

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

Information current as of: Monday April 26, 2010

This report summarizes patient specimens (1 specimen/patient) collected and received at the Ontario Agency for Health Protection and Promotion (OAHP) public health laboratories (PHL) in Ontario for influenza virus testing since September 1, 2009. This information is current as of Monday April 26, 2010 and is updated weekly. Note that influenza A positivity rates are only reported for influenza A tests performed at the OAHP 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 2, 2010. The most recent influenza B sample was identified on March 25, 2010. Low levels of respiratory syncytial virus (RSV), parainfluenza viruses and human Metapneumovirus (hMPV) are circulating in Ontario.

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

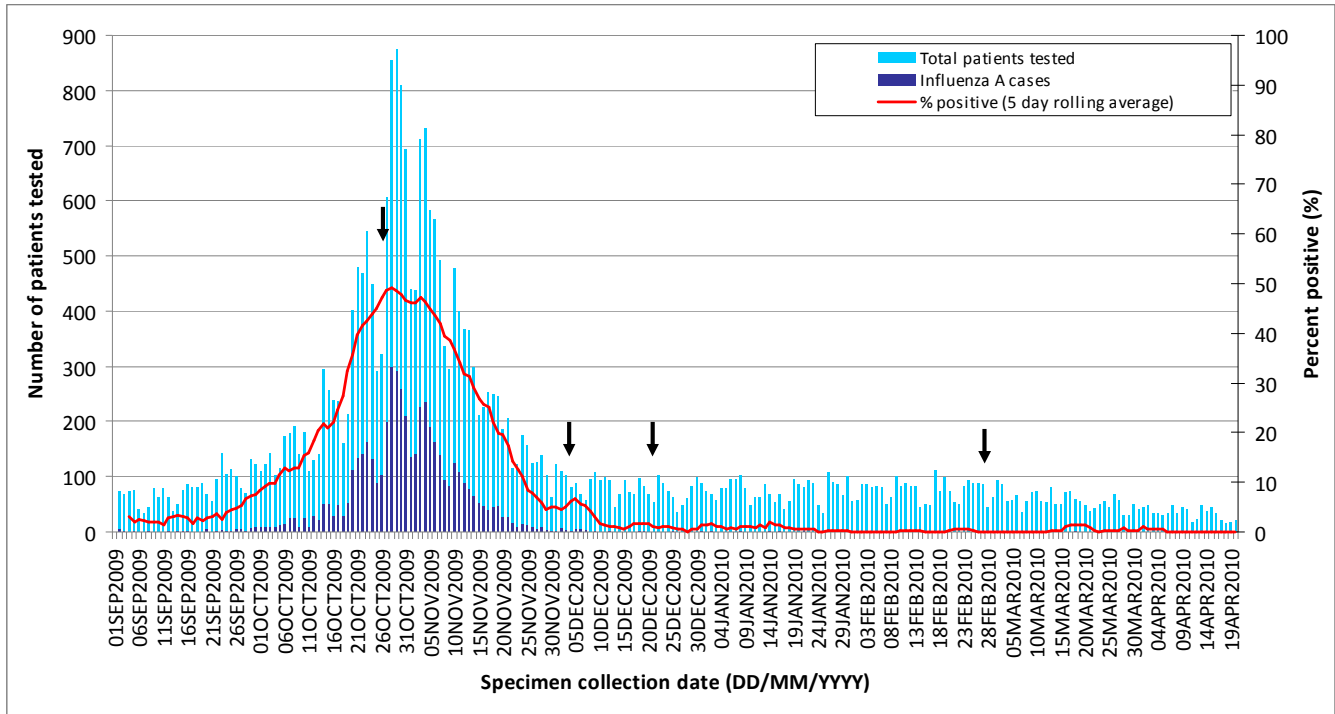
Case statistics:

Between September 1, 2009 and April 26, 2010, a total 26,569 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, 25, 865 specimens and isolates have been tested for influenza A at the PHL, of which 5,039 (19.5%) 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.

