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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

WEST NILE VIRUS

West Nile Virus (WNV) is a mosquito-borne virus that belongs to the family *Flaviviridae*. In Ontario, mosquitoes of the *Culex* genus are the primary vectors of WNV and transmission to humans is mainly through the bite of a WNV infected mosquito. Although rare, direct person-to-person transmission during pregnancy from mother to child or through infected breast milk as well as transmission through blood transfusion or organ transplant can occur.[1-3]

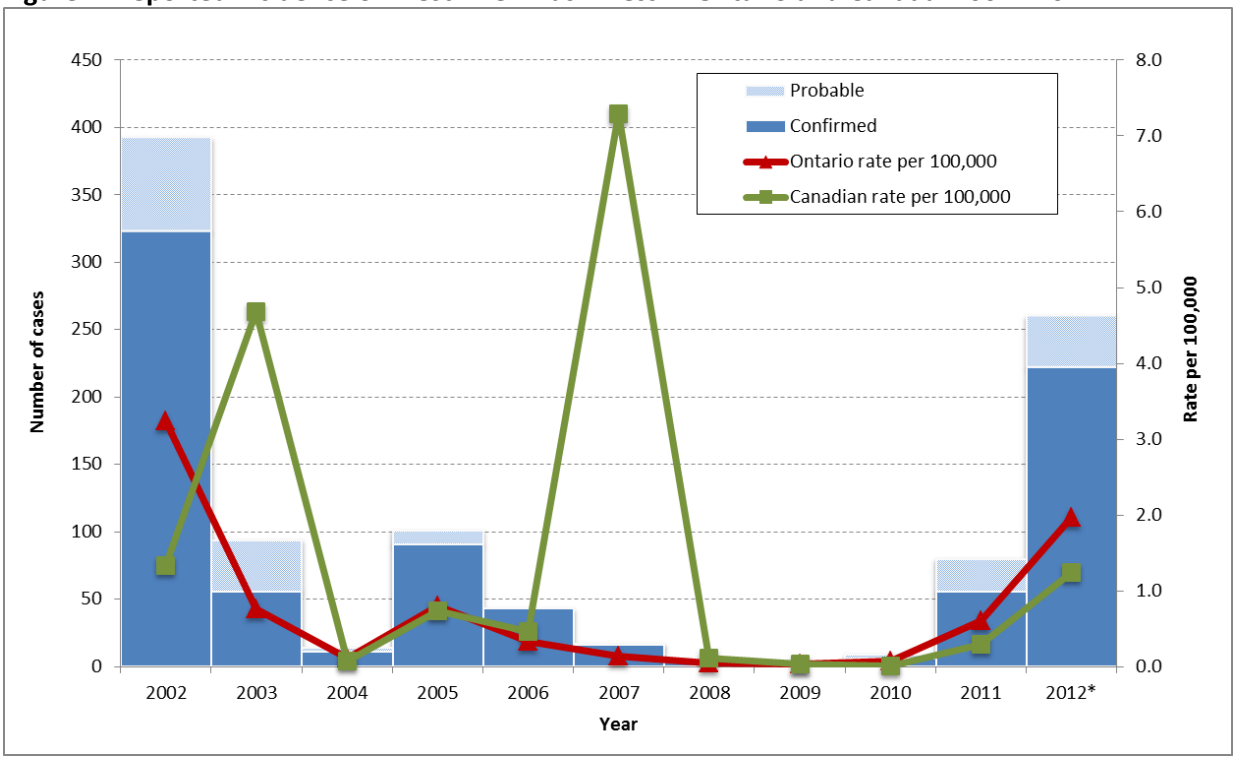
WNV was first identified in the Western Hemisphere and specifically in New York City (NYC) in 1999.[4] The identification of the virus in mosquitoes, birds and humans in NYC in 1999 signalled the emergence of a new vectorborne disease in North America that became endemic to the region within a decade. In 2001, WNV was confirmed for the first time in Ontario in birds and then in humans in 2002. Since then, cases have been reported every year. The WNV season typically spans from June to October, with the majority of cases occurring from July to September.

Symptoms of WNV illness usually develop between two and fifteen days after infection. Symptoms vary among

infected individuals and range from no symptoms to mild or severe illness involving the neurological system. Approximately 80% of persons infected with WNV do not show any symptoms at all, which results in under-diagnosis and under-reporting of the disease. Of the 20% of symptomatic persons infected with WNV, most experience mild illness including fever, headache, body ache, fatigue, skin rash and occasionally vomiting and nausea.[3] Less than 1% of persons infected with WNV will develop severe illness involving the central nervous system; severe illness is characterized by high fever, headache, neck stiffness, disorientation, muscle weakness, visual impairment and paralysis. While persons of any age, sex or health status can be infected with WNV, the risk of severe illness and/or serious outcome is greatest among those with weakened immune systems, those with underlying medical conditions such as diabetes and increases with increasing age.[3,4]

Although WNV illness became reportable in Ontario in 2003[5], local health units have reported cases of WNV illness to the province since 2002. Since that time, a total of 1,020 confirmed and probable human cases of WNV illness have been reported in Ontario (up to November 1, 2012). Nationally, the overall trend in the annual incidence of WNV illness from 2002 to 2012 was comparable to that of Ontario; however higher annual incidence rates occurred nationally in 2003 and 2007 (Figure 1).[6] The highest rate of WNV in Canada was observed in 2007 when Manitoba, Saskatchewan and Alberta experienced significant increases in disease incidence.[6] In Ontario, the highest number of cases was reported in 2002, the year in which human cases were first identified in the province (Figure 1).

