

Ontario Agency for Health Protection and Promotion (OAHPP): Laboratory Pandemic Influenza Surveillance Report

Information current as of: Monday March 1, 2010

This report summarizes patient specimens (1 specimen/patient) collected and received at the Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories (PHL) in Ontario for influenza virus testing since September 1, 2009. This information is current as of Monday March 1, 2010 and is updated weekly. Note that influenza A positivity rates are only reported for influenza A tests performed at the OAHPP Public Health Laboratories.

Specimen collection date is used in this weekly report to classify the specimens submitted and tested by time. The PHL performs the majority of subtype testing; however, several hospital laboratories also perform subtyping. Therefore, the numbers reported here may not reconcile precisely with those reported through the integrated Public Health Information System (iPHIS) since results from hospital laboratories may be entered into iPHIS without being entered into the PHL database.

SUREVILLANCE SUMMARY

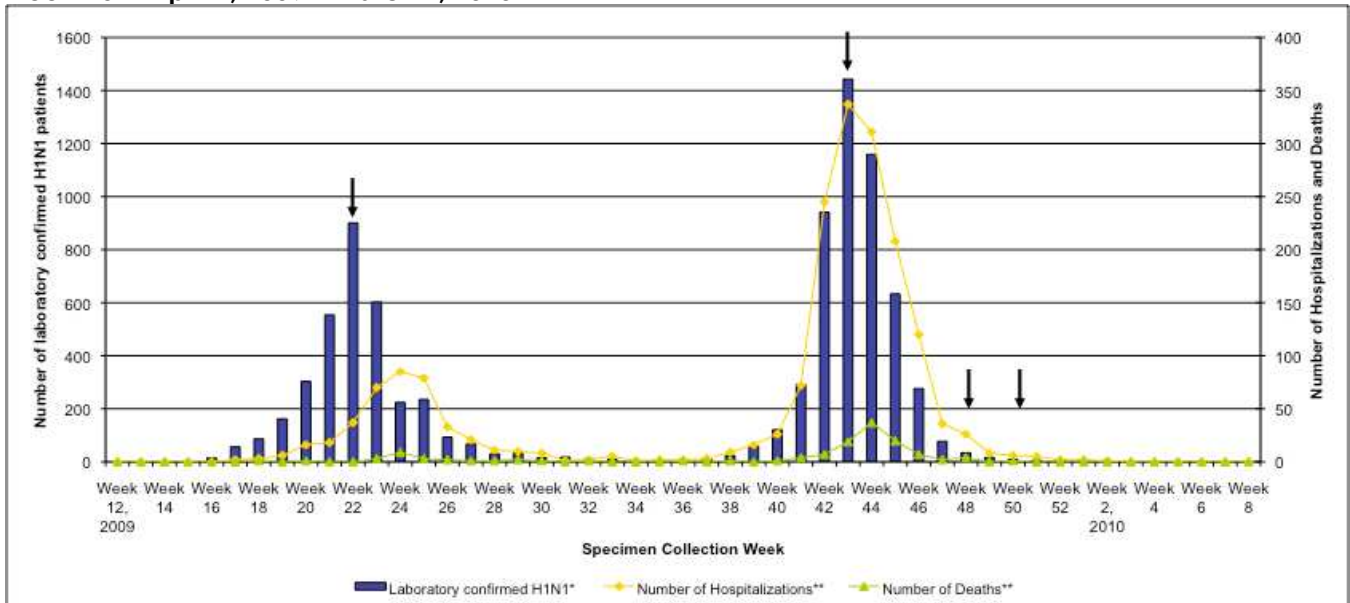
Pandemic influenza (pH1N1) is virtually absent in Ontario with the most recent H1N1 positive isolates being collected on February 21 and 22, 2010. The predominant circulating respiratory virus is respiratory syncytial virus (RSV).

Case statistics:

Between September 1, 2009 and March 1, 2010, a total of 21,115 patient specimens and isolates (1/patient) have been submitted for influenza testing and subtyping at the PHL and entered into the PHL electronic system. Of those, 20,486 specimens and isolates have been tested for influenza A at the PHL, of which 4,634 (22.8%) were positive for Influenza A; an additional 629 patient specimens that tested positive for influenza A at hospital laboratories were forwarded to the PHL for subtyping. Four cases of seasonal influenza (H3) have been detected in Weeks 36, 37, 52 and Week 1, 2010. No seasonal influenza A H1 has been detected. Four cases of influenza B have been detected in Weeks 40, 44, 45, 2009 and Week 2, 2010.

