, 18, and 28 to 30 indicating statistically significant increases above the expected call volume from mid to late December 2012 (Figure 4).

Figure 4. Gastrointestinal syndrome calls: Ontario, December 1 to 31, 2012.

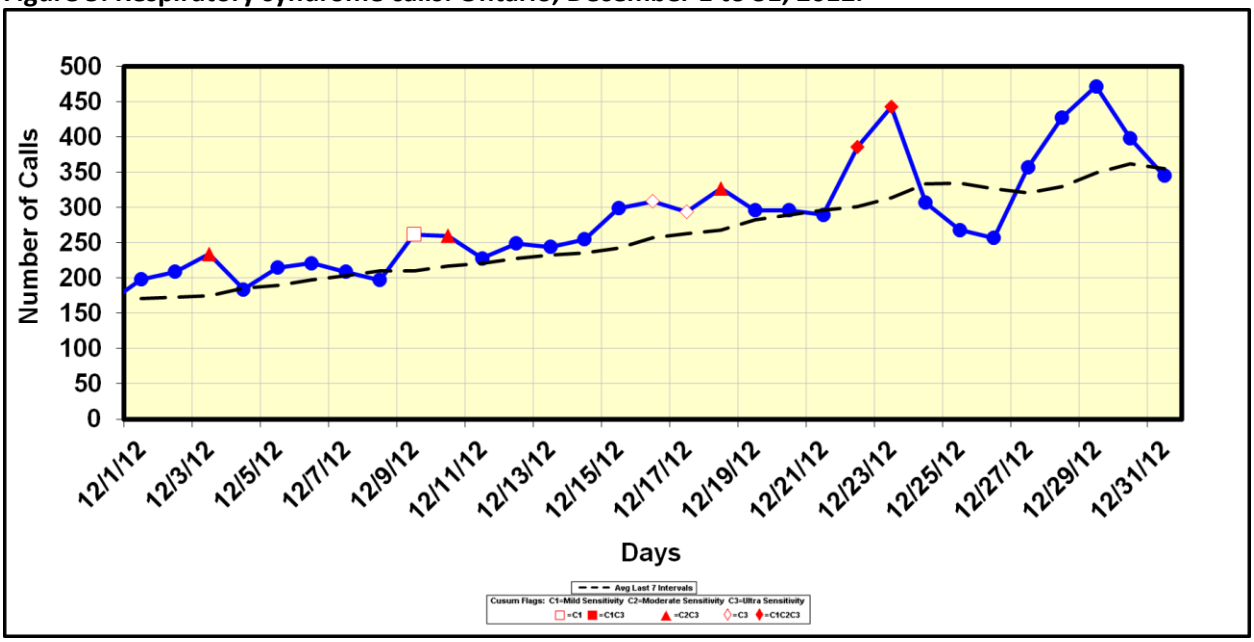


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/01/07].

TELEHEALTH CALL VOLUMES - RESPIRATORY SYNDROME

A total of six distinct respiratory syndrome call clusters were identified in December 2012 (Table 1). For a detailed summary of each cluster, including the affected health units and date ranges for which each cluster was identified, please refer to Table 1. There were also eight respiratory EARS flags generated on December 3, 9, 10, 16 to 18, 22 and 23 indicating statistically significant increases above the expected call volume throughout the month (Figure 5).

Figure 5. Respiratory syndrome calls: Ontario, December 1 to 31, 2012.



Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/01/07].

Ontario Outbreak Review

The review of outbreaks section provides the total number of institutional respiratory infection outbreaks for the 2012-2013 influenza season (Table 2). The number of outbreaks during the same period for the 2010-2011 and 2011-2012 influenza seasons are also presented for comparison.

Table 2. Total number of institutional respiratory infection outbreaks: Ontario, surveillance season to week 52, 2010-11 to 2012-13

Time period	Total Number of Confirmed Outbreaks
2012-13 season	407
2011-12 season	178
2010-11 season	281

Sources: Ontario Respiratory Virus Bulletin – Surveillance Weeks 51 and 52 (December 16 – December 29, 2012); Ontario Influenza Bulletin – Surveillance Weeks 51 and 52 (December 18 – December 31, 2011); and Ontario Influenza Bulletin – Surveillance Weeks 51 and 52 (December 19, 2010 – January 1, 2011).

