

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

Information current as of: Monday May 3, 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 3, 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. The most recent influenza B sample was identified on March 25, 2010. Low levels of parainfluenza viruses (PIV), human metapneumovirus (hMPV) and respiratory syncytial virus (RSV), are circulating in Ontario.

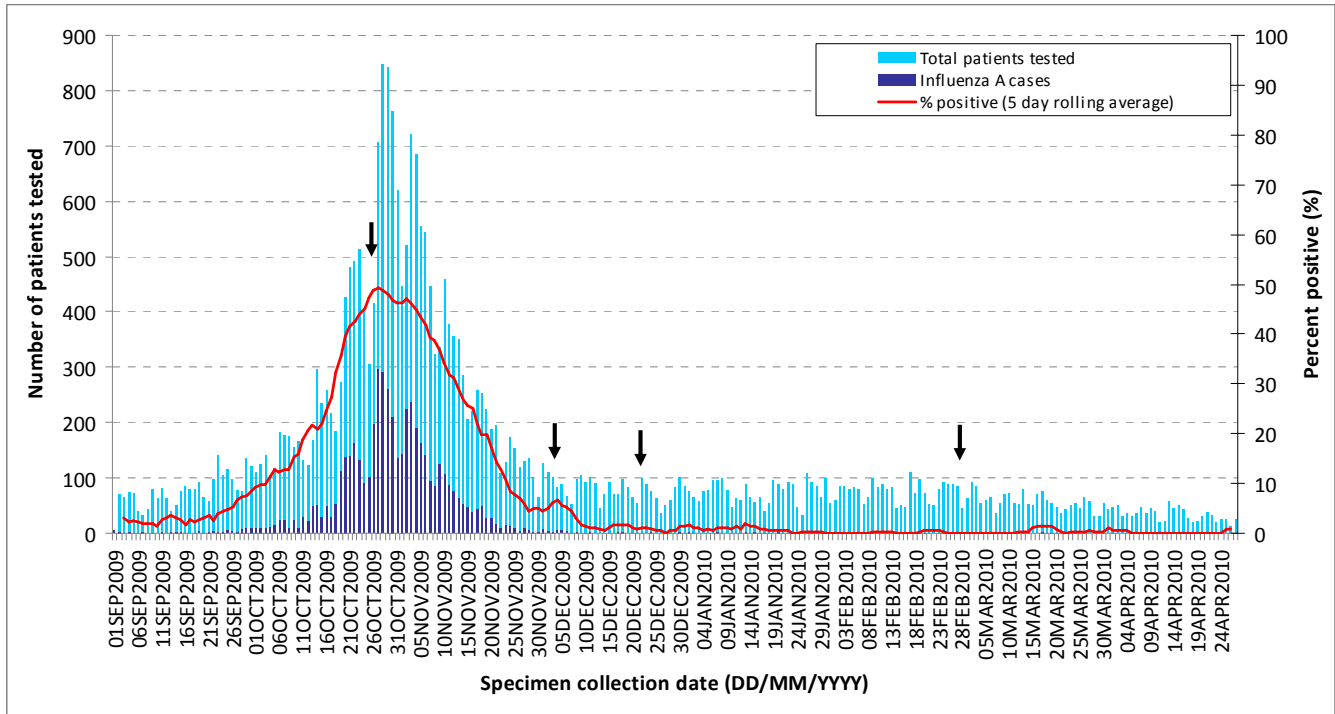
## **Case statistics:**

Between September 1, 2009 and May 3, 2010, a total 26,811 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, 26,099 specimens and isolates have been tested for influenza A at the PHL, of which 5,040 (19.3%) 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.

Four cases of seasonal influenza (H3) have been detected in Weeks 36, 37, 52, 2009, and Week 2, 2010. No seasonal influenza A H1 has been detected. Eight cases of influenza B have been detected: one each in Week 40, 44, 45 of 2009 and Weeks 2, 10 and 12 of 2010, and two in Week 9 of 2010.

