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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.

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Infectious Disease in Focus

TYPHOID FEVER & PARATYPHOID FEVER

Typhoid fever and paratyphoid fever are bacterial infections caused by *Salmonella* Typhi and *Salmonella* Paratyphi, respectively, which are only found in human hosts.[1,2] Both *S.* Typhi and *S.* Paratyphi are classified as typhoidal *Salmonella* (also known as enteric fever). Non-typhoidal salmonella infections, such as *S.* Enteritidis and *S.* Typhimurium, as well as *S.* Paratyphi B variant Java, are much more common than these two enteric fevers.[3-5]

The transmission of typhoid fever or paratyphoid fever most commonly occurs when an individual ingests food or water that has been contaminated by an infected person's feces or urine.[1] Person-to-person transmission has also been documented.[1] Typhoid and paratyphoid fevers are endemic in countries with poor sanitation, resulting in exposure of the population to contaminated food and water.[6,7] Infections with typhoid fever or paratyphoid fever in developed countries such as Canada are usually acquired during travel to endemic areas.[2]

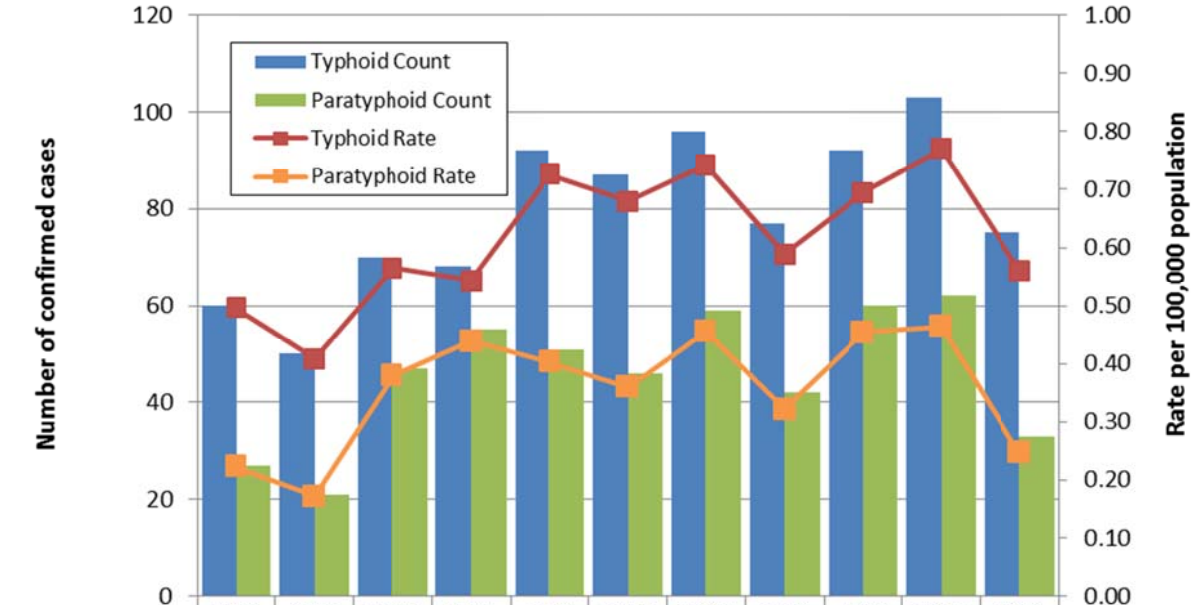
The incubation period for typhoid fever can range from

three to 60 days, but typically ranges from one to three weeks.[4,8] The incubation period for paratyphoid fever is shorter, ranging from one to ten days.[1] Symptoms of typhoid fever include sustained fever, chills, headache, malaise, constipation or diarrhea, and anorexia. Abdominal pain may also develop and rose spots may be seen on the abdomen and chest.[1,4] Paratyphoid fever presents with similar clinical signs and symptoms.[1,5] Typhoid and paratyphoid fever are usually communicable from the first week after illness onset through to recovery.[1] As many as 5% of those infected may become chronic carriers.[1] Carriers are infected persons that do not show symptoms or have recovered from the disease, but still harbour the bacteria, which can be passed to others through fecal shedding.[6]

With appropriate antibiotic treatment, infected individuals with typhoid or paratyphoid fever usually recover within ten to 14 days, and the mortality rate is less than 1%.[4] Up to 20% of typhoid fever cases may experience relapses following treatment, depending on the antimicrobials used.[1] This proportion is smaller for paratyphoid fever at approximately 4%.[1] Individuals who do not seek or do not have access to effective medical treatment may continue to experience symptoms, leading to complications. Up to 20% of untreated cases have a fatal outcome.[1,6] Complications of typhoid fever, which typically occur after two to three weeks of illness, may include intestinal perforation, myocarditis, encephalopathy, bacteremia/septicemia, and altered mental status.[4,6] These complications may be less common in travel-related cases from developed countries,[5] where medical care is readily available once these cases return home.

