

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

Information current as of: **Monday February 22, 2010**

This report summarizes patient specimens (1 specimen/patient) collected and received at OAHPP Public Health Laboratories (PHL) in Ontario for influenza virus testing since September 1, 2009. This information is current as of Monday February 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.

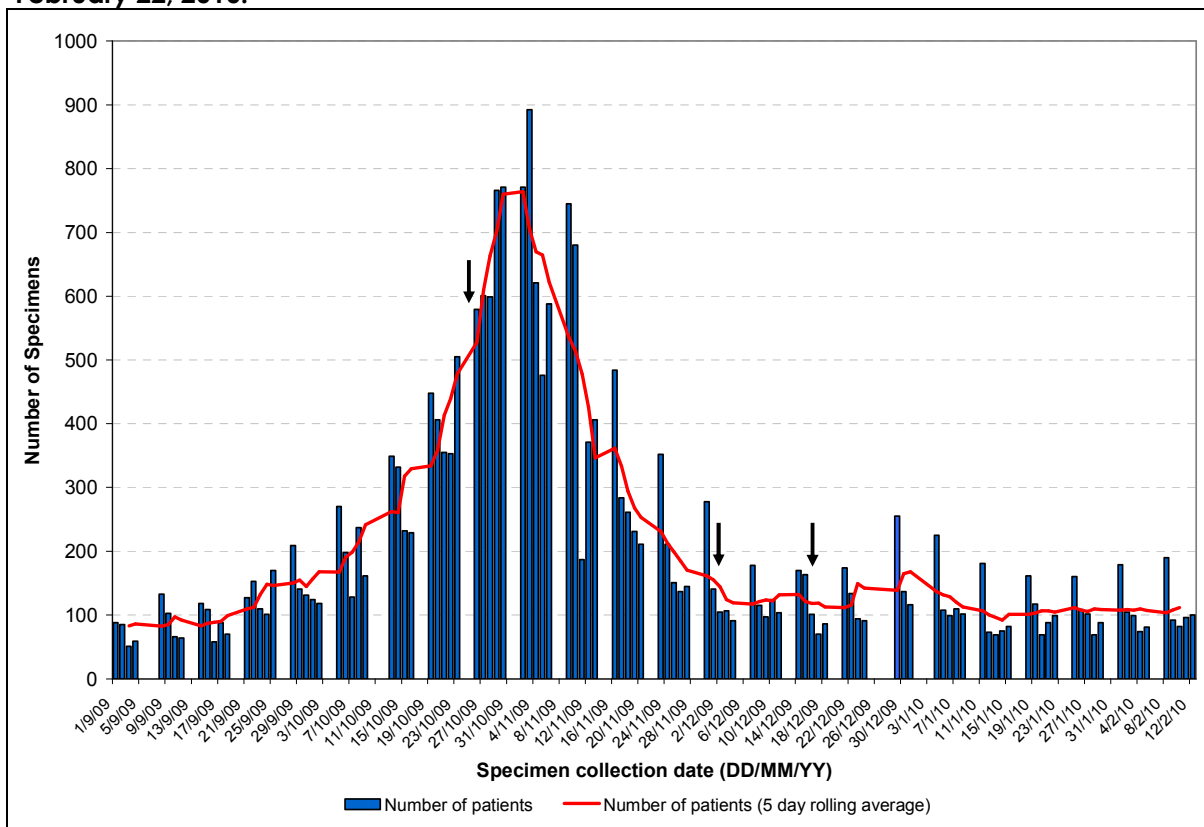
Specimen collection date is used in this weekly report to classify the specimens submitted and tested by time. The PHL performs the majority of subtype testing; however, several hospital laboratories also perform subtyping. Therefore, the numbers reported here may not reconcile precisely with those reported 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 isolate being collected on February 11, 2010. The last laboratory confirmed influenza A positive was identified on January 20, 2010. The predominant circulating respiratory virus is respiratory syncytial virus (RSV).

Lab Submissions

Figure 1. The number of specimens received (1/patient) at PHL/OAHPP for pH1N1 testing by date, irrespective of testing status and includes rejected specimens. Specimen receipt dates: September 1, 2009- February 22, 2010.



