Ontario Agency for Health Protection and Promotion Laboratory Pandemic H1N1 Surveillance Report
Information current as of: Monday December 14, 2009

This report summarizes patient specimens (1 specimen/patient) collected and received at OAHPP Public Health Laboratories (PHL) in Ontario for pandemic H1N1 influenza virus (pH1N1) testing since September 1, 2009. This information is current as of Monday December 14, 2009 and is updated weekly.

Specimen collection date is used in this weekly report to classify the specimens submitted and tested by time. A daily summary is also prepared which uses the date the specimen was logged into the PHL electronic system. Because of these differences, numbers may not always match accordingly.

The PHL performs the majority of testing for pH1N1; however, several hospital laboratories also perform pH1N1 testing. 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.

RECENT CHANGE IN LAB TESTING ALGORITHM:
Starting on Dec. 2nd, 2009 subtyping is being increased as resources allow. Please see Appendix 1 for all prior changes to the testing algorithm. As the pre-test probability for an influenza A positive sample testing positive for pH1N1 is currently 99%, the percent positive for influenza A will be reported instead of the percent positive for pH1N1. Note that influenza A positivity rates are only reported for influenza A tests performed at the OAHPP laboratories.
For additional details on changes to the laboratory testing algorithm, please see the November Labstract at www.oahpp.ca

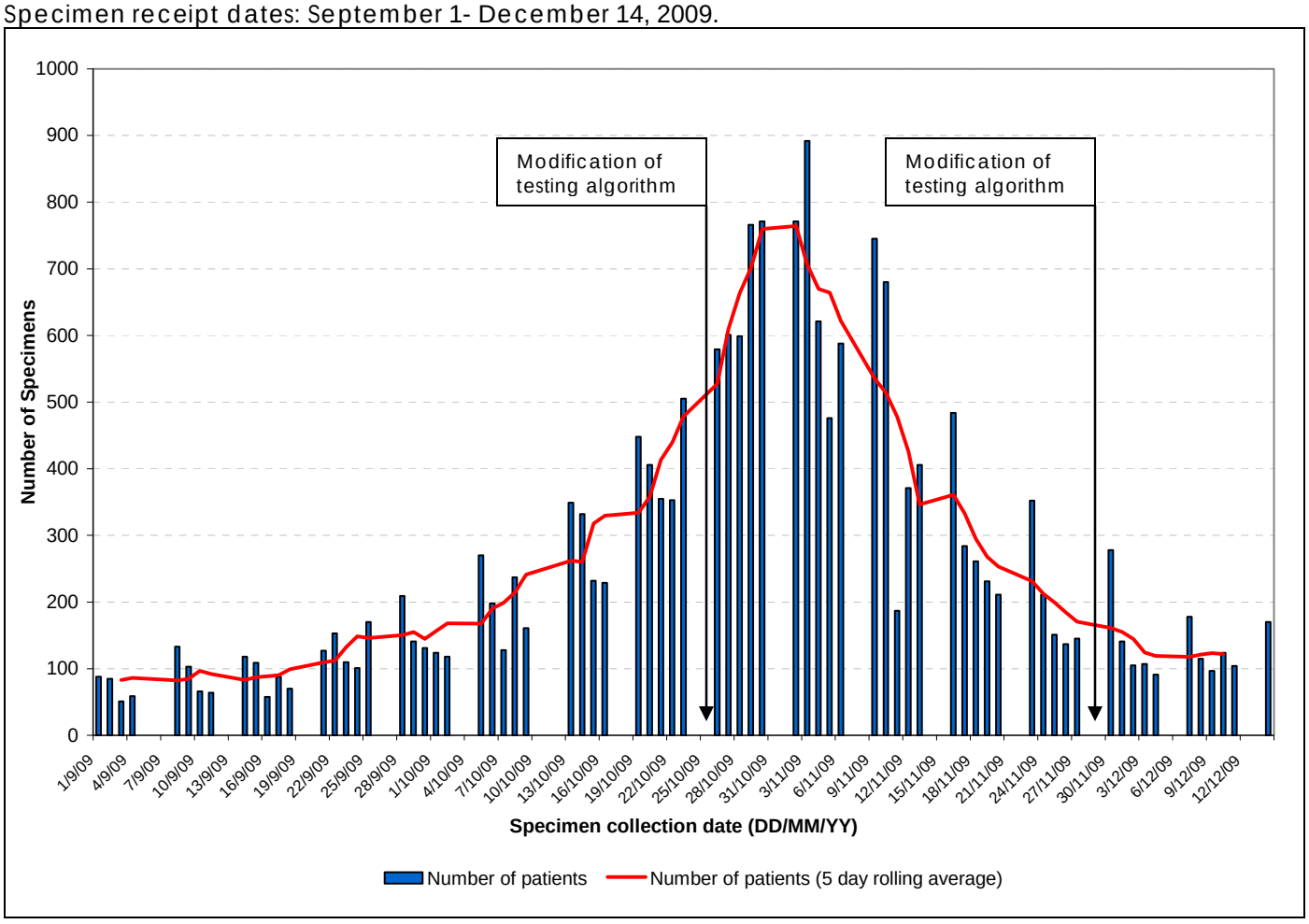
Week 49 Summary Snapshot

- There were 10 laboratory confirmed cases of influenza A so far this week, which is a drop from 27 laboratory confirmed influenza A cases last week.
- The RT-PCT % positivity continues to fall, down from 5.4% in Week 48 week to 3.0% in Week 49.

Lab Submissions

Figure 1 displays the daily number of patient specimens (1 specimen/patient) received at PHL for pH1N1 testing since September 1, 2009, as well as a five-day rolling average. Rolling averages offer a method of smoothing time series data to reduce the effects of random variation and reveal underlying trends. The total number of patients with specimens received as of December 14, 2009 is 19,920. This number includes all specimens received, irrespective of testing status and also includes rejected specimens. The number of specimen submissions remained relatively constant in the first three weeks of September. However, the number of specimens received steadily increased until the end of October. There were 788 specimens received for pH1N1 testing during the 7 day period between December 7 – December 14, 2009; 3.96% of the total received since September 1. Within the past five weeks submissions have declined.

Figure 1. The number of specimens received (1/patient) at PHL/OAHPP for pH1N1 testing by date. Specimen receipt dates: September 1- December 14, 2009.



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

Case Statistics

Between September 1 and December 14, 2009, a total of 16,415 patient specimens and isolates (1/patient) have been submitted for pH1N1 testing at the PHL and entered into the PHL electronic system. This number does not include rejected samples or samples for which testing has been cancelled. 15,790 of the samples were submitted to PHL directly for influenza A testing and subsequent pH1N1 subtyping. The additional samples, tested for influenza A at hospitals, were forwarded to the PHL to be subtyped for pH1N1. Please refer to Appendix 1 for further information on testing protocols. The number of patient specimens and isolates submitted for pH1N1 testing by test result (or status) by collection date is displayed in **Figure 2**. The percentage of all patient specimens tested by RT-PCR and viral culture that have detected influenza A (percent positive Influenza A for RT-PCR and viral culture) in addition to the percentage of all subytyped specimens that have detected pH1N1 (percent positive pH1N1 for subtyped cases) across specimen collection weeks are displayed in **Table 1.** The highest influenza A percent positive since September 1st, 2009 reached 54.2% on October 27, 2009. At the height of the Spring/Summer pH1N1 outbreak, percent positive pH1N1 reached approximately 54% (Source: OAHPP Laboratory Pandemic H1N1 Surveillance Report: Tuesday September 22, 2009).