In 2012, 75 cases of typhoid fever were reported in Ontario, representing an incidence rate of 0.56 cases per 100,000 population. This rate was similar to the average incidence rate of 0.62 cases per 100,000 population for the period 2002 to 2011 (Figure 1). While moderate fluctuations occurred from year to year, no significant trend was observed over this ten year period. By comparison, 33 cases of paratyphoid fever were reported provincially in 2012. This represents an incidence rate of 0.25 cases of paratyphoid fever per 100,000 population, similar to the average rate of 0.37 cases per 100,000 population from 2002 to 2011. Notably, the degree of underreporting estimated for typhoid fever is considerably lower than estimates for other enteric diseases (e.g., campylobacteriosis, salmonellosis), likely owing to its more severe symptomatology.[11] It has been estimated that each reported case of typhoid fever represents one unreported case in the population,[11] compared to an estimated range of ten to 49 unreported cases for other enteric diseases.[12]

Figure 1. Incidence of typhoid and paratyphoid fevers: Ontario, 2002-2012



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Typhoid Count	60	50	70	68	92	87	96	77	92	103	75
Paratyphoid Count	27	21	47	55	51	46	59	42	60	62	33
Typhoid Rate	0.50	0.41	0.56	0.54	0.73	0.68	0.74	0.59	0.70	0.77	0.56
Paratyphoid Rate	0.22	0.17	0.38	0.44	0.40	0.36	0.46	0.32	0.45	0.46	0.25

Year

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2013/01/16]. Population data: MOHLTC, intelliHEALTH Ontario, extracted [2012/11/27]

Of the 75 typhoid fever cases reported in 2012, 56% (42/75) were female. Cases ranged in age from one to 82 years, with a median age of 21 years. Thirty-seven percent (28/75) of cases were hospitalized, which is similar to previously reported hospitalization rates for typhoid fever.[13] None of the 75 cases of typhoid fever in 2012 reported having been immunized prior to becoming ill.

In 2012, ten of 36 health units in Ontario reported at least one case of typhoid fever. Of cases reported provincially, 58% (44/75) were from Peel Region and 27% (20/75) were from Toronto. These health units represent 10% and 21% of the provincial population, respectively. The disproportionately high number of cases reported in Peel Region yields an incidence rate of 3.2 cases per 100,000, which is significantly higher than the provincial average. The high incidence in Peel Region compared to other health units has been associated with more frequent travel to areas where typhoid fever is endemic among the health unit's residents. The geographic distribution of paratyphoid fever was similar, with Peel Region and Toronto accounting for 42% (14/33) and 30% (10/33) of cases reported in 2012, respectively.

As expected and as seen in past years, travel continues to be reported by a large proportion of typhoid fever cases in Ontario.[14] In 2012, 87% (65/75) of cases reported travel within the incubation period. Of the remaining ten cases, exposures were either unknown (one case) or not reported (nine cases). Among the 65 cases reporting travel (Table 1), the most commonly reported travel destination was India (69%), followed by Pakistan (14%) and Bangladesh (6%). These findings are comparable to the results of a study in the United States, where 67% of typhoid fever cases with travel information available visited India, Pakistan or Bangladesh prior to illness onset.[14]

As with typhoid fever, the majority of paratyphoid fever cases in Ontario in 2012 reported travel outside of Canada (73%, 24/33). India, Pakistan and Bangladesh were similarly the most commonly reported countries of travel for paratyphoid fever cases (Table 1).

Table 1. Country visited for typhoid and paratyphoid fever cases reporting travel: Ontario, 2012

Country of Travel	Typhoid		Paratyphoid	
	Cases (n)	Percent (%)	Cases (n)	Percent (%)
India	45	69.2	11	45.8
Pakistan	9	13.8	6	25.0
Bangladesh	4	6.2	2	8.3
Spain	2	3.1	0	0
Cameroon	1	1.5	0	0
Guinea	1	1.5	0	0
Tanzania	1	1.5	0	0
Cambodia	0	0	1	4.2
Peru	0	0	1	4.2
Sri Lanka	0	0	1	4.2
Unspecified*	2	3.1	2	8.3
Total cases where travel was reported**	**65**	**100.0**	**24**	**100.0**

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2013/01/16].
*Country of travel was not reported. **Travel as determined by the case reporting travel as an exposure or as a risk factor. Cases of typhoid (10 cases) and paratyphoid (9 cases) who did not report travel as either an exposure or a risk factor were not included in the table above.

The traditional antibiotic treatment for typhoid and paratyphoid fever are fluoroquinolones (e.g., ciprofloxacin).[9] However, over the past decade isolates of *S.* Typhi with reduced ciprofloxacin susceptibility have emerged and become widespread have been reported.[10] Resistance to fluoroquinolones is highest in the Indian subcontinent,[17] where the majority of travel-associated cases of typhoid and paratyphoid fever in Ontario have reported visiting, and is increasing in other areas.[15] In Ontario, the incidence of antimicrobial resistance strains of *S.* Typhi is increasing as well.[16,17] In 2012, 32% (23/74) of *S.* Typhi isolates tested at the Public Health Ontario Laboratories were considered ciprofloxacin-resistant.