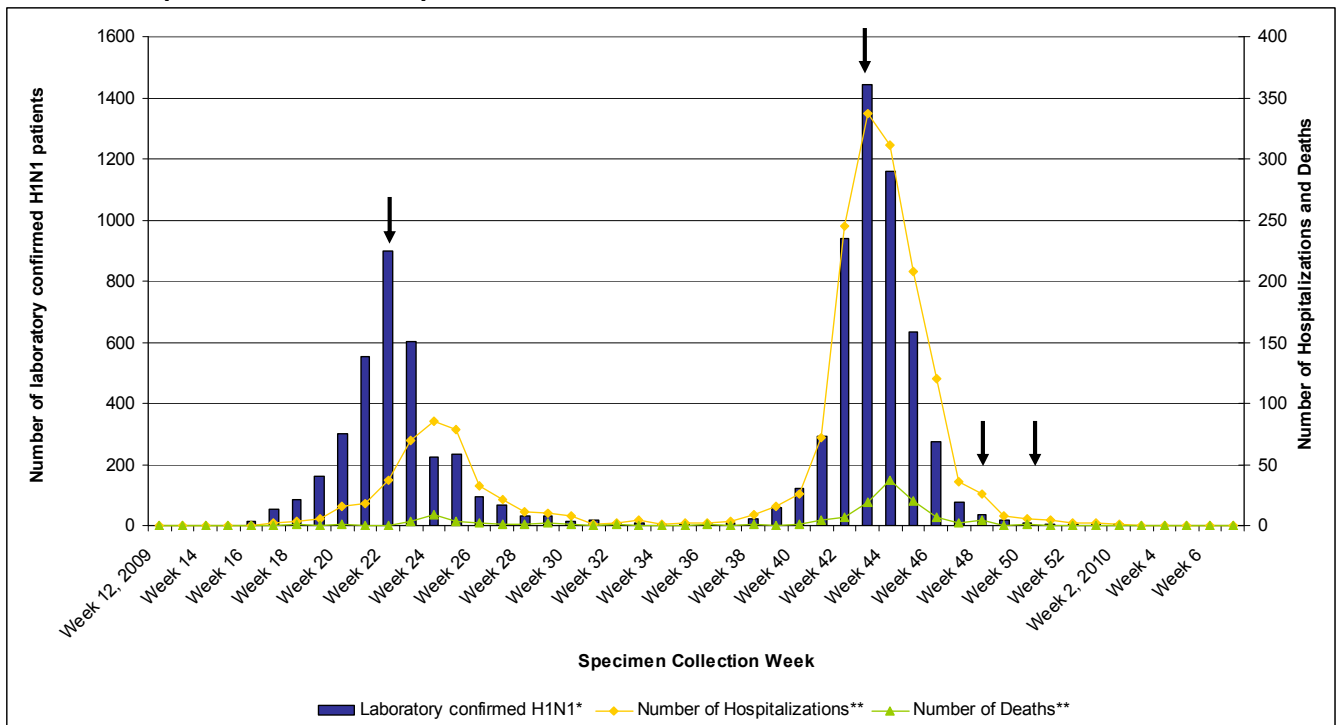
Source: PHL, Ontario Agency for Health Protection and Promotion (OAHPP). ↓ Modification to testing algorithm

Case statistics:

Between September 1, 2009 and February 22, 2010, a total of 20,712 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, 19,927 specimens and isolates have been tested for influenza A at the PHL, of which 4,633 (23.2%) were positive for Influenza A; an additional 628 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 2. Laboratory confirmed cases of pandemic H1N1, hospitalizations and deaths by collection week from April 1 2009 – February 22, 2010