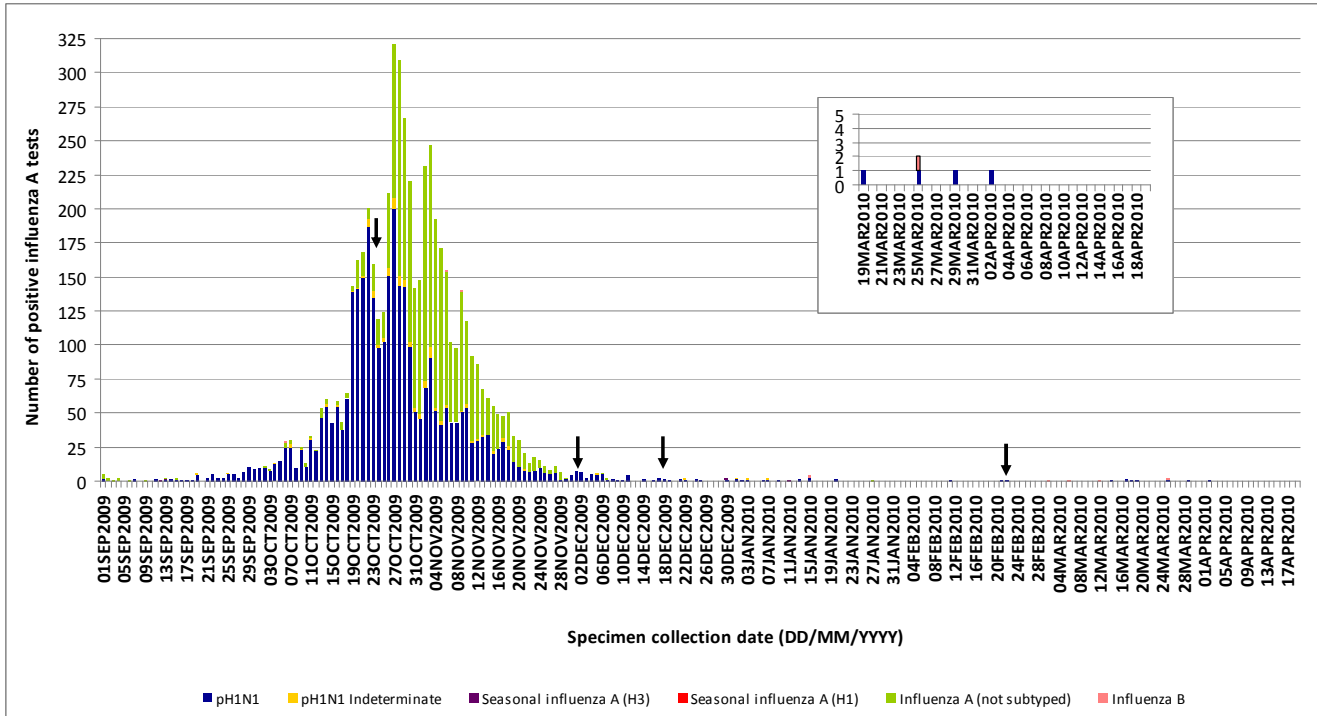
Please refer to **Appendix 1** for further information on lab testing algorithms and interpreting subtyping results.

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 19, 2010**.



Source: The Ontario Agency for Health Protection and Promotion (OHPP) 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 19, 2010**.



