Public Health Ontario | Santé publique Ontario

ONTARIO RESPIRATORY PATHOGEN BULLETIN

Surveillance Week 43: (October 21, 2018 - October 27, 2018)

This issue of the Ontario Respiratory Pathogen Bulletin provides information on the surveillance period from October 21, 2018 to October 27, 2018 (Week 43). It also provides information on the current influenza season to date, from a start date of September 1, 2018. Unless otherwise specified, data presented in this issue of the bulletin are for Week 43 and data extraction occurred on Wednesday, October 31, 2018.

Assessment of Influenza Activity in Ontario

Measure of Activity	Assessment of Measure Compared to the Previous Week (Lower, Similar, Higher)	Reasoning Behind Assessment
Laboratory-confirmed influenza cases[1]	Higher	There were 23 influenza cases (21 influenza A, 0 influenza A & B, and 2 influenza B) reported in Week 43, which was higher than the 8 influenza cases reported in Week 42 (8 influenza A, 0 influenza A & B, and 0 influenza B).
Percent positivity for influenza[2]	Similar	Percent positivity of laboratory tests for all influenza types in Week 43 was 1.2%, which was similar to the percent positivity in Week 42 (1.5%). In Week 43, percent positivity was 1.1% for influenza A and 0.1% for influenza B.
Institutional influenza outbreaks[3]	Lower	There were no new influenza outbreaks reported in Week 43, which was lower than the number of influenza outbreaks reported in Week 42 (1).
Influenza activity levels reported by public health units	Higher	In Week 43, 0 public health units reported 'widespread activity,' 2 public health units reported 'localized' activity, 5 reported 'sporadic' activity, 27 reported no activity and 1 public health unit did not report. In Week 42, 0 public health unit reported 'widespread activity,' 2 public health units reported 'localized' activity, 4 reported 'sporadic' activity, 28 reported no activity and 1 public health unit did not report.
OVERALL ASSESSMENT	**Similar**	**Overall, the indicators show that influenza activity for Week 43 was similar when compared to Week 42.**

Notes:

[1] Based on the date the case was reported to the public health unit.

[2] Positivity among viral respiratory specimens tested by Ontario laboratories that submit results to the Centre for Immunization and Respiratory Infectious Diseases (CIRID). Due to rounding, percentages presented here may not add up to the overall influenza percent positivity.

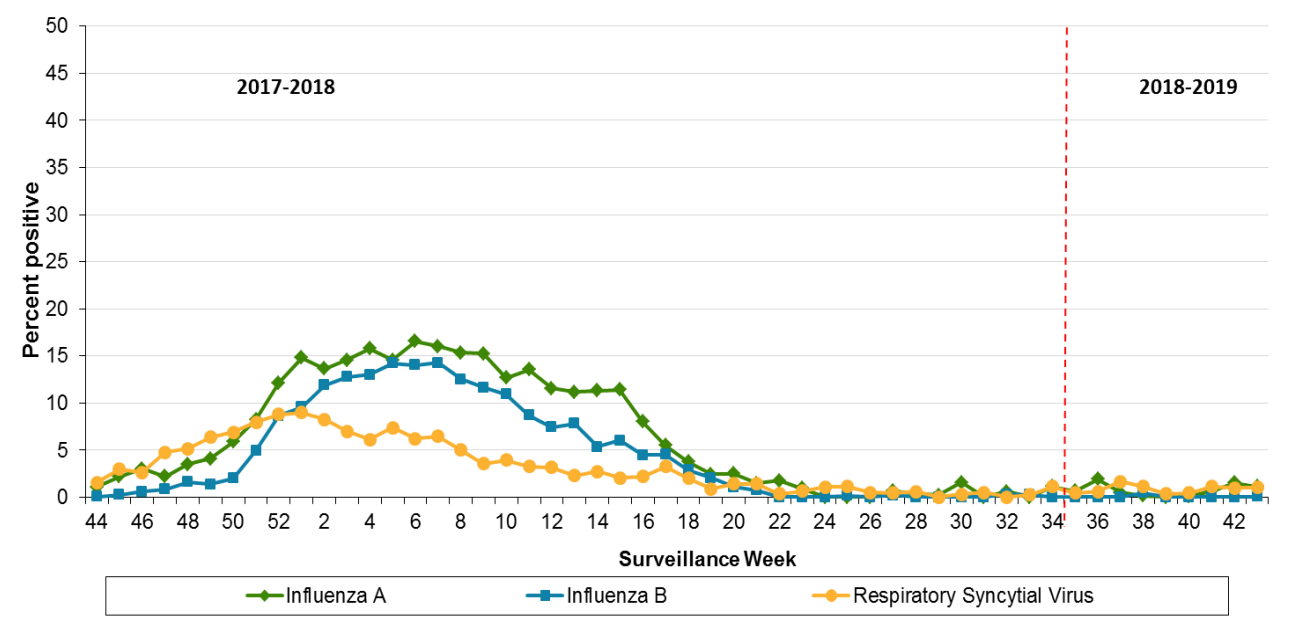
[3] The number of new outbreaks reported for the current week is based on the date the outbreak was reported to the public health unit; when reported date is unavailable, the date the outbreak was created in iPHIS is used.