Enhanced Surveillance Directives (ESD) Discontinued in December

FOOD POISONING

York Region Community and Health Services Department investigated an enteric outbreak related to meals consumed at a restaurant in Newmarket between December 6 and 10, 2012. Ninety-seven (60%) of 162 patrons who were interviewed in five health units reported gastrointestinal symptoms. Norovirus was isolated from stool specimens submitted for laboratory analysis. On January 3, 2013 the outbreak was declared over by York Region Community and Health Services Department following no further reports of cases linked to this outbreak.

References

IN FOCUS – Invasive Group A Streptoccocal (iGAS) Infections

1. Heymann DL, editor. Control of communicable diseases manual. 19th ed. Washington: American Public Health Association; 2008.
2. Public Health Agency of Canada. Guidelines for the Prevention and Control of Invasive Group A Streptococcal Disease. Can Comm Dis Report. 2006 [cited 2012 Dec 18]; 32S2:1-26. Available from: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/06vol32/32s2/index-eng.php.
3. Ministry of Health and Long-Term Care. Infectious Diseases Protocol, 2013 - Appendix B: Provincial Case Definitions for Reportable Diseases (Group A Streptococcal Disease, Invasive). Toronto: Queen's Printer for Ontario; 2013 Jan [cited 2013 Jan 4]. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/gas_cd.pdf.
4. National Center for Immunization and Respiratory Diseases: Division of Bacterial Diseases. Group A Streptococcal (GAS) Disease: Technical information. Atlanta: Centers for Disease Control and Prevention; 2008 Apr 3 [cited 2012 Dec 18]. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_t.htm.
5. Provincial Infectious Diseases Advisory Committee. Statement on public health management of invasive Group A streptococcal (iGAS) disease in Ontario (Draft). 2012.
6. National Microbiology Laboratory. Streptococcus and STI Unit. Winnipeg: Public Health Agency of Canada; 2012 Oct 1 [cited 2012 Dec 18]. Available from: http://www.nml-lnm.gc.ca/eb-be/strepSTI-eng.htm.
7. Public Health Agency of Canada, Canadian Notifiable Disease Section. National incidence rates 2002-2008; received by Public Health Ontario 2012 Sep 21.
8. Sieswerda L. Community-based Outbreak of Invasive Group A Streptococcal Disease in Thunder Bay & District. Thunder Bay District Health Unit; 2008 Nov 12 [cited 2012 Dec 18]. Available from: http://ricn.on.ca/photos/custom/SEOICNfiles/Single%20slide%20Thunder%20Bay%20IGAS%20Outbreak%20RICN%20Rounds%2012%20Nov%202008.pdf.
9. Tyrrell GJ, Lovgren M, St Jean T, Hoang L, Patrick DM, Horsman G, et al. Epidemic of group A Streptococcus M/emm59 causing invasive disease in Canada. Clin Infect Dis. 2010 [cited 2012 Dec 18];51(11):1290-7. Available from: http://cid.oxfordjournals.org/content/51/11/1290.long.
10. D'Souza C, Whelan M, Marshall S, Adinkrah L, D'Souza C. Proportion of invasive Group A Streptococcus (iGAS) by emm type in Ontario. Poster presented at: Toronto Invasive Bacterial Diseases Bacterial Network Education Day. 2010 Nov 19; Toronto.
11. National Center for Immunization and Respiratory Diseases: Division of Bacterial Diseases. Group A Streptococcal (GAS) Disease: Frequently Asked Questions. Atlanta: Centers for Disease Control and Prevention; 2008 Apr 3 [cited 2013 Jan 4]. Available from: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm.
12. Ministry of Health and Long-Term Care. Infectious Diseases Protocol, 2013 - Appendix A: Disease-Specific Chapters (Group A Streptococcal Disease, Invasive). Toronto: Queen's Printer for Ontario; 2013 Jan [cited 2013 Jan 4]. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/gas_chapter.pdf.
13. Health Protection Agency, Health Protection Scotland, Public Health Wales, and Public Health Agency Northern Ireland. Shooting Up: Infections among people who inject drugs in the United Kingdom 2010. London: Health Protection Agency; 2011 Nov. Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131377664.