Three types of typhoid vaccine are available for protection against typhoid fever in Canada, including a combination hepatitis A-typhoid vaccine.[18] While typhoid vaccines are not publicly funded in Ontario, typhoid immunization should be considered for travellers to endemic countries, including those visiting friends and relatives, to reduce their risk of acquiring the disease. Information collected from recent typhoid fever cases reported in Ontario indicates that uptake of the typhoid vaccine among cases was low. The efficacy of typhoid vaccines has been estimated to be between 50 and 55%.[18] As such, travelers should be advised to take additional precautions by ensuring good personal hygiene and avoiding food or water from unsafe sources. To reduce further spread of the disease, infected individuals, as well as chronic carriers, should be excluded from handling food or providing patient care, and should also ensure frequent and appropriate hand hygiene.[1] Currently, there is no vaccine available for the prevention of paratyphoid fever.

Significant Reportable Disease Activity

From January 1 to December 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 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.

DENGUE FEVER: UPDATE FOR TRAVELLERS

Dengue fever is an acute viral disease that can result in influenza-like symptoms. It is spread through the bite of an infected mosquito. Dengue outbreaks have become more common in the past 25 years, particularly in areas with a tropical climate and among urban regions. The number of reported cases has increased recently in certain areas of Central and South America; the Caribbean; South and Southeast Asia; Western, Eastern and Central Africa as well as Oceania.

Editor's Note: Only the hemorrhagic form of dengue fever is reportable in Ontario and no cases have been reported in the province to date (as of February 21, 2013). During peak travel season in the winter, many Ontarians are at greater risk of acquiring dengue fever when headed to destinations where the disease is endemic. Travellers are advised to minimize exposure by practicing protective measures against mosquito bites, such as using insect repellent on exposed skin. Currently, there is no vaccine available for prevention. Information regarding measures travellers can take to protect themselves and a map of areas where dengue fever is widespread is available on the Public Health Agency of Canada's website via the link below.

http://www.phac-aspc.gc.ca/tmp-pmv/thn-csv/dengue-eng.php

NOVEL CORONAVIRUS INFECTION

On February 15, 2013, the Health Protection Agency (HPA) in the United Kingdom (UK) confirmed a third case of novel coronavirus infection in a family cluster. The most recent UK case is a UK resident who does not have recent travel history and experienced mild respiratory illness. Although this situation may indicate person-to-person spread, based on current evidence the risk of sustained person-to-person spread remains low. As of February 21, the total number of confirmed coronavirus cases is 13, of whom 7 have died.

Editor's Note: The Ontario Ministry of Health and Long-Term Care issued an Important Health Notice on novel coronavirus infection on September 27, updated on December 17, 2012. The WHO has also issued updates to surveillance and laboratory guidance of novel coronavirus on February 19, 2013. As of February 21, 2013, no cases of this novel coronavirus have been identified in Ontario.

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/NovelCoronavirus2012/GeneralInformation/respqandanovelcoronavirus2012/
http://www.who.int/csr/disease/coronavirus_infections/en/

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 utilized to determine whether observed call volumes are greater than statistically expected and to identify significant clusters of 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 can be found in the Glossary.

In January 2013, five geographically distinct GI syndrome clusters and seven distinct respiratory syndrome clusters were identified among Telehealth calls (Table 2). In addition, one GI syndrome EARS flag, indicating statistically significant increases above the expected call volume, was identified in the month of January (Figure 3).

[*] 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 2. Significant fever/ILI, GI and respiratory syndrome clusters identified by SaTScan: Ontario, January 2013

Cluster Type	Cluster	FSA	# FSAs	Health Units Affected	Rad (km)	Obs	Exp	Obs/ exp	p
GI	Dec 26 to Jan 1	L7B	7	York	12.38	39	20.95	1.86	.014
	Jan 14 to Jan 20	N0H-1	18	Grey Bruce, Simcoe-Muskoka and Sudbury & District	111.99	16	5.79	2.76	.048
	Jan 17 to Jan 23	K2M	8	Ottawa	8.29	18	7.11	2.53	.041
	Jan 21 to Jan 27	M4W	5	Toronto	1.69	17	6.49	2.62	.049
	Jan 23 to Jan 29	L0S-2	20	Niagara	31.81	34	17.52	1.84	.038
Resp	Dec 26 to Jan 1	P0G-1	49	North Bay Parry Sound, Sudbury & District, Simcoe-Muskoka, Huron County, Grey Bruce, Perth District, Haliburton-Kawartha-Pine Ridge District	140.78	162	120.87	1.34	.014
	Dec 26 to Jan 1[1]	L7C	31	Peel, Halton, Toronto, York	22.01	291	235.46	1.24	.016
	Dec 27 to Jan 2[1]	L6R	32	Peel, Halton, Toronto, York	18.87	284	230.34	1.23	.027
	Dec 31 to Jan 6[2]	P0L-2	73	North West Health Unit Region (NWR, THB), North East Health Unit Region (PQP, SUD, TSK, ALG, NPS), Simcoe Muskoka District and Grey Bruce	630.96	180	135.85	1.32	.016