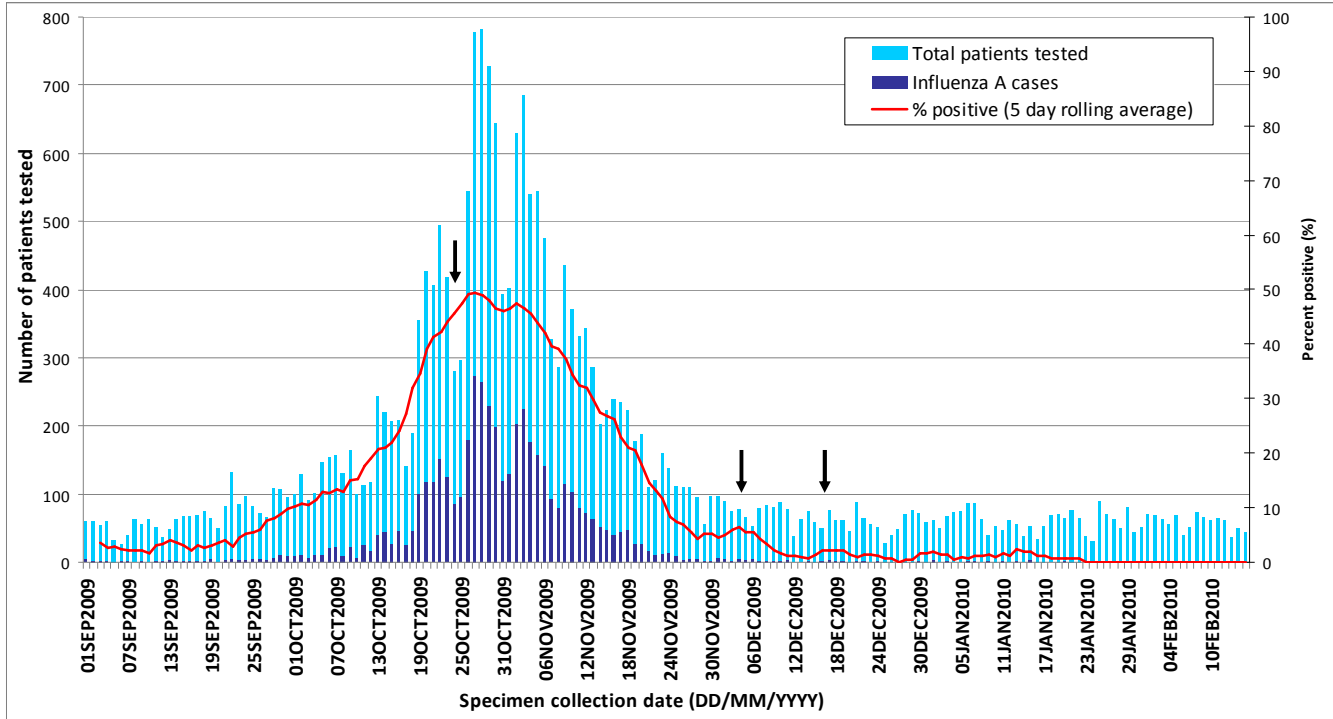


Source: *PHL, Ontario Agency for Health Protection and Promotion (OAHPP); **Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS), extracted February 23, 2010

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.