Significant Reportable Disease Activity

14. Van den Wijngaard CC, van Asten L, Meijer A, van Pelt W, Nagelkerke NJ, Donker GA, et al. Detection of excess influenza severity: associating respiratory hospitalization and mortality data with reports of influenza-like illness by primary care physicians. Am J Public Health. 2010 Nov [cited 2013 Jan 18];100(11):2248-54. Available from: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2009.168245.
15. Simonsen L, Clarke MJ, Williamson GD, Stroup DF, Arden NH, Schonberger LB. The impact of influenza epidemics on mortality: introducing a severity index. Am J Public Health. 1997 Dec [cited 2013 Jan 18];87(12):1944-50. Available from: http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.87.12.1944.

Appendix – Reportable Diseases

Appendix 1. Confirmed cases of reportable disease* by month: Ontario, 2010-2012

REPORTABLE DISEASE	2012														2011					2010				
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YTD	YTD Rate	YTM	YTM Rate	% Difference (YTM 2012 - 2011)†	2011 Total	2011 Rate	YTM	YTM Rate	% Difference (YTM 2012 - 2010)†	2010 Total	2010 Rate
AIDS	15	1	4	5	5	6	4	5	2	4	1		**52**	0.4	**101**	0.8	*-49.1*	**106**	0.8	**98**	0.7	*-48.2*	**104**	0.8
Amebiasis	25	16	18	13	14	12	24	10	17	15	8		**172**	1.3	**204**	1.5	*-16.7*	**215**	1.6	**291**	2.2	*-42.3*	**311**	2.4
Botulism	0	0	0	3	1	0	0	0	0	0	0		**4**	0.0	**1**	0.0	*295.2*	**2**	0.0	**1**	0.0	*290.5*	**1**	0.0
Brucellosis	0	1	1	0	0	3	2	1	1	0	0		**9**	0.1	**1**	0.0	*789.2*	**1**	0.0	**2**	0.0	*339.3*	**2**	0.0
Campylobacter Enteritis	210	177	239	255	264	405	520	486	422	384	238		**3,600**	26.6	**3,331**	24.9	*6.8*	**3,507**	26.2	**3,155**	23.9	*11.4*	**3,359**	25.4
Chlamydial Infections	3,336	3,174	3,063	3,056	3,223	2,999	3,004	3,074	2,944	3,093	2,999		**33,965**	251.0	**33,652**	251.7	*-0.3*	**36,390**	272.2	**31,029**	234.9	*6.9*	**33,496**	253.6
Cholera	0	0	0	0	0	0	0	0	0	0	0		**0**	0.0	**0**	0.0	-	**0**	0.0	**0**	0.0	-	**0**	0.0
Cryptosporidiosis	13	12	25	12	7	26	55	72	33	18	7		**280**	2.1	**290**	2.2	*-4.6*	**302**	2.3	**324**	2.5	*-15.6*	**338**	2.6
Cyclosporiasis	2	0	2	10	13	25	10	2	3	6	3		**76**	0.6	**101**	0.8	*-25.7*	**105**	0.8	**166**	1.3	*-55.3*	**168**	1.3
Cytomegalovirus Infection, Congenital	0	0	0	0	1	0	1	0	1	0	0		**3**	0.0	**10**	0.1	*-70.4*	**11**	0.1	**4**	0.0	*-26.8*	**5**	0.0
Encephalitis- Primary Viral	2	1	0	1	2	1	2	1	1	2	0		**13**	0.1	**13**	0.1	*-1.2*	**14**	0.1	**14**	0.1	*-9.4*	**15**	0.1
Encephalitis- Unspecified	1	0	0	0	1	0	0	0	1	0	0		**3**	0.0	**1**	0.0	*196.4*	**1**	0.0	**1**	0.0	*192.9*	**1**	0.0
Encephalitis/Meningitis	9	9	11	18	8	14	21	21	17	17	11		**156**	1.2	**130**	1.0	*18.6*	**140**	1.0	**146**	1.1	*4.3*	**155**	1.2