1. Circulating respiratory viruses in Ontario

Provincial percent positivity was low for influenza A and low for influenza B, at 1.1% (13/1158) and 0.1% (1/1158) respectively in Week 43 (Figure 1 and Figure 3). Of the 3 influenza A positive tests for which subtyping was available, 66.7% (2/3) were H3N2 in week 43; for the season to date, 54.8% (17/31) were H3N2. Influenza activity based on percent positivity in week 43 was low.

Rhinovirus was the most common circulating non-influenza respiratory virus, with provincial percent positivity at 28.6% (52/182) (Figure 2).

Figure 1. Percentage of tests positive for respiratory viral pathogens (influenza A, influenza B, and respiratory syncytial virus) for specimens tested by all methods: Ontario, October 29, 2017 to October 27, 2018

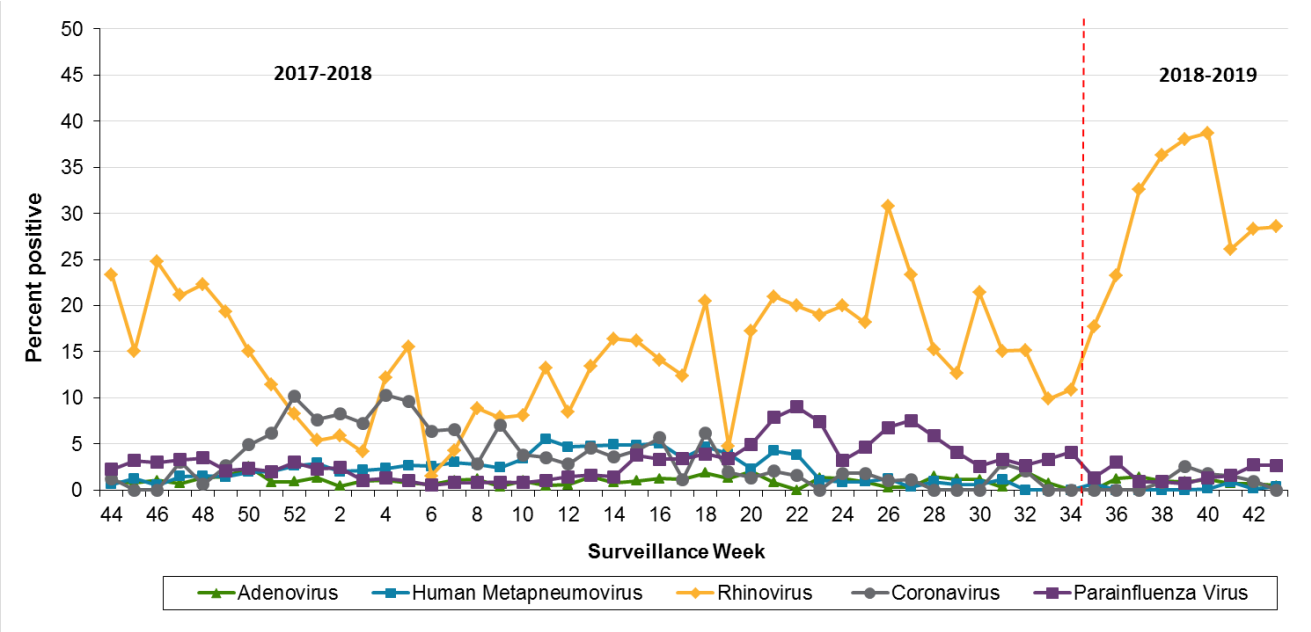


Source: Centre for Immunization and Respiratory Infectious Diseases (CIRID)