	Jan 1 to Jan 7[2]	P8N	70	North West Health Unit Region (NWR, THB), North East Health Unit Region (PQP, SUD, TSK, ALG, NPS), and Grey Bruce	1064.88	170	125.07	1.36	.0076
	Jan 4 to Jan 10	P0T-1	46	North West Health Unit Region (NWR, THB), North East Health Unit Region (PQP, SUD, TSK, ALG, NPS)	500.77	113	78.68	1.42	.048
	Jan 7 to Jan 13[3]	P0H-2	46	North West Health Unit Region (NWR, THB), North East Health Unit Region (PQP, SUD, TSK, ALG, NPS)	777.12	110	73.83	1.49	.0074
	Jan 8 to Jan 14[3]	P0L-3	42	North East Health Unit Region (PQP, SUD, TSK, ALG, NPS), and Thunder Bay District	648.30	110	73.40	1.50	.0062
	Jan 9 to Jan 15[3]	P0V-5	48	Northern Health Unit Region (NWR, THB, PQP, SUD, TSK, ALG, NPS)	937.68	119	77.54	1.53	.00077
	Jan 9 to Jan 15	L5S	73	Peel, Toronto, Halton, York	21.34	467	394.41	1.18	.043
	Jan 10 to Jan 16[3]	P0V-5	48	North Health Unit Region (NWR, THB, PQP, SUD,	937.68	127	79.02	1.61	.000022

				TSK, ALG, NPS)					
	Jan 11 to Jan 17[3]	P0V-5	48	North Health Unit Region (NWR, THB, PQP, SUD, TSK, ALG, NPS)	937.68	127	78.56	1.62	.000019
	Jan 14 to Jan 20	P0L-2	23	Porcupine, Algoma District, Sudbury & District, Timiskaming, and Thunder Bay District	370.52	65	38.12	1.71	.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 [2013/02/04].

[1] Identified Respiratory clusters that represent a single event that remained significant for two consecutive days.

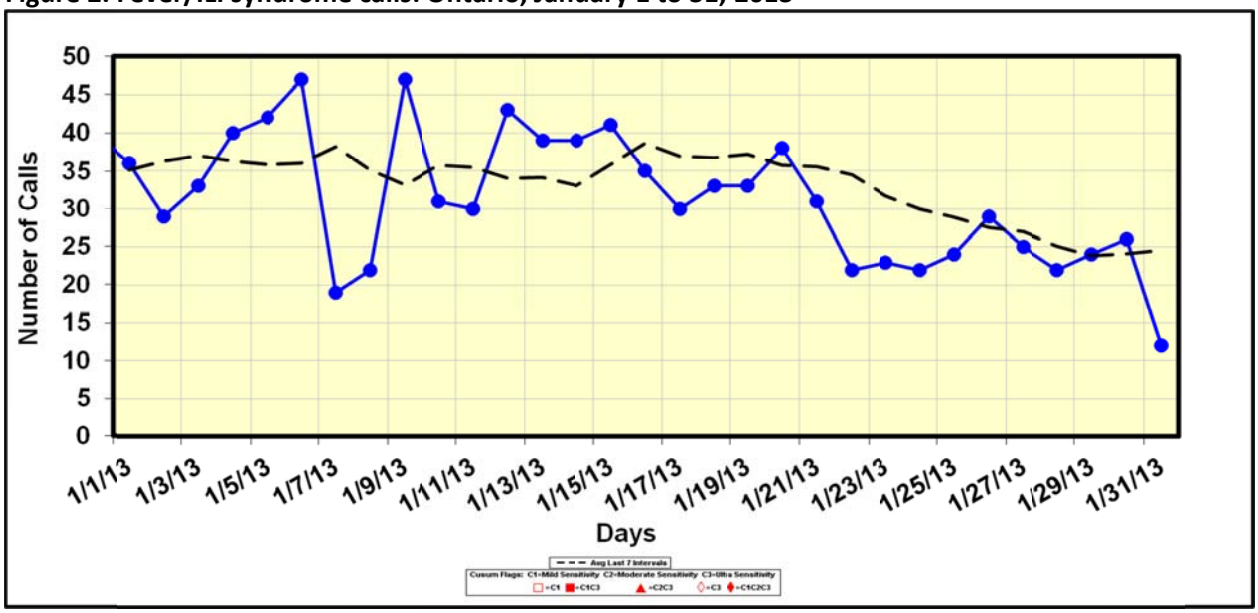
[2] Identified Respiratory clusters that represent a single event that remained significant for two consecutive days.

[3] Identified Respiratory clusters that represent a single event that remained significant for five consecutive days.