Food poisoning, all causes	5	0	1	1	2	2	8	6	8	6	3		**42**	0.3	**55**	0.4	*-24.6*	**63**	0.5	**87**	0.7	*-52.9*	**90**	0.7
Giardiasis	89	106	119	99	97	102	119	125	116	93	60		**1,125**	8.3	**1,206**	9.0	*-7.8*	**1,291**	9.7	**1,301**	9.8	*-15.6*	**1,410**	10.7
Gonorrhoea (All types)	375	321	350	315	379	349	372	354	315	331	338		**3,799**	28.1	**3,897**	29.1	*-3.7*	**4,204**	31.4	**3,649**	27.6	*1.6*	**3,965**	30.0
Group A Streptococcal Disease, Invasive	69	67	66	55	49	44	46	23	34	43	42		**538**	4.0	**609**	4.6	*-12.7*	**669**	5.0	**479**	3.6	*9.6*	**561**	4.2
Group B Streptococcal Disease, Neonatal	5	4	3	3	5	5	4	6	3	5	6		**49**	0.4	**52**	0.4	*-6.9*	**58**	0.4	**48**	0.4	*-0.3*	**52**	0.4
Haemophilus Influenzae B Disease, Invasive	0	0	0	1	2	0	0	0	1	0	1		**5**	0.0	**9**	0.1	*-45.1*	**11**	0.1	**2**	0.0	*144.0*	**2**	0.0
Hepatitis A	5	20	12	10	5	9	5	8	12	13	6		**105**	0.8	**95**	0.7	*9.2*	**104**	0.8	**122**	0.9	*-16.0*	**136**	1.0
Hepatitis B	10	8	10	8	6	10	8	4	6	5	8		**83**	0.6	**110**	0.8	*-25.5*	**120**	0.9	**112**	0.8	*-27.7*	**116**	0.9
Hepatitis C	372	339	352	341	341	366	319	367	303	350	360		**3,810**	28.2	**3,860**	28.9	*-2.5*	**4,173**	31.2	**4,215**	31.9	*-11.8*	**4,523**	34.2
Hepatitis D	1	1	0	0	0	0	0	0	0	0	0		**2**	0.0	**3**	0.0	*-34.1*	**3**	0.0	**0**	0.0	-	**1**	0.0
Herpes, Neonatal	0	0	0	1	0	0	1	0	2	0	1		**5**	0.0	**7**	0.1	*-29.4*	**8**	0.1	**8**	0.1	*-39.0*	**9**	0.1
HIV	84	75	64	68	75	64	64	56	52	57	50		**709**	5.2	**796**	6.0	*-12.0*	**868**	6.5	**783**	5.9	*-11.6*	**847**	6.4
Influenza**	228	950	1,823	628	185	14	12	5	5	61	518		**4,429**	32.7	**4,171**	31.2	*4.9*	**4,247**	31.8	**292**	2.2	*1380.7*	**1,949**	14.8
Legionellosis	6	6	4	0	2	14	11	68	35	15	9		**170**	1.3	**150**	1.1	*12.0*	**162**	1.2	**110**	0.8	*50.9*	**116**	0.9
Leprosy	0	0	0	0	0	0	0	0	0	0	1		**1**	0.0	**1**	0.0	*-1.2*	**1**	0.0	**1**	0.0	*-2.4*	**1**	0.0
Listeriosis	3	4	3	4	2	4	5	6	5	4	1		**41**	0.3	**52**	0.4	*-22.1*	**57**	0.4	**55**	0.4	*-27.2*	**60**	0.5
Lyme Disease	0	1	0	3	10	27	37	14	7	0	0		**99**	0.7	**88**	0.7	*11.2*	**89**	0.7	**72**	0.5	*34.2*	**72**	0.5
Malaria	14	5	11	11	23	26	27	26	33	13	15		**204**	1.5	**209**	1.6	*-3.6*	**230**	1.7	**244**	1.8	*-18.4*	**259**	2.0
Measles	0	0	0	0	1	0	0	1	1	0	0		**3**	0.0	**8**	0.1	*-62.9*	**8**	0.1	**4**	0.0	*-26.8*	**9**	0.1
Meningitis- Bacterial	5	2	1	3	3	1	6	3	6	6	3		**39**	0.3	**24**	0.2	*60.6*	**25**	0.2	**30**	0.2	*26.9*	**32**	0.2
Meningitis- Other	1	0	1	1	2	0	0	0	0	1	1		**7**	0.1	**4**	0.0	*72.9*	**4**	0.0	**4**	0.0	*70.8*	**5**	0.0
Meningitis- Viral	3	2	8	3	1	7	10	13	8	8	6		**69**	0.5	**38**	0.3	*79.4*	**41**	0.3	**107**	0.8	*-37.0*	**111**	0.8
