

SURVEILLANCE WEEK 47 (November 22, 2009– November 28, 2009)

This issue of the Ontario Influenza Bulletin provides information on the surveillance period from November 22, 2009–November 28, 2009, (Week 47). **All data are for week 47 unless otherwise specified. Death and hospitalization information among pandemic (H1N1) 2009 (abbreviated as pH1N1) confirmed cases is current as of December 2, 2009.** Data extraction and analysis for this issue of the Bulletin occurred on December 2, 2009.

In order to enable our readers to better assess influenza activity in Ontario, we have combined various sources of information in the following table.

Assessment of Influenza Activity in Ontario

Measure	Assessment of measure compared to previous week (Lower, Similar, Higher)	Reasoning behind assessment
Laboratory Confirmed Cases	Lower	398 total influenza cases (232 pH1N1) in week 47 compared to 978 reported in week 46 (457 pH1N1)*. The percent positivity of laboratory tests for influenza A was 7.5%, which is lower than in week 46 (22.7%),
Influenza A Outbreaks	Lower	No new institutional influenza outbreaks were reported for the current reporting week.
Influenza Activity Levels Reported by Health Units	Lower	Six health units reported 'localized' activity and twenty-two reported 'sporadic' activity for the current reporting week.
ILI Consultation Rate reported by Sentinel Physicians	Lower	The overall ILI consultation rate decreased from 56.13/1,000 patient visits to 40.36/1,000 patient visits.
Hospitalizations Among Lab Confirmed Cases of pandemic (H1N1) 2009 virus	Lower	Fewer hospitalized cases were reported from November 26 to December 2 as compared to November 18 to November 25 (115 compared to 216).
Deaths Among Lab Confirmed Cases of pandemic (H1N1) 2009 virus	Lower	Nine new deaths were reported from November 26 to December 2 compared to sixteen new deaths reported from November 18 to November 25.
OVERALL ASSESSMENT	Influenza activity in Ontario is <i>lower</i> compared to the previous week.	All measures indicate that influenza activity is lower in week 47 compared to week 46. Starting in week 45 (Nov.8-14) influenza activity in Ontario has declined each week.

*Counts from previous weeks may be updated and therefore may not match reports in earlier Bulletins

Ontario Influenza Bulletin, 2009-2010

Surveillance Week 47 (November 22, 2009 – November 28, 2009)

Overall, influenza activity in Ontario during week 47, 2009, was **lower** when compared to week 46, 2009. Ontario health units reported 398 new confirmed cases of influenza through the integrated Public Health Information System (iPHIS). This count includes 232 laboratory confirmed cases of pH1N1. During week 47, new laboratory confirmed cases of pH1N1 continued to be seen in all regions of Ontario. No new institutional influenza outbreaks were reported. For week 47, six health units reported localized influenza activity, twenty-two health units reported sporadic activity, and the remaining health units reported no influenza activity or did not report. The rate of influenza-like illness (ILI) in patients seen by sentinel physicians remained higher than the range that is expected for this time of the year based on the average ILI rate reported in week 47 from previous years.

For a definition of ILI activity levels and links to websites providing current influenza information from other sources, please refer to the attached Appendix- I. If you would like to provide feedback on the Bulletin, please contact Christine D'Souza (christine.dsouza1@ontario.ca, 416-212-5323) or Michael Whelan (michael.whelan@ontario.ca, 416-327-9174).

Table 1: Summary of confirmed influenza cases and institutional influenza outbreaks by health region (Week 47, 2009-2010)

Confirmed influenza cases*†	HEALTH REGION							TOTAL
	North West	North East	Eastern	Central East	Toronto	South West	Central West	
Pandemic (H1N1) 2009	3	5	21	50	57	71	25	232
Influenza A (Not Subtyped)	3	6	7	53	38	44	15	166
Influenza A (Seasonal H1/H3)	0	0	0	0	0	0	0	0
Influenza A (Indeterminate pH1N1/ unsubtypeable)	0	0	0	0	0	0	0	0
Influenza B	0	0	0	0	0	0	0	0
Influenza A & B	0	0	0	0	0	0	0	0
Total new cases	6	11	28	103	95	115	40	398
Institutional outbreaks of pandemic (H1N1) 2009 ‡	0	0	0	0	0	0	0	0
Institutional outbreaks of Influenza (Other Subtypes/Not Subtyped)‡	0	0	0	0	0	0	0	0

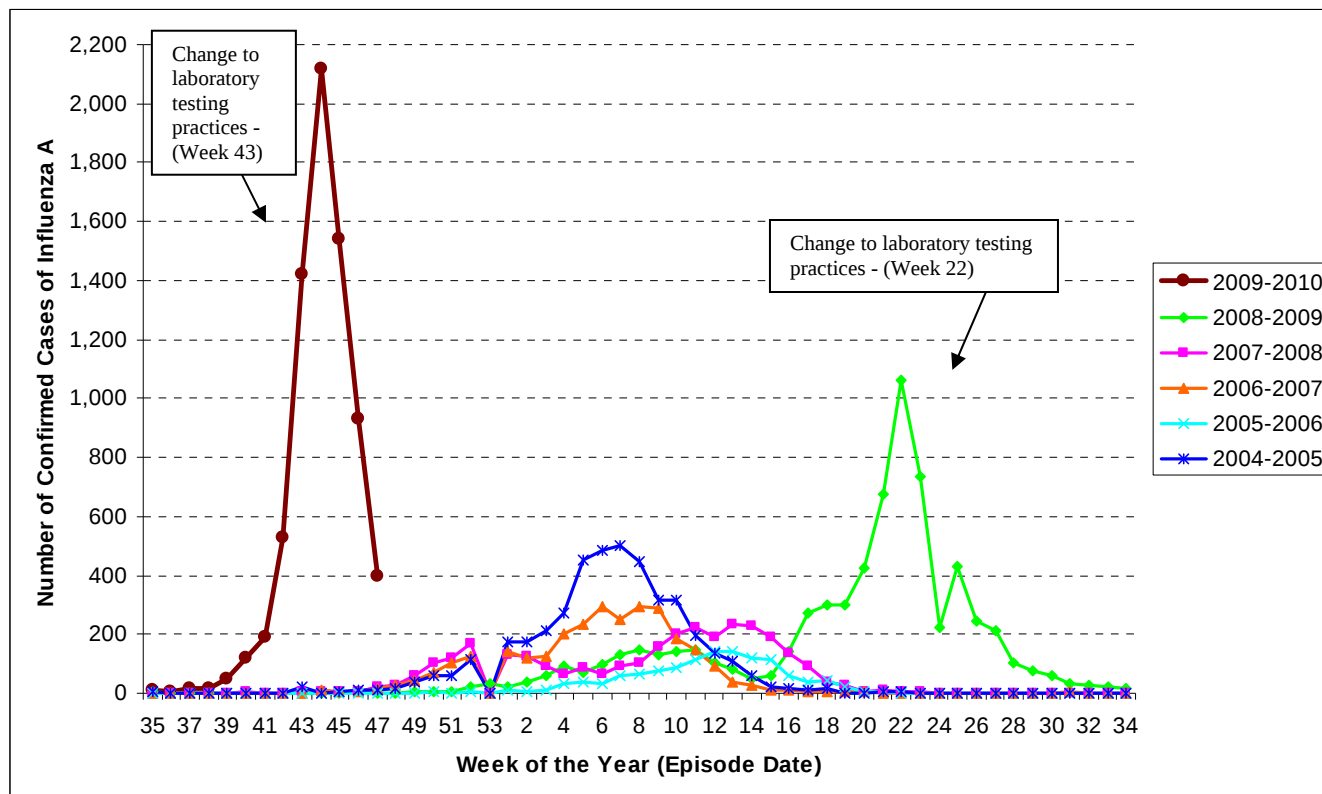
SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

* Includes reports of confirmed influenza through iPHIS, as well as cases in institutional outbreaks, with dates of onset for the first case in the surveillance period.

‡ Confirmed outbreaks in institutions with onset date of symptoms during the surveillance period.

The number of laboratory confirmed cases of influenza A reported to date in the 2009-2010 season is much higher than in the previous five seasons at this time (Figure 1). The number of influenza A cases reported during the second wave began to increase in early September, with a maximum number of cases reported in week 44 (November 1 -7). The number of cases reported in each of weeks 43-45 in the second wave of the pandemic was higher than the maximum for any week observed in the first wave. The maximum case volume observed to date in the 2009-2010 season has exceeded the maximum case volume in all of the past five influenza seasons.

Figure 1: All confirmed cases of Influenza A in Ontario by week, 2004-2010^{†*}



SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

[†] Episode Date for a case corresponds to the earliest date on record for the case according to the iPHIS hierarchy (Symptom Date > Clinical Diagnosis Date > Specimen Collection Date > Lab Test Date > Reported Date)

Table 2: Laboratory confirmed cases of pandemic (H1N1) 2009 virus by health unit & health region, reported during Week 47[†], 2009-10, wave two, wave one, and cumulative* confirmed cases between April 1, 2009 – November 28, 2009

Region	Health Unit	Confirmed pH1N1			
		Current week (WK 47)	Wave 2 (WK 35-current)	Wave 1 (WK 15-WK 34)	Total cumulative
North West	Northwestern	2	72	74	146
	Thunder Bay District	1	86	10	96
	TOTAL NORTH WEST	3	158	84	242
North East	Algoma	0	53	6	59
	North Bay Parry Sound District	3	47	7	54
	Porcupine	1	105	4	109
	Sudbury & District	1	43	24	67
	Timiskaming	0	53	0	53
	TOTAL NORTH EAST	5	301	41	342
Eastern	City of Ottawa	12	407	359	766
	Eastern Ontario	3	171	25	196
	Hastings & Prince Edward Counties	0	76	4	80
	Kingston, Frontenac, Lennox & Addington	5	146	15	161
	Leeds, Grenville And Lanark District	1	92	10	102
	Renfrew County And District	0	37	12	49
	TOTAL EASTERN	21	929	425	1,354
Central East	Durham Region	n/a	146	124	270
	Haliburton, Kawartha, Pine Ridge	5	42	13	55
	Peel Region	32	350	704	1,054
	Peterborough County-City	n/a	42	4	46
	Simcoe Muskoka District	5	126	64	190
	York Region	8	197	494	691
	TOTAL CENTRAL EAST	50	903	1,403	2,306
Toronto	Toronto	57	798	1,591	2,389
	TOTAL TORONTO	57	798	1,591	2,389
South West	Chatham-Kent	7	32	6	38
	Elgin-St. Thomas	0	20	0	20
	Grey Bruce	7	32	12	44
	Huron County	4	23	2	25
	Lambton County	3	54	1	55
	Middlesex-London	5	195	28	223
	Oxford County	3	61	3	64
	Perth District	5	33	3	36
	Windsor-Essex County	37	135	49	184
	TOTAL SOUTHWEST	71	585	104	689
Central West	Brant County	4	22	8	30
	City Of Hamilton	3	206	124	330
	Haldimand-Norfolk	0	0	6	6
	Halton Region	9	163	219	382
	Niagara Region	6	221	20	241
	Waterloo Region	0	114	38	152
	Wellington-Dufferin-Guelph	3	43	26	69
	TOTAL CENTRAL WEST	25	769	441	1,210
	Out of Province	0	0	6	6
	TOTAL ONTARIO	232	4,443	4,095	8,538