TELEHEALTH CALL VOLUMES - FEVER/ILI SYNDROME

For the month of January 2013, no Fever/ILI syndrome clusters or Fever/ILI EARS flags were detected (Table 2 and Figure 2).

Figure 2. Fever/ILI syndrome calls: Ontario, January 1 to 31, 2013

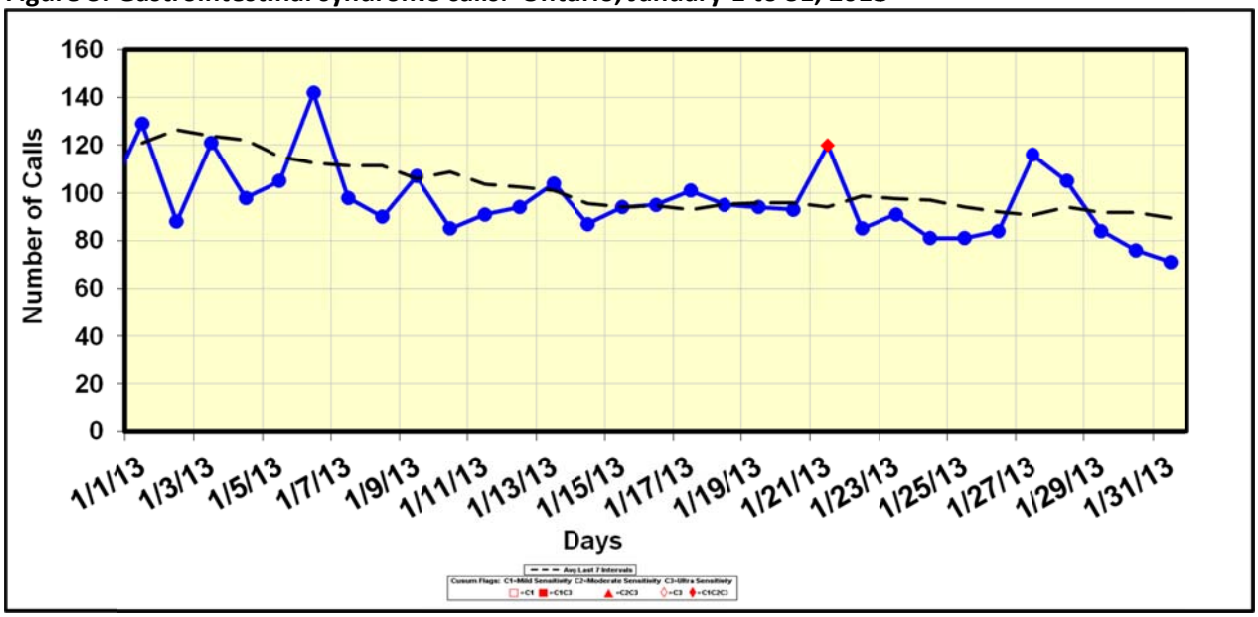


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/02/04].

TELEHEALTH CALL VOLUMES - GI SYNDROME

A total of five distinct GI syndrome clusters were identified in January 2013. 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 2. One GI EARS flag was detected on January 21, indicating a statistically significant increase above the expected call volume towards the end of the month (Figure 3).