Meningococcal Disease, Invasive	2	3	8	1	3	0	0	1	4	5	2		**29**	0.2	**40**	0.3	*-28.4*	**43**	0.3	**31**	0.2	*-8.7*	**34**	0.3
Mumps	1	4	1	2	0	1	0	2	0	1	0		**12**	0.1	**61**	0.5	*-80.6*	**63**	0.5	**68**	0.5	*-82.8*	**68**	0.5
Ophthalmia Neonatorum	0	1	0	1	0	1	0	0	0	0	0		**3**	0.0	**1**	0.0	*196.4*	**1**	0.0	**5**	0.0	*-41.4*	**5**	0.0
Paratyphoid Fever	4	2	2	4	4	4	1	5	2	4	0		**32**	0.2	**59**	0.4	*-46.4*	**62**	0.5	**57**	0.4	*-45.2*	**60**	0.5
Pertussis (Whooping Cough)	70	23	28	49	104	111	115	106	67	46	40		**759**	5.6	**158**	1.2	*374.6*	**230**	1.7	**97**	0.7	*663.8*	**101**	0.8
Q Fever	4	0	1	1	1	1	1	3	0	1	0		**13**	0.1	**20**	0.1	*-35.8*	**20**	0.1	**7**	0.1	*81.3*	**7**	0.1
Rabies	0	0	0	1	0	0	0	0	0	0	0		**1**	0.0	**0**	0.0	-	**0**	0.0	**0**	0.0	-	**0**	0.0
Rubella	1	0	0	0	0	0	0	0	0	0	0		**1**	0.0	**0**	0.0	-	**0**	0.0	**1**	0.0	*-2.4*	**1**	0.0
Rubella, Congenital Syndrome	0	0	0	0	0	0	0	0	0	0	0		**0**	0.0	**0**	0.0	-	**0**	0.0	**0**	0.0	-	**0**	0.0
Salmonellosis	189	280	286	227	238	242	338	373	322	216	128		**2,839**	21.0	**2,440**	18.2	*15.0*	**2,575**	19.3	**2,535**	19.2	*9.3*	**2,724**	20.6
Shigellosis	34	20	13	21	19	13	41	32	27	16	13		**249**	1.8	**240**	1.8	*2.5*	**255**	1.9	**234**	1.8	*3.9*	**252**	1.9
Streptococcus Pneumoniae, Invasive	138	122	127	111	105	62	40	49	68	117	99		**1,038**	7.7	**1,103**	8.2	*-7.0*	**1,258**	9.4	**1,058**	8.0	*-4.2*	**1,205**	9.1
Syphilis, Congenital	0	0	0	0	0	0	0	0	0	0	0		**0**	0.0	**1**	0.0	*-100.0*	**1**	0.0	**2**	0.0	*-100.0*	**2**	0.0
Syphilis, Infectious	85	58	78	53	75	71	60	58	53	53	19		**663**	4.9	**701**	5.2	*-6.6*	**769**	5.8	**719**	5.4	*-10.0*	**780**	5.9
Syphilis, Other	70	66	71	61	52	64	52	43	46	33	35		**593**	4.4	**675**	5.0	*-13.2*	**753**	5.6	**734**	5.6	*-21.1*	**791**	6.0
Tetanus	0	0	0	0	0	1	0	0	0	0	0		**1**	0.0	**1**	0.0	*-1.2*	**1**	0.0	**1**	0.0	*-2.4*	**1**	0.0
Tuberculosis	48	51	59	50	48	42	47	53	46	52	37		**533**	3.9	**594**	4.4	*-11.3*	**656**	4.9	**592**	4.5	*-12.1*	**647**	4.9
Tularemia	0	0	0	0	0	1	0	0	0	0	0		**1**	0.0	**0**	0.0	-	**0**	0.0	**2**	0.0	*-51.2*	**2**	0.0
Typhoid Fever	6	6	7	9	5	8	4	7	7	8	2		**69**	0.5	**101**	0.8	*-32.5*	**103**	0.8	**84**	0.6	*-19.8*	**92**	0.7
Verotoxin Producing E. Coli including HUS	5	8	3	9	11	16	45	43	19	13	10		**182**	1.3	**225**	1.7	*-20.1*	**232**	1.7	**149**	1.1	*19.2*	**153**	1.2
West Nile Virus Illness	0	0	0	0	0	0	35	145	48	3	0		**231**	1.7	**56**	0.4	*307.6*	**56**	0.4	**6**	0.0	*3658.3*	**6**	0.0
Yellow Fever	1	0	0	0	1	0	0	0	0	0	0		**2**	0.0	**0**	0.0	-	**0**	0.0	**0**	0.0	-	**0**	0.0
Yersiniosis	16	20	24	13	8	5	16	20	8	8	8		**146**	1.1	**197**	1.5	*-26.8*	**211**	1.6	**192**	1.5	*-25.8*	**204**	1.5