Figure 1. Reported incidence of West Nile Virus Illness in Ontario and Canada: 2002 - 2012*



Data sources: (Ontario case counts) - Ontario Ministry of Health and Long-Term Care, iPHIS database, extracted by Public Health Ontario [2012/11/01]. (Ontario population data) - MOHLTC, intelliHEALTH Ontario, extracted [2012/03/18]. (Canadian case counts) – Public Health Agency of Canada, http://www.phac-aspc.gc.ca/wnv-vwn/index-eng.php, retrieved [2012/12/06]. (Canadian population data) - Statistics Canada, CANSIM, table 051-0001.
* Includes WNV cases reported as confirmed and probable. 2012 includes data from January 1 to November 1.

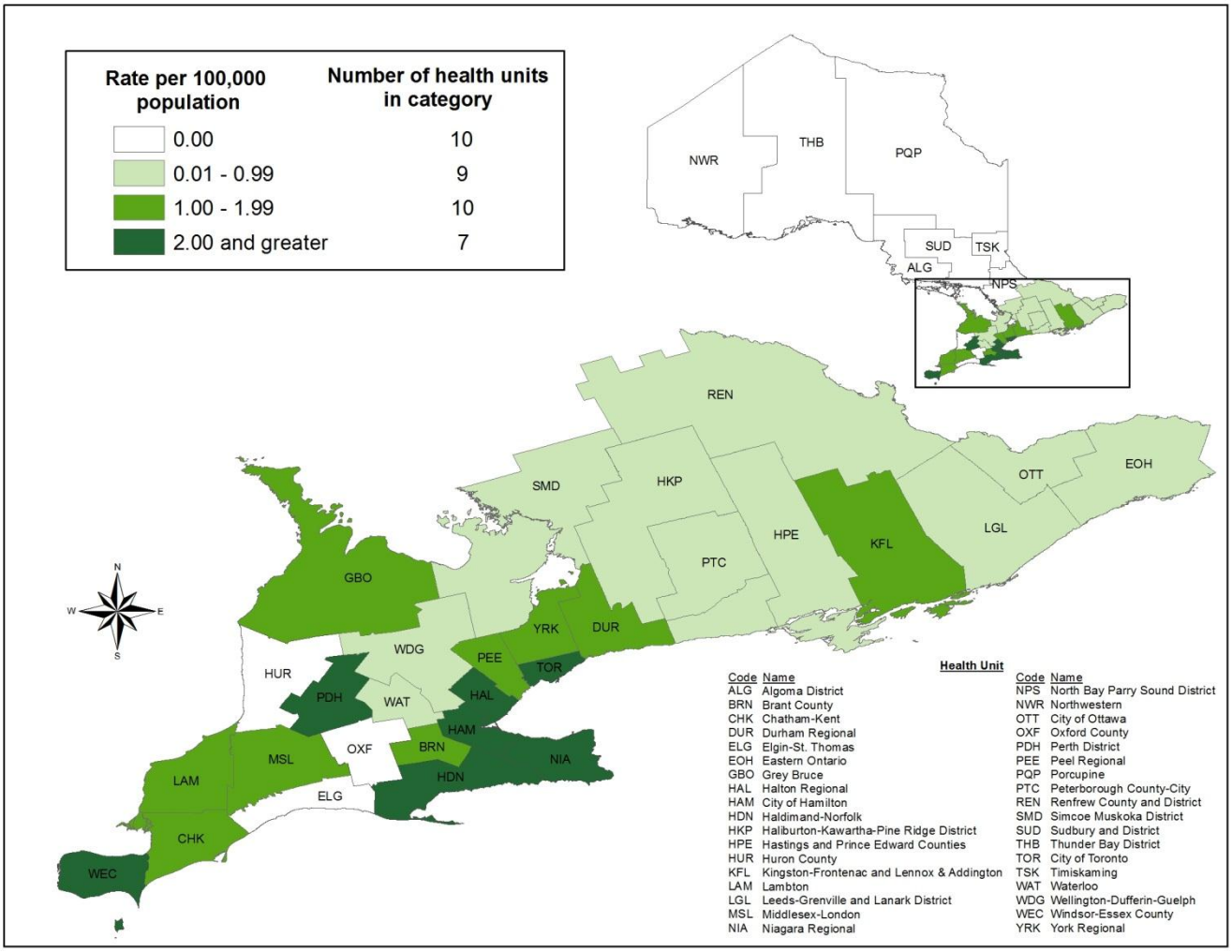
From January 1 to November 1, 2012, there were 260 confirmed and probable cases of WNV illness reported through the integrated Public Health Information System (iPHIS) in Ontario, representing an incidence rate of 1.97 cases per 100,000 population. Similar peaks in incidence for 2012 were observed elsewhere in Canada and in the United States.[6,7] Cases were evenly distributed among males and females

with ages ranging from 7 to 93 years. Cases aged 50 years and older accounted for 64% of cases in 2012 and this was comparable to the average proportion of 56% in earlier years in Ontario.