Figure 3. Gastrointestinal syndrome calls: Ontario, January 1 to 31, 2013

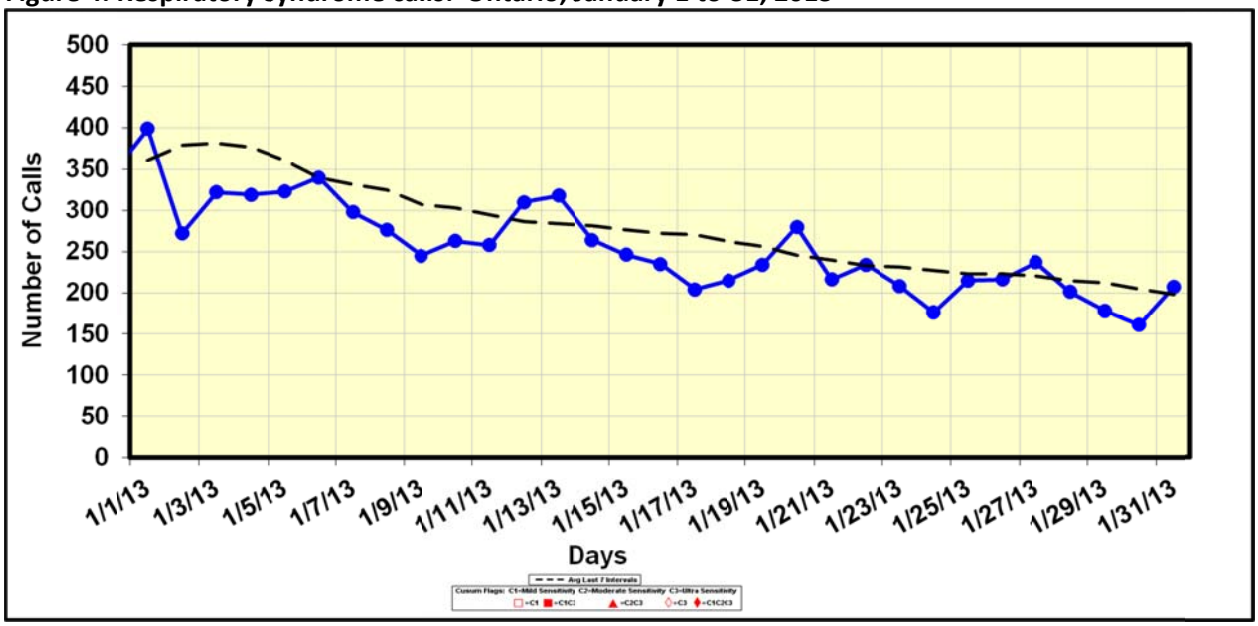


Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/02/04].

TELEHEALTH CALL VOLUMES – RESPIRATORY SYNDROME

A total of seven distinct respiratory syndrome clusters were identified in January 2013. 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 2. No respiratory syndrome EARS flags were detected for the month of January 2013 and call volumes showed a gradual decline towards the end of the month (Figure 4).

Figure 4. Respiratory syndrome calls: Ontario, January 1 to 31, 2013



Source: Ontario Ministry of Health and Long-Term Care, Telehealth Ontario, extracted by Public Health Ontario [2013/02/04].

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 4, 2010-11 to 2012-13, cumulative from September 1 of each season

Time period	Total Number of Confirmed Outbreaks
2012-13 season	765
2011-12 season	256
2010-11 season	461

Sources: Ontario Respiratory Virus Bulletin – Surveillance Week 4 (January 20, 2013 – January 26, 2013); Ontario Influenza Bulletin – Surveillance Week 4 (January 22 - January 28, 2012); and Ontario Influenza Bulletin – Surveillance Week 4 (January 23, 2011 - January 29, 2011).

Enhanced Surveillance Directives (ESD) Discontinued in January

E. COLI IN FROZEN BEEF BURGERS

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 frozen beef burgers. In total, 5 confirmed cases of *E. coli* O157:H7 were identified as part of this outbreak in two provinces (two cases from Alberta and three cases from two health units across Ontario). Symptom onset dates of confirmed cases ranged from September 30, 2012 to November 22, 2012. Sixty percent of the cases were male and ages ranged from 10 to 59 years. On December 12, 2012, the Canadian Food Inspection Agency issued a health hazard alert warning the public not to consume Butcher's Choice Beef Burgers. The outbreak was declared over on January 10 and the ESD was discontinued on January 11, 2013.

http://www.phac-aspc.gc.ca/fs-sa/phn-asp/ecoli-1212-eng.php
http://www.phac-aspc.gc.ca/fs-sa/phn-asp/ecoli-epi-info-1212-eng.php#f1

E. COLI IN LETTUCE

The Public Health Agency of Canada (PHAC) led an investigation, along with provincial and federal partners, related to a multi-provincial outbreak of *E. coli* O157:H7 illnesses. A national Outbreak Investigation Coordinating Committee (OICC) was established on January 4, 2013. Two field epidemiologists from the Canadian Field Epidemiology Program supported the outbreak investigation and conducted coordinated interviewing. In total, 30 confirmed cases of *E. coli* O157:H7 were identified as part of this outbreak in three provinces (seven cases from New Brunswick, ten cases from Nova Scotia, and thirteen cases from five health units across Ontario). Lettuce distributed to KFC and KFC-Taco Bell restaurants was identified as the most likely source of the outbreak. Implicated products were recalled by the Canadian Food Inspection Agency (CFIA) and the producer on January 10 and January 13, 2013 in six different Canadian provinces. PHAC closed the OICC on January 21, 2013 and declared the outbreak over on February 4, 2013 after recall of the implicated product was completed and no additional cases were identified.

http://www.phac-aspc.gc.ca/fs-sa/phn-asp/2013/ecoli-0113-eng.php
http://www.inspection.gc.ca/food/consumer-centre/food-safety-investigations/freshpoint-inc-/eng/1357957709129/1357963344258