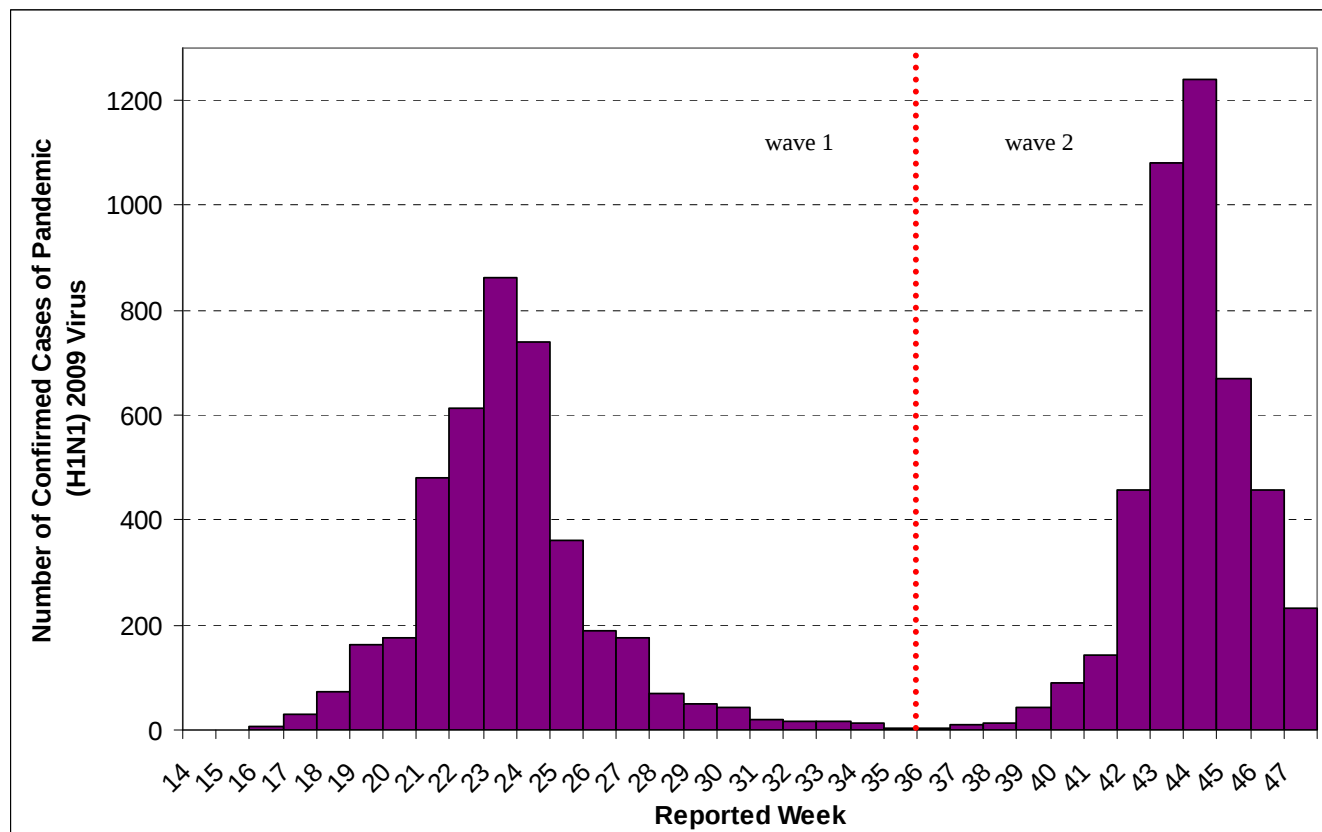
SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

[†] Reported date corresponds to the date pandemic (H1N1) 2009 was reported to the health unit

* Cumulative case counts include late reports and records that are otherwise reconciled. Therefore, cumulative counts may not equal new cases plus previous cumulative value.

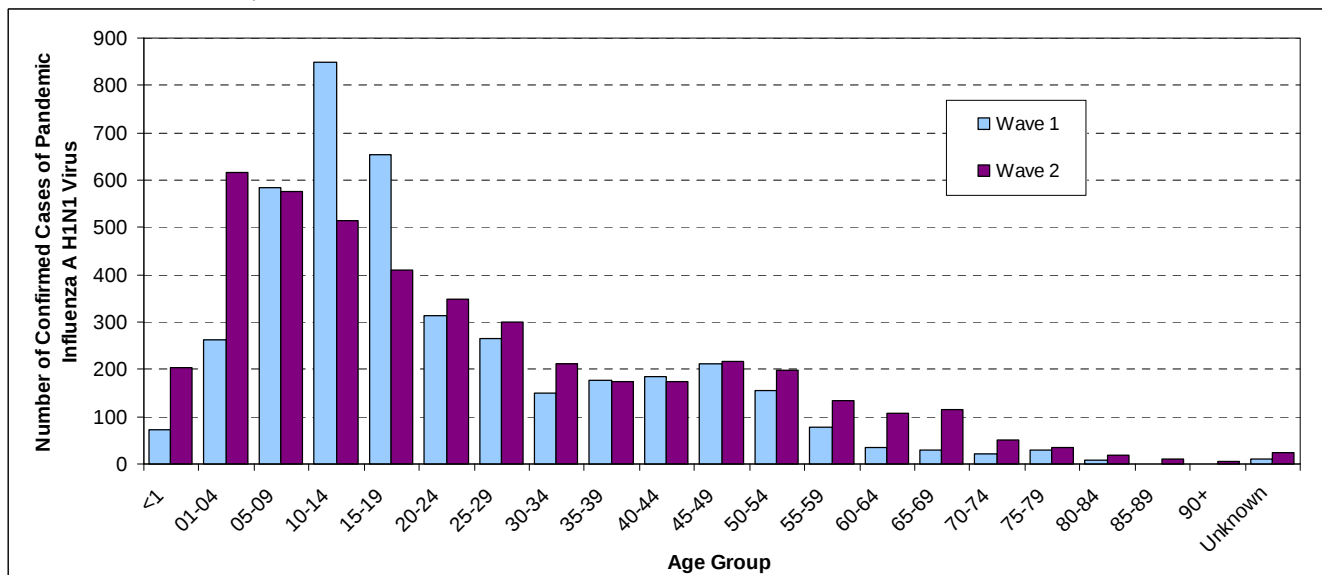
Note: Wave 1 corresponds to April 12, 2009 to August 29, 2009; Wave 2 corresponds to August 30, 2009 to the last date of the current week.

Figure 2: Laboratory confirmed cases of pandemic (H1N1) 2009 in Ontario by week between April 13 and November 28, 2009



SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

Figure 3: Laboratory confirmed cases of pandemic (H1N1) 2009 in Ontario by age group and wave between April 13 and November 28, 2009



SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

Table 3: Confirmed cases of influenza by health unit & health region, excluding laboratory confirmed pandemic (H1N1) 2009, with an episode date[†] during Week 47, 2009-10

Region	Health Unit	Confirmed Influenza				
		Influenza A (Not Subtyped)	Influenza A [‡] (Other subtypes)	Influenza A & B	Influenza B	TOTAL
North West	Northwestern	0	0	0	0	0
	Thunder Bay District	3	0	0	0	3
	TOTAL NORTH WEST	3	0	0	0	3
North East	Algoma	0	0	0	0	0
	North Bay Parry Sound District	1	0	0	0	1
	Porcupine	2	0	0	0	2
	Sudbury & District	3	0	0	0	3
	Timiskaming	0	0	0	0	0
	TOTAL NORTH EAST	6	0	0	0	6
Eastern	City of Ottawa	0	0	0	0	0
	Eastern Ontario	0	0	0	0	0
	Hastings & Prince Edward Counties	1	0	0	0	1
	Kingston, Frontenac, Lennox & Addington	5	0	0	0	5
	Leeds, Grenville And Lanark District	1	0	0	0	1
	Renfrew County And District	0	0	0	0	0
	TOTAL EASTERN	7	0	0	0	7
Central East	Durham Region	5	0	0	0	5
	Haliburton, Kawartha, Pine Ridge	0	0	0	0	0
	Peel Region	25	0	0	0	25
	Peterborough County-City	0	0	0	0	0
	Simcoe Muskoka District	7	0	0	0	7
	York Region	16	0	0	0	16
	TOTAL CENTRAL EAST	53	0	0	0	53
Toronto	Toronto	38	0	0	0	38
	TOTAL TORONTO	38	0	0	0	38
South West	Chatham-Kent	1	0	0	0	1
	Elgin-St. Thomas	0	0	0	0	0
	Grey Bruce	16	0	0	0	16
	Huron County	2	0	0	0	2
	Lambton County	1	0	0	0	1
	Middlesex-London	7	0	0	0	7
	Oxford County	2	0	0	0	2
	Perth District	2	0	0	0	2
	Windsor-Essex County	13	0	0	0	13
	TOTAL SOUTHWEST	44	0	0	0	45
Central West	Brant County	0	0	0	0	0
	City Of Hamilton	4	0	0	0	4
	Haldimand-Norfolk	2	0	0	0	2
	Halton Region	6	0	0	0	6
	Niagara Region	2	0	0	0	2
	Waterloo Region	0	0	0	0	0
	Wellington-Dufferin-Guelph	1	0	0	0	1
	TOTAL CENTRAL WEST	15	0	0	0	15
	TOTAL ONTARIO	166	0	0	0	166

SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

[†] Episode Date for a case corresponds to the earliest date on record for the case according to the iPHIS hierarchy (Symptom Date > Clinical Diagnosis Date > Specimen Collection Date > Lab Test Date > Reported Date)

[‡]includes seasonal H1/H3 and Influenza A indeterminate pH1N1 and unsubtypeable

Table 4: Cumulative* confirmed cases of influenza by health unit & health region, excluding laboratory confirmed pandemic (H1N1) 2009, with an episode date[†] between September 1, 2009 – November 28, 2009

Region	Health Unit	Confirmed Influenza				
		Influenza A (Not Subtyped)	Influenza A [‡] (Other subtypes)	Influenza A & B	Influenza B	TOTAL
North West	Northwestern	1	0	0	0	1
	Thunder Bay District	72	2	0	0	74
	TOTAL NORTH WEST	73	2	0	0	75
North East	Algoma	54	0	0	0	54
	North Bay Parry Sound District	59	3	0	0	62
	Porcupine	48	7	0	0	55
	Sudbury & District	74	1	0	0	75
	Timiskaming	9	1	0	0	10
	TOTAL NORTH EAST	244	12	0	0	256
Eastern	City of Ottawa	8	0	0	0	8
	Eastern Ontario	19	0	0	0	19
	Hastings & Prince Edward Counties	36	0	0	0	36
	Kingston, Frontenac, Lennox & Addington	35	0	0	0	35
	Leeds, Grenville And Lanark District	19	0	0	0	19
	Renfrew County And District	14	1	0	0	15
	TOTAL EASTERN	131	1	0	0	132
Central East	Durham Region	91	5	0	0	96
	Haliburton, Kawartha, Pine Ridge	37	2	0	0	39
	Peel Region	275	2	0	2	279
	Peterborough County-City	33	3	0	0	36
	Simcoe Muskoka District	150	1	0	0	151
	York Region	165	0	0	0	165
	TOTAL CENTRAL EAST	751	13	0	2	766
Toronto	Toronto	371	11	0	1	383
	TOTAL TORONTO	371	11	0	1	383
South West	Chatham-Kent	29	0	0	0	29
	Elgin-St. Thomas	25		0	0	25
	Grey Bruce	86	0	0	0	86
	Huron County	29	0	0	0	29
	Lambton County	22		0	0	22
	Middlesex-London	125	3	0	0	128
	Oxford County	24	5	0	0	29
	Perth District	17	0	0	2	19
	Windsor-Essex County	238	0	0	0	238
	TOTAL SOUTHWEST	595	8	0	2	605
Central West	Brant County	29	0	0	0	29
	City Of Hamilton	209	0	0	1	210
	Haldimand-Norfolk	25	0	0	0	25
	Halton Region	132	2	0	0	134
	Niagara Region	117	7	0	1	125
	Waterloo Region	122	1	0	0	123
	Wellington-Dufferin-Guelph	54	0	0	1	55
	TOTAL CENTRAL WEST	688	10	0	3	701
	TOTAL ONTARIO	2853	57	0	8	2918

SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009].