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

For 1,440 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 19, 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)	766	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 – 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
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	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	0	N/A
Influenza B	0	N/A
Rhinovirus	4	Hamilton (2) Ottawa Simcoe Muskoka
Parainfluenza 2	1	Kingston-Frontenac and Lennox & Addington
Parainfluenza 3	2	Brant County Niagara
Total number of positive specimens	7	
Total number of specimens tested	8	

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 Enterovirus/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- April 26, 2010 (Specimens collected: April 18-April 24, 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	444(1)	381.9(0.9)	50	103	443	23.3	88.6
Brant County	315(2)	251.7(1.6)	28	50	311	16.1	40.0
Chatham-Kent	255(1)	234.8(0.9)	33	62	254	24.4	57.1
City of Hamilton	684(5)	135.6(1.0)	266	137	512	26.8	27.2
City of Ottawa	123(1)	15.1(0.1)	18	27	122(1)	22.1	3.3
City of Toronto	5,238(1)	209.2(0.0)	371	673	5144(37)	13.1	26.9
Durham Regional	904(4)	161.1(0.7)	122	208	898(2)	23.2	37.1
Eastern Ontario	406(1)	213.0(0.5)	99	118	401(1)	29.4	61.9
Elgin-St. Thomas	166(2)	194.5(2.3)	19	40	162	24.7	46.9
Grey Bruce	536(1)	339.8(0.6)	37	113	530	21.3	71.6
Haldimand-Norfolk	184(1)	170.7(0.9)	36	50	177	28.2	46.4
Haliburton-Kawartha-Pine Ridge District	391(4)	227.8(2.3)	43	70	383	18.3	40.8
Halton Regional	1,202(12)	273.6(2.7)	138	197	1149(3)	17.1	44.8
Hastings & Prince Edward Counties	438(4)	280.8(2.6)	91	81	407(4)	19.9	51.9
Huron County	172(1)	289.9(1.7)	24	48	170	28.2	80.9
Kingston-Frontenac and Lennox & Addington	573(3)	310.7(1.6)	133	133	554(2)	24.0	72.1
Lambton	273(4)	212.9(3.1)	35	53	271(4)	19.6	41.3
Leeds-Grenville and Lanark District	227(1)	139.3(0.6)	49	63	222(1)	28.4	38.7
Middlesex-London	344(3)	81.5(0.7)	141	104	285(1)	36.5	24.6
Niagara Regional Area	998(14)	233.5(3.3)	128	213	972(4)	21.9	49.8
North Bay Parry Sound District	382(1)	311.0(0.8)	44	75	379(1)	19.8	61.1
Northwestern	439(1)	545.1(1.2)	70	127	437	29.1	157.7
Oxford County	167(0)	162.5(0.0)	29	48	167	28.7	46.7
Peel Regional	3,479(31)	300.1(2.7)	251	435	3421(20)	12.7	37.5
Perth District	284(1)	382.0(1.3)	30	43	279	15.4	57.8
Peterborough County-City	328(2)	246.5(1.5)	45	84	326	25.8	63.1
Porcupine	640(1)	760.5(1.2)	178	236	640(1)	36.9	280.4
Renfrew County & District	93(13)	93.6(13.1)	15	27	92(2)	29.3	27.2
Simcoe Muskoka District	1,817(2)	378.7(0.4)	150	253	1747(9)	14.5	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	468(5)	243.3(2.6)	57	124	464(1)	26.7	64.5
Thunder Bay District	567(67)	368.0(43.5)	87	157	564(2)	27.8	101.9
Timiskaming	120(4)	350.7(11.7)	34	44	119(1)	37.0	128.6
Waterloo	653(8)	136.6(1.7)	78	127	640(3)	19.8	26.6
Wellington-Dufferin-Guelph	567(5)	222.5(2.0)	43	85	557(4)	15.3	33.4
Windsor-Essex County	907(14)	230.6(3.6)	118	325	904(2)	36.0	82.6
York Regional	1,678(223)	188.0(25.0)	134	281	1,657(8)	17.0	31.5
Out of Province/Not Available	107	N/A	17	25	105(1)	23.8	N/A
Grand Total	26,569(444)	218.5(3.7)	3,241	5,039	25,865(115)	19.5	41.4

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.

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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.

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>