Please refer to **Appendix 1** for further information on lab testing algorithms and interpreting subtyping results.

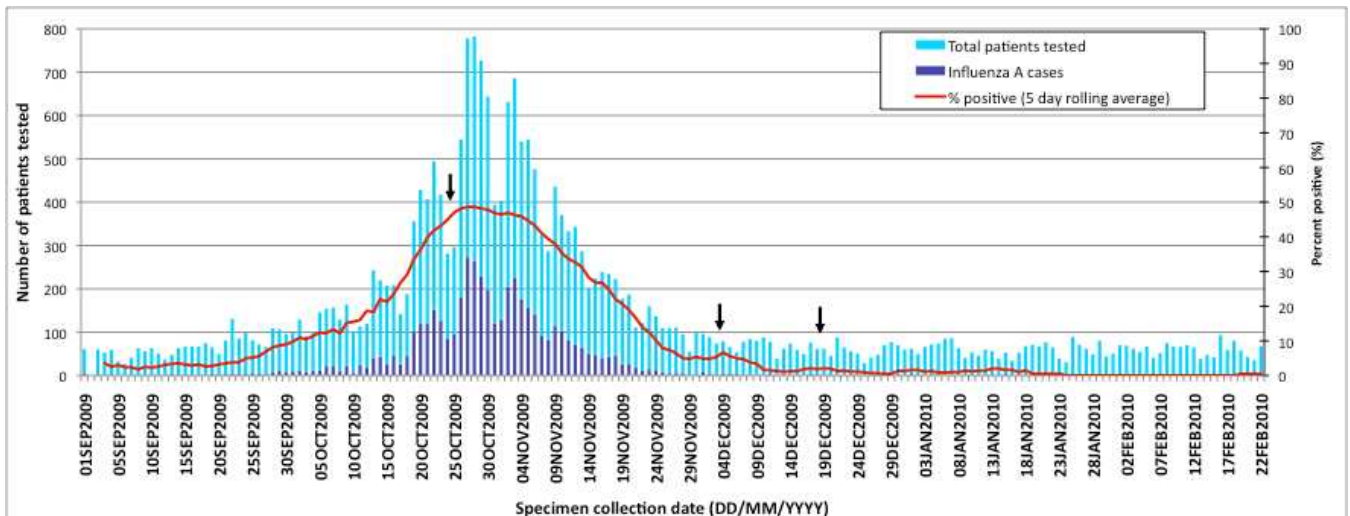
Figure 1. Laboratory confirmed cases of pandemic H1N1, hospitalizations and deaths by collection week from April 1, 2009 – March 1, 2010



Source: * The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.
 **Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS), extracted March 3, 2010
 NOTE: Laboratory confirmed H1N1 include influenza A positives, not subtyped from Oct 23, 2009 – Feb 22, 2010. Laboratory confirmed cases are from PHL testing. Hospitalization and death data is from iPHIS.