* Cumulative case counts include late reports and records that are otherwise reconciled. Therefore, cumulative counts may not equal new cases plus previous cumulative value.

† Episode Date for a case corresponds to the earliest date on record for the case according to the iPHIS hierarchy (Symptom Date > Clinical Diagnosis Date > Specimen Collection Date > Lab Test Date > Reported Date)

[‡]includes seasonal H1/H3 and Influenza A indeterminate pH1N1 and unsubtypeable

Deaths among pandemic (H1N1) 2009 virus cases, April 13 – December 2, 2009

A total of 104 deaths have been reported since April, with 24% (25) reported in wave 1 and 76% (79) in wave 2. Of the reported deaths, 77% (80) were hospitalized prior to death. Overall, cases that died ranged in age from 0 to 95 years and had a mean and median age of 52 and 55 years, respectively. Women accounted for slightly less than half of all cases that have died, with 42% of deaths occurring among women.

Mortality due to pH1N1 increased with increasing age; people in the 45-64 and in the 65 and older age groups accounted for the highest mortality rates. These rates were higher than the overall provincial rate. A similar trend was observed for both waves one and two.

The mean and median days from symptom onset to death were 20.6 and 14 days, respectively, in Wave 1. The mean and median days from symptom onset to death were 10.7 and 9 days, respectively, in Wave 2. Among the 104 confirmed cases that have died, 74 (71%) had underlying chronic medical conditions reported, compared to 88% (22) of wave 1 cases and 66% (52) of wave 2 cases. Reporting of underlying chronic medical conditions may be incomplete for wave 2 cases due to backlogs in data entry.

Hospitalizations among pandemic (H1N1) 2009 virus cases, April 13 – December 2, 2009

A total of 1,656 hospitalizations have been reported, with 23% (384) reported in wave 1 and 77% (1,272) reported in wave 2. The cumulative hospitalization rate of pH1N1 related hospitalizations is 12.8 hospitalizations per 100,000 population. In general, the hospitalization rate of pH1N1 cases decreased with increasing age, with persons in the three youngest age ranges (under 15 years) accounting for the highest hospitalization rates. Persons aged 15 years and older had the lowest hospitalization rates which were all below the overall provincial hospitalization rate for pH1N1. A similar trend was observed for wave one and wave two cases. Hospitalized cases under the age of 20 years account for 47% of hospitalized cases in wave 1 and 44% of hospitalized cases in wave 2.

Admission to ICU and/or use of a ventilator was reported for 21% (80) of wave one cases and 18% (224) of wave 2 cases; Overall, 18% (304) of hospitalizations have been admitted to ICU and/or placed on a ventilator. Fever, cough, shortness of breath, vomiting, malaise, myalgia and sore throat/difficulty swallowing have been the most commonly reported symptoms among hospitalized cases. The mean and median days from symptom onset to hospitalization were 2.7 and 2 days, respectively, in Wave 1. The mean and median days from symptom onset to hospitalization were 2.0 and 2 days, respectively, in Wave 2.

Table 5. Overview of key surveillance indicators among fatal and hospitalized cases in Ontario*

Surveillance Indicators	Wave 2 (Sep 1 – Dec 2, 2009)	Wave 1 (Apr - Aug 31, 2009)	Total (Apr - Dec 2, 2009)
Number of deaths	79 (76%)	25 (24%)	104 (100%)
Number of hospitalizations	1272 (77%)	384 (23%)	1,656 (100%)
Hospitalization status			
Discharged	84% (1071)	98% (376)	85% (1,447)
Currently hospitalized	16% (201)	2% (8)	15% (209)
Length of hospital stay (days)			
Mean	3	7	6
Median	3	4	3
Range	0-106	0-127	0-127

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted at 8:30 am [02/12/2009]

* **Note:** Cases that were hospitalized or that have died are not mutually exclusive.

* 24 fatal cases were not hospitalized before death; Mean and Median LOS excludes those outside of the 95th percentile.

Table 6. Hospitalizations among confirmed cases of pandemic (H1N1) 2009 in Ontario, April 13 – December 2, 2009

Hospitalization Status	Ventilator and/or ICU	Not in ICU and not on ventilator	Number of cases hospitalized to date
Number Currently Hospitalized	80 (38%)	129 (62%)	209 (100%)
Number Hospitalized and Discharged	224 (15%)	1223 (85%)	1447 (100%)
Total Hospitalized to date	304 (18%)	1352 (82%)	1656 (100%)

Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted at 8:30 am [02/12/2009]

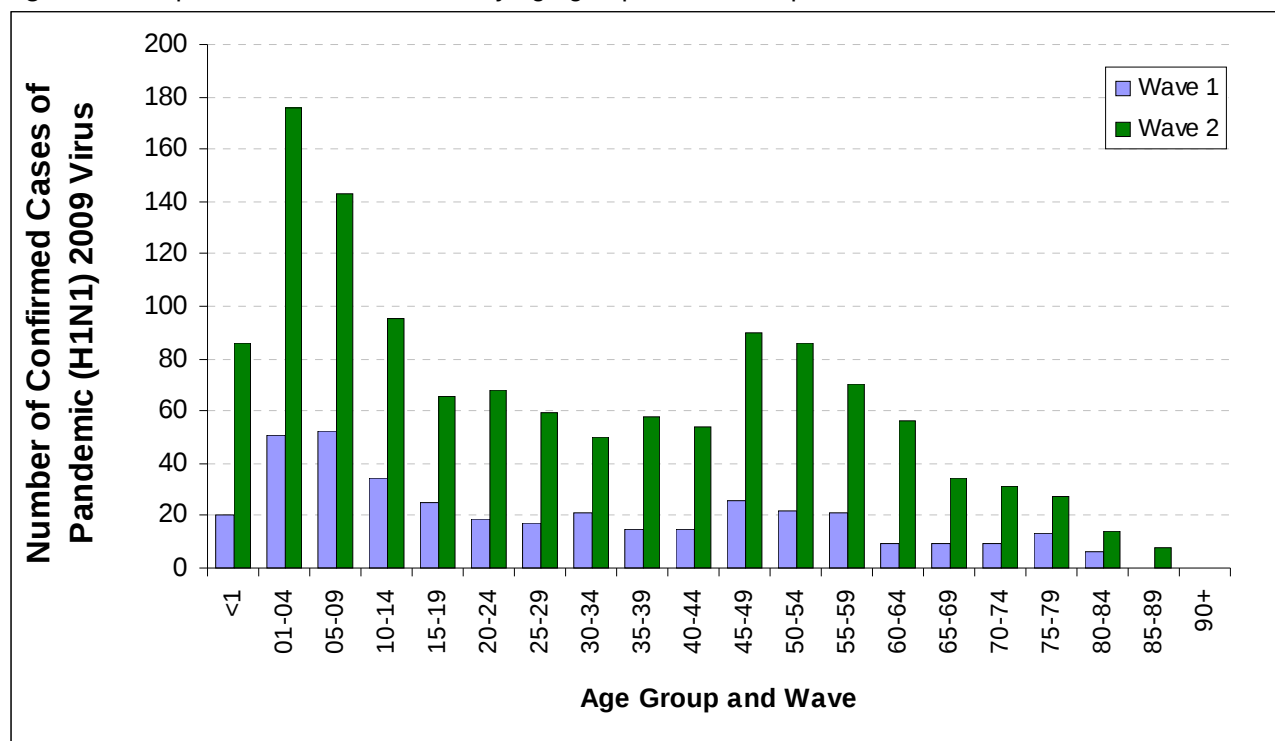
Table 7. Incidence of hospitalization and death due to pandemic H1N1 2009 in Ontario, April 13 – December 2, 2009

Age Group	Hospitalizations	Rate/100,000	Deaths	Rate/100,000
<1	106	79.11	1	0.75
1-4	227	41.56	0	0.00
5-14	324	20.99	5	0.32
15-24	178	10.18	8	0.46
25-44	289	7.72	17	0.45
45-64	380	10.94	45	1.30
65+	151	8.74	28	1.62
TOTAL	1655	12.81	104	0.80

Source (incidence): Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted at 8:30 am [02/12/2009]

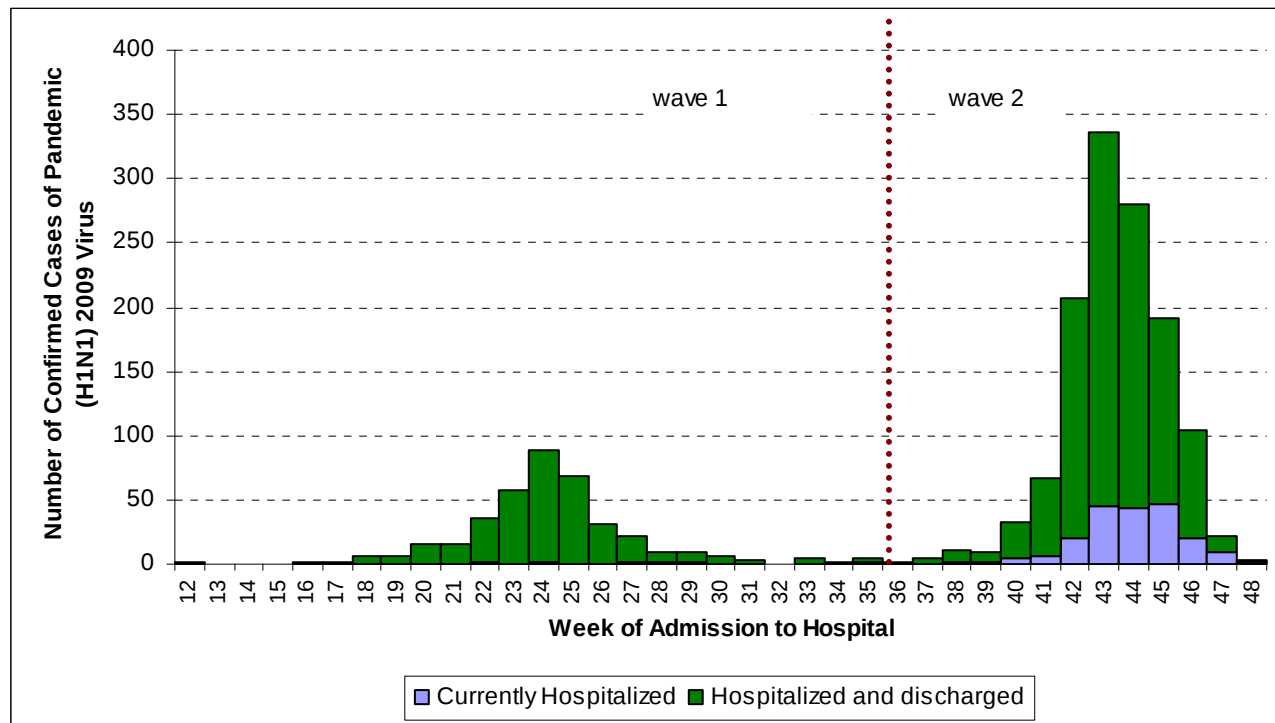
Source (incidence): Ontario population projections for 2008: Ontario Ministry of Health and Long-Term Care, Public Health Planning Database (PHPDB), extracted [12/02/2009]

Figure 4: Hospitalized cases in Ontario by age group and wave, April 13 to December 2, 2009



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted at 8:30 am [02/12/2009]

Figure 5: Hospitalized cases of pandemic (H1N1) 2009 by hospital admission week in Ontario, April 13 – December 2, 2009*



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted at 8:30 am [02/12/2009]

Note: Interpret tail with caution due to reporting lags, changes in lab testing, case identification and data entry.

