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

Information current as of: Monday May 25, 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 May 25, 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 Flu A/(pH1N1) positive sample collected on April 27, 2010. A Flu A/(H3) positive sample was collected on May 19, 2010 in Toronto. The most recent influenza B sample was collected on March 24, 2010. Low levels of parainfluenza viruses (PIV), respiratory syncytial virus (RSV), adenovirus and human metapneumovirus (hMPV) are circulating in Ontario.

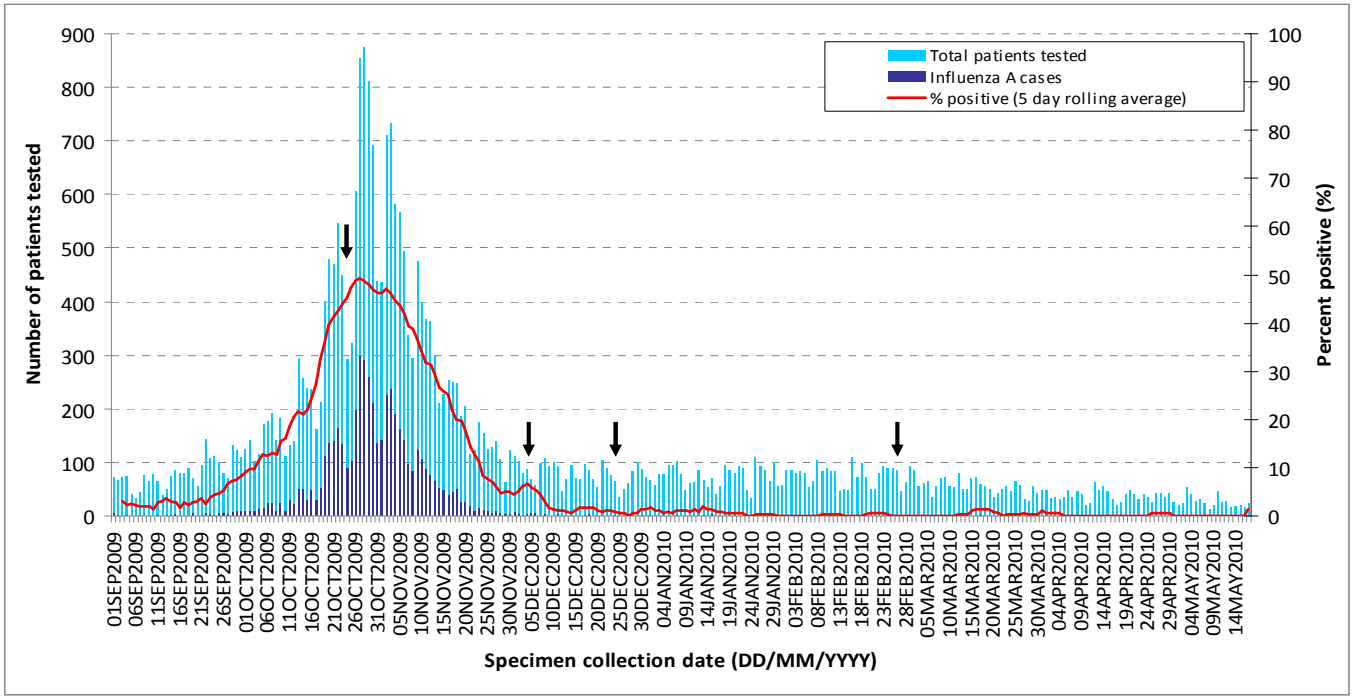
Case statistics:

Between September 1, 2009 and May 25, 2010, a total 27,416 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, 26,752 specimens and isolates have been tested for influenza A at the PHL, of which 5,042 (18.8%) were positive for Influenza A; an additional 487 patient specimens that tested positive for influenza A at hospital laboratories were forwarded to the PHL for subtyping.

Five cases of seasonal influenza (H3) have been detected in Weeks 36, 37, 52, 2009, and Week 2 and 20, 2010. No seasonal influenza A H1 has been detected. Eight cases of influenza B have been detected: one each in Week 40 of 2009 and Weeks 2, 8, 9, 10 and 12 of 2010, and two in Week 43 of 2010.