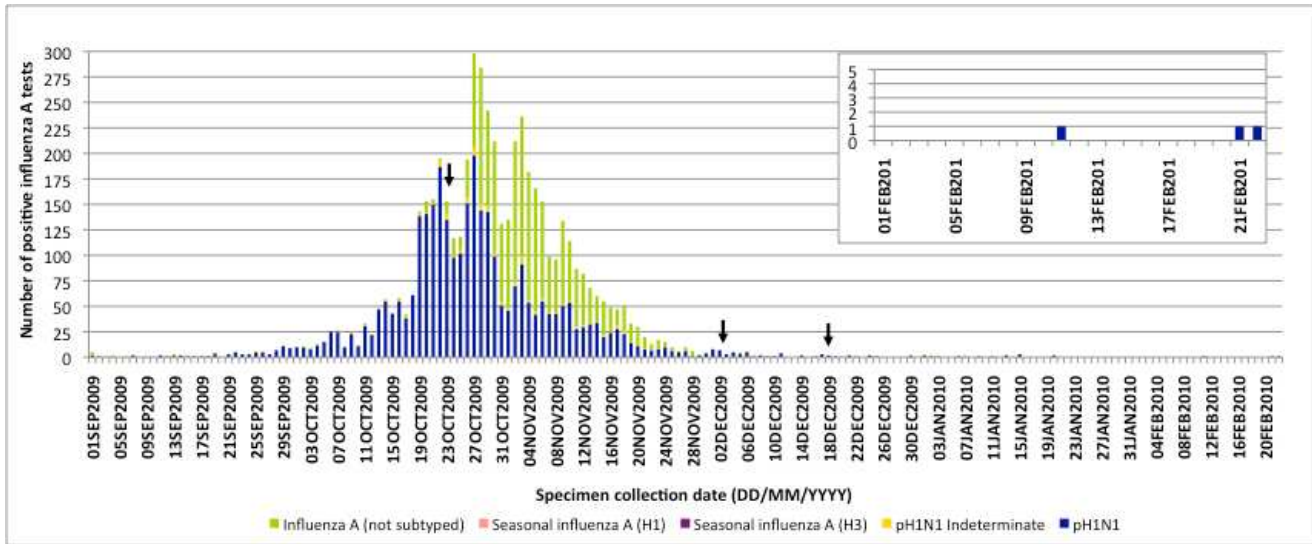
↓ **Modification to testing algorithm**

Figure 2. Total number of influenza A tests conducted, the number of influenza A positive cases and the percent positive (5 day rolling average), September 1, 2009 – February 22, 2010.**



Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.
 For 990 specimens, no specimen collection date was available; the date the specimen was received at the lab has been used as a proxy. **Data collected since Feb 22, 2010 has been excluded from Figures 3. Since not all specimens collected on those dates have test results available, the data from those days may not reflect the current situation. ↓ **Modification to testing algorithm**

Figure 3. The number of positive influenza A test results by subtype (pH1N1, seasonal H1/H3, indeterminate pH1N1 Influenza A - not subtyped & influenza B), September 1, 2009 – February 22, 2010**.



Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.

For 990 specimens, no specimen collection date was available; the date the specimen was received at the lab has been used as a proxy. **Data collected since Feb 22, 2010 has been excluded from Figures 3. Since not all specimens collected on those dates have test results available, the data from those days may not reflect the current situation. ↓ **Modification to testing algorithm**

Resistance testing

A proportion of isolates undergo oseltamivir susceptibility testing, specifically looking for a nucleotide mutation at position 275 for tyrosine (H275Y) in the neuraminidase gene, which confers resistance.

Table 1: PHL oseltamivir susceptibility testing results since September 1, 2009.

Isolate tested	Total tested	Total Positive (%)	Total number of patients	Collection date of first resistant isolate
Pandemic Influenza A (H1N1)	760	15 (2.0)	5	1 Week 30 1 Week 36 2 Week 45 1 Week 49

Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.

Nationally oseltamivir, amantadine and zanamivir susceptibility testing is conducted at the National Microbiology Laboratory (NML).

Table 2: NML susceptibility assay results for influenza isolates in Canada from Sept. 1, 2009 – Feb 25, 2010

Isolates tested	Isolates tested for Oseltamivir susceptibility	Isolates resistant to Oseltamivir (%)	Isolates tested for Amantadine susceptibility	Isolates resistant to Amantadine (%)	Isolates tested for Zanamivir susceptibility	Isolates resistant to Zanamivir (%)
Seasonal Influenza A (H1N1)	4	4(100)	5	1 (20)	2	0 (0)
Influenza A (H3N2)	9	0 (0)	24	24(100)	9	0 (0)
Influenza B	1	0 (0)	n/a	n/a	1	0 (0)
Pandemic Influenza A (H1N1)	1053	12 (1.14)	1115	1115 (100)	1031	0 (0)

Source: Influenza and Respiratory Viruses Section, National Microbiology Laboratory, Public Health Agency of Canada.

Table 3: NML Strain Characterization of isolates from Ontario and Canada from Sept 1, 2009 to Feb 26, 2010.

Strain	Positive isolates, Ontario	Positive isolates, Canada
Seasonal Influenza A (H1N1)		
A/Brisbane/59/2007-like	0	3
Seasonal Influenza A (H3N2)		
A/Brisbane/10/2007 – like	0	1
A/Perth/16/2009 – like	0	8
Seasonal Influenza B		
B/Brisbane/60/2008 – like	1	1
Pandemic Influenza A (H1N1)		
A/California/07/2009 – like	291	835

Source: Influenza and Respiratory Viruses Section, National Microbial Laboratory, Public Health Agency of Canada.

Note:

Pandemic (2009) H1N1 vaccine component: A/California/07/2009

Seasonal influenza vaccine for 2009/2010: A/Brisbane/59/07-like (H1N1 component),

A/Brisbane/10/2007-like (H3N2 component), B/Brisbane/60/2008-like (influenza B component)

For the season to date, the vast majority of circulating influenza was the pH1N1 strain. However, of the seasonal influenza strains that circulated in Canada, most of the H3N2 subtype has drifted from the 2009/10 H3N2 vaccine component.

Table 4: Respiratory viruses detected using RT-PCR and Multiplex methods among Vaccine Effectiveness (VE) Study specimens by geographic location, February 15 to February 26, 2010

DETECTED VIRUSES	NUMBER OF SPECIMENS	PERCENTAGE OF SPECIMENS (%)	PATIENT PHU
FLU A	0	0.0	NA
FLU B	0	0.0	NA
RSV A	2	28.6	LONDON
METAPNEUMOVIRUS	1	14.3	ELGIN
TOTAL POSITIVE SPECIMENS	3	42.9	
TOTAL SPECIMENS TESTED	7	100.0	

Source: PHL, Ontario Agency for Health Protection and Promotion (OAHPP).

Additional information on the VE study can be found at <http://www.oahpp.ca/vestudy/index.php>

Ontario Public Health Units

At the PHL, a patient is sorted into a public health unit (PHU) based on their place of residence. If this information is not available, the address of the physician who submitted the sample is used to classify patients into PHUs. As a result, influenza A cases may not necessarily be residents of the PHU in which they have been classified.

Table 5. Number of influenza specimens submitted for testing, pH1N1 and influenza A cases, percent positive and submission rate and cumulative influenza A cases (/100,000) by PHU. Cumulative numbers from Sept. 1, 2009- Mar.1, 2010 (Specimens collected: Feb 21 – 27, 2010 (**Week 8*****)) are in displayed in brackets, **if no bracket value is 0**)

Public Health Unit	Total number of specimens submitted	Submission rate (/100,000)	Number of lab confirmed cases of pH1N1	Number of lab confirmed Influenza A cases	Number of laboratory Influenza A tests completed	Percent positive (%) influenza A**	Cumulative influenza A cases rate (/100,000)
Algoma District	389(8)	334.6(6.9)	51	99	386(6)	25.6	85.2
Brant County	266(4)	212.6(3.2)	28	50	261(2)	19.2	40.0
Chatham-Kent	175(2)	161.2(1.8)	33	51	172(2)	29.7	47.0
City of Hamilton	493(5)	97.7(1.0)	265	121	320(5)	37.8	24.0
City of Ottawa	98(2)	12.1(0.2)	18	27	98(2)	27.6	3.3
City of Toronto	3,918(52)	156.5(2.1)	368	652	3,863(41)	16.9	26.0
Durham Regional	641(12)	114.2(2.1)	122	154	604(10)	25.5	27.4
Eastern Ontario	379(7)	198.9(3.7)	99	118	373(6)	31.6	61.9
Elgin-St. Thomas	148(10)	173.4(11.7)	19	40	144(7)	27.8	46.9
Grey Bruce	481(14)	304.9(8.9)	36	112	472(9)	23.7	71.0
Haldimand-Norfolk	153(1)	142.0 (0.9)	36	50	147(1)	34.0	46.4
Haliburton-Kawartha-Pine Ridge District	291(4)	169.5(2.3)	43	54	278(3)	19.4	31.5
Halton Regional	725(6)	165.1(1.4)	138	146	673(4)	21.7	33.2
Hastings & Prince Edward Counties	400(5)	256.5(3.2)	91	78	367(5)	21.3	50.0
Huron County	157(6)	264.6(10.1)	24	48	154(5)	31.2	80.9
Kingston-Frontenac and Lennox & Addington	508(5)	275.5(2.7)	133(1)	128	485(2)	26.4	69.4
Lambton	243(14)	189.5(10.9)	35	53	237(11)	22.4	41.3
Leeds-Grenville and Lanark District	211(4)	129.5(2.5)	49	63	205(3)	30.7	38.7
Middlesex-London	292(1)	69.1(0.2)	144	103	232(1)	44.4	24.4
Niagara Regional Area	728(5)	170.3(1.2)	128	199	708(3)	28.1	46.6
North Bay Parry Sound District	324(8)	263.7(6.5)	45	76	317(4)	24.0	61.9
Northwestern	376(7)	466.9(8.7)	70	126	374(6)	33.7	156.5
Oxford County	161(3)	156.7(2.9)	29	48	158(2)	30.4	46.7
Peel Regional	2,927(55)	252.5(4.7)	252(1)	429(1)	2,866(43)	15.0 (2.3)	37.0
Perth District	250(12)	336.3(16.1)	30	43	242(8)	17.8	57.8
Peterborough County-City	266(7)	199.9(5.3)	45	73	262(7)	27.9	54.9
Porcupine	568(8)	674.9(9.5)	179	234	568(8)	41.2	278.0
Renfrew County & District	84	84.5	15	26	82	31.7	26.2
Simcoe Muskoka District	1,548(36)	322.7(7.5)	147	240	1,464(22)	16.4	50.0

Public Health Unit	Total number of specimens submitted	Submission rate (/100,000)	Number of lab confirmed cases of pH1N1	Number of lab confirmed Influenza A cases	Number of laboratory Influenza A tests completed	Percent positive (%) influenza A**	Cumulative influenza A cases rate (/100,000)
Sudbury & District	390(5)	202.7(2.6)	56	124	388(5)	32.0	64.5
Thunder Bay District	503(9)	326.5(5.8)	86	153	499(6)	30.7	99.3
Timiskaming	107	312.7	34	43	106	40.6	125.7
Waterloo	532(24)	111.3(5.0)	77	126	516(15)	24.4	26.4
Wellington-Dufferin-Guelph	468(12)	183.6(4.7)	43	84	460(9)	18.3	33.0
Windsor-Essex County	517(2)	131.4(0.5)	117	172	477(1)	36.1	43.7
York Regional	1,312(25)	147.0(2.8)	133	267	1,295(22)	20.6	29.9
Out of Province/Not Available	86(4)	N/A	17	24	84(4)	28.6	N/A
Grand Total	21,115(384)	173.6(3.2)	3,235(2)	4,634(1)	20,337(290)	22.8 (0.3)	38.1

Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.

*** Because of the lag in time from the date the specimen was collected to the date the final test result is confirmed, not all cases with specimens collected during the most recent week are included in this summary.

**Percent positive influenza A is calculated based on the number of specimens where testing has been completed. This may not equal the number of specimens submitted for testing.

Appendix 1

Changes to Testing Algorithm:

Date	Change
February 22, 2010	All limitations on ambulatory (community) viral culture requests and influenza A subtyping have been removed.
December 17, 2009	Viral culture testing was increased to all ambulatory samples and a minimum of 20% of influenza A negative RT-PCR tests. Viral culture testing increases as resources allowed.
December 2, 2009	Subtyping was increased as resources allow.
November 9-12, 2009	Only 20% of ambulatory (community) viral culture requests were being processed.
October 25-31, 2009	Subtyping was performed on all intensive care samples, outbreak samples and on 20% of all additional influenza A positive tests.

For additional details on modifications to the testing algorithm, please view the November Lababstract at www.oahpp.ca/resources/lababstracts.html

Interpretation of subtyping results:

- **Indeterminate:** a RT-PCR test reflects a very low level of the target (e.g. influenza, or influenza subtype). Due to the level of target being near the threshold of detection it is not known if this is a true positive result, or nonspecific activity giving a false positive response.
- **Untypeable:** occurs when an influenza A is detected, but the sample does not match any of the subtypes that can be tested for (e.g. pH1N1, seasonal H3N2, H1N1).
- **Unable to subtype:** occurs when an influenza A positive sample has a very low amount of virus and the subtype cannot be detected.

This report and past versions are available on our website and can be viewed at anytime at <http://oahpp.ca/h1n1>