Influenza Subtype(s):

During week 47, a total of 7928 results of isolate testing were received by the Public Health Agency of Canada, with 1915 testing positive for influenza A and none positive for influenza B. 774 of the reported influenza A isolates were from Quebec (40.4%), 377 were from Manitoba (19.7%), 188 were from Manitoba (9.8%), and 187 were from Ontario (9.8%). Quebec also reported 1 seasonal H3 isolate for week 47*

(Antigenic Characterization and Antiviral Resistance data are current as of December 3, 2009)

Antigenic Characterization (National):

Since September 1, 2009, National Microbiology Laboratory (NML) has antigenically characterized 374 pandemic H1N1 viruses and five seasonal influenza viruses (two A/H1N1, two H3N2 and one B virus) that were received from Canadian laboratories.

Pandemic Influenza A (H1N1):

Among the 374 pandemic influenza A (H1N1) viruses characterized, 372 (99.5%) were antigenically related to A/California/7/2009, which is the pandemic reference virus selected by WHO as a potential candidate for 2009 influenza A (H1N1) vaccine. Two viruses (0.5%) tested showed reduced titer with antisera produced against A/California/7/09. Sequence analysis showed that the two viruses with reduced titer did not have the mutation at amino acid position 222 as reported by Norway.

CDC also reported that of the 348 pandemic H1N1 viruses tested, one virus showed reduced titer with antisera produced against A/California/7/09.

Seasonal Influenza A (H1N1):

Two seasonal influenza A/H1N1 viruses characterized were related to A/Brisbane/59/07, which is the influenza A/H1N1 component for the 2009-10 influenza vaccine.

Seasonal Influenza A (H3N2):

Of the two H3N2 viruses, one seasonal influenza A (H3N2) virus characterized was related to A/Brisbane/10/07, which is the influenza A/H3N2 component recommended for the 2009-10 influenza vaccine. One virus was antigenically related to A/Perth/16/09, which is the WHO recommended influenza A (H3N2) component for the 2010 Southern Hemisphere vaccine.

Influenza B:

The one influenza B virus characterized was antigenically related to B/Brisbane/60/08, which is the influenza B component for the 2009-10 influenza vaccine.

Antigenic Characterization (Provincial):

The National Microbiology Laboratory (NML) has antigenically characterized the following strains from Ontario: 206 influenza A/California/07/2009-like and 1 influenza B/Brisbane/60/2008-like.

Antiviral Resistance and Sensitivity (National):

a) Amantadine:

Ten seasonal influenza A viruses (two H1N1 and eight H3N2) and 369 pandemic H1N1 viruses were tested for resistance to amantadine and found that one H1N1 virus, all eight H3N2 viruses and all 369 pandemic H1N1 viruses were resistant. One seasonal H1N1 virus was sensitive to amantadine.

b) Oseltamivir:

Five seasonal influenza viruses (two H1N1, two H3N2 and one B) and 361 pandemic H1N1 viruses were tested for resistance to oseltamivir and found that two seasonal H1N1 isolates were resistant to oseltamivir. Three pH1N1 isolates were resistant to oseltamivir with the H275Y mutation. The resistance was associated with oseltamivir treatment. 358 pH1N1 isolates were sensitive to oseltamivir. The two H3N2 and B viruses were sensitive to oseltamivir.

c) Zanamivir:

Five seasonal influenza viruses (two H1N1, two H3N2 and one B) and 351 pandemic H1N1 viruses were tested for resistance to zanamivir. All five seasonal influenza viruses and all 351 pandemic H1N1 viruses were sensitive to zanamivir.

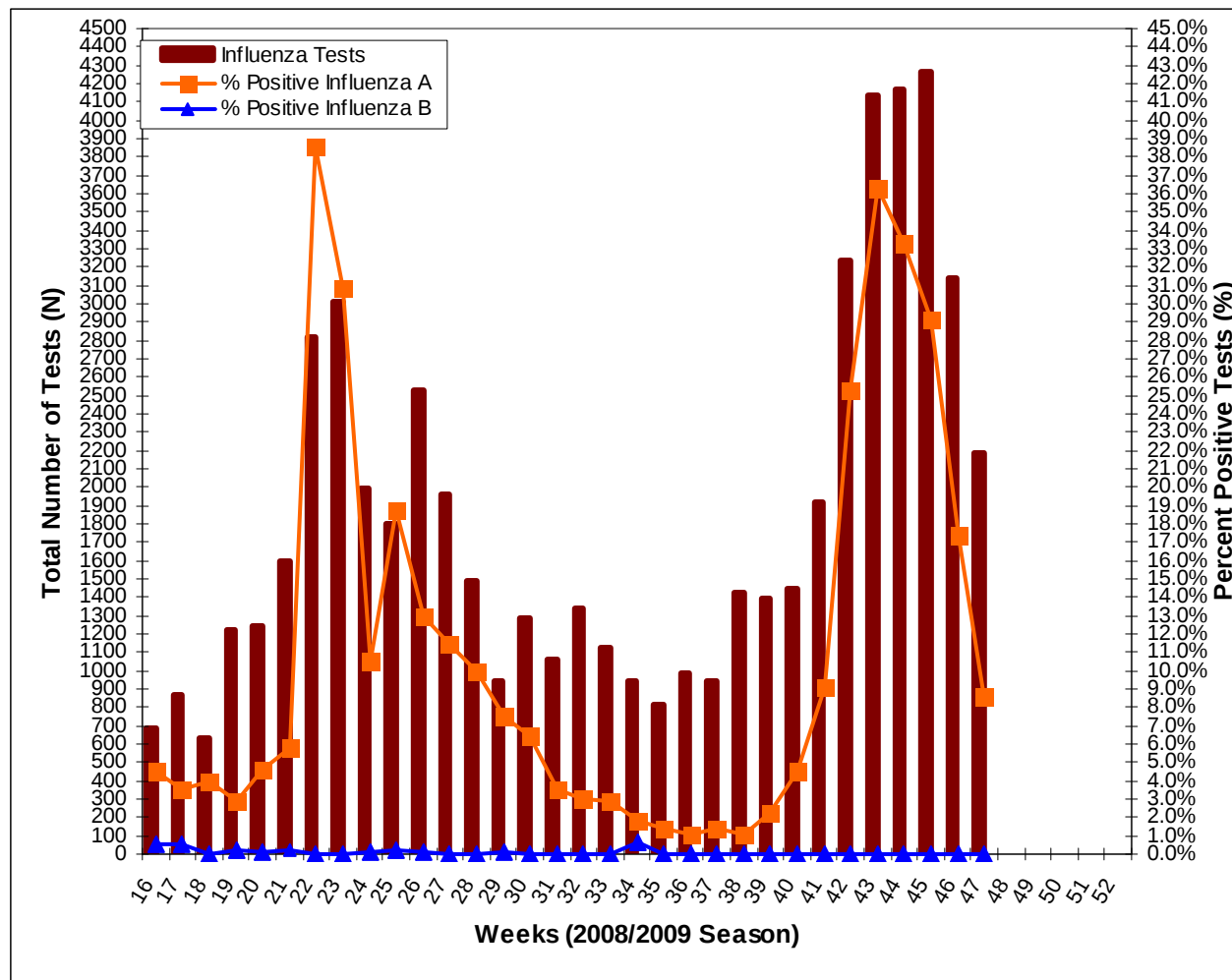
Antiviral Resistance (Provincial):

181/183 influenza pH1N1 isolates were sensitive to oseltamivir (note that the two resistant isolates were obtained from the same patient), 180 of 180 tested were sensitive to zanamivir, and 184 of 184 tested were resistant to amantadine. The influenza B isolate was sensitive to oseltamivir and zanamivir. The one H3N2 isolate was also resistant to amantadine.[†]

* These data have been obtained from the Respiratory Virus Detection tables of Public Health Agency of Canada and do not include data from late reports to PHAC: Week 47, 2009. Please note that the last version received from PHAC as of 4:00PM on December 3, 2009 was used.

[†] These data have been obtained from the National Microbiology Laboratory of the Public Health Agency of Canada for Week 47, 2009.

Figure 6: Total number of influenza tests performed and percent of positive tests in Ontario reported to the Centre for Immunization and Respiratory Infectious Diseases (CIRID), by report week*.

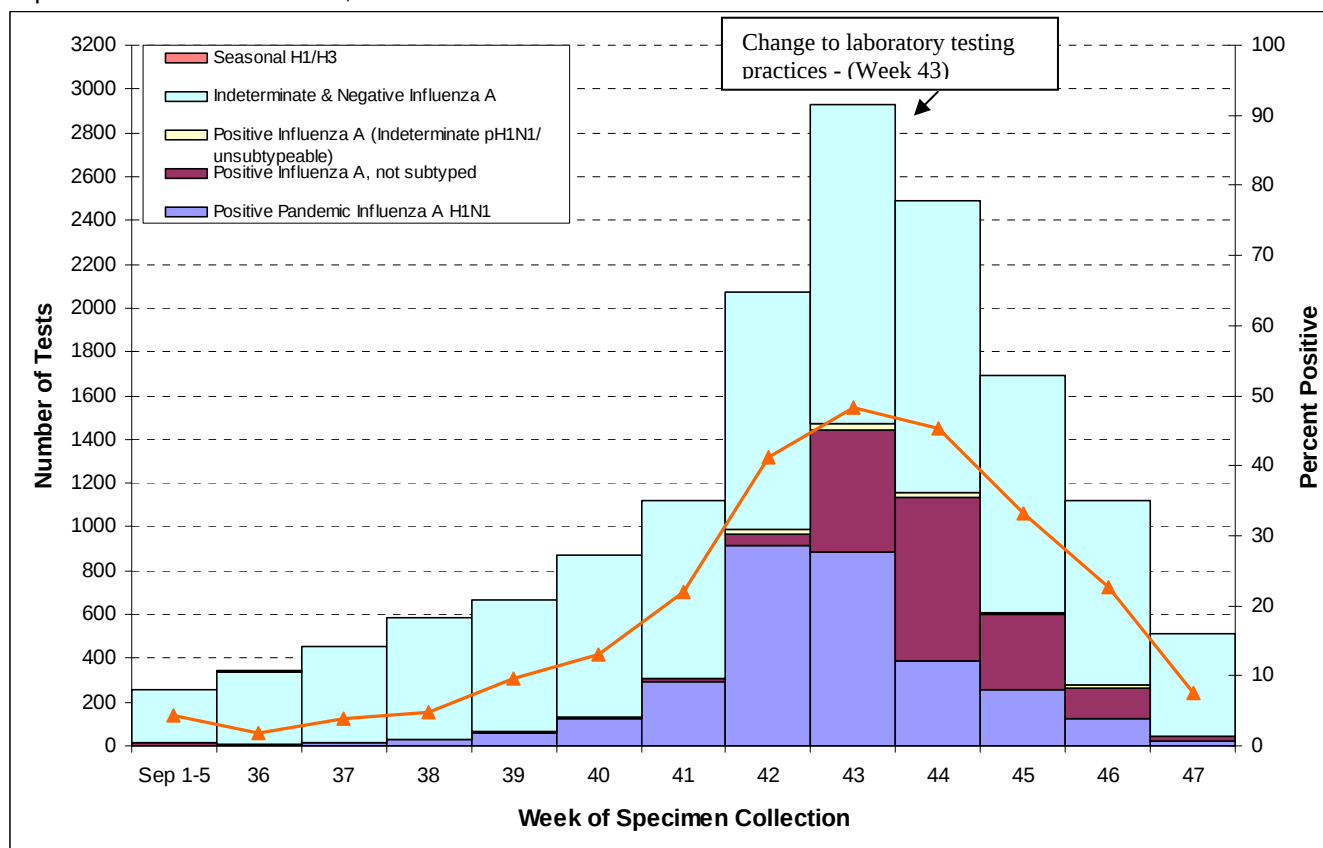


Source: Public Health Agency of Canada. These data have been obtained from the Respiratory Virus Detection tables of Public Health Agency of Canada from 17 labs in Ontario and do not include data from late reports to PHAC for the current season: Week 47, 2009. Please note that the last version received from PHAC as of 4:00PM on December 3, 2009 was used.