Of WNV cases reported in Ontario in the 2012 season, 67% (173/260) of cases had mild illness and 24% (62/260) reported severe illness with neurological system involvement. Four percent (10/260) of WNV cases reported asymptomatic infection. Severity of symptoms was undefined for the remaining cases (6%; 15/260). Hospitalization was reported for 30% (79/260) of cases during this time period. Among hospitalized cases, 60% (47/79) were classified as having severe illness involving the neurological system compared to 37% (29/79) with milder illness; illness severity was not reported for the remaining hospitalized cases (4%, 3/79). WNV was reported as the underlying cause of death for four cases, all of whom reported severe illness involving the neurological system. In comparison to cases with milder illness, cases with severe illness involving the neurological system were more likely to have a fatal outcome ($p=0.004$) or to have been hospitalized ($p<0.0001$). This may be the result of increased identification and reporting of cases with more severe outcomes such as death and/or hospitalization compared to cases with less severe outcomes.

The distribution of human WNV cases with respect to time and place of occurrence is reflective of the seasonal distribution and preferred habitat of the *Culex* mosquito vector. The *Culex* mosquito is most active in the warmer months with the highest number of mosquitoes occurring in the urban and built environments where water tends to stand undisturbed. In 2012 (up to November 1), cases occurred from June to October, with the number of cases reported in August (163 cases) representing a four-fold increase compared to the ten-year average number of cases reported in the month of August (37 cases). More than 75% of WNV cases (198/260) were reported by six health units with large urban centres in the southern part of Ontario, which together make up 50% of the Ontario population. Health units in southern Ontario also reported the highest incidence rates of WNV illness in 2012 (Map 1).

Map 1. Incidence of West Nile Virus illness by health unit of residence, Ontario: 2012*



Data source: (Case counts) **-** Ontario Ministry of Health and Long-Term Care, iPHIS database, extracted by Public Health Ontario [2012/11/01]. (Population data) - MOHLTC, intelliHEALTH Ontario, extracted [2012/03/18].

* Includes WNV cases reported as confirmed or probable up to November 1. Health unit refers to the health unit of residence at the time of illness onset or laboratory diagnosis and may not be the same as the health unit in which the exposure occurred.

Although the overall risk of acquiring WNV illness is low, a number of preventive measures can be taken to reduce the risk of exposure to the virus. For example, the risk of exposure around the home can be reduced by eliminating mosquito breeding sites from standing water in bird baths, eavestroughs, flower pots and old tires, by wearing protective clothing, always using mosquito repellent when outdoors at dawn and dusk, and by preventing mosquito entry into the home through the use of intact window and door screens. Depending on the risk within communities, public health units may also coordinate mosquito control programs that generally include the use of larvicides to control mosquito populations in catch basins and other standing bodies of water and adulticides to kill adult mosquitos.

Significant Reportable Disease Activity

From January 1 to October 31, 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 the last issue of this report (Volume 1, Issue 12). Table 1 and Appendix 1 provide additional details on the YTM confirmed counts for these and other reportable diseases for 2012 with comparisons to 2011 and 2010.

Compared to the same time period in the previous two years, a significant increase in the YTM rate of *Campylobacter* enteritis was noted for the period January 1 to October 31, 2012 (Table 1). *Campylobacter* enteritis is the most frequently reported enteric disease in Ontario. The vast majority of cases occur as isolated sporadic events. Over the last five years, the YTM rate over this time period declined from 26.9 cases per 100,000 population in 2007 to 22.9 cases per 100,000 population in 2011, before the noted YTM increase in 2012. The cause of the earlier decrease and the current increase is unknown; however, is it not unusual for the incidence of an enteric disease to fluctuate over time. *Campylobacter* enteritis incidence will continue to be monitored.

Table 1. Summary of significant year-to-month (YTM) increases in reportable disease rates, Ontario: January 1 to October 31, 2010, 2011 and 2012*

Disease	2012		2011			2010		
	YTM Confirmed cases	YTM rate per 100,000	YTM Confirmed cases	YTM rate per 100,000	% Difference (YTM 2012-2011)†	YTM Confirmed cases	YTM rate per 100,000	% Difference (YTM 2012-2010)†
Campylobacter	3,338	24.7	3,060	22.9	7.8	2,936	22.2	11.0

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2012/11/21]. Population data obtained from IntelliHEALTH Ontario, extracted by Public Health Ontario [2012/03/15].

* Statistically significant differences ($p<0.05$) were identified in reported disease rates for 2012 compared to either 2010 or 2011 rates or both.

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

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.

NOVEL CORONAVIRUS INFECTION: UPDATE

As of November 30, 2012 the World Health Organization (WHO) has reported a total of 9 laboratory-confirmed cases of infection with the novel coronavirus; 5 cases (including 3 deaths) from Saudi Arabia, 2 cases from Qatar and 2 cases (both fatal) from Jordan. The WHO has stated that it does not know the source of the virus or its mode of transmission. The Ministry of Health (MOH) Jordan has requested WHO assistance in investigating these infections. A mission from WHO Eastern Mediterranean Regional Office (EMRO) and headquarters arrived in Amman on November 28 to assist in further epidemiological surveillance and to strengthen the sentinel surveillance systems for severe acute respiratory infections (SARIs). At this time, the WHO has not recommended any travel or trade restrictions for Saudi Arabia, Qatar or Jordan.