Figure 3 displays the number of influenza A cases detected, the total number of patients tested, as well as the 5 day rolling averages for total number of patients tested and the number of influenza A cases confirmed by laboratory results (average of the current date, 2 preceding and 2 following dates), by specimen collection date.

Since September 1, 2009, 15,577 specimens and isolates have been tested for influenza A at the PHL. Influenza A virus has been identified in 4,560 (29.3%) of the patients tested at PHL; an additional 625 patient specimens that tested positive for influenza A at hospital laboratories were forwarded to the PHL to be subtyped for pH1N1. There are 1,920 that have been confirmed positive for influenza A but have not been subtyped. Of all specimens and isolates subtyped for pH1N1, 3173 cases of pH1N1have been detected. Two cases of seasonal influenza (H3) have been detected. One-hundred-one samples tested positive for influenza A but were indeterminate for pH1N1 (**Table 1**). Please refer to Appendix 1 for further information on interpreting subtyping results.

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. Since September 1, 2009, of the 728 isolates that have been tested, 5 (0.69%) have been identified as containing the H725Y mutation that confers resistance.
Of the 5 cases, 1 was identified in Week 40, 2 in Week 46 and 2 in Week 49.

Table 1. Patient test results for specimens collected between September 1 and December 12, 2009, tested at the PHL in Ontario.

Specimen collection date*	pH1N1 positive	Positive influenza A, not subtyped	Seasonal H1 influenza	Seasonal H3 influenza	Positive influenza A – indeterminate pH1N1	Indeterminate & negative influenza A	Total cases tested**	Percent positive (%) influenza A RT-PCR	Percent Positive (%) influenza A Viral culture‡	Percent Positive (%) pH1N1 for influenza A subtyped cases	Positive influenza B†
Sep. 1 – Sep. 5	2	9	0	0	0	242	253	4.0	2.4	100.0	0
Week 36 (Sep. 6 – 12)	2	3	0	1	0	335	341	1.6	7.2	66.7	0
Week 37 (Sep. 13 – 19)	12	4	0	1	1	432	450	5.2	3.1	85.7	0
Week 38 (Sep. 20 – 26)	27	1	0	0	1	557	586	5.8	0.8	96.4	0
Week 39 (Sep. 27 – Oct. 3)	59	6	0	0	0	597	662	11.4	0.0	100.0	0
Week 40 (Oct. 4 – 10)	126	3	0	0	4	741	874	13.9	4.2	96.9	1
Week 41 (Oct. 11 – 17)	293	12	0	0	4	808	1117	21.0	15.5	98.7	0
Week 42 (Oct. 18 – 24)	915	54	0	0	15	1086	2070	38.3	33.8	98.4	0
Week 43 (Oct. 25 – 31)	884	556	0	0	35	1448	2923	48.0	49.8	96.2	0
Week 44 (Nov. 1 – 7)	389	747	0	0	25	1333	2494	45.5	60.9	94.0	1
Week 45 (Nov. 8 – 14)	259	346	0	0	7	1088	1700	34.2	31.3	97.4	1
Week 46 (Nov. 15 – 21)	128	141	0	0	8	875	1152	22.3	23.9	94.1	0
Week 47 (Nov. 22 – 28)	35	34	0	0	0	683	752	7.0	11.6	100.0	0

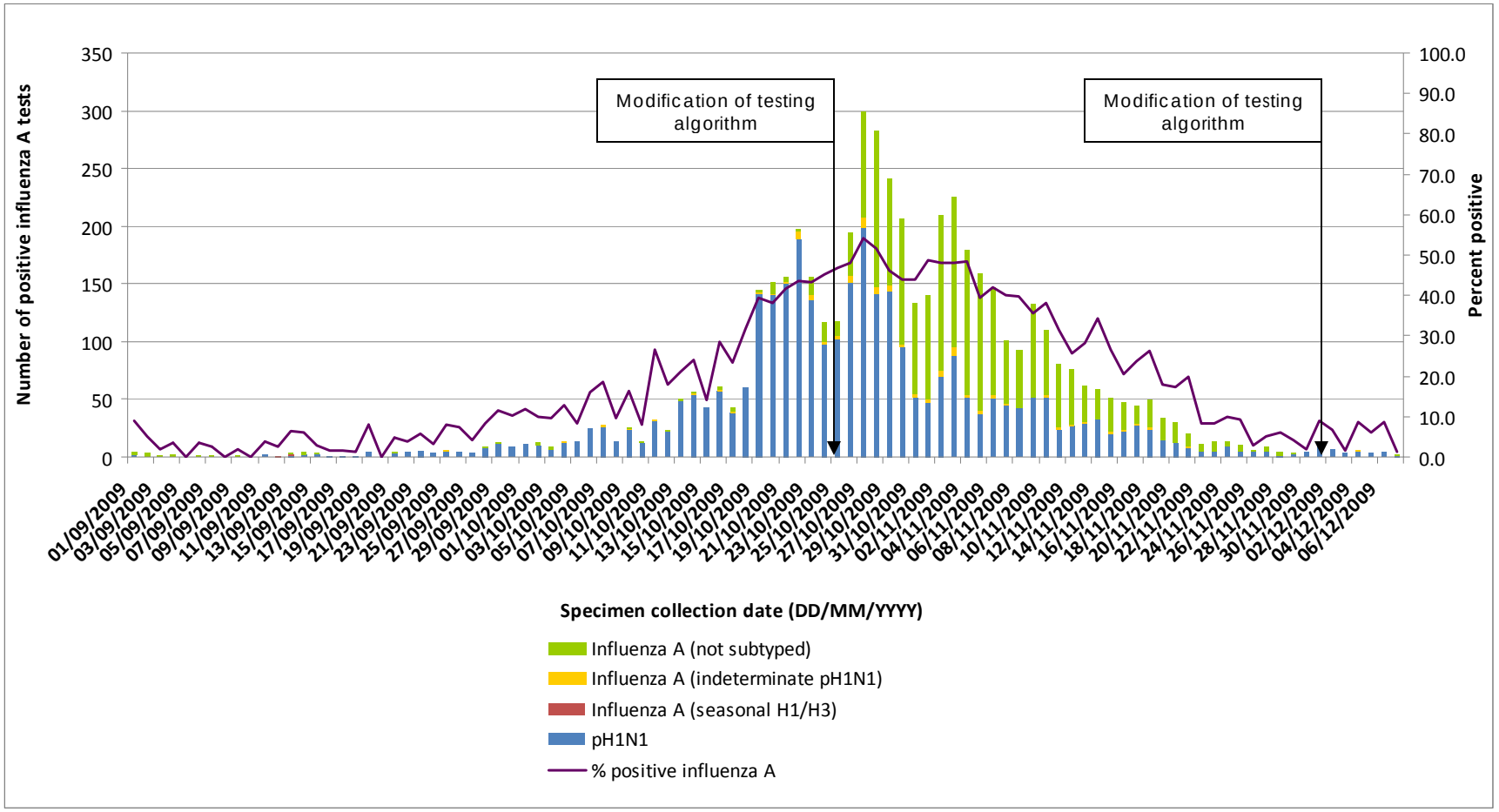
Table 1 – Continued

Specimen collection date*	pH1N1 positive	Positive influenza A, not subtyped	Seasonal H1 influenza	Seasonal H3 influenza	Positive influenza A – indeterminate pH1N1	Indeterminate & negative influenza A	Total cases tested**	Percent positive (%) influenza A RT-PCR	Percent Positive (%) influenza A Viral culture‡	Percent Positive (%) pH1N1 for influenza A subtyped cases	Positive influenza B†
Week 48 (Nov. 29 – Dec. 5)	33	1	0	0	1	463	498	5.4	7.1	97.1	0
Week 49 *** (Dec 6-12)	9	3	0	0	0	324	336	3.0	7.9	100.0	0
Total	3173	1920	0	2	101	11012	16208	28.9	29.9	96.9	3

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

* For 808 specimens, no specimen collection date was available; the date the specimen was received at the lab has been used as a proxy. ****** This number includes specimens for which the primary detection was not completed at the PHL (N=625) ******* 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. ‡ Viral culture % positive is based on resulted tests from September 1st 2009 onwards. †Influenza B positives are counted in the week in which testing was resulted and released.