* Total numbers reported include late reports from previous seasons; therefore totals may not be equal to the sum of the weekly numbers.

Note: Cumulative numbers for season to date are available through FluWatch: <http://www.phac-aspc.gc.ca/fluwatch/>

Figure 6a: Total number of influenza tests performed and percent of positive tests in Ontario conducted by the Ontario Agency for Health Protection and Promotion Laboratory – Toronto, by specimen collection week September 1 – November 30, 2009



Source: Adapted from Table 1 in the "OAHPP Laboratory Pandemic H1N1 Surveillance Report"; Monday, November 30, 2009

Note: Not all cases with specimens collected during week 47 are included in this summary due to the lag in time from the date of specimen collection to the date the final test result is confirmed.

Note: Beginning on Week 43, subtyping will be only performed on 20% of influenza A positive tests, in addition to all intensive care patients and outbreak samples.

Table 8: Summary of Other Respiratory Virus Detections/Isolations in Ontario in Week 47

Organism Name	Number of Positive Tests	Number of Tests	% Positive
Respiratory Syncytial Virus	13	1107	1.17
Parainfluenza (all types)	54	1123	4.81
Adenovirus	7	1123	0.62
Human Metapneumovirus	0	306	0.00

SOURCE: These data have been obtained from the Respiratory Virus Detection tables of Public Health Agency of Canada from 17 labs in Ontario and do not include data from late reports to PHAC: Week 47, 2009. Please note that the last version received from PHAC as of 4:00PM on December 3, 2009 was used.

Table 9: Institutional respiratory infection outbreaks in Ontario: new outbreaks* in Week 47 and total outbreaks for the season**

Institutional Respiratory Infection Outbreaks		
New Outbreaks*	N	% (of outbreaks)
Influenza A (All subtypes)	0	0.0
Influenza B	0	0.0
Influenza A and B	0	0.0
Parainfluenza (All types)	0	0.0
RSV	0	0.0
Other organisms	0	0.0
No organism identified	1	100.0
TOTAL	1	100.0
Total Respiratory Infection Outbreaks of the Season to date**	N	% (of outbreaks)
Influenza A	53	26.9
Influenza B	0	0.0
Influenza A and B	0	0.0
Parainfluenza (All types)	2	1.0
RSV	2	1.0
Combined Outbreaks [†]	18	9.1
Other organisms	56	28.4
No organism identified	66	33.5
TOTAL	197	100.0
Types of Institutions – All Outbreaks **	N	% (of outbreaks)
Long-Term Care Homes	115	58.4
Hospitals	18	9.1
Retirement Homes	13	6.6
Other	8	4.1
Unknown	43	21.8
TOTAL	197	100.0
	N	% (of outbreaks)
New Outbreaks – Pandemic (H1N1) 2009*	0	0.0
Total pH1N1 2009 Infection Outbreaks of the Season to date**	41	100.0
	N	% (of outbreaks)
Types of Institutions (pH1N1 Outbreaks)		
Long-Term Care Homes	8	19.5
Hospitals	14	34.1
Retirement Homes	3	7.3
Other	3	7.3
Unknown	13	31.7
TOTAL	41	100.0

SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009]

* New outbreaks are those in which the date of onset of illness in the first case occurred and recorded through iPHIS in the current surveillance period; i.e. November 22, 2009 – November 28, 2009

** Season to date includes all outbreaks in which the date of onset of illness in the first case occurred up to Week 45. For pH1N1 note that there have been 4 outbreaks between April 13, 2009 and August 31, 2009 - 2 in LTCHs and 2 in Hospitals.

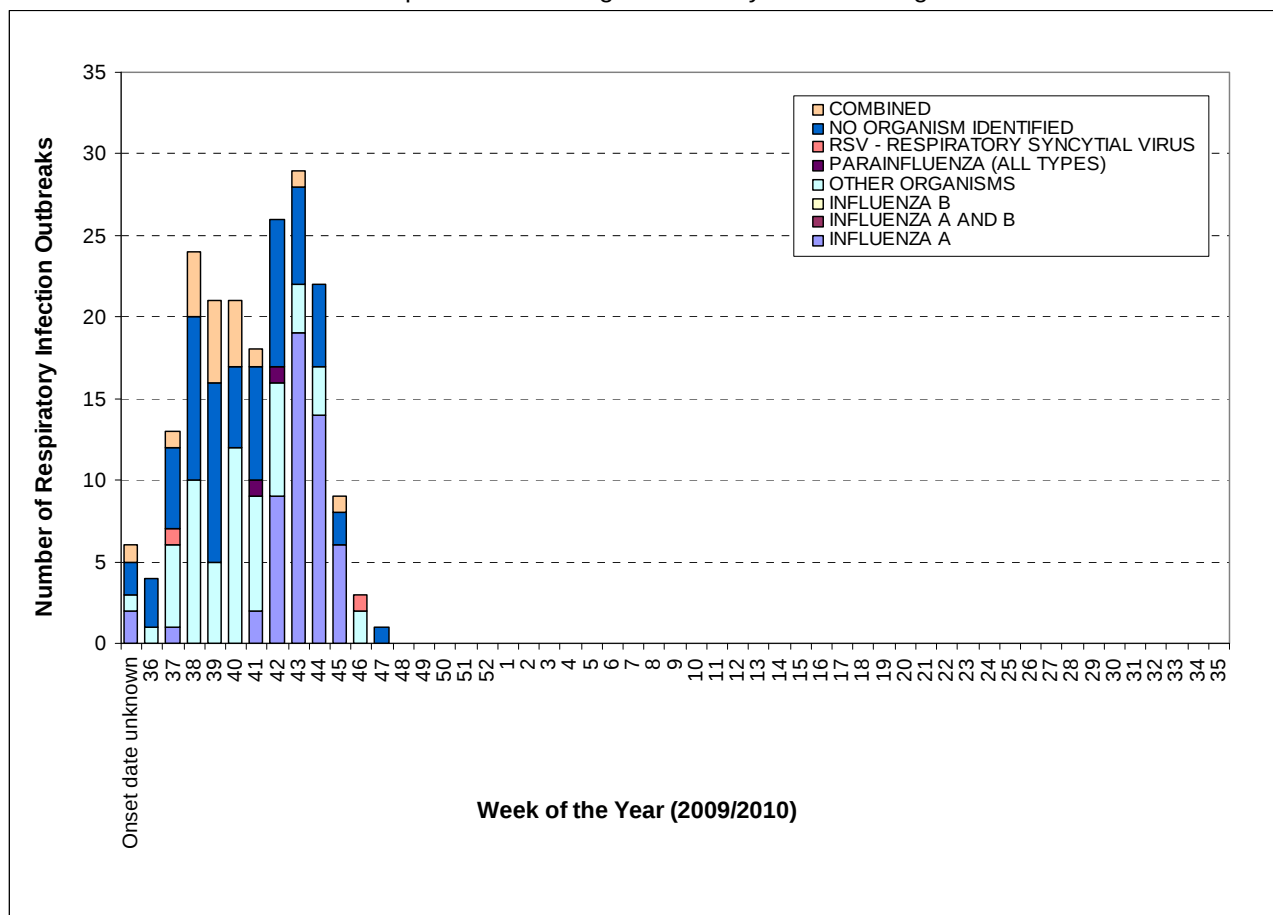
[†] Combined outbreaks include outbreaks in which more than one non-influenza organism has been identified (e.g. RSV, parainfluenza, rhinovirus, etc.)

Table 10: Outbreak Related Complications in institutional respiratory infection outbreaks in Ontario during the Surveillance Season*

Outbreak Related Cases – All Outbreaks	N	% (of total cases)
Residents	1765	64.1
Patients	139	5.0
Staff	851	30.9
Total Cases	2755	100.0
Deaths		% (of cases per role)
Residents	50	2.8
Patients	2	1.4
Staff	0	0.0
Pneumonia (Chest x-ray confirmed)		% (of cases per role)
Residents	42	2.4
Patients	9	6.5
Staff	0	0.0
Hospitalizations		% (of cases per role)
Residents	70	4.0
Staff	0	0.0
Outbreak Related Cases – All Influenza Outbreaks	N	% (of total cases)
Residents	243	52.1
Patients	61	13.1
Staff	162	34.8
Total Cases	466	100.0
Deaths		% (of cases per role)
Residents	18	7.4
Patients	1	0.0
Staff	0	0.0
Pneumonia (Chest x-ray confirmed)		% (of cases per role)
Residents	2	0.8
Patients	5	2.1
Staff	0	0.0
Hospitalizations		% (of cases per role)
Residents	19	7.8
Staff	0	0.0
Outbreak Related Cases – Pandemic (H1N1) 2009 Outbreaks	N	% (of total cases)
Residents	156	44.1
Patients	52	14.7
Staff	146	41.2
Total Cases	354	100.0
Deaths		% (of cases per role)
Residents	17	10.9
Patients	1	1.9
Staff	0	0.0
Pneumonia (Chest x-ray confirmed)		% (of cases per role)
Residents	1	0.6
Patients	5	9.6
Staff	0	0.0
Hospitalizations		% (of cases per role)
Residents	17	10.9
Staff	0	0.0