Editor's Note: Laboratory analyses have demonstrated that the causative agent, a human coronavirus, is genetically distinct from the severe acute respiratory syndrome (SARS) virus, which is also a member of the *Coronaviridae* family. There has been no evidence reported to indicate that the novel coronavirus is easily transmitted between humans. It is possible that animals were the source of infection and early investigations show that it is closely related to coronavirus found in bats. The Ontario Ministry of Health and Long-Term Care issued an Important Health Notice on novel coronavirus infection on September 27. The WHO has also issued updated guidelines on November 28 and 30. As of November 30, 2012, no cases of the virus have been identified in Ontario.

http://www.who.int/csr/disease/coronavirus_infections/en/index.html
http://www.who.int/csr/disease/coronavirus_infections/faq_dec12/en/index.html
http://www.health.gov.on.ca/en/pro/programs/emb/health_notices/ihn_20120927.pdf
http://wwwnc.cdc.gov/eid/article/15/3/08-1013_article.htm
http://www.nejm.org/doi/full/10.1056/NEJMoa1211721#t=article

CHOLERA OUTBREAK: INFORMATION FOR TRAVELLERS

Cholera is a bacterial disease that can cause diarrhea and dehydration. Cholera is most often spread through the ingestion of contaminated food or drinking water. Water may be contaminated by the feces of an infected person or by untreated sewage. Food is often contaminated by water containing cholera bacteria or by being handled by a person ill with cholera. Cholera outbreaks have been ongoing in Haiti and neighbouring Dominican Republic since October 2010. The number of reported cases of cholera has decreased since last year in the Dominican Republic and Haiti, although cases continue to be reported in some of the provinces in the Dominican Republic and throughout Haiti.

Editor's Note: During the holiday season in the month of December, many Ontarians travel south to destinations such as the Dominican Republic. It is unlikely that travellers to the Dominican Republic will become ill due to cholera during their vacation, but should exercise caution to avoid getting sick. Information regarding precautions travellers can take is available on the Public Health Agency of Canada's website via the links below. To date, Ontario has not reported any cases of cholera due to travel to the Dominican Republic or Haiti.

http://www.phac-aspc.gc.ca/tmp-pmv/thn-csv/rep-cholera-eng.php
http://www.phac-aspc.gc.ca/tmp-pmv/thn-csv/quake-tremble-haiti-eng.php

Telehealth Report

Telehealth Ontario is a toll-free nursing helpline available to all residents of Ontario 24 hours a day, 7 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 November 2012, one geographically distinct GI syndrome call cluster and two distinct respiratory syndrome call clusters were identified among Telehealth calls (Table 2). In addition, one respiratory EARS flag and one fever/ILI EARS flag, indicating statistically significant increases above expected call volumes, were identified during the month of November (Figures 2 to 4).

Table 2. Significant call clusters by syndrome identified by SaTScan: Ontario, November 2012

Cluster Type	Cluster	FSA	# FSAs in the cluster	Health Units Affected	Rad (km)	Obs	Exp	Obs/ exp	p
GI	Nov 13 to Nov 19*	K2B	5	Ottawa	7.69	20	7.81	2.56	0.0081
	Nov 14 to Nov 20*	K2B	5	Ottawa	7.69	18	7.30	2.47	0.047
Resp	Nov 13 to Nov 19*	L4S	21	Toronto, York	13.56	79	51.75	1.53	0.022
	Nov 14 to Nov 20*	L6A	23	Toronto, York	14.75	93	64.08	1.45	0.039
	Nov 19 to Nov 25	M8X	19	Toronto	6.67	107	69.38	1.54	0.00061