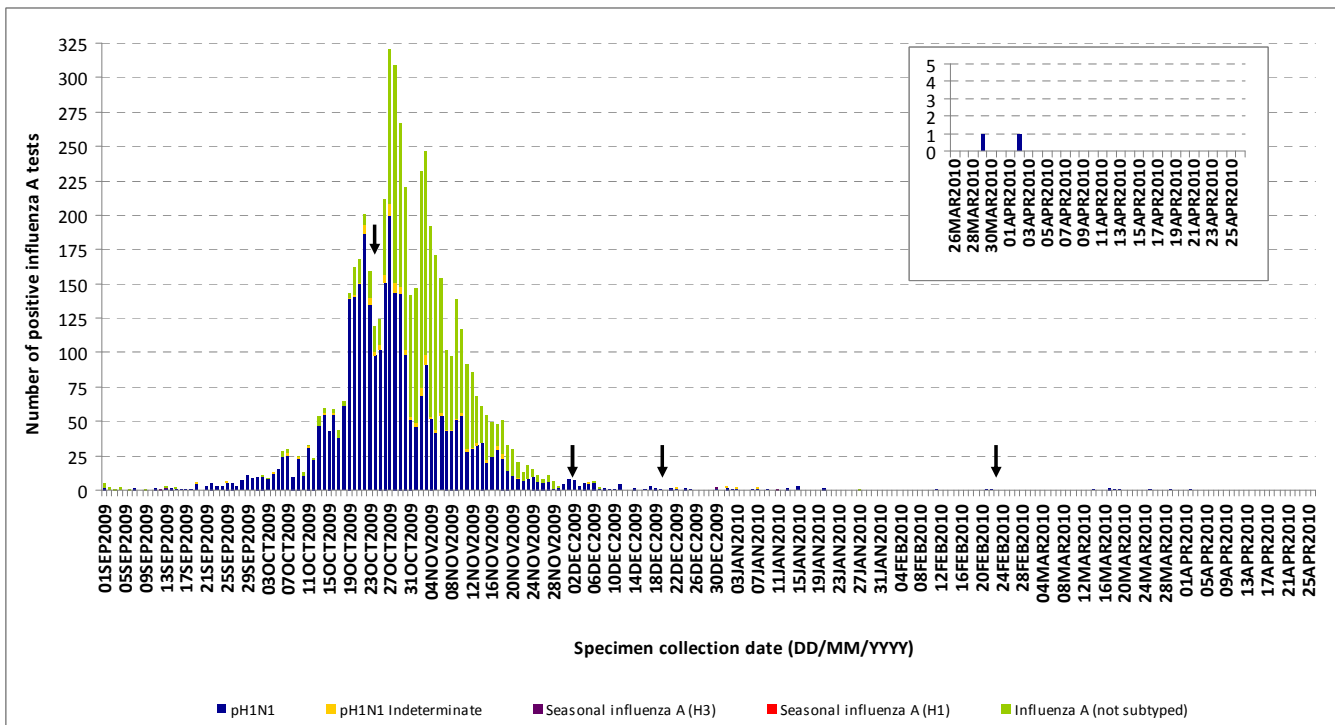
Please refer to **Appendix 1** for further information on lab testing algorithms and interpreting subtyping results.

**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 – April 26, 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 – April 26, 2010\*\*.



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

For 1,451 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 April 26, 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)	768	15 (1.95)	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 – April 15, 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)	1077	12 (1.11)	1129	1129(100)	1055	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 April 14, 2010.**

Strain	Positive isolates, Ontario	Positive isolates, Canada
<b>Seasonal Influenza A (H1N1)</b>		
A/Brisbane/59/2007-like	0	3
<b>Seasonal Influenza A (H3N2)</b>		
A/Brisbane/10/2007 – like	0	2
A/Perth/16/2009 – like	0	8
<b>Seasonal Influenza B</b>		
B/Brisbane/60/2008 – like	2	2
B/Florida/04/2006 –like	0	1
B/Malaysia/2506/2004 – like	1	1
<b>Pandemic Influenza A (H1N1)</b>		
A/California/07/2009 – like	295	848

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: Influenza and other circulating respiratory viruses among influenza Vaccine Effectiveness (VE) study specimens March 28, 2009 to April 24, 2010.**

Detected viruses	Number of specimen submitted	Public Health Unit
Influenza A(pH1N1)	1	Waterloo
Influenza B	0	N/A
Rhinovirus	1	Waterloo
<b>Total number of positive specimens</b>	<b>2</b>	
<b>Total number of specimens tested</b>	<b>2</b>	

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

**Spotlight on Current Research at the OAHPP Public Health Laboratories:**

A study looking at circulating respiratory viruses and co-infection during the H1N1 pandemic was presented at the Clinical Virology Symposium and Annual Meeting of the Pan American Society for Clinical Virology in Florida this week.

The study describes and quantifies the profile of respiratory viruses, in addition to pandemic H1N1 (pH1N1), detected during the period April, 2009 to February, 2010 among patients presenting with influenza-like illness (ILI) to community-based sentinel physicians in Ontario.