Sources: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2012/12/14]. Population data obtained from IntelliHEALTH Ontario, retrieved by Public Health Ontario [2012/03/15].

Note 1: Rates (year-to-date (YTD) and year-to-month (YTM)) presented in the table are per 100,000 population.

Note 2: 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 3: Case counts for tuberculosis and AIDS are based on diagnosis date and not episode date. HIV case counts are based on encounter date.

Note 4: Differentials in year over year comparisons are reflective of changes in disease incidence and changes in the size of the population.

Note 5: The case of rubella reported in January 2012, the case of rabies reported in April 2012, the measles cases reported in May and August 2012 were related to travel and were not acquired in Ontario. The measles case reported in September 2012 had an unknown source and no travel history. The leprosy case reported in November 2012 emigrated from Burma in 2007, where they likely acquired their illness; leprosy has an incubation period ranging from nine months to 20 years.

Note 6: Statistical tests comparing rates were not performed when the YTM rate in previous years was zero.

* Appendix 1 is not an exhaustive list of all reportable diseases in Ontario.

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

** For 2010, influenza counts include the influenza A (H1N1) pdm09 counts, in addition to seasonal influenza A, B, and A & B. As influenza A (H1N1)pdm09 aggregate reporting occurred on a weekly basis, the week in which more days belonged to a particular month was counted in that month.

Glossary

Early Aberration Reporting System (EARS) – Software from the U.S. Centers for Disease Control and Prevention (CDC) designed for aberration detection using public health surveillance data. EARS uses three limited baseline aberration detection methods (based on a positive one-sided CUSUM calculation) and produces three types of statistically marked aberrations, or flags, when the observed values are greater than statistically expected (details below). More information on EARS can be found at www.bt.cdc.gov/surveillance/ears.

C1 (mild) – Lowest sensitivity EARS flag. The baseline period for C1-MILD is obtained from the previous seven days in closest proximity to the current value. Therefore, when this flag is produced on a particular day, the next day is less likely to produce a flag because the elevated count from the previous day will be incorporated into the new baseline period.

C2 (medium) – EARS flag that uses a seven-day baseline period, but with a two-day lag between the baseline and the current day. For example, on the tenth day of surveillance the baseline data will be from day one to day seven. This flag is more likely to note high consecutive values, because they are not immediately incorporated into the baseline period as for C1 flag.

C3 (ultra) – Highest sensitivity EARS flag. Uses the baseline period as the C2-MEDIUM, but the threshold is based on a three-day average run length of the one-sided positive CUSUM. It is useful for identifying aberrations that gradually increase over short periods of time.

SaTScan – Software that analyzes geospatial and temporal data using space-time scan statistic. It utilizes thousands or millions of overlapping cylinders to define the scanning window with its base representing the geographical area of a potential outbreak and its height representing the number of days. For each cylinder the observed/expected ratio is calculated and the most likely cluster is identified, along with secondary clusters. More information on SaTScan can be found at www.satscan.org.