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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	5	2	4	1	6	**58**	0.4	**106**	0.8	*-45.9*	**106**	0.8	**104**	0.8	*-45.6*	**104**	0.8
Amebiasis	25	16	18	13	14	13	26	9	15	16	13	10	**188**	1.4	**216**	1.6	*-14.0*	**216**	1.6	**311**	2.4	*-41.0*	**311**	2.4
Botulism	0	0	0	3	1	0	0	0	0	0	0	0	**4**	0.0	**2**	0.0	*97.6*	**2**	0.0	**1**	0.0	*290.5*	**1**	0.0
Brucellosis	0	1	1	0	0	3	2	1	1	0	0	0	**9**	0.1	**1**	0.0	*789.2*	**1**	0.0	**2**	0.0	*339.3*	**2**	0.0
Campylobacter Enteritis	211	177	239	255	264	408	521	490	421	391	261	172	**3,810**	28.2	**3,507**	26.2	*7.3*	**3,507**	26.2	**3,359**	25.4	*10.7*	**3,359**	25.4
Chlamydial Infections	3,341	3,175	3,063	3,056	3,223	3,003	3,003	3,078	2,947	3,105	3,067	2,273	**36,334**	268.5	**36,404**	272.3	*-1.4*	**36,404**	272.3	**33,496**	253.6	*5.9*	**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**	0.0
Cryptosporidiosis	13	12	25	12	7	27	55	73	32	18	8	8	**290**	2.1	**301**	2.3	*-4.8*	**301**	2.3	**338**	2.6	*-16.2*	**338**	2.6
Cyclosporiasis	2	0	2	10	13	25	10	2	3	7	4	0	**78**	0.6	**105**	0.8	*-26.6*	**105**	0.8	**168**	1.3	*-54.7*	**168**	1.3
Cytomegalovirus Infection, Congenital	0	0	0	0	1	0	1	0	1	0	0	1	**4**	0.0	**11**	0.1	*-64.1*	**11**	0.1	**5**	0.0	*-21.9*	**5**	0.0
Encephalitis- Primary Viral	2	1	0	1	2	1	2	1	1	2	1	0	**14**	0.1	**14**	0.1	*-1.2*	**14**	0.1	**15**	0.1	*-8.9*	**15**	0.1
Encephalitis- Unspecified	1	0	0	0	1	0	0	0	1	0	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	16	14	11	**169**	1.2	**140**	1.0	*19.3*	**140**	1.0	**155**	1.2	*6.4*	**155**	1.2
Food poisoning, all causes	5	0	1	1	2	2	8	6	8	6	3	3	**45**	0.3	**63**	0.5	*-29.4*	**63**	0.5	**90**	0.7	*-51.2*	**90**	0.7
Giardiasis	90	106	119	99	97	102	120	129	119	101	75	43	**1,200**	8.9	**1,291**	9.7	*-8.2*	**1,291**	9.7	**1,410**	10.7	*-16.9*	**1,410**	10.7
Gonorrhoea (All types)	375	321	350	315	379	349	372	354	316	331	345	272	**4,079**	30.1	**4,206**	31.4	*-4.2*	**4,205**	31.4	**3,966**	30.0	*0.4*	**3,966**	30.0
Group A Streptococcal Disease, Invasive	69	67	66	55	49	44	46	23	34	43	43	57	**596**	4.4	**669**	5.0	*-12.0*	**669**	5.0	**561**	4.2	*3.7*	**561**	4.2
Group B Streptococcal Disease, Neonatal	5	4	3	3	5	5	4	6	3	5	6	1	**50**	0.4	**57**	0.4	*-13.3*	**57**	0.4	**52**	0.4	*-6.1*	**52**	0.4
Haemophilus Influenzae B Disease, Invasive	0	0	0	1	2	0	0	0	1	0	1	0	**5**	0.0	**11**	0.1	*-55.1*	**11**	0.1	**2**	0.0	*144.0*	**2**	0.0
Hepatitis A	5	20	12	10	5	9	5	8	13	13	8	10	**118**	0.9	**105**	0.8	*11.0*	**105**	0.8	**136**	1.0	*-15.3*	**136**	1.0
Hepatitis B	10	8	10	8	7	10	10	3	6	5	8	6	**91**	0.7	**120**	0.9	*-25.1*	**120**	0.9	**116**	0.9	*-23.4*	**116**	0.9
Hepatitis C	371	339	352	340	339	367	318	366	304	357	364	245	**4,062**	30.0	**4,172**	31.2	*-3.8*	**4,172**	31.2	**4,523**	34.2	*-12.3*	**4,523**	34.2
Hepatitis D	1	1	0	0	0	0	0	0	0	0	0	0	**2**	0.0	**3**	0.0	*-34.1*	**3**	0.0	**1**	0.0	*95.2*	**1**	0.0
Herpes, Neonatal	0	0	0	1	0	0	1	0	2	0	1	0	**5**	0.0	**8**	0.1	*-38.2*	**8**	0.1	**9**	0.1	*-45.8*	**9**	0.1
HIV	84	75	64	68	75	64	64	57	52	55	51	53	**762**	5.6	**868**	6.5	*-13.3*	**868**	6.5	**847**	6.4	*-12.2*	**847**	6.4
Influenza**	230	950	1,823	628	185	14	12	5	5	62	576	3,592	**8,082**	59.7	**4,248**	31.8	*88.0*	**4,248**	31.8	**1,949**	14.8	*304.8*	**1,949**	14.8
Legionellosis	6	6	4	0	3	13	11	69	37	15	10	9	**183**	1.4	**162**	1.2	*11.6*	**162**	1.2	**116**	0.9	*54.0*	**116**	0.9