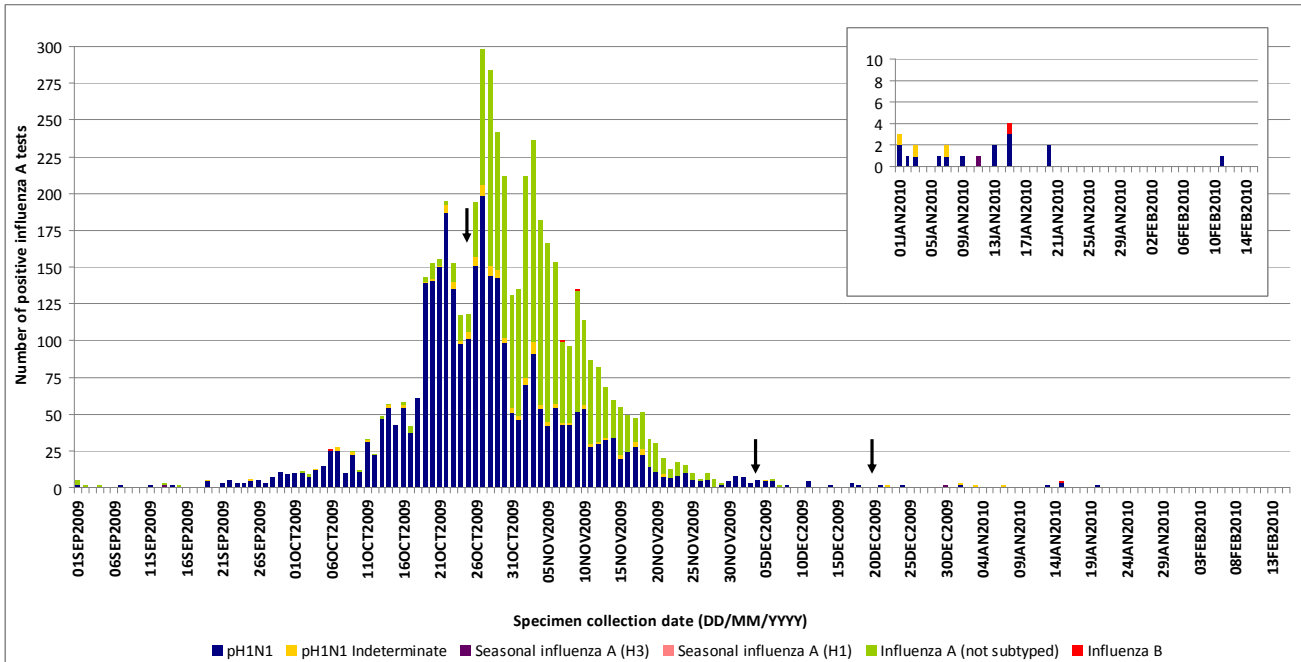
↓ **Modification to testing algorithm**

Figure 3. Total number of influenza A tests conducted, the number of influenza A positive cases and the percent positive (5 day rolling average), September 1 – February 15, 2010.**



Source: PHL, Ontario Agency for Health Protection and Promotion (OAHP).
 For 980 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 15, 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 4. The number of positive influenza A test results by subtype (pH1N1, seasonal H1/H3, indeterminate pH1N1 Influenza A - not subtyped & influenza B), September 1 – February 15, 2010.**



Source: PHL, Ontario Agency for Health Protection and Promotion (OAHP).
 For 980 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 15, 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: PHL, Ontario Agency for Health Protection and Promotion (OAHPP)

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 – February 18, 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)	3	1 (33)	2	0 (0)
Influenza A (H3N2)	9	0 (0)	17	17(100)	9	0 (0)
Influenza B	1	0 (0)	n/a	n/a	1	0 (0)
Pandemic Influenza A (H1N1)	1007	12 (1.19)	1056	1056 (100)	985	0 (0)

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

Table 3: NML Strain Characterization of isolates in Canada Sept 1, 2009 to Feb 19, 2010.

Strain	Total positive isolates
Seasonal Influenza A (H1N1)	
A/Brisbane/59/2007-like	2
Seasonal Influenza A (H3N2)	
A/Brisbane/10/2007 – like	1
A/Perth/16/2009 – like	6
Seasonal Influenza B	
B/Brisbane/60/2008 – like	1
Pandemic Influenza A (H1N1)	
A/California/07/2009 – like	793

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

The strains selected for the vaccine formulation include:

A/California/07/2009: selected for the 2009 H1N1 vaccine

B/Brisbane/60/2008 – like: selected as the influenza B component for the 2009/2010 influenza vaccine

A/Perth/16/2009: selected for the H3N2 component for the 2010 Southern hemisphere vaccine.

A/Brisbane/10/2007 – like: selected for the H3N2 component for the 2008/2009 and 2009/2010 vaccine.

A/Brisbane/59/07 – like: selected for the H1N1 component for the 2008/2009 and 2009/2010 vaccine.

The seasonal H3N2 strain has drifted from the A/Brisbane/10/2007 – like, to the A/Perth/16/2009 – like. This drift has impacted the recommended vaccine formulations to having the same vaccine formulation in both the Northern and Southern hemispheres.

Due to low submissions the Vaccine Effective Study results will be reported in the next update.