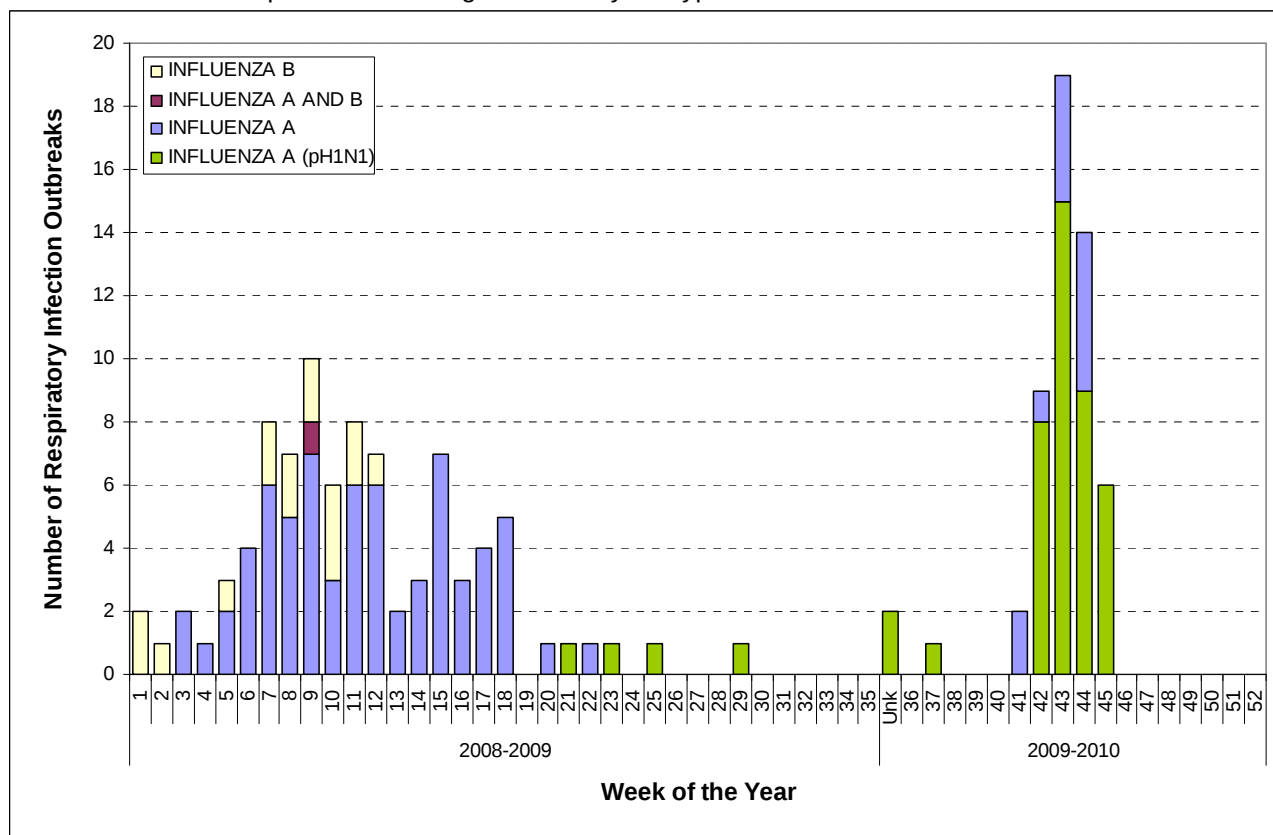
SOURCE: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009]

Figure 8: Institutional respiratory infection outbreaks in Ontario by onset of illness in the first case: Total Outbreaks up to and including Week 47 by causative organism



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009]

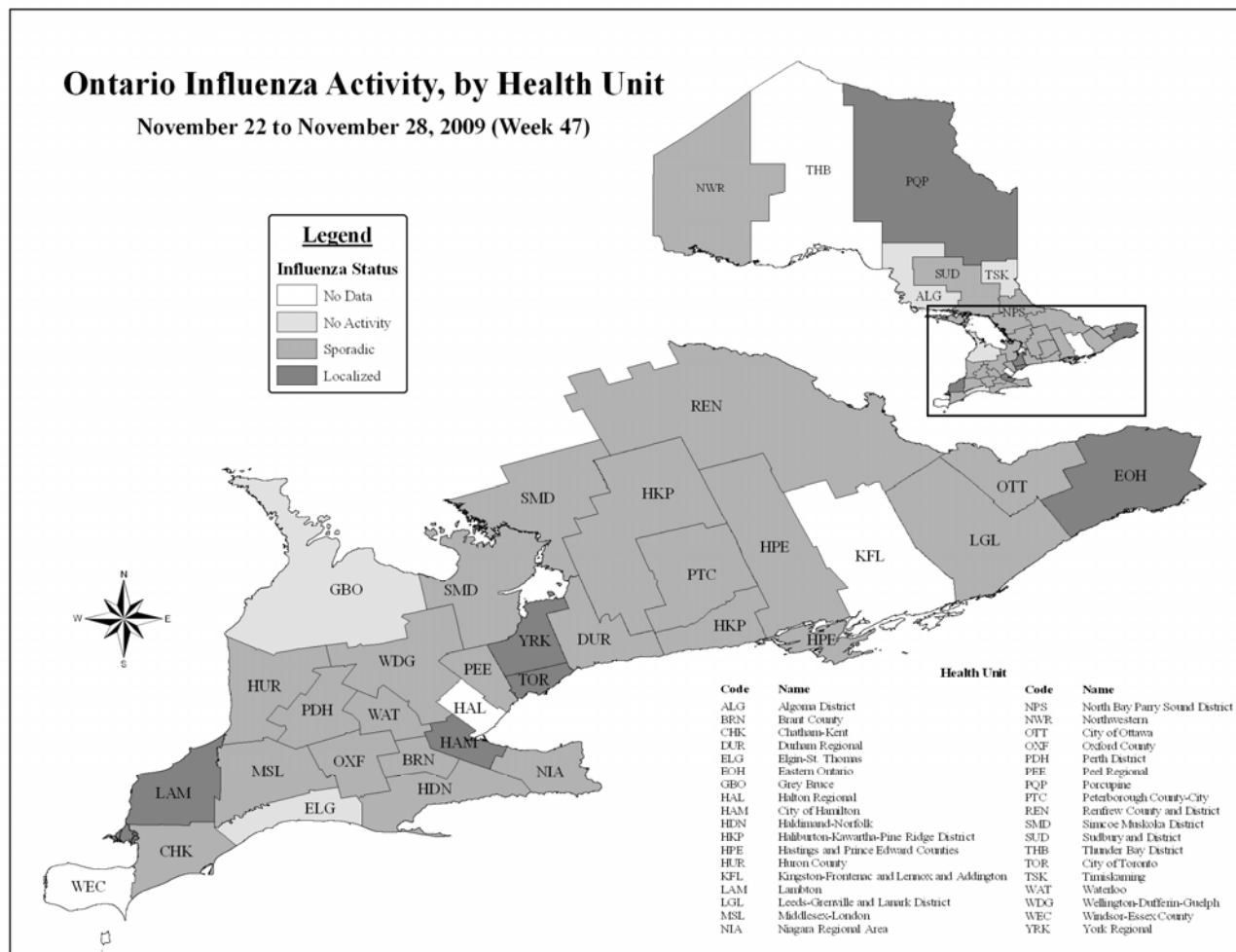
Figure 9: Institutional influenza outbreaks in Ontario by onset of illness in the first case: Total Outbreaks up to and including Week 47 by subtype*



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009]

*School outbreaks are not included in this chart.

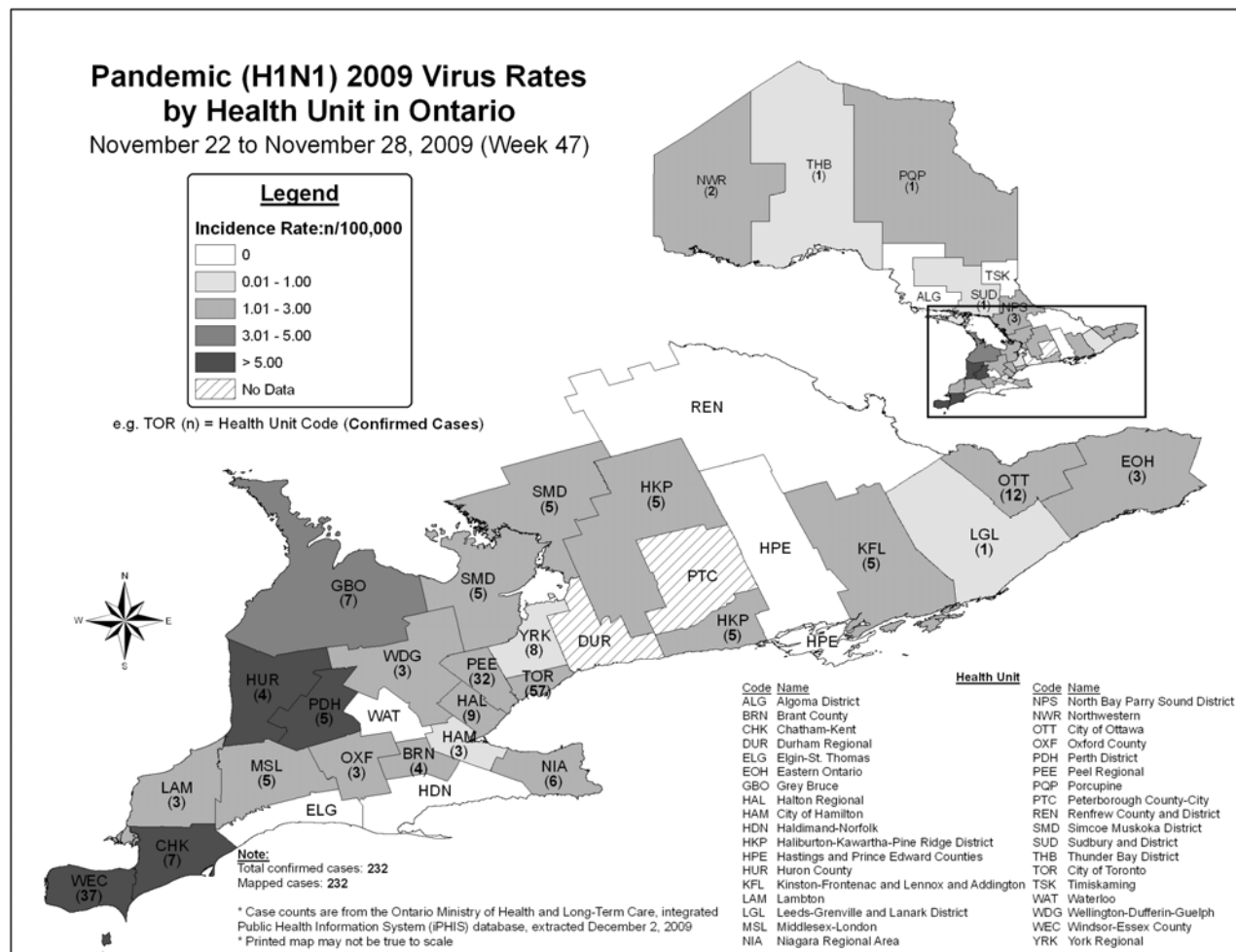
Figure 10: Influenza Activity* levels in Ontario by health unit for Week 47, 2009



SOURCE: MOHLTC [Provincial Influenza Activity Report (Appendix C) Database]