Leprosy	0	0	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	1	3	**44**	0.3	**57**	0.4	*-23.7*	**57**	0.4	**60**	0.5	*-28.4*	**60**	0.5
Lyme Disease	0	1	0	3	10	29	39	13	5	1	0	0	**101**	0.7	**89**	0.7	*12.1*	**89**	0.7	**72**	0.5	*36.9*	**72**	0.5
Malaria	14	5	11	11	23	26	27	26	33	13	15	10	**214**	1.6	**231**	1.7	*-8.5*	**231**	1.7	**259**	2.0	*-19.3*	**259**	2.0
Measles	0	0	0	0	1	0	0	1	1	0	0	0	**3**	0.0	**8**	0.1	*-62.9*	**8**	0.1	**9**	0.1	*-67.5*	**9**	0.1
Meningitis- Bacterial	5	2	1	3	3	1	6	3	7	6	4	2	**43**	0.3	**25**	0.2	*69.9*	**25**	0.2	**32**	0.2	*31.2*	**32**	0.2
Meningitis- Other	1	0	1	1	2	0	0	0	0	1	1	0	**7**	0.1	**4**	0.0	*72.9*	**4**	0.0	**5**	0.0	*36.7*	**5**	0.0
Meningitis- Viral	3	2	8	3	1	7	10	13	8	8	6	1	**70**	0.5	**41**	0.3	*68.7*	**41**	0.3	**111**	0.8	*-38.4*	**111**	0.8
Meningococcal Disease, Invasive	2	3	8	1	3	0	0	1	4	5	2	2	**31**	0.2	**43**	0.3	*-28.8*	**43**	0.3	**34**	0.3	*-11.0*	**34**	0.3
Mumps	1	4	1	2	0	1	0	2	0	1	1	2	**15**	0.1	**63**	0.5	*-76.5*	**63**	0.5	**68**	0.5	*-78.5*	**68**	0.5
Ophthalmia Neonatorum	0	1	0	1	0	1	0	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	5	1	6	1	3	1	0	**33**	0.2	**62**	0.5	*-47.4*	**62**	0.5	**60**	0.5	*-46.3*	**60**	0.5
Pertussis (Whooping Cough)	70	23	28	49	104	111	116	105	67	47	45	27	**792**	5.9	**230**	1.7	*240.2*	**230**	1.7	**101**	0.8	*665.5*	**101**	0.8
Q Fever	4	0	1	1	1	1	2	3	0	1	0	1	**15**	0.1	**20**	0.1	*-25.9*	**20**	0.1	**7**	0.1	*109.2*	**7**	0.1
Rabies	0	0	0	1	0	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	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**	0.0
Salmonellosis	189	280	286	227	238	243	338	375	320	219	144	135	**2,994**	22.1	**2,575**	19.3	*14.9*	**2,575**	19.3	**2,724**	20.6	*7.3*	**2,724**	20.6
Shigellosis	34	20	13	21	19	13	41	33	28	15	14	17	**268**	2.0	**255**	1.9	*3.8*	**255**	1.9	**252**	1.9	*3.8*	**252**	1.9
Streptococcus Pneumoniae, Invasive	138	122	127	111	105	62	40	49	68	119	103	175	**1,219**	9.0	**1,258**	9.4	*-4.3*	**1,258**	9.4	**1,205**	9.1	*-1.2*	**1,205**	9.1
Syphilis, Congenital	0	0	0	0	0	0	0	0	0	0	0	1	**1**	0.0	**1**	0.0	*-1.2*	**1**	0.0	**2**	0.0	*-51.2*	**2**	0.0
Syphilis, Infectious	85	58	78	54	77	72	63	61	55	59	41	19	**722**	5.3	**768**	5.7	*-7.1*	**768**	5.7	**780**	5.9	*-9.6*	**780**	5.9
Syphilis, Other	71	66	71	61	51	64	53	46	49	39	40	24	**635**	4.7	**753**	5.6	*-16.7*	**753**	5.6	**791**	6.0	*-21.6*	**791**	6.0
Tetanus	0	0	0	0	0	1	0	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	51	47	42	47	53	47	53	43	40	**581**	4.3	**657**	4.9	*-12.6*	**657**	4.9	**647**	4.9	*-12.3*	**647**	4.9
Tularemia	0	0	0	0	0	1	0	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	5	7	8	6	1	8	**76**	0.6	**103**	0.8	*-27.1*	**103**	0.8	**92**	0.7	*-19.4*	**92**	0.7
Verotoxin Producing E. Coli including HUS	5	8	3	9	11	16	45	43	19	13	10	16	**198**	1.5	**232**	1.7	*-15.7*	**232**	1.7	**153**	1.2	*26.3*	**153**	1.2
West Nile Virus Illness	0	0	0	0	0	0	35	146	49	3	1	2	**236**	1.7	**56**	0.4	*316.4*	**56**	0.4	**6**	0.0	*3739.7*	**6**	0.0
Yellow Fever	1	0	0	0	1	0	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	13	7	**158**	1.2	**211**	1.6	*-26.0*	**211**	1.6	**204**	1.5	*-24.4*	**204**	1.5

Sources: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [2013/01/17]. 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.