Infection with a single virus was detected in 531 (52%) of 1018 specimens tested between April, 2009 and February, 2010, of which 270 (51%) were pH1N1 and 242 (49%) were other viruses. Co-infection was detected in 143 (14%) of specimens. Influenza A (Flu A) and Respirator Syncytial Virus (RSV) or Flu A and Entero/Rhinovirus (ERV) co-infections were the most common, detected in 64% and 20 % of all co-infections, respectively. Co-infection was more commonly detected in younger patients who are at higher risk of infections with respiratory viruses. Co-infection was more commonly detected in patients under 4 years of age compared to patients 5 and older (OR 1.79; 95% CI 1.07 to 2.98); co-infection was less common in patients 55 years and older compared to patients less than 54 (OR 0.5; 95% CI 0.26 to 0.95). The presence of an underlying chronic condition also increased the likelihood of co-infection (OR 1.51; 95% CI 1.01 to 2.26).

Respiratory co-infections were common during the 2009 pandemic, were more frequent in younger persons, and were associated with chronic health conditions.

**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 September 1, 2009- May 3, 2010 (Specimens collected: April 25 - May 1, 2010 (**Week 16\*\*\***)) 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	447(2)	384.5(1.7)	50	103	444	23.2	88.6
Brant County	316(1)	252.5(0.8)	28	50	315(1)	15.9	40.0
Chatham-Kent	255	234.8	33	62	255	24.3	57.1
City of Hamilton	689(2)	136.6(0.4)	266	137	519	26.4	27.2
City of Ottawa	125	15.4	18	27	125	21.6	3.3
City of Toronto	5,312(67)	212.2(2.7)	371	673	5,209(31)	12.9	26.9
Durham Regional	914(7)	162.8(1.2)	122	208	906(3)	23.0	37.1
Eastern Ontario	408(2)	214.1(1.0)	99	118	403(2)	29.3	61.9
Elgin-St. Thomas	166(1)	194.5(1.2)	19	40	165(1)	24.2	46.9
Grey Bruce	538(5)	341.0(3.2)	37	113	535(4)	21.1	71.6
Haldimand-Norfolk	188(4)	174.4(3.7)	36	50	179(2)	27.9	46.4
Haliburton-Kawartha-Pine Ridge District	393	228.9	43	70	389	18.0	40.8
Halton Regional	1,209(5)	275.2(1.1)	138	197	1,158(1)	17.0	44.8
Hastings & Prince Edward Counties	439(1)	281.5(0.6)	91	81	408(1)	19.9	51.9
Huron County	172	289.9	24	48	170	28.2	80.9
Kingston-Frontenac and Lennox & Addington	576(2)	312.4(1.1)	133	133	558(1)	23.8	72.1
Lambton	278(6)	216.8(4.7)	35	53	275(4)	19.3	41.3
Leeds-Grenville and Lanark District	230(2)	141.1(1.2)	49	63	224(1)	28.1	38.7
Middlesex-London	344	81.5	141	104	287	36.2	24.6
Niagara Regional Area	1,012(11)	236.8(2.6)	128	213	981(1)	21.7	49.8
North Bay Parry Sound District	385	313.4	44	75	381	19.7	61.1
Northwestern	441(2)	547.6(2.5)	70	127	439(1)	28.9	157.7
Oxford County	169(1)	164.5(1.0)	29	48	168(1)	28.6	46.7
Peel Regional	3,515(36)	303.2(3.1)	251	435	3,458(24)	12.6	37.5
Perth District	285(2)	383.4(2.7)	30	43	283(1)	15.2	57.8
Peterborough County-City	329(2)	247.2(1.5)	45	84	328(1)	25.6	63.1
Porcupine	643(3)	764.0(3.6)	179(1)	237(1)	642(2)	36.9(50.0)	281.6
Renfrew County & District	93	93.6	15	27	92	29.3	27.2
Simcoe Muskoka District	1,837(17)	382.9(3.5)	150	253	1,758(5)	14.4	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	471(4)	244.8(2.1)	57	124	468(3)	26.5	64.5
Thunder Bay District	569	369.3	87	157	569	27.6	101.9
Timiskaming	120	350.7	34	44	119	37.0	128.6
Waterloo	654(3)	136.8(0.6)	78	127	644(2)	19.7	26.6
Wellington-Dufferin-Guelph	572(3)	224.4(1.2)	43	85	564(3)	15.1	33.4
Windsor-Essex County	909(2)	231.1(0.5)	118	325	905	35.9	82.6
York Regional	1,700(21)	190.4(2.4)	134	281	1,670(9)	16.8	31.5
Out of Province/Not Available	<b>108(1)</b>	N/A	17	25	<b>106</b>	<b>23.6</b>	N/A
<b>Grand Total</b>	<b>26,811(215)</b>	<b>220.5(1.8)</b>	<b>3,242(1)</b>	<b>5,040(1)</b>	<b>26,099(105)</b>	<b>19.3(0.9)</b>	<b>41.4</b>

Source: The Ontario Agency for Health Protection and Promotion (OHPP) 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 Lababstract at [www.oahpp.ca/resources/lababstracts.html](http://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 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>