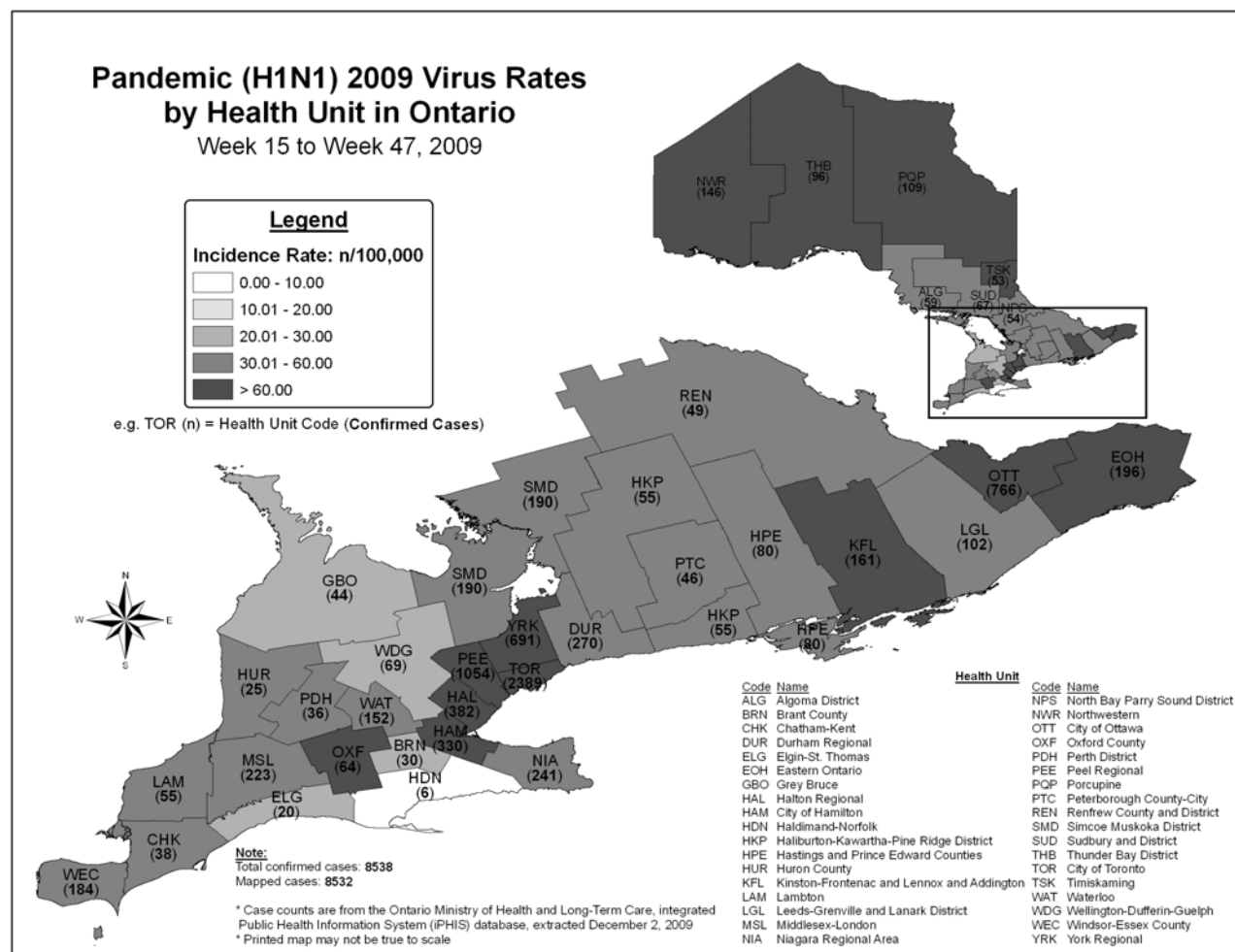
* Influenza activity levels are assigned by local public health units and reported to the MOHLTC by the Tuesday following the end of the surveillance week at 4 pm. Activity levels are assigned based on laboratory confirmations, ILI reports from various sources, and laboratory confirmed institutional outbreaks. Please refer to detailed definitions for the 2009-2010 season included in the Appendix-1]

Figure 11: Pandemic (H1N1) 2009 Virus incidence rates and counts in Ontario by health unit for Week 47, 2009



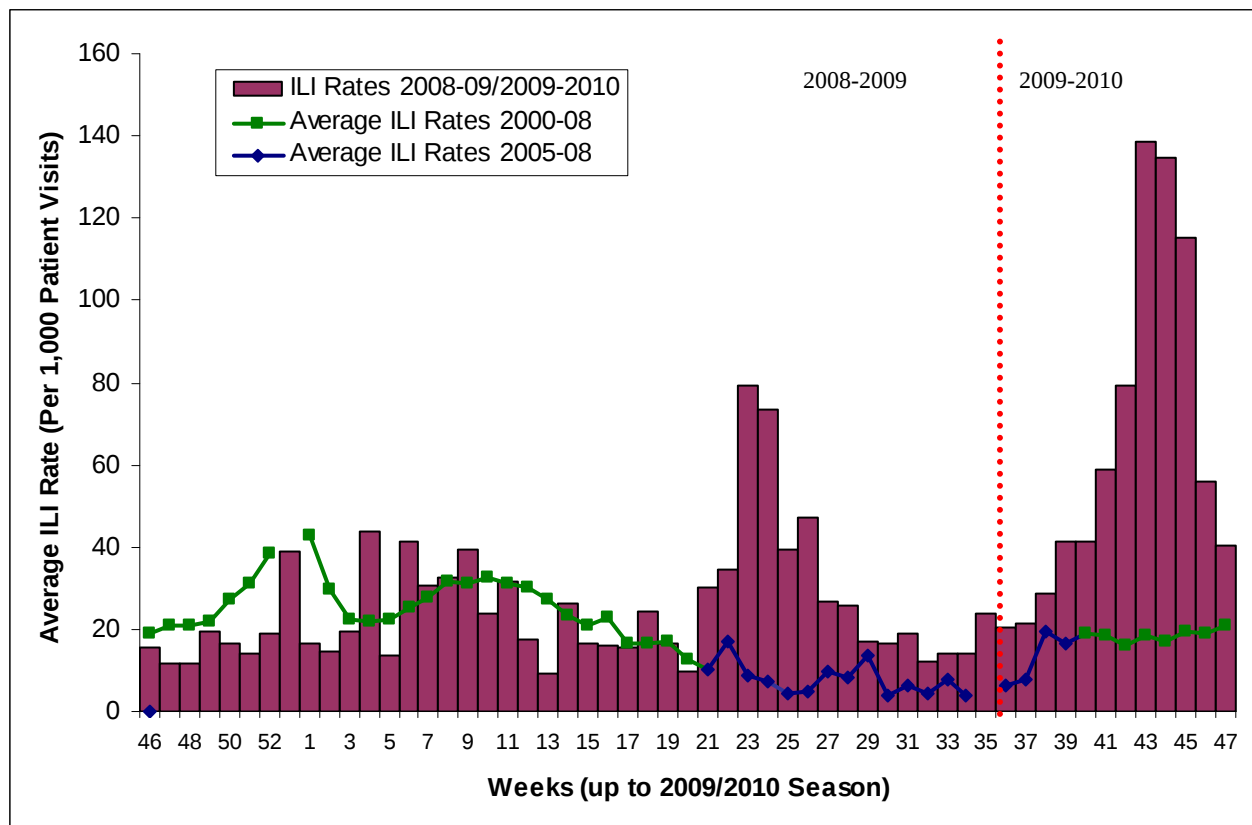
Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted [02/12/2009]

Figure 12: Pandemic (H1N1) 2009 Virus cumulative incidence rates and counts in Ontario by health unit, Week 15 – 47 (April 12 – November 28, 2009)



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (IPHIS) database, extracted [02/12/2009]

Figure 13: Average influenza-like illness (ILI) consultation rate (per 1,000 patient visits) reported by sentinel physicians* in Ontario up to the 2009-10 surveillance season, by report week, compared to Ontario average† (1999/2000 to 2007/08 seasons).



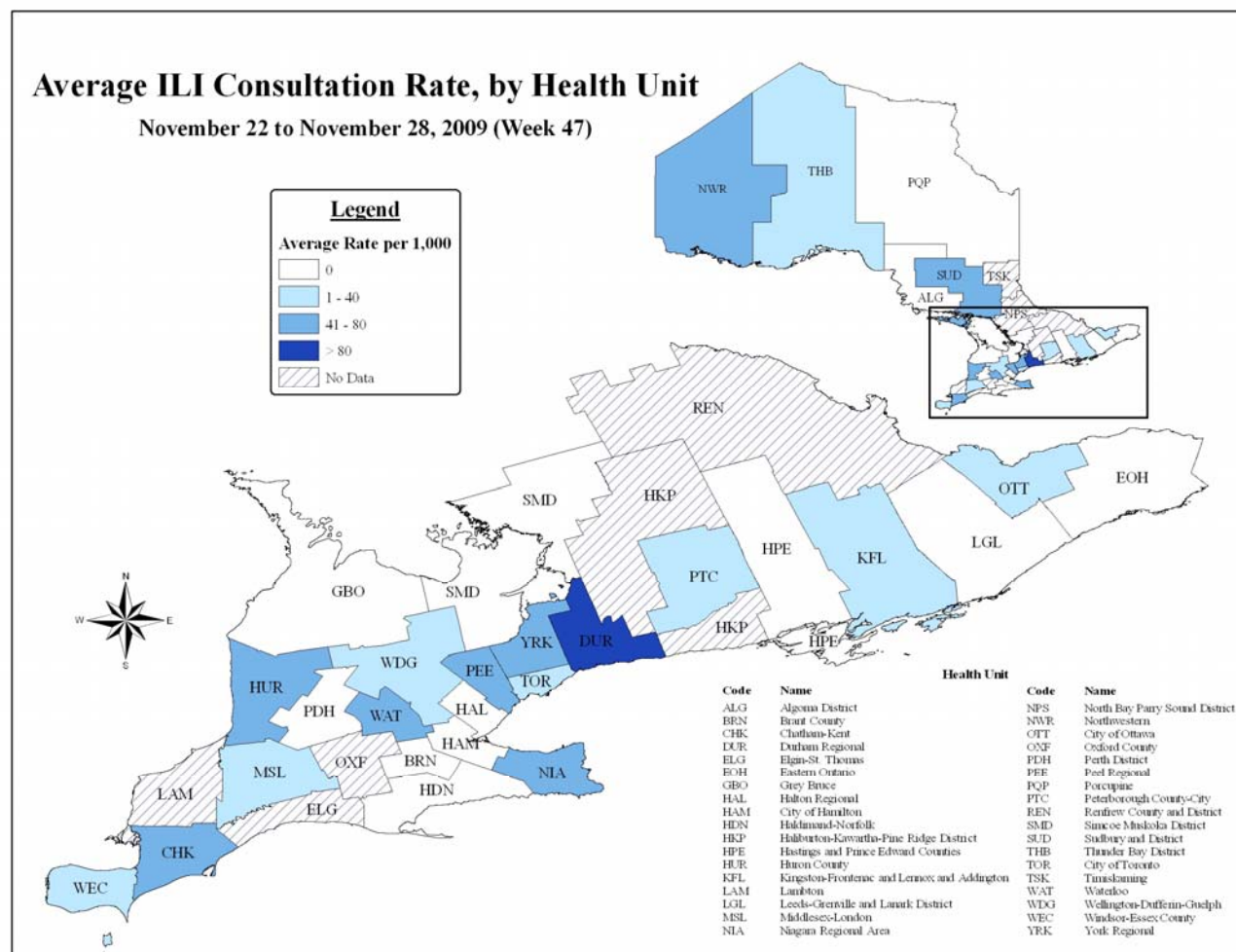
Source: Public Health Agency of Canada

* Sentinel physician information is reported to Public Health Agency of Canada, 99 sentinels reported this week.

† No data available for mean rate in previous years for weeks 21 to 39 (1999-2000 through 2004-2005 seasons). During weeks 20-39, 2002-2003/2004-2005 seasons, ILI is reported once every two weeks, on even weeks only.

Since Week 23, 2009, the number of sentinel physicians has increased, which might affect ILI rate starting from week 23.

Figure 14: Average influenza-like illness consultation rate (per 1,000 patient visits) by health unit as reported by sentinel physicians* in Ontario, for Week 47.



Source: Public Health Agency of Canada

* Sentinel physicians report ILI and patient data to the Public Health Agency of Canada; 99 sentinels reported this week of which all were matched to a health unit and represented in the above map.

Note: The small numbers of sentinel physicians reporting at the local level can make the ILI rates unstable. Please interpret these data correspondingly.

Table 11: Average influenza-like illness consultation rate (per 1,000 patient visits) by age group as reported by sentinel physicians* in Ontario, for Week 47.