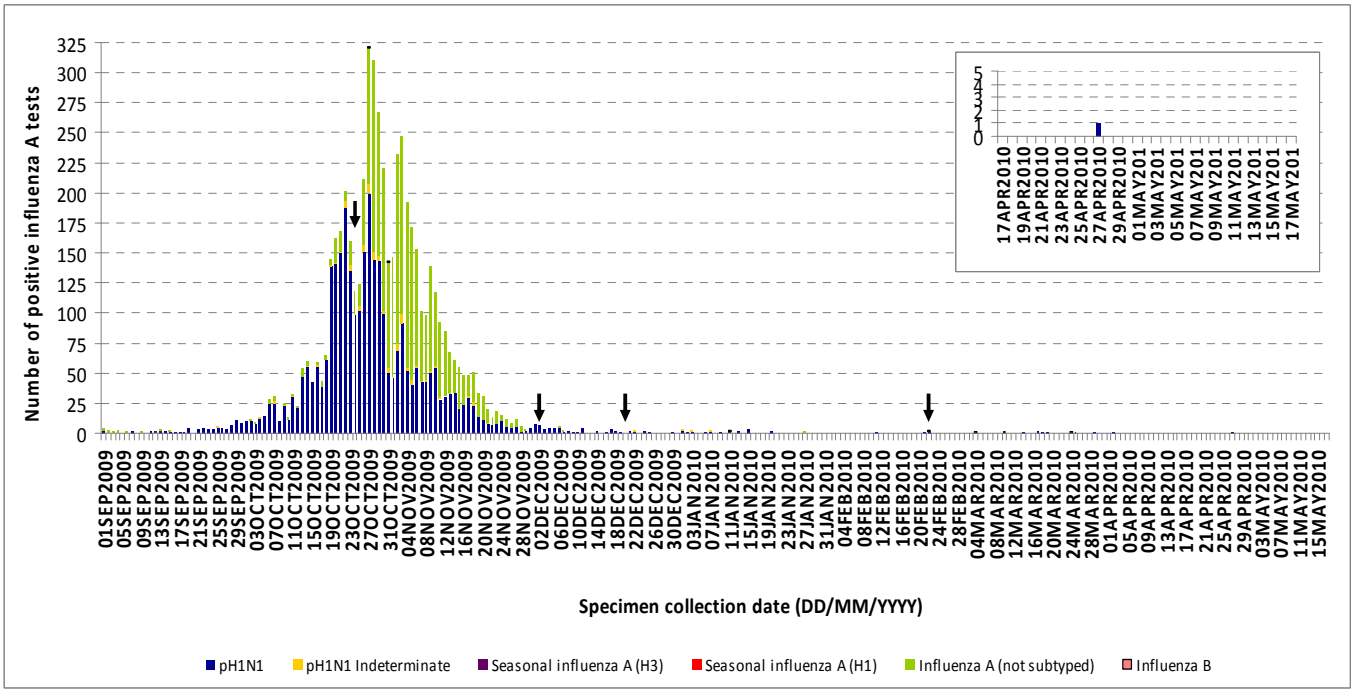
Please refer to **Appendix 1** for further information on lab testing algorithms and interpreting subtyping results.

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 – May 17, 2010.**



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

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 – May 17, 2010.**



Source: The Ontario Agency for Health Protection and Promotion (OAHPP) public health laboratories.
For 1,495 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 May 18, 2010 has been excluded from Figures 1 and 2. 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)	770	15 (19.4)	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 – May 6, 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	4	0 (0)	n/a	n/a	4	0(0)
Pandemic Influenza A (H1N1)	1079	12 (1.11)	1136	1136(100)	1057	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 May6, 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
B/Malaysia/2506/2004 – like	1	1
Pandemic Influenza A (H1N1)		
A/California/07/2009 – like	295	851

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 (VE) Study will be included in a future 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 4. 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 are from September 1, 2009- May 25, 2010. Specimens collected from May 16 – May 22, 2010 (**Week 20*****) 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	453(1)	389.7(0.9)	50	104	453(1)	23.0	89.5
Brant County	325(4)	259.7(3.2)	28	50	324(4)	15.4	40.0
Chatham-Kent	263(2)	242.2(1.8)	33	62	260	23.8	57.1
City of Hamilton	701(2)	138.9(0.4)	266	138	533(1)	25.9	27.4
City of Ottawa	130(1)	16.0(0.1)	18	27	129(1)	20.9	3.3
City of Toronto	5,506(61)	220.0(2.4)	371	674(1)	5,416(35)	12.4	26.9
Durham Regional	934(6)	166.4(1.1)	122	208	920(2)	22.6	37.1
Eastern Ontario	409	214.6	99	117	404	29.0	61.4
Elgin-St. Thomas	167	195.7	19	40	166	24.1	46.9
Grey Bruce	543(1)	344.2(0.6)	37	113	538	21.0	71.6
Haldimand-Norfolk	191(1)	177.2(0.9)	36	50	184	27.2	46.4
Haliburton-Kawartha-Pine Ridge District	402(2)	234.2(1.2)	43	70	399(2)	17.5	40.8
Halton Regional	1,246(6)	283.7(1.4)	138	197	1,196(5)	16.5	44.8
Hastings & Prince Edward Counties	440	282.1	91	81	408	19.9	51.9
Huron County	174(1)	293.3(1.7)	24	48	172	27.9	80.9
Kingston-Frontenac and Lennox & Addington	579	314.0	133	133	562	23.7	72.1
Lambton	286(4)	223.1(3.1)	35	53	284(2)	18.7	41.3
Leeds-Grenville and Lanark District	230	141.1	49	63	225	28.0	38.7
Middlesex-London	346(1)	81.9(0.2)	141	104	289	36.0	24.6
Niagara Regional Area	1,035(2)	242.2(0.5)	128	213	1,014	21.0	49.8
North Bay Parry Sound District	399(5)	324.8(4.1)	44	75	392(3)	19.1	61.1
Northwestern	444	551.3	70	127	442	28.7	157.7
Oxford County	173(1)	168.4(1.0)	29	48	173(1)	27.7	46.7
Peel Regional	3,576(20)	308.4(1.7)	251	436	3,532(16)	12.3	37.6
Perth District	288(1)	387.4(1.3)	30	43	286	15.0	57.8
Peterborough County-City	341(1)	256.2(0.8)	45	84	340(1)	24.7	63.1
Porcupine	655(2)	778.3(2.4)	179	237	650(1)	36.5	281.6
Renfrew County & District	94	94.6	15	27	93	29.0	27.2
Simcoe Muskoka District	1,868(7)	389.4(1.5)	150	253	1,797(5)	14.1	52.7

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	479	249.0	57	124	478	25.9	64.5
Thunder Bay District	585(5)	379.7(3.2)	87	157	582(3)	27.0	101.9
Timiskaming	124(2)	362.4(5.8)	34	44	124(2)	35.5	128.6
Waterloo	671(5)	140.3(1.0)	78	127	661(3)	19.2	26.6
Wellington-Dufferin-Guelph	584(2)	229.1(0.8)	43	84	578(1)	14.5	33.0
Windsor-Essex County	915	232.6	118	325	913	35.6	82.6
York Regional	1,751(14)	196.1(1.6)	134	281	1,728(8)	16.3	31.5
Out of Province/Not Available	109(3)	N/A	17	25	107(1)	23.4	N/A
Grand Total	**27,416(163)**	**225.5(1.3)**	**3,242**	**5,042(1)**	**26,752(98)**	**18.8(1.0)**	**41.5**

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
March 12, 2010	Due to technical changes made to the data extraction process, results, may differ slightly from those presented in the previous reports.
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 influenza A positive sample has a very low amount of virus and the subtype cannot be detected.

A reference calendar of epidemiological weeks can be found at http://www.phac-aspc.gc.ca/fluwatch/09-10/09-10cal-eng.php

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