Notes:

- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

Figure 2. Percentage of tests positive for respiratory viral pathogens (parainfluenza virus, adenovirus, human metapneumovirus, rhinovirus and coronavirus) for specimens tested by all methods: Ontario, October 29, 2017 to October 27, 2018

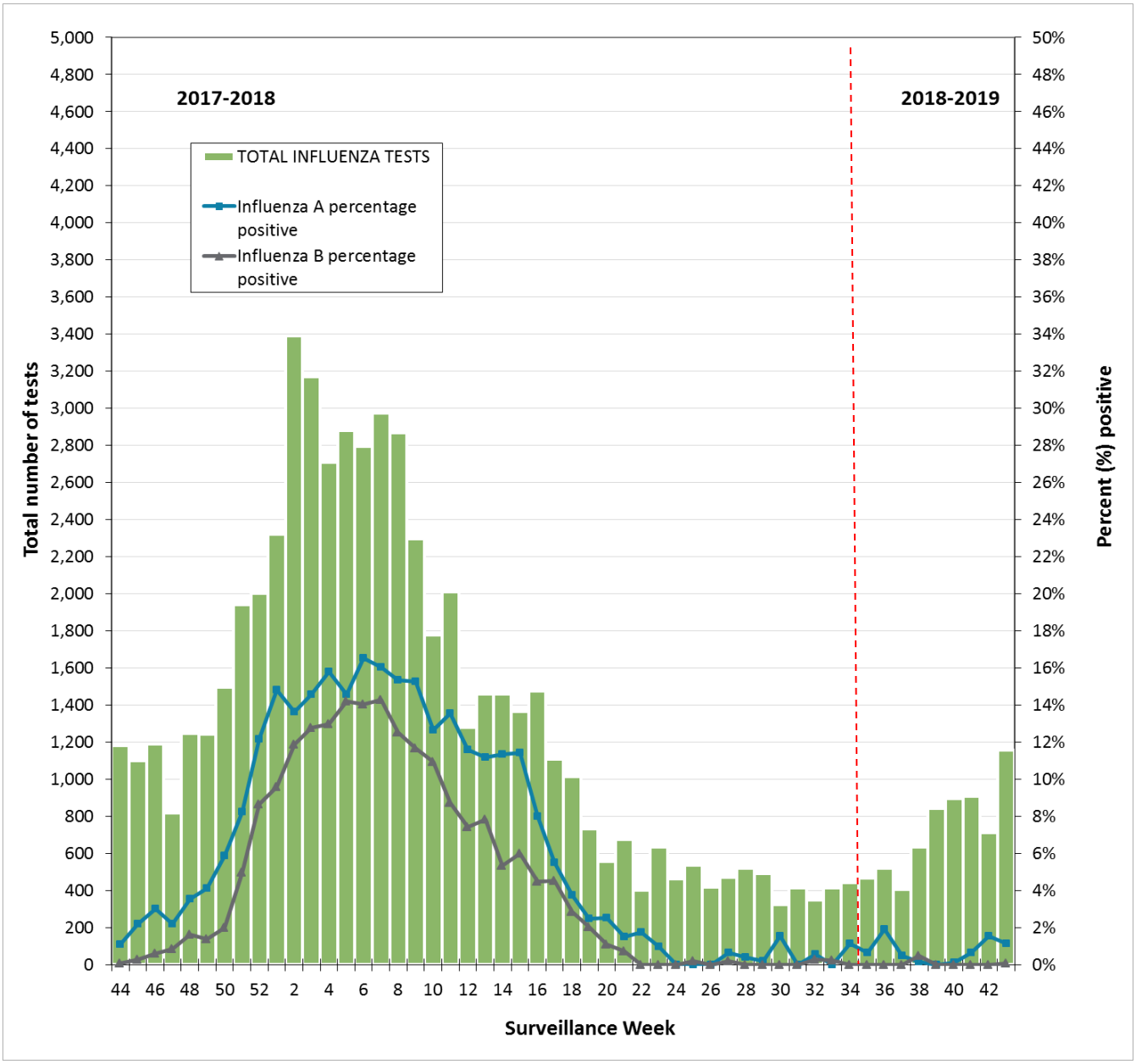


Source: