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

Information current as of: Monday March 22, 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 22, 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.

This report uses the specimen collection date to classify the specimens submitted. 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 samples collected on March 17 and 18, 2010. The most recent influenza B sample was identified on March 12, 2010. The predominant circulating respiratory virus continues to be respiratory syncytial virus (RSV).

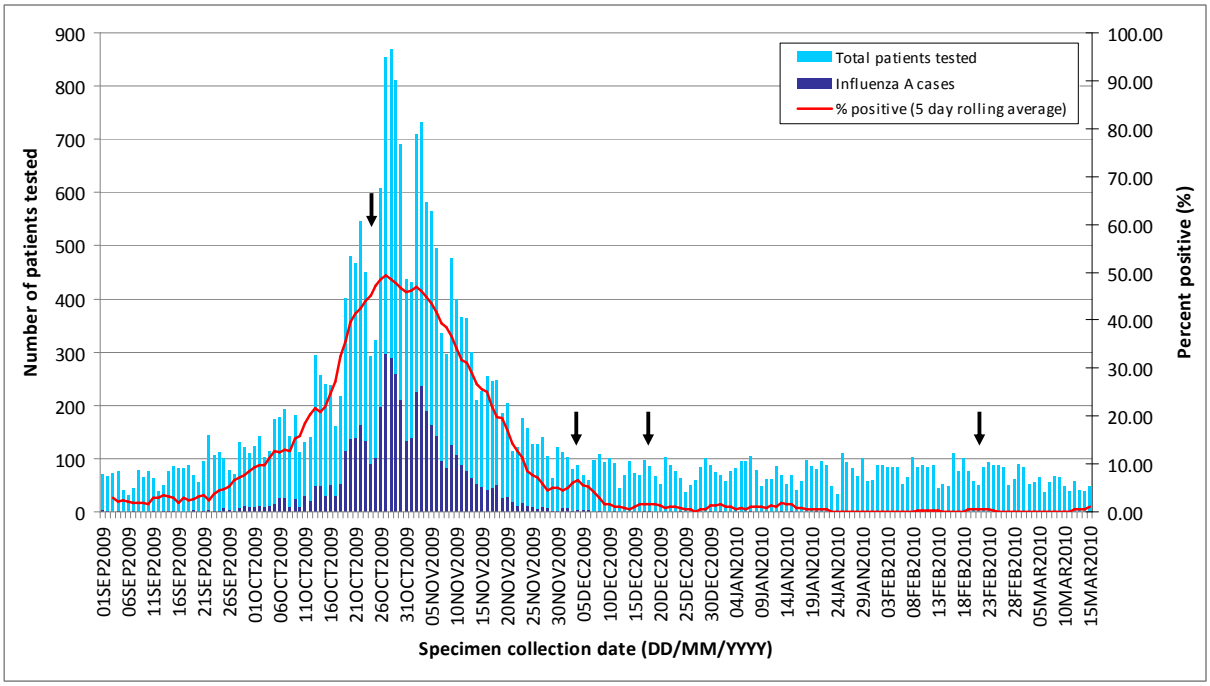
PLEASE NOTE DUE TO A TECHNICAL CHANGE ON MARCH 12, 2010 THE RESULTS PRESENTED IN THIS WEEK'S REPORT MAY DIFFER FROM PREVIOUS REPORTS.

Case statistics:

Between September 1, 2009 and March 22, 2010, a total of 25,029 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, 24,436 specimens and isolates have been tested for influenza A at the PHL, of which 5,025 (20.6%) were positive for Influenza A; an additional 486 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. Seven cases of influenza B have been detected in Weeks 40, 44, 45 of 2009, Week 2, 2010 and two in Week 9 and one in Week 10 of 2010.

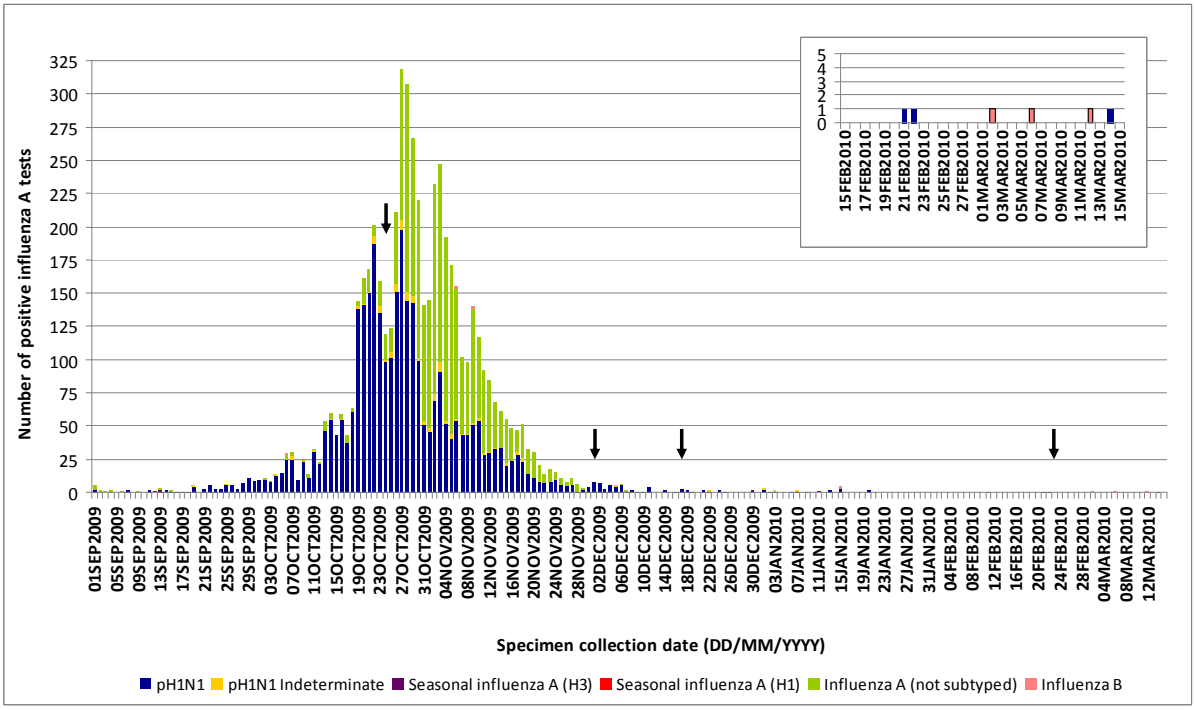
Please refer to **Appendix 1** for further information on lab testing algorithms and interpreting subtyping results.

Figure 1. 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 – March 15, 2010.**



Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.
For 1,378 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 March 15, 2010 ha s 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 2. 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 – March 15, 2010.**



Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.
For 1,378 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 March 15, 2010 ha s 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)	762	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 September 1, 2009 – March 11, 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)	6	6(100)	5	1 (20)	2	0 (0)
Influenza A (H3N2)	13	0 (0)	24	24(100)	13	0 (0)
Influenza B	3	0 (0)	n/a	n/a	3	0 (0)
Pandemic Influenza A (H1N1)	1065	12 (1.13)	1121	1121 (100)	1043	0 (0)

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

Table 3: NML strain characterization of isolates from Ontario and Canada from September 1, 2009 to March 11, 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	2
A/Perth/16/2009 – like	0	8
Seasonal Influenza B		
B/Brisbane/60/2008 – like	2	2
B/Florida/04/2006 –like	0	1
Pandemic Influenza A (H1N1)		
A/California/07/2009 – like	292	836

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.

*****Due to low submissions, results from the Vaccine Effective Study will be included in the next laboratory report.*****

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.22, 2010 (Specimens collected: March14-20, 2010 (**Week 11*****) 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	422(5)	363.0(4.3)	51	103	420(3)	24.5	88.6
Brant County	294(9)	234.9(7.2)	28	50	287(4)	17.4	40.0
Chatham-Kent	248	228.4	33	62	244	25.4	57.1
City of Hamilton	658(3)	130.4(0.6)	265	136	488	27.9	27.0
City of Ottawa	118(1)	14.5(0.1)	18	27	118(1)	22.9	3.3
City of Toronto	4,927(69)	196.8(2.8)	370(2)	672(2)	4,836(34)	13.9(5.9)	26.8
Durham Regional	854(7)	152.2(1.2)	122	208	842(3)	24.7	37.1
Eastern Ontario	395(2)	207.3(1.0)	99	118	390(2)	30.3	61.9
Elgin-St. Thomas	157(2)	183.9(2.3)	19	40	156(2)	25.6	46.9
Grey Bruce	511(6)	323.9(3.8)	36	113	503(2)	22.5	71.6
Haldimand-Norfolk	177(3)	164.2(2.8)	36	50	167	29.9	46.4
Haliburton-Kawartha-Pine Ridge District	370(7)	215.5(4.1)	43	70	364(5)	19.2	40.8
Halton Regional	1,139(20)	259.3(4.6)	138	197	1,074(5)	18.3	44.8
Hastings & Prince Edward Counties	424(3)	271.8(1.9)	91	81	393(3)	20.6	51.9
Huron County	164(2)	276.4(3.4)	24	48	161(1)	29.8	80.9
Kingston-Frontenac and Lennox & Addington	555(6)	301.0(3.3)	133	132	530(5)	24.9	71.6
Lambton	264(5)	205.9(3.9)	35	53	261(3)	20.3	41.3
Leeds-Grenville and Lanark District	222(2)	136.2(1.2)	49	63	216(1)	29.2	38.7
Middlesex-London	332	78.6	142	104	274	38.0	24.6
Niagara Regional Area	945(11)	221.1(2.6)	128	213	916(1)	23.3	49.8
North Bay Parry Sound District	365(7)	297.1(5.7)	44	75	357(3)	21.0	61.1
Northwestern	409(5)	507.9(6.2)	70	127	407(5)	31.2	157.7
Oxford County	164	159.6	29	48	164	29.3	46.7
Peel Regional	3,297(57)	284.4(4.9)	252	436	3,223(40)	13.5	37.6
Perth District	268(8)	360.5(10.8)	30	43	259(3)	16.6	57.8
Peterborough County-City	314(3)	235.9(2.3)	45	84	314(3)	26.8	63.1
Porcupine	612(8)	727.2(9.5)	178	236	609(7)	38.8	280.4
Renfrew County & District	87	87.6	15	27	86	31.4	27.2
Simcoe Muskoka District	1,708(30)	356.0(6.3)	147	245	1,631(20)	15.0	51.1

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	443(3)	230.3(1.6)	55	123	441(2)	27.9	63.9
Thunder Bay District	546(10)	354.4(6.5)	86	156	545(9)	28.6	101.3
Timiskaming	114(3)	333.2(8.8)	34	44	114(3)	38.6	128.6
Waterloo	613(17)	128.2(3.6)	78(1)	127(1)	594(8)	21.4 (12.5)	26.6
Wellington-Dufferin-Guelph	529(10)	207.6(3.9)	43	85	519(6)	16.4	33.4
Windsor-Essex County	887(4)	225.5(1.0)	117	324	882(2)	36.7	82.4
York Regional	1,581(15)	177.1(1.7)	133	280	1,556(8)	18.0	31.4
Out of Province/Not Available	96	N/A	17	25	95	26.3	N/A
Grand Total	**25,209(343)**	**207.3(2.8)**	**3,233(3)**	**5,025(3)**	**24,436(194)**	**20.6(1.5)**	**41.3**

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.

PLEASE NOTE DUE TO A TECHNICAL CHANGE ON MARCH 12, 2010 THE RESULTS PRESENTED IN THIS WEEK'S REPORT MAY DIFFER FROM PREVIOUS REPORTS.

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 Labstract at www.oahpp.ca/resources/labstracts.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