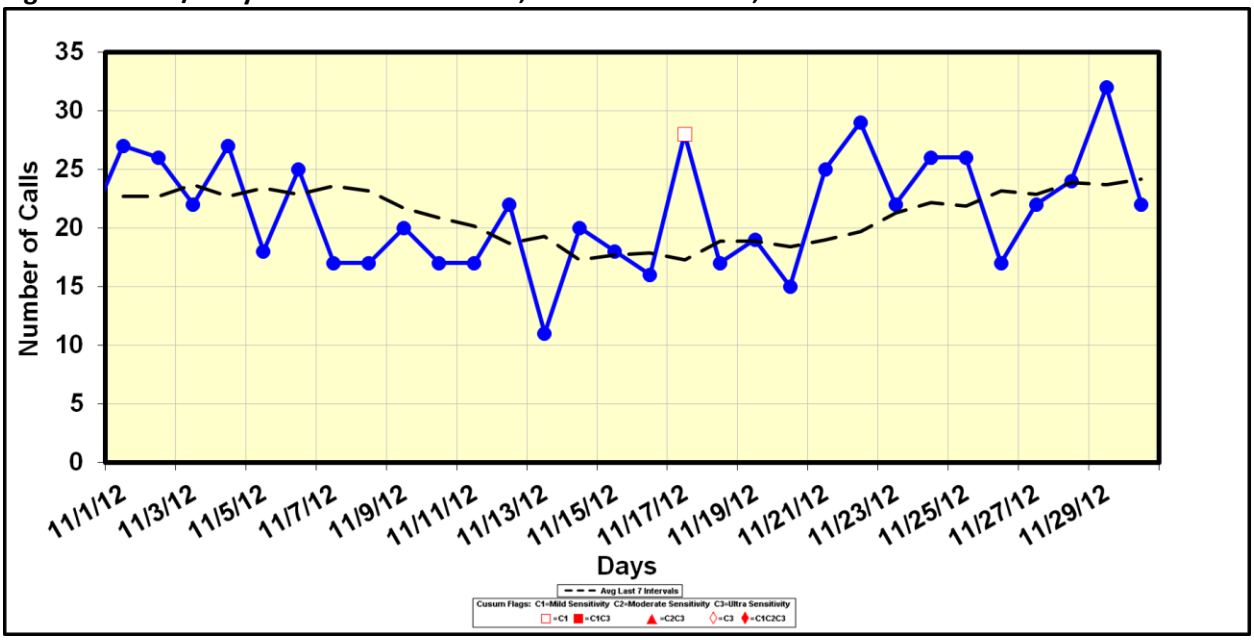
Obs = Observed count, Exp = Expected count, FSA = Forward sortation area, Km = Kilometre
Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2012/12/03].
* Cluster remained significant for two consecutive days.

* 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

TELEHEALTH CALL VOLUMES - FEVER/ILI SYNDROME

No fever/ILI syndrome call clusters were detected in November 2012 (Table 2). There was one fever/ILI EARS flag generated on November 17 indicating a statistically significant increase above the expected call volume in mid-November 2012 (Figure 2).

Figure 2. Fever/ILI syndrome calls: Ontario, November 1 to 30, 2012

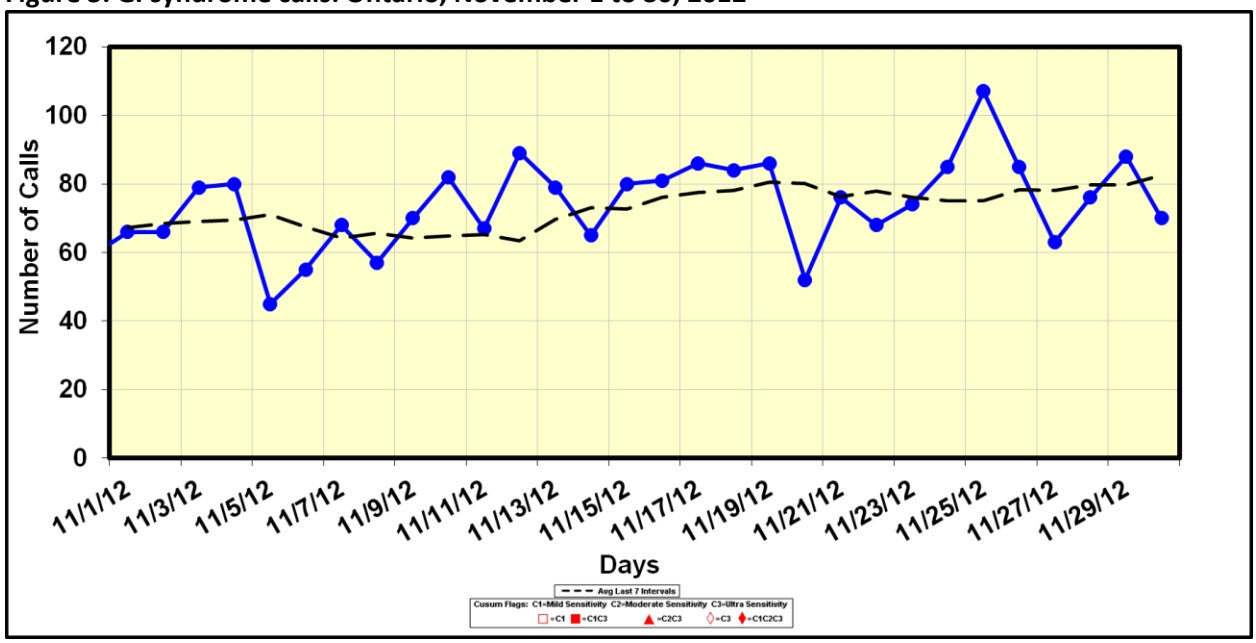


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2012/12/03].

TELEHEALTH CALL VOLUMES - GI SYNDROME

One distinct GI syndrome call cluster was identified in November 2012. The cluster was identified among calls made from November 13 to 20 in Ottawa and remained significant for two consecutive days (Table 2). No GI EARS flags were detected in the month of November 2012 (Figure 3).

Figure 3. GI syndrome calls: Ontario, November 1 to 30, 2012

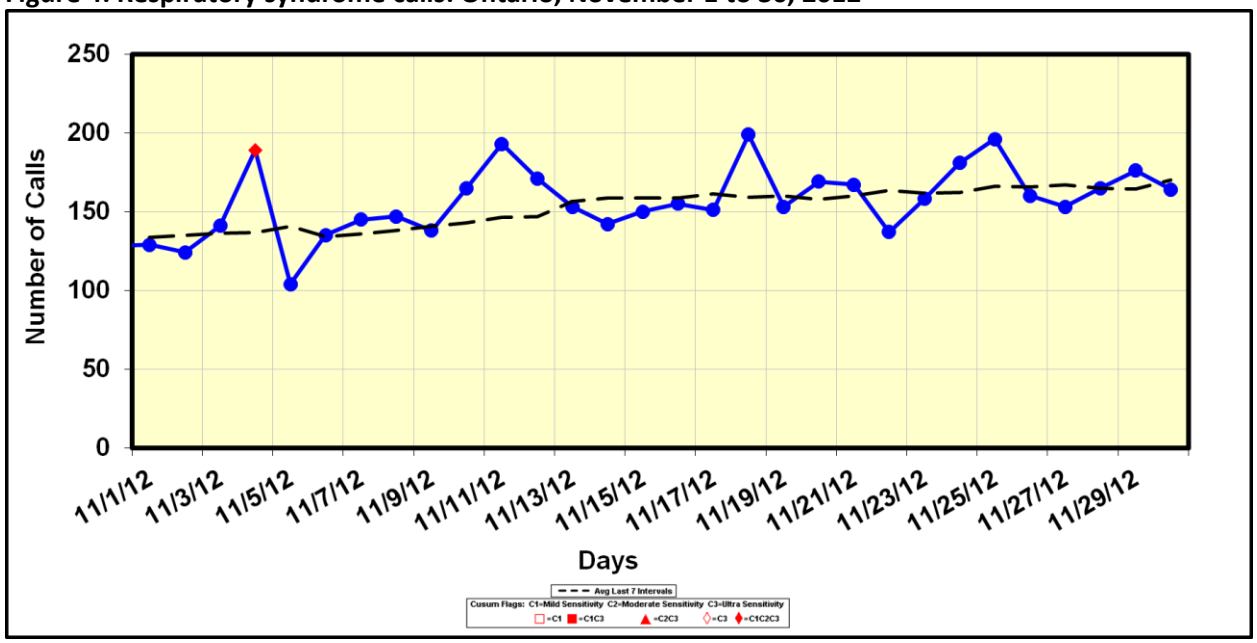


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2012/12/03].

TELEHEALTH CALL VOLUMES - RESPIRATORY SYNDROME

Two distinct respiratory syndrome call clusters were identified in November 2012 (Table 2). The first cluster was identified among calls made from November 13 to 20 in Toronto and York Region health units. The cluster remained significant for two consecutive days. The second cluster was detected among calls made from November 19 to 25 in Toronto (Table 2). There was also one respiratory EARS flag generated on November 4, indicating a statistically significant increase above the expected call volume at the beginning of the month (Figure 4).

Figure 4. Respiratory syndrome calls: Ontario, November 1 to 30, 2012



Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2012/12/03].

Ontario Outbreak Review

The review of outbreaks section provides the total number of institutional respiratory infection outbreaks for the 2012-2013 influenza season (Table 3). The number of outbreaks during the same period for the 2010-2011 and 2011-2012 influenza seasons are also presented for comparison.

Table 3. Total number of institutional respiratory infection outbreaks: Ontario, surveillance season to week 48, 2010-11 to 2012-13

Time period	Total Number of Confirmed Outbreaks
2012-13 season	219
2011-12 season	136
2010-11 season	179

Sources: Ontario Respiratory Virus Bulletin – Surveillance Week 48 (November 25 – December 1, 2012); Ontario Influenza Bulletin – Surveillance Week 48 (November 27 – December 3, 2011); and Ontario Influenza Bulletin – Surveillance Week 48 (November 28 – December 4, 2010).

Enhanced Surveillance Directives (ESD) Discontinued in November

SALMONELLA HEIDELBERG

The Ministry of Health and Long-Term Care (MOHLTC), in collaboration with Public Health Ontario (PHO) and several public health units, investigated a provincial increase in *Salmonella* Heidelberg phage type (PT) 19. On October 10, 2012, a provincial outbreak was declared and an Ontario Outbreak Investigation Coordination Committee (OOICC) was established. This followed increases in *S.* Heidelberg counts noted through provincial monitoring by PHO and the National Enteric Surveillance Program, dating back to surveillance week 35 (beginning August 26). A Field Epidemiologist from the Canadian Field Epidemiology Program was deployed to PHO to support the outbreak investigation and conduct coordinated interviewing. On November 23, the outbreak was declared over and the ESD was discontinued following a reduction in incident cases. In total, 105 outbreak-associated cases (101 confirmed, four probable) were reported in 24 health units across the province, including Toronto (35 cases) and York Region (12 cases). No common exposure was identified to account for the increase.

E. COLI

The Public Health Agency of Canada (PHAC) led an investigation along with provincial and federal partners to share epidemiological, microbiological and food safety information related to *E. coli* O157:H7 observed in XL Foods Inc. In total, 18 confirmed cases of *E. coli* O157:H7 were identified as part of this outbreak in four provinces (eight cases from Alberta, six cases from Quebec, three cases from British Columbia and one case from Newfoundland). The outbreak was declared over on November 28 and the ESD was discontinued on November 30.

References

IN FOCUS – West Nile Virus

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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	4	2	3			**49**	0.4	**89**	0.7	*-45.6*	**106**	0.8	**91**	0.7	*-47.4*	**104**	0.8
Amebiasis	25	16	18	13	14	11	23	10	15	14			**159**	1.2	**184**	1.4	*-14.6*	**215**	1.6	**275**	2.1	*-43.6*	**311**	2.4
Botulism	0	0	0	3	1	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			**9**	0.1	**1**	0.0	*789.2*	**1**	0.0	**2**	0.0	*339.3*	**2**	0.0
Campylobacter Enteritis	210	177	238	256	264	405	520	486	415	367			**3,338**	24.7	**3,060**	22.9	*7.8*	**3,506**	26.2	**2,936**	22.2	*11.0*	**3,358**	25.4
Chlamydial Infections	3,336	3,174	3,065	3,056	3,224	2,997	3,003	3,071	2,941	3,040			**30,907**	228.4	**30,314**	226.7	*0.7*	**36,395**	272.2	**27,797**	210.4	*8.5*	**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
Cryptosporidiosis	13	12	25	12	7	26	55	72	32	14			**268**	2.0	**279**	2.1	*-5.1*	**302**	2.3	**306**	2.3	*-14.5*	**338**	2.6
Cyclosporiasis	2	0	2	10	13	25	10	2	3	7			**74**	0.5	**98**	0.7	*-25.4*	**105**	0.8	**163**	1.2	*-55.7*	**168**	1.3
Cytomegalovirus Infection, Congenital	0	2	1	1	1	0	3	0	1	2			**11**	0.1	**10**	0.1	*8.7*	**11**	0.1	**4**	0.0	*168.5*	**5**	0.0
Encephalitis- Primary Viral	2	1	0	1	2	1	2	1	1	1			**12**	0.1	**12**	0.1	*-1.2*	**14**	0.1	**10**	0.1	*17.1*	**15**	0.1
Encephalitis- Unspecified	1	0	0	0	1	0	0	0	1	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	20	17	18			**145**	1.1	**121**	0.9	*18.4*	**140**	1.0	**141**	1.1	*0.4*	**155**	1.2
Food poisoning, all causes	5	0	1	1	2	2	8	6	8	6			**39**	0.3	**49**	0.4	*-21.4*	**63**	0.5	**85**	0.6	*-55.2*	**90**	0.7
Giardiasis	89	106	119	99	96	100	116	122	106	78			**1,031**	7.6	**1,127**	8.4	*-9.6*	**1,290**	9.6	**1,187**	9.0	*-15.2*	**1,410**	10.7
Gonorrhoea (All types)	375	319	345	312	376	347	367	346	312	315			**3,414**	25.2	**3,498**	26.2	*-3.6*	**4,204**	31.4	**3,252**	24.6	*2.5*	**3,965**	30.0
Group A Streptococcal Disease, Invasive	69	67	66	55	49	44	46	23	34	43			**496**	3.7	**569**	4.3	*-13.9*	**669**	5.0	**434**	3.3	*11.6*	**561**	4.2
Group B Streptococcal Disease, Neonatal	5	4	2	3	5	5	4	6	3	5			**42**	0.3	**49**	0.4	*-15.3*	**57**	0.4	**42**	0.3	*-2.4*	**52**	0.4
Haemophilus Influenzae B Disease, Invasive	0	0	0	1	2	0	0	0	1	0			**4**	0.0	**9**	0.1	*-56.1*	**11**	0.1	**2**	0.0	*95.2*	**2**	0.0
Hepatitis A	5	20	12	10	5	9	5	8	12	11			**97**	0.7	**88**	0.7	*8.9*	**104**	0.8	**108**	0.8	*-12.3*	**136**	1.0
Hepatitis B	9	8	10	8	6	10	8	4	6	6			**75**	0.6	**101**	0.8	*-26.6*	**120**	0.9	**104**	0.8	*-29.6*	**116**	0.9
Hepatitis C	371	341	352	339	337	364	319	359	304	342			**3,428**	25.3	**3,460**	25.9	*-2.1*	**4,170**	31.2	**3,815**	28.9	*-12.3*	**4,523**	34.2
Hepatitis D	1	1	0	0	0	0	0	0	0	0			**2**	0.0	**2**	0.0	*-1.2*	**3**	0.0	**0**	0.0	-	**1**	0.0
Herpes, Neonatal	0	0	0	1	0	0	1	0	2	0			**4**	0.0	**7**	0.1	*-43.5*	**8**	0.1	**7**	0.1	*-44.2*	**9**	0.1
HIV	84	75	64	69	74	64	64	56	49	57			**656**	4.8	**729**	5.5	*-11.1*	**868**	6.5	**698**	5.3	*-8.3*	**847**	6.4
Influenza**	228	950	1,823	628	185	14	12	5	5	54			**3,904**	28.8	**4,160**	31.1	*-7.3*	**4,246**	31.8	**119**	0.9	*3102.6*	**1,949**	14.8
Legionellosis	6	6	4	0	2	14	11	68	35	14			**160**	1.2	**136**	1.0	*16.2*	**162**	1.2	**101**	0.8	*54.6*	**116**	0.9
Leprosy	0	0	0	0	0	0	0	0	0	0			**0**	0.0	**1**	0.0	*-100.0*	**1**	0.0	**1**	0.0	*-100.0*	**1**	0.0
Listeriosis	3	4	3	4	2	4	5	6	5	4			**40**	0.3	**48**	0.4	*-17.7*	**57**	0.4	**53**	0.4	*-26.3*	**60**	0.5
Lyme Disease	0	1	0	3	10	27	37	12	9	0			**99**	0.7	**86**	0.6	*13.7*	**89**	0.7	**70**	0.5	*38.1*	**71**	0.5
Malaria	14	5	11	11	23	27	27	25	32	10			**185**	1.4	**202**	1.5	*-9.5*	**231**	1.7	**226**	1.7	*-20.1*	**259**	2.0
Measles	0	0	0	0	1	0	0	1	1	0			**3**	0.0	**8**	0.1	*-62.9*	**8**	0.1	**3**	0.0	*-2.4*	**9**	0.1
Meningitis- Bacterial	6	2	1	3	3	1	6	3	6	6			**37**	0.3	**19**	0.1	*92.4*	**25**	0.2	**28**	0.2	*29.0*	**32**	0.2
Meningitis- Other	1	0	1	1	2	0	0	0	0	1			**6**	0.0	**4**	0.0	*48.2*	**4**	0.0	**3**	0.0	*95.2*	**5**	0.0
Meningitis- Viral	3	2	8	3	1	7	10	13	8	7			**62**	0.5	**37**	0.3	*65.6*	**41**	0.3	**100**	0.8	*-39.5*	**111**	0.8
Meningococcal Disease, Invasive	2	3	8	1	3	0	0	1	4	5			**27**	0.2	**40**	0.3	*-33.3*	**43**	0.3	**26**	0.2	*1.4*	**34**	0.3
Mumps	1	4	1	2	0	1	0	2	0	1			**12**	0.1	**58**	0.4	*-79.6*	**63**	0.5	**66**	0.5	*-82.3*	**68**	0.5
Ophthalmia Neonatorum	0	1	0	1	0	1	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	3	4	4			**32**	0.2	**57**	0.4	*-44.5*	**62**	0.5	**53**	0.4	*-41.1*	**60**	0.5
Pertussis (Whooping Cough)	70	23	28	49	104	111	113	106	67	38			**709**	5.2	**141**	1.1	*396.8*	**230**	1.7	**85**	0.6	*714.3*	**101**	0.8
Q Fever	4	0	1	1	1	1	1	3	0	1			**13**	0.1	**15**	0.1	*-14.4*	**20**	0.1	**7**	0.1	*81.3*	**7**	0.1
Rabies	0	0	0	1	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			**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
Salmonellosis	189	280	286	227	238	241	335	372	318	197			**2,683**	19.8	**2,295**	17.2	*15.5*	**2,575**	19.3	**2,328**	17.6	*12.5*	**2,724**	20.6
Shigellosis	34	20	13	21	19	13	41	29	26	15			**231**	1.7	**223**	1.7	*2.3*	**255**	1.9	**221**	1.7	*2.0*	**252**	1.9
Streptococcus Pneumoniae, Invasive	138	122	127	109	102	62	40	49	66	117			**932**	6.9	**992**	7.4	*-7.2*	**1,257**	9.4	**950**	7.2	*-4.2*	**1,205**	9.1
Syphilis, Congenital	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	84	58	78	53	76	66	57	55	43	37			**607**	4.5	**617**	4.6	*-2.8*	**768**	5.7	**667**	5.0	*-11.2*	**779**	5.9
Syphilis, Other	70	65	72	60	51	64	51	45	38	34			**550**	4.1	**612**	4.6	*-11.2*	**754**	5.6	**655**	5.0	*-18.0*	**791**	6.0
Tetanus	0	0	0	0	0	1	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	41	46	51	43	52			**489**	3.6	**544**	4.1	*-11.2*	**656**	4.9	**532**	4.0	*-10.3*	**647**	4.9
Tularemia	0	0	0	0	0	1	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			**67**	0.5	**97**	0.7	*-31.8*	**103**	0.8	**78**	0.6	*-16.1*	**92**	0.7
Verotoxin Producing E. Coli including HUS	5	8	3	9	11	16	45	43	19	13			**172**	1.3	**214**	1.6	*-20.6*	**232**	1.7	**140**	1.1	*19.9*	**153**	1.2
West Nile Virus Illness	0	0	0	0	0	0	34	141	48	3			**226**	1.7	**54**	0.4	*313.5*	**56**	0.4	**6**	0.0	*3577.0*	**6**	0.0
Yellow Fever	1	0	0	0	1	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	19	8	7			**136**	1.0	**182**	1.4	*-26.2*	**211**	1.6	**179**	1.4	*-25.8*	**204**	1.5

Sources: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2012/11/21]. 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.

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 1-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 7 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 7-day baseline period, but with a 2-day lag between the baseline and the current day. For example, on the 10th day of surveillance the baseline data will be from day 1 to day 7. 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 3-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.