Age Category	0 – 4	5 – 19	20 – 64	65 +	Unknown	TOTAL
ILI Sum	14	30	59	5	0	108
ILI Consultation Rate (per 1,000 patient visits)	77.35	103.81	36.42	8.53	0.00	40.36

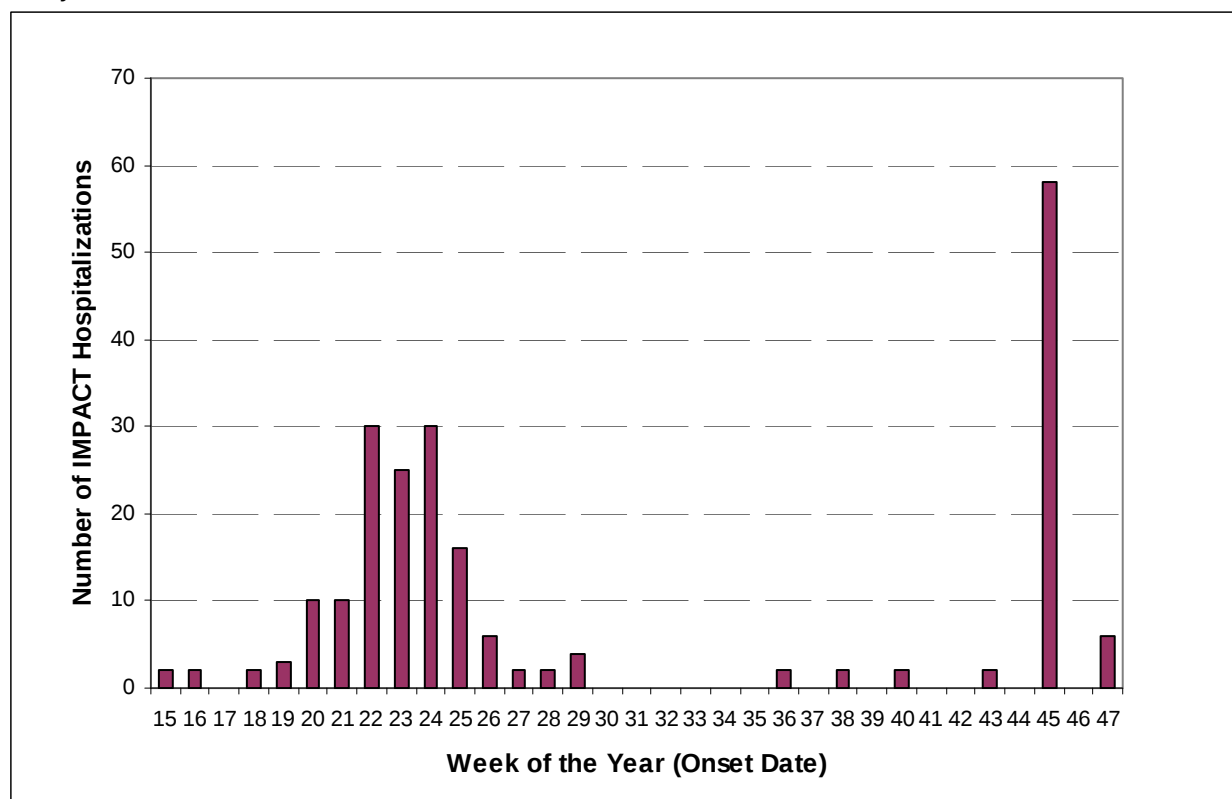
Source: Public Health Agency of Canada

* Sentinel physician information is reported to the Public Health Agency of Canada; 99 sentinels reported this week.

Immunization Monitoring Program ACTive (IMPACT) is a paediatric hospital-based national active surveillance network for adverse events following immunization and selected infectious diseases in children, including influenza-associated pediatric hospitalizations and complements the [Canadian Adverse Event Following Immunization Surveillance System](#) (CAEFISS). It involves 12 Canadian centres, two of which are in Ontario (Children's Hospital of Eastern Ontario in Ottawa and the Hospital for Sick Children, Toronto).

Reports of adverse events following immunization are reported to the Vaccine Safety Unit at the Immunization Division of the Public Health Agency of Canada. Note that the number of IMPACT hospitalizations presented in this week's bulletin has been updated with the latest data received from PHAC.

Figure 15: Number of influenza related hospitalizations in Ontario reported through IMPACT up to Week 47, by onset date.



Source: Public Health Agency of Canada

***Note:** The number of IMPACT hospitalizations presented reflect the latest data received at the time of publication, thus lower numbers of cases reported in recent weeks may be attributed in part to reporting delays.

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Table 12: Number of RT-PCR & Multiplex test results by health unit and agent in Ontario by the Ontario Agency for Health Protection and Promotion Laboratory, for the period November 23, 2009 to November 27, 2009

Health Unit	Results	Total
KINGSTON FRONTENAC	PARAINFLUENZA 1	1
LONDON	FLU A/RSV B	1
NIAGARA	FLU A/RSV B	4
	RSV B	1
OTTAWA	RHINOVIRUS	1
	FLU A/RSV B	1
OXFORD	PARAINFLUENZA 1	1
SIMCOE MUSKOKA	HUMAN ADENOVIRUS	1
WINDSOR	RHINOVIRUS	1

Source: Ontario Agency for Health Protection and Promotion, December 2, 2009

FURTHER INFORMATION

1. Ontario Ministry of Health and Long-Term Care
Previous issues of the *Ontario Influenza Bulletin* can be accessed at:
http://www.health.gov.on.ca/english/providers/program/pubhealth/flu/flu_08/flubul_mn.html
2. Public Health Agency of Canada
Issues of FluWatch can be accessed at:
www.phac-aspc.gc.ca/fluwatch/
3. United States Centers for Disease Control and Prevention
<http://www.cdc.gov/flu/weekly/fluactivity.htm>
4. European Influenza Surveillance Scheme
http://www.eiss.org/cgi-files/bulletin_v2.cgi

INFORMATION ABOUT H1N1 INFLUENZA (HUMAN SWINE INFLUENZA)

1. CDC (Human swine flu investigation)
<http://www.cdc.gov/swineflu/investigation.htm>
2. PHAC (Human swine flu investigation)
http://www.phac-aspc.gc.ca/alert-alerte/swine_200904-eng.php
3. WHO Swine Flu general info
<http://www.who.int/csr/disease/swineflu/en/index.html>
4. Ontario Ministry of Health (Important Health Notices)
<http://www.health.gov.on.ca/english/providers/program/emu/ihn.html>

INFORMATION ABOUT AVIAN INFLUENZA

For latest information on the status of avian influenza worldwide please use the following link:

Public Health Agency of Canada
<http://www.phac-aspc.gc.ca/h5n1/index.html>

Influenza Surveillance Weeks 2009-2010 and date of submission of Appendix C

WEEKS	START	END	Appendix C Submission to MOHLTC
WK48	29-Nov-09	5-Dec-09	8-Dec-09
WK49	6-Dec-09	12-Dec-09	15-Dec-09
WK50	13-Dec-09	19-Dec-09	22-Dec-09
WK51	20-Dec-09	26-Dec-09	29-Dec-09
WK52	27-Dec-09	2-Jan-10	5-Jan-10
WK1	3-Jan-10	9-Jan-10	12-Jan-10
WK2	10-Jan-10	16-Jan-10	19-Jan-10
WK3	17-Jan-10	23-Jan-10	26-Jan-10
WK4	24-Jan-10	30-Jan-10	2-Feb-10
WK5	31-Jan-10	6-Feb-10	9-Feb-10
WK6	7-Feb-10	13-Feb-10	16-Feb-10
WK7	14-Feb-10	20-Feb-10	23-Feb-10
WK8	21-Feb-10	27-Feb-10	2-Mar-10
WK9	28-Feb-10	6-Mar-10	9-Mar-10
WK10	7-Mar-10	13-Mar-10	16-Mar-10
WK11	14-Mar-10	20-Mar-10	23-Mar-10
WK12	21-Mar-10	27-Mar-10	30-Mar-10
WK13	28-Mar-10	3-Apr-10	6-Apr-10
WK14	4-Apr-10	10-Apr-10	13-Apr-10
WK15	11-Apr-10	17-Apr-10	20-Apr-10
WK16	18-Apr-10	24-Apr-10	27-Apr-10
WK17	25-Apr-10	1-May-10	4-May-10
WK18	2-May-10	8-May-10	11-May-10
WK19	9-May-10	15-May-10	18-May-10
WK20	16-May-10	22-May-10	25-May-10
WK21	23-May-10	29-May-10	1-Jun-10
WK22	30-May-10	5-Jun-10	8-Jun-10
WK23	6-Jun-10	12-Jun-10	15-Jun-10
WK24	13-Jun-10	19-Jun-10	22-Jun-10
WK25	20-Jun-10	26-Jun-10	29-Jun-10
WK26	27-Jun-10	3-Jul-10	6-Jul-10

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WEEKS	START	END	Appendix C Submission to MOHLTC
WK27	4-Jul-10	10-Jul-10	13-Jul-10
WK28	11-Jul-10	17-Jul-10	20-Jul-10
WK29	18-Jul-10	24-Jul-10	27-Jul-10
WK30	25-Jul-10	31-Jul-10	3-Aug-10
WK31	1-Aug-10	7-Aug-10	10-Aug-10
WK32	8-Aug-10	14-Aug-10	17-Aug-10
WK33	15-Aug-10	21-Aug-10	24-Aug-10
WK34	22-Aug-10	28-Aug-10	31-Aug-10
WK35	29-Aug-10	4-Sep-10	7-Sep-10

APPENDIX - I

Definitions for influenza activity levels:

No Data: No activity report corresponding to the surveillance week was received at the Ministry of Health and Long-Term Care Call Centre by the Tuesday (at 4 p.m.) following the end of the surveillance period.

No Activity: **No laboratory-confirmed* influenza and NO outbreaks detected** within the health unit/ influenza surveillance area, within the prior week, although sporadically occurring ILI may or may not be present.†

Sporadic: Sporadically (infrequently) occurring **ILI and at least one lab-confirmed influenza* case with NO outbreaks** detected within the health unit area.†

Localized: sporadically occurring **ILI and lab-confirmed influenza* together with outbreaks of ILI** in schools§ and work sites, or laboratory-confirmed influenza in residential institutions occurring in < 50% of the health unit. Outbreaks affect a single and/or adjacent geographic area within the health unit jurisdiction, e.g. outbreaks in a nursing home and a school in close proximity to each other.†

Widespread: sporadically occurring **ILI and lab-confirmed influenza* together with outbreaks of ILI** in schools and work sites, or laboratory-confirmed influenza in residential institutions occurring in > 50% of the health unit. Outbreaks affect multiple and non-adjacent geographic areas within the health unit jurisdiction, such as two or more regions of the health unit, two or more municipalities, two or more electoral wards, etc.†

* Confirmation of influenza within the surveillance region at any time within the prior week

† Sub-regions within the province or territory as defined by the provincial/territorial epidemiologist

§ Health units have been requested to consider laboratory confirmed pH1N1 outbreaks in camps in their region when evaluating ILI activity levels

Influenza-Like Illness (ILI) Definitions:

A) ILI in the general population:

Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which could be due to influenza virus. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

B) ILI/Influenza outbreaks:

Schools and work sites: greater than 10% absenteeism on any day, most likely due to ILI.

Residential institutions: two or more cases of ILI within a seven-day period, **including at least one laboratory confirmed case.**

Current Provincial Surveillance Case Definition for pH1N1 (as of May 5, 2009):

Confirmed

Person with or without Influenza-like illness¹ and

Laboratory confirmation of swine influenza A (H1N1) virus infection by one or more of the following tests:

- RT-PCR with genotyping of H1 and/or N1 swine influenza virus
- Viral culture with strain typing
- Four-fold rise in swine influenza A(H1N1) virus specific antibodies by serology testing

¹Influenza-like illness: Acute onset of respiratory illness with fever AND one or more of the following - cough, sore throat, arthralgia, myalgia, prostration, or malaise. In cases under 5 or 65 and older fever may not be prominent.