Figure 2. The number of positive test results and the percent positive for influenza A, by subtype (pH1N1, seasonal H1/H3, unsubtypeable & indeterminate pH1N1 or pending subtype), for specimen collection dates* September 1 – December 7, 2009, 2009**.

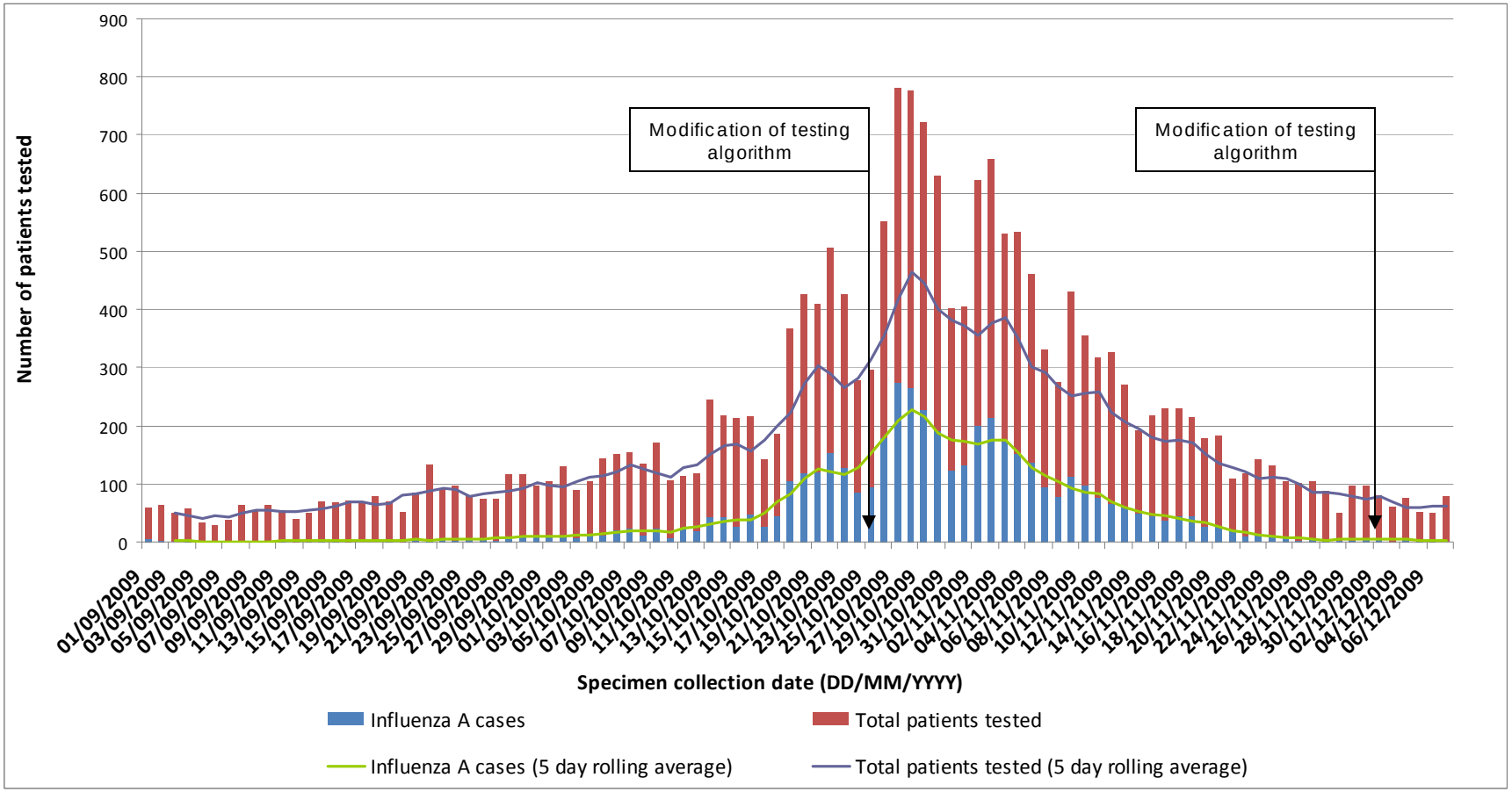


Source: PHL, Ontario Agency for Health Protection and Promotion (OAHPP).

***** For 808 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 December 7th, 2009 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.

Figure 3. Total counts and 5 Day rolling averages of the number of influenza A cases and number of patients tested, by specimen collection* dates September 1 – December 7, 2009**.



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

***** For 808 specimens, no specimen collection date was available; the date the specimen was received at the lab has been used as a proxy.

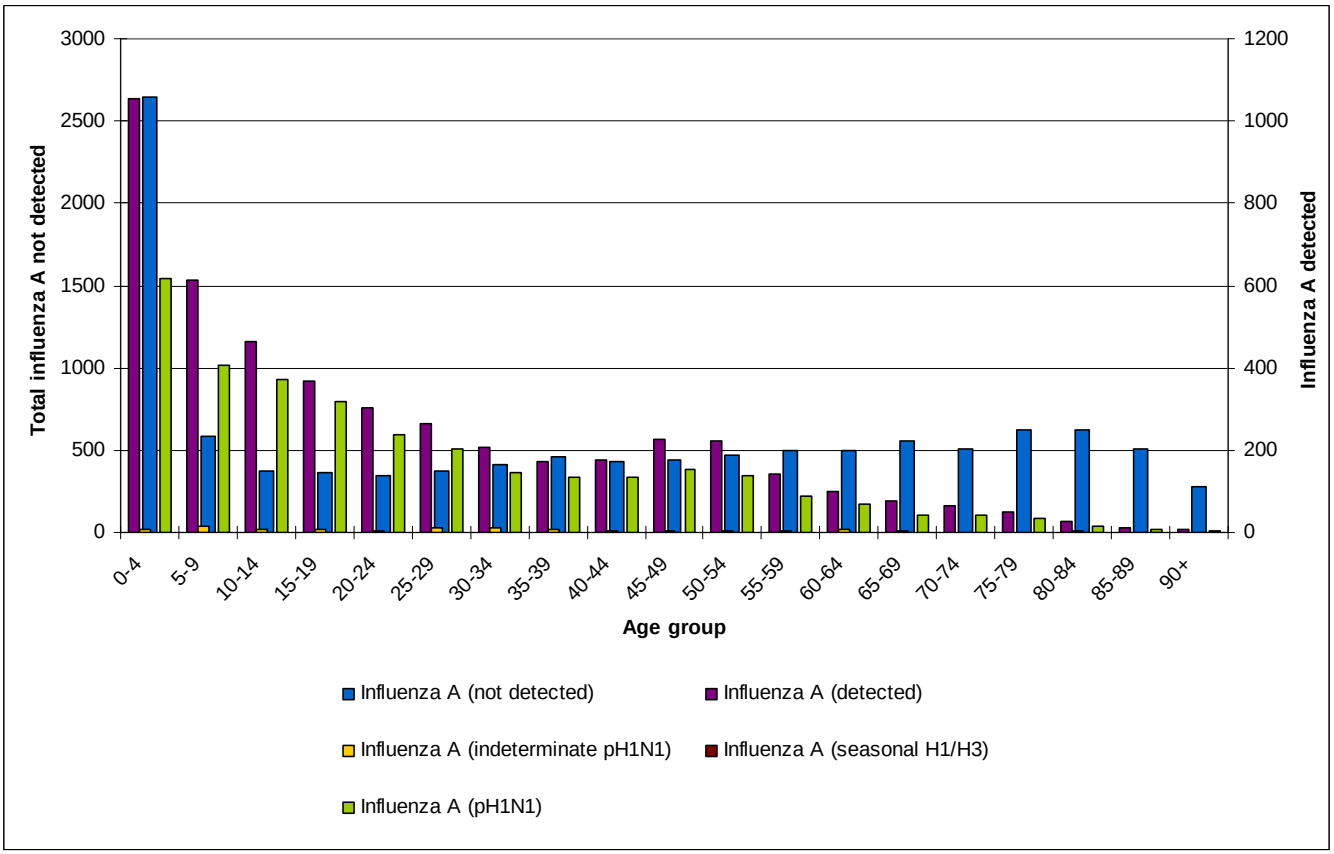
******Data collected since December 7th, 2009 has been excluded from Figures 3. Since not all specimens collected on those dates have test results available, the data from those days may not reflect the current situation.

Sex and Age Distribution

Over half (52.1%; n=8,389) of all patient specimens submitted for testing for pH1N1 were from female patients. Males made up 47.9% (n=7,728) of patients and sex was not reported for 298 of patients. Females make up 51.6% (n=1,607) of all lab confirmed cases of pH1N1 detected. Males made up 48.4% (n=1,505) of confirmed pH1N1 cases. Sex was not reported for 61 cases.

The age distribution of patients by influenza A test result since September 1, 2009 is shown in **Figure 4**. The largest amount of influenza A cases occurred in children under the age of five, with 1055 cases (23.2%). Children aged 0-19 represent over half of the cases (55.0%; n=2502). There were 566 cases of pH1N1 among adults aged 20-29 (12.6%). Adults aged 30-59 make up 25.2% of pH1N1cases (n=1147). 333 influenza A cases occurred among adults 60 years of age and older.

Figure 4. Age distribution of patients tested at PHL for influenza A by test result, for specimens collected between September 1- December 14, 2009*.



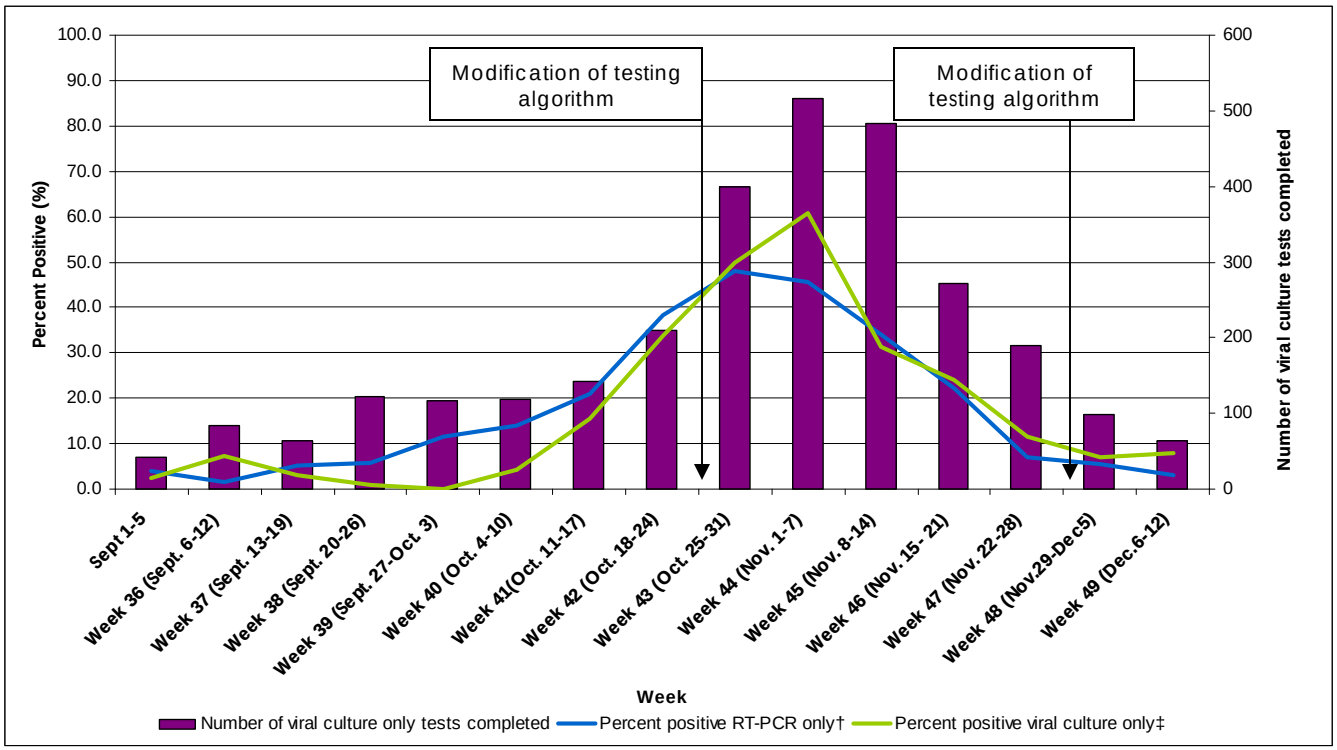
Source: PHL, Ontario Agency for Health Protection and Promotion (OAHPP).
*Note: Age was not available for 42 patients.

Second wave peak

To date various indicators (specimen submission, percent positive, activity at local health unit level) reveal that Ontario has passed the second wave peak activity in terms of infections. It should be noted that the peak in hospitalizations and/or deaths would be anticipated to follow the peak in infections due to the lag between the onset of infection and hospitalization or death.

The percent positive for influenza A separated by testing method (PCR† and viral culture‡) is shown in **Figure 5**. The percentage of specimens positive for influenza by RT-PCR has declined in the past three weeks, with sharp declines in the most recent two weeks. For viral culture approximately 7.9 % of these specimens tested positive in the most recent reporting week. Percent positivity by RT-PCR provides a better indicator of the overall trend given that this test is performed on the majority of patient specimens and provides a more timely result compared to viral culture due to the inherent lag time of growing cultures. Since ambulatory samples are primarily tested with only viral culture, the percent positive of viral culture tests provides an indicator for ambulatory activity.

Figure 5: Percent positive of influenza A tests conducted by RT-PCR and viral culture at the public health labs from September 1st, 2009 to December 12th, 2009



Source: PHL, Ontario Agency for Health Protection and Promotion (OAHPP).
Note: †RT-PCR percent positive is calculated based on date of specimen collection.
‡Viral culture percent positive is calculated based on date of entry of results.

Public Health Unit

The cumulative number of specimens submitted for pH1N1 testing, submission rates, number of lab-confirmed cases and percent positives by PHU, since September 1, 2009, are displayed in **Table 2**. The number of pH1N1 cases and influenza A cases detected in Weeks 48 and 49, as well as the total number of specimens submitted, by public health unit (PHU), is displayed in **Tables 3 and 4**. Rates of the submission of specimens for pH1N1 testing and percent positive by PHU are also displayed. A map of influenza A cases by PHU and specimen collection week is displayed in **Figure 6.** Each ring on the map represents one week, with the most recent full week (Week 49 – December 5 – December 12, 2009) as the outermost ring. The rings are divided into sections representing each PHU in Ontario. The map of Ontario includes the cumulative number of influenza A cases in brackets and the cumulative population rate per 100,000, for the number of influenza A cases by PHU since September 1, 2009. At the PHL, 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.

Cumulative: September 1 – December 14

Since, September 1, the highest submission rates for specimens being tested for pH1N1 observed were from the Porcupine (596.5 submissions/100,000 persons) and Northwestern (384.9 submissions/100,000 persons) PHUs. The Toronto area had the highest number of influenza A cases in the province (n=637) during this time period, followed by Peel Regional (n=417) and York Regional (n=260) (**Table 2**). Percent positive for influenza A was greatest in Middlesex-London, with 46.8% of samples tested yielding positive results.

Week 48: November 29 – December 5

In the recent full week, Porcupine (10.7 submissions/100,000 persons) and Simcoe Muskoka District (10.2 submissions/100,000 persons) PHUs had the highest submission rates for specimens to be tested for pH1N1. In Week 48, 27 new influenza A cases have been identified (33 confirmed new cases of pH1N1) to date. The greatest number of influenza A cases was identified in Toronto and Peel (n=6). This was followed by York Regional (n=3) and Leeds-Grenville and Lanark County, Simcoe Muskoka District and Waterloo (n=2) (**Table 3**).

Most recent full week: December 6 – December 12 (Week 49)

In the most recent full week, Porcupine (9.5 submissions/100,000 persons) and Peel (8.0 submissions/100,000 persons) PHUs had the highest submission rates for specimens to be tested for pH1N1. In Week 49, 10 new influenza A cases have been identified (9 confirmed new cases of pH1N1) to date. The greatest number of cases was identified in Peel Region (n=4), followed by Toronto and Niagara Regional Area with 2 cases each (**Table 4**).

Table 2. Number of pH1N1 specimens submitted for testing, pH1N1 cases, percent positive and submission rate (/100,000) by PHU. Specimen collection dates: September 1- December 14, 2009.

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	Percent positive (%) influenza A**
Algoma District	338	290.7	51	100	30.0
Brant County	177	141.4	28	50	29.1
Chatham-Kent	148	136.3	32	50	34.5
City of Hamilton	444	88.0	262	117	43.8
City of Ottawa	90	11.1	18	27	30.0
City of Toronto	3114	124.4	357	637	21.0
Durham Regional	502	89.4	118	149	32.0
Eastern Ontario	304	159.5	99	118	39.5
Elgin-St. Thomas	109	127.7	19	40	37.0
Grey Bruce	357	226.3	34	110	31.3
Haldimand-Norfolk	125	116.0	35	49	41.5
Haliburton-Kawartha-Pine Ridge District	227	132.2	43	54	25.2
Halton Regional	583	132.7	134	142	27.1
Hastings & Prince Edward Counties	307	196.8	90	77	28.5
Huron County	124	209.0	24	49	39.8
Kingston-Frontenac and Lennox & Addington	428	232.1	132	129	32.4
Lambton	156	121.7	35	53	34.2
Leeds-Grenville and Lanark District	189	116.0	50	63	34.4
Middlesex-London	279	66.1	142	104	46.8
Niagara Regional Area	582	136.2	127	198	35.7
North Bay Parry Sound District	248	201.9	43	74	30.3
Northwestern	310	384.9	69	123	40.5
Oxford County	132	128.5	29	47	35.6
Peel Regional	2036	175.6	243	417	21.3
Perth District	155	208.5	30	43	28.3
Peterborough County-City	199	149.5	43	72	36.5
Porcupine	502	596.5	179	233	46.5
Renfrew County & District	75	75.5	15	26	35.6
Simcoe Muskoka District	1143	238.2	148	243	23.1
Sudbury & District	337	175.2	56	122	36.2
Thunder Bay District	412	267.4	83	149	36.6
Timiskaming	95	277.6	32	41	44.1
Waterloo	346	72.4	75	123	36.8
Wellington-Dufferin-Guelph	324	127.1	42	83	26.2
Windsor-Essex County	449	114.1	110	165	40.4
York Regional	1005	112.6	129	260	26.6
Out of Province/Not Available	64	N/A	17	23	35.9
Grand Total	16415	135.0	3173	4560	29.3

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

**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.

Table 3. Number of pH1N1 specimens submitted for testing, pH1N1 cases, percent positive and submission rate (/100,000) by PHU. Specimen collection dates: Nov.29 – Dec.5, 2009(**Week 48**).

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	Percent positive (%) influenza A**
Algoma District	4	3.4	0	0	0.0
Brant County	3	2.4	0	1	33.3
Chatham-Kent	7	6.4	0	0	0.0
City of Hamilton	11	2.2	1	0	0.0
City of Ottawa	0	0.0	0	0	N/A
City of Toronto	88	3.5	8	6	7.2
Durham Regional	15	2.7	1	1	6.7
Eastern Ontario	13	6.8	1	1	7.7
Elgin-St. Thomas	2	2.3	0	0	0.0
Grey Bruce	8	5.1	0	0	0.0
Haldimand-Norfolk	5	4.6	1	1	20.0
Haliburton-Kawartha-Pine Ridge District	6	3.5	0	0	0.0
Halton Regional	20	4.6	0	0	0.0
Hastings & Prince Edward Counties	9	5.8	0	0	0.0
Huron County	3	5.1	0	0	0.0
Kingston-Frontenac and Lennox & Addington	5	2.7	0	0	0.0
Lambton	4	3.1	0	0	0.0
Leeds-Grenville and Lanark District	9	5.5	2	2	22.2
Middlesex-London	5	1.2	0	0	0.0
Niagara Regional Area	21	4.9	1	1	4.8
North Bay Parry Sound District	6	4.9	0	0	0.0
Northwestern	1	1.2	0	0	0.0
Oxford County	5	4.9	0	0	0.0
Peel Regional	87	7.5	8	6	7.1
Perth District	1	1.3	0	0	0.0
Peterborough County-City	5	3.8	1	1	20.0
Porcupine	9	10.7	0	0	0.0
Renfrew County & District	2	2.0	0	0	0.0
Simcoe Muskoka District	49	10.2	3	2	4.2
Sudbury & District	6	3.1	0	0	0.0
Thunder Bay District	11	7.1	0	0	0.0
Timiskaming	3	8.8	0	0	0.0
Waterloo	17	3.6	2	2	11.8
Wellington-Dufferin-Guelph	11	4.3	0	0	0.0
Windsor-Essex County	13	3.3	0	0	0.0
York Regional	32	3.6	4	3	9.7
Out of Province/Not Available	2	N/A	0	0	0.0
Grand Total	498	4.1	33	27	5.5

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

Table 4. Number of pH1N1 specimens submitted for testing, pH1N1 cases, percent positive and submission rate (/100,000) by PHU. Specimen collection dates: Dec. 6 - Dec. 12, 2009 (**Week 49*****).

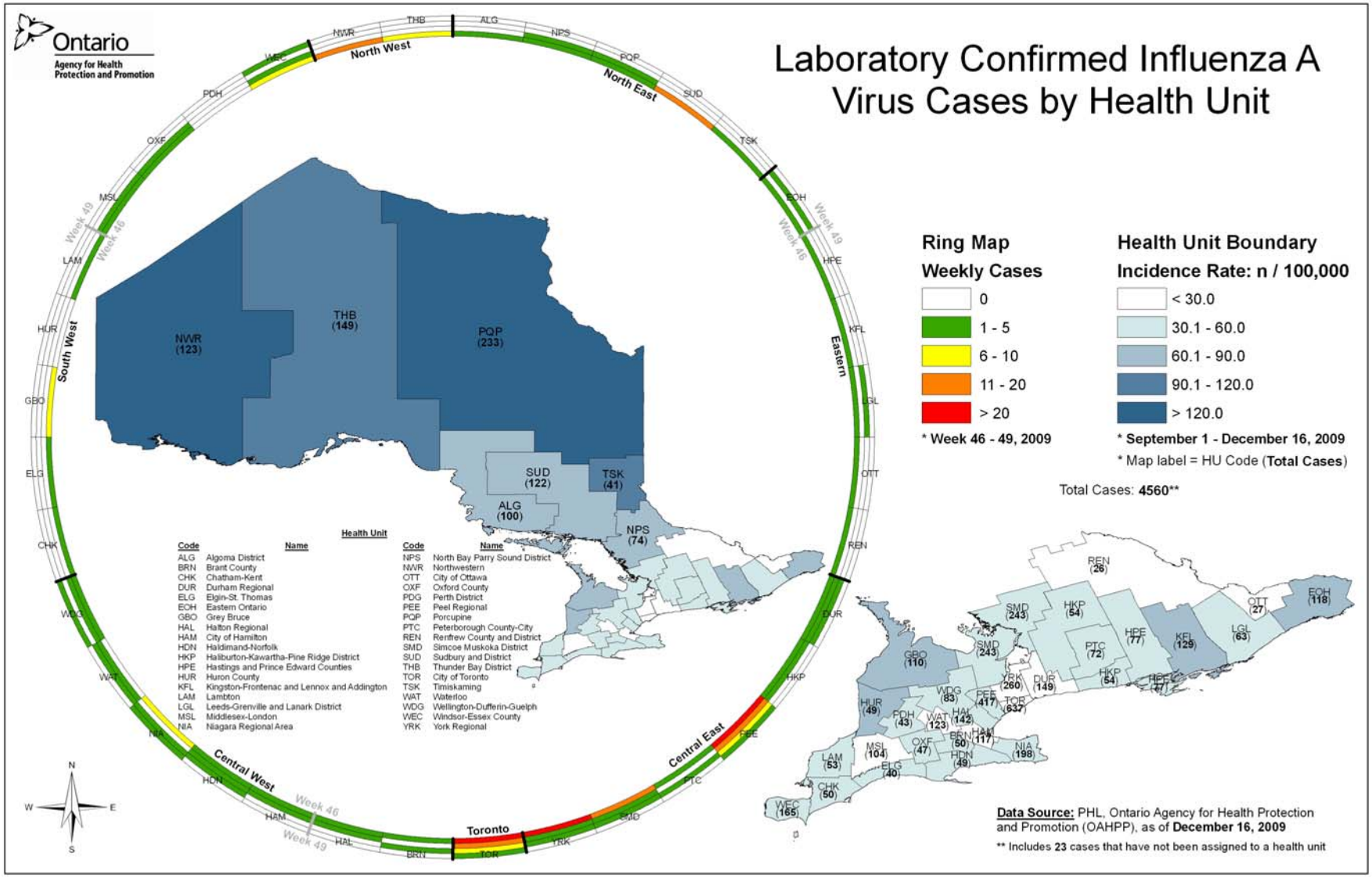
Public Health Unit	Total number of specimens submitted	Submission rate (/100,000)	Number of lab confirmed cases of pH1N1	Number of lab confirmed Influenza A cases	Percent positive (%) influenza A**
Algoma District	5	4.3	0	0	0.0
Brant County	7	5.6	0	0	0.0
Chatham-Kent	3	2.8	0	0	0.0
City of Hamilton	9	1.8	1	0	0.0
City of Ottawa	0	0.0	0	0	N/A
City of Toronto	105	4.2	1	2	2.6
Durham Regional	6	1.1	0	0	0.0
Eastern Ontario	6	3.1	0	0	0.0
Elgin-St. Thomas	1	1.2	0	0	0.0
Grey Bruce	12	7.6	0	0	0.0
Haldimand-Norfolk	4	3.7	0	0	0.0
Haliburton-Kawartha-Pine Ridge District	6	3.5	0	0	0.0
Halton Regional	18	4.1	0	0	0.0
Hastings & Prince Edward Counties	7	4.5	0	0	0.0
Huron County	0	0.0	0	0	N/A
Kingston-Frontenac and Lennox & Addington	11	6.0	0	0	0.0
Lambton	0	0.0	0	0	N/A
Leeds-Grenville and Lanark District	3	1.8	0	0	0.0
Middlesex-London	0	0.0	0	0	N/A
Niagara Regional Area	23	5.4	2	2	11.8
North Bay Parry Sound District	1	0.8	0	0	0.0
Northwestern	4	5.0	0	0	0.0
Oxford County	0	0.0	0	0	N/A
Peel Regional	93	8.0	4	4	5.6
Perth District	2	2.7	0	0	0.0
Peterborough County-City	8	6.0	0	0	0.0
Porcupine	8	9.5	0	0	0.0
Renfrew County & District	0	0.0	0	0	N/A
Simcoe Muskoka District	29	6.0	0	0	0.0
Sudbury & District	7	3.6	0	0	0.0
Thunder Bay District	7	4.5	0	0	0.0
Timiskaming	1	2.9	0	0	N/A
Waterloo	10	2.1	0	0	0.0
Wellington-Dufferin-Guelph	8	3.1	1	1	20.0
Windsor-Essex County	10	2.5	0	1	11.1
York Regional	36	4.0	0	0	0.0
Out of Province/Not Available	0	N/A	0	0	N/A
Grand Total	450	3.7	9	10	3.0

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

**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

*** 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.

Figure 6. Map of the laboratory confirmed influenza A cases by PHU. Weekly cases are represented in the ring map, and the total number of positive influenza A cases is represented in brackets in the map of Ontario (PHU was not available for 23 influenza A cases).



Ontario Influenza Vaccine Effectiveness Program: Weekly Report.
Information current as of December 11, 2009

The Ontario Influenza Vaccine Effectiveness (VE) Program is part of a national surveillance system that monitors circulating influenza viruses. Data in this report represents VE specimens (1specimen/1patient) tested at TPHL since the beginning of September up to December 11, 2009. Rejected specimens are not included in the analyses. For more information related to this study please see Appendix 1.

Figure 1 represents the total number of VE specimens submitted to be tested for influenza from September 1 up to December 11. During last week (Wk49) 11 specimens were received were, which is 39% lower than during the previous week (48). Of the total number of specimens received, only 2 specimens (18.2 %) were Flu A positive, which represents a 5.1 times higher positivity rate compared to the previous week (3.6%). The strain of the positive specimens was influenza A/ (pH1N1).

Figure 1. Weekly epidemic curve of influenza for VE specimens, September 1- December 11, 2009

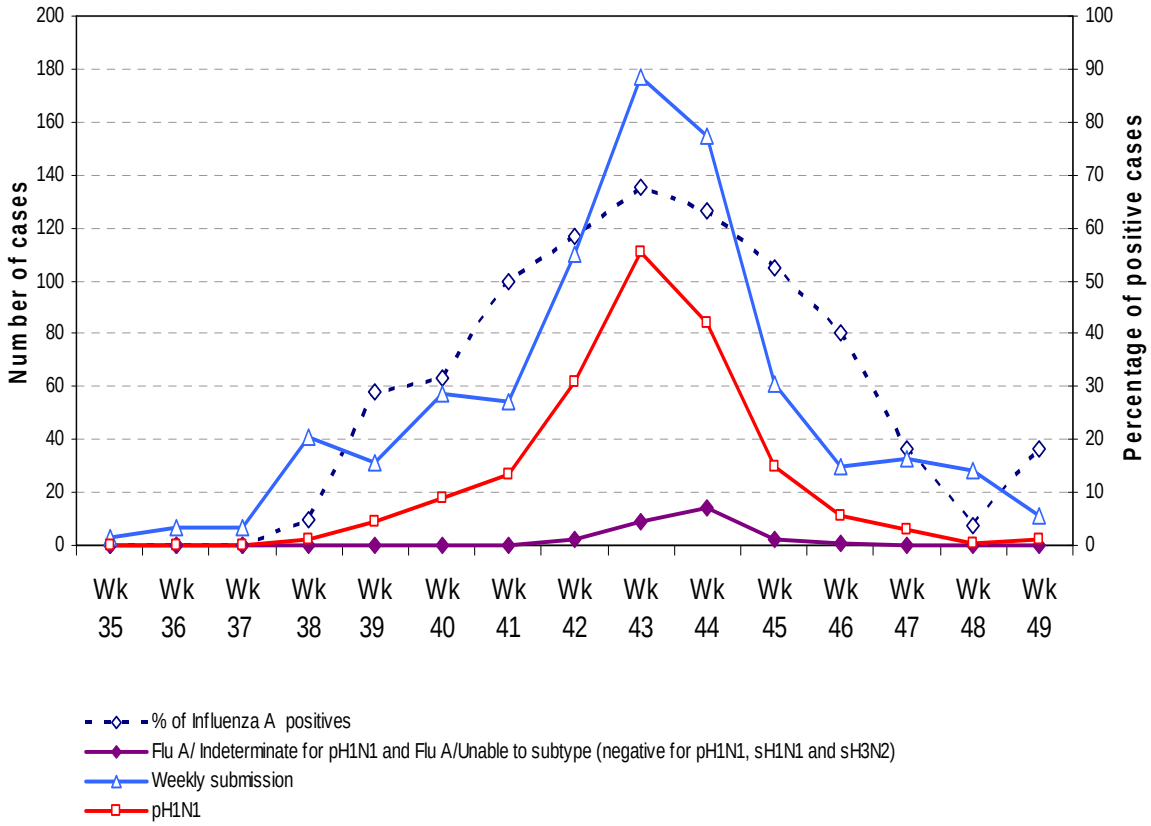


Figure 2 shows the distribution of age of influenza A positive patients (cases) and influenza A negative patients (controls). During the Wk 49, Influenza A remains more commonly detected in younger age

groups, with the most cases detected in the interval age of 10 -14 years. Almost 70% of cumulative cases were between the ages 0-24 which is the same as the previous week. Influenza remains less commonly detected in older age groups. In samples tested from individuals 60 and over, the cumulative percentage of positive for Influenza A was 8/66 which is 2% lower than during the previous week. This is because Influenza was not detected in any of specimens tested from patients in this age interval.

Figure 2. Age distribution of VE patients tested for influenza by influenza subtype, September 1 – December 11, 2009

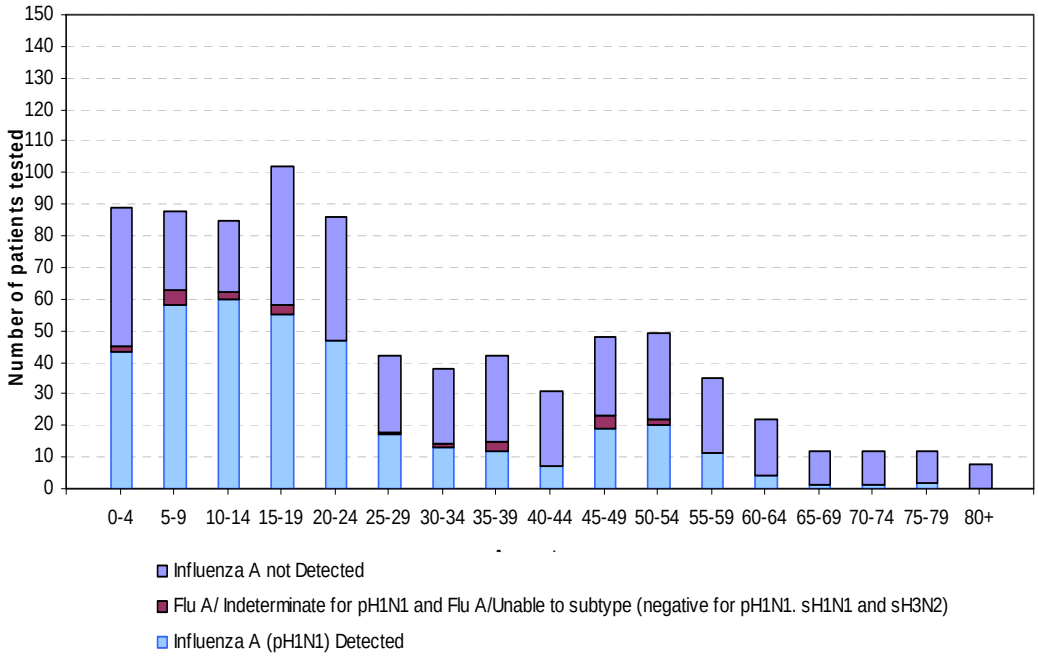


Table 1 shows the distribution of all detected circulating respiratory viruses in VE specimens during the Wk 49, using RT_PCR and Multiplex as testing methods. Beside Flu A /pH1N1 no other respiratory virus was detected in VE specimens.

Table 1 Circulating respiratory viruses detected by RT_PCR and Multiplex in VE specimens, December 7 to December 11, 2009

THE DETECTED VIRUSES	NUMBER OF SPECIMENS	PERCENTAGE OF SPECIMENS
FLU A/pH1N1	2	18.2
FLU B	0	0.0
TOTAL POSITIVE SPECIMENS	**2**	**18.2**
TOTAL SPECIMENS TESTED	**11**	**100.0**

Table 2 shows the geographical and age distribution of patients tested positive by RT_PCR and Multiplex methods during the Wk 49. Due to small sample size it is hard to observe any age or geographical trend.

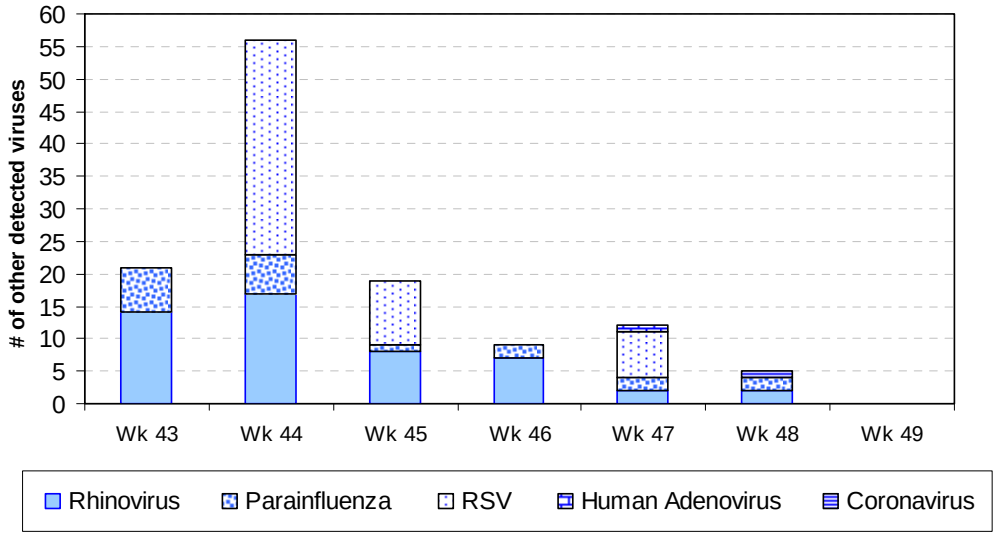
Two detected cases of Flu A/ pH1N1 were from Niagara Health Unit. Both cases are less than 29 years old.

Table 2 Geographical and age distribution of positive tested patients by RT_PCR and Multiplex methods, December 7 – December 11, 2009.

THE DETECTED VIRUSES	PATIENT_PHU	AGE_CATEGORY
FLU A/pH1N1		25-29
FLU A/pH1N1	NIAGARA	5-10

Figure 3 represents other circulating viruses detected in VE specimens from October 26 to December 4. Influenza positive cases that were not tested during the peak of the Influenza A outbreak (Wk 43 - Wk 44), were tested during this week by Multiplex for the presence of other respiratory viruses. The information provided in the graph below was updated accordingly. The number of viruses identified do not necessary represent the number of specimens tested as in 73/393 specimens tested, coinfections of two or three viruses were detected in 69/73 and 4/73, respectively. Respiratory Syncytial Viruses (RSV) have been highly detected during the Wk 44 in 17/50 specimens and dropped gradually at 7/33 in Wk 33. Rhinovirus and Parainfluneza viruses have been consistently present during the entire period with the exception of Wk 49. Rhinovirus reached the peak in the Wk 44 at 12/50 specimens and continuously dropped at 2/28 specimens during the Wk 48. Similarly, Painfluenza viruses reached the peak in Wk 43 at 6/42 specimens and slightly dropped at 2/28 specimens in Wk 48. Other detected respiratory specimens are Human Adenovirus 1/33 during Wk 47 and Coronovirus 1/28 specimens during Wk 48.

Figure 3. Weekly epidemic curve of other circulating respiratory viruses detected in VE specimens, October 26- December 11, 2009



Appendix 1

Changes to Testing Algorithm:

Date	Change
December 2, 2009	Subtyping is being increased as resources allow.
November 9-12, 2009	Only 20% of ambulatory (community) viral culture requests are being processed.
October 25-31, 2009	Subtyping performed on all intensive care samples, outbreak samples and on 20% of all additional influenza A positive tests.

Additional information on Testing Protocol for Influenza A:

The majority of specimens received at PHL, which have been approved for testing, are first tested for influenza A by real-time reverse transcriptase (RT) polymerase chain reaction (PCR). A subset of samples is tested by viral culture. Subtyping of positive influenza A tests is done to determine if samples are pH1N1 or seasonal H1/H3. For Influenza A real-time RT-PCR negative samples, 20% are followed up with viral culture to look for other viral pathogens. Viral culture analyses take considerably longer to process (up to 10 days) than analyses by real-time RT-PCR.

Interpretation of subtyping results:

An **indeterminate** result occurs in a RT-PCR test when a result is obtained that 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 of the RT-PCR test, it is not known if this is a true positive result, or nonspecific activity giving a false positive response. The clinical interpretation of an indeterminate result depends on the prevalence of the target of interest in the population being tested at that point in time. Currently an indeterminate pH1N1 result should be clinically interpreted as a pH1N1 case given that over 99% of influenza samples are of this subtype. An influenza isolate is considered **unsubtypeable** when influenza A is detected, but this sample does not match any of the subtypes that can be tested for (e.g. pH1N1, seasonal H3N2, H1N1). These samples are investigated further for the possibility of new strains or subtypes (due to genetic drift or shift). On occasion an influenza A positive sample that has very low amount of virus in it does not match any subtype. This occurs because the subtyping PCR tests are less sensitive than the influenza A RT-PCR tests available. When this occurs a result of "**unable to subtype**" is released.

Ontario Influenza Vaccine Effectiveness Program Additional Information

The Ontario Influenza Vaccine Effectiveness (VE) Program aims to monitor circulating influenza viruses and measure the effectiveness of yearly influenza vaccine. Through a case-control design, VE links laboratory testing results with patient's epidemiological information to measure influenza vaccine effectiveness. Ontario joined the VE study in the 2006/07 influenza season along with British Columbia, Alberta and Quebec. The Ontario VE program represent a collaboration between OAHPP Public Health Laboratories and Surveillance and Epidemiology teams, the Ontario Ministry of Health and Long Term Care (MOHLTC), the Ontario College of Family Physicians and a network of 115 sentinel physicians across the province. Sentinel physicians who volunteer to join the VE study submit respiratory specimens (nasal or nasopharyngeal) for influenza testing along with vaccine history and other epidemiologic information collected from eligible consenting participants from community presenting within 7 days of onset of influenza like illness (ILI). ILI is defined as acute onset of respiratory illness with fever and cough and with one or more of the following: sore throat, arthralgia, myalgia or prostration. Sentinel physicians are exempted from any restrictions placed on other clinicians who submit respiratory specimens. They are permitted to collect specimens without restrictions as they contribute to national and provincial influenza surveillance systems. At the Toronto Public Health Laboratory (TPHL) specimens are tested for

influenza A/B and subtypes (seasonal H1N1 and H3N2, and pH1N1). They are also screened for a panel of common respiratory viruses and cultured for antigenic strain characterization (performed at the National Microbiology Laboratory (NML)). Lab results are merged with epidemiological data to calculate VE from cases and controls with adjustments for covariates such as age and chronic conditions. For more details, please look at the study website available at: http://www.oahpp.ca/vestudy/index.php