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

Ontario Public Health Units

At the PHU, a patient is sorted into a 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 from Sept. 1, 2009- Feb. 22, 2010 (Specimens collected: Feb 14 – 20, 2010 **(Week 7***)** 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	382(3)	328.6 (2.6)	51	99	378 (1)	26.2	325.2
Brant County	262(10)	209.4(8.0)	28	50	257(7)	19.5	205.4
Chatham-Kent	173(2)	159.3(1.8)	33	51	170(2)	30.0	156.6
City of Hamilton	490(2)	97.1(0.4)	265	121	316(2)	38.3	62.6
City of Ottawa	96(1)	11.8(0.1)	18	27	96(1)	28.1	11.8
City of Toronto	3,861(59)	154.2(2.4)	368	652	3,801(45)	17.2	151.8
Durham Regional	628(16)	111.9(2.9)	122	154	593(15)	26.0	105.7
Eastern Ontario	370(7)	194.1(3.7)	99	118	365(7)	32.3	191.5
Elgin-St. Thomas	141(5)	165.2(5.9)	19	40	137(5)	29.2	160.5
Grey Bruce	465(8)	294.8(5.1)	36	112	460(8)	24.3	291.6
Haldimand-Norfolk	153(1)	142.0(0.9)	36	50	146(1)	34.2	135.5
Haliburton-Kawartha-Pine Ridge District	284(5)	165.4(2.9)	43	54	274(5)	19.7	159.6
Halton Regional	718(12)	163.5(2.7)	138	146	667(10)	21.9	151.8
Hastings & Prince Edward Counties	395(8)	253.3(5.1)	91	78	360(6)	21.7	230.8
Huron County	151(5)	254.5(8.4)	24	48	146(2)	32.9	246.1
Kingston-Frontenac and Lennox & Addington	500(7)	271.1(3.8)	132	128	477(4)	26.8	258.7
Lambton	226(12)	176.3(9.4)	35	53	222(8)	23.9	173.2
Leeds-Grenville and Lanark District	207(3)	127.0(1.8)	49	63	202(3)	31.2	123.9

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)
Middlesex-London	290(2)	68.7(0.5)	144	103	230(1)	44.8	54.5
Niagara Regional Area	723(16)	169.2(3.7)	128	199	704(15)	28.3	164.7
North Bay Parry Sound District	314(5)	255.6(4.1)	45	76	306(1)	24.8	249.1
Northwestern	368(14)	457.0(17.4)	70	126	357(5)	35.3	443.3
Oxford County	157(3)	152.8(2.9)	29	48	155(2)	31.0	150.8
Peel Regional	2,869(63)	247.5(5.4)	251	428	2,811(52)	15.2	242.5
Perth District	239(12)	321.5(16.1)	30	43	231(8)	18.6	310.7
Peterborough County-City	259(5)	194.6(3.8)	45	73	256(5)	28.5	192.4
Porcupine	559(7)	664.2(8.3)	179	234	559(7)	41.9	664.2
Renfrew County & District	84	84.5	15	26	82	31.7	82.5
Simcoe Muskoka District	1,501(28)	312.9(5.8)	147	240	1,427(25)	16.8	297.4
Sudbury & District	384(4)	199.6(2.1)	56	124	381(2)	32.5	198.0
Thunder Bay District	494(5)	320.6(3.2)	86	153	488(3)	31.4	316.7
Timiskaming	107	312.7	34	43	106	40.6	309.8
Waterloo	517(23)	108.1(4.8)	77	126	496(18)	25.4	103.7
Wellington-Dufferin-Guelph	459(11)	180.1(4.3)	43	84	449(9)	18.7	176.2
Windsor-Essex County	515(3)	130.9(0.8)	117	172	476(3)	36.1	121.0
York Regional	1,291(24)	144.6(2.7)	133	267	1,268(19)	21.1	142.0
Out of Province/Not Available	80(2)	N/A	17	24	78	30.8	N/A
Grand Total	20,712 (393)	170.3 (3.2)	3,233	4,633	19,927 (307)	23.2 (0)	163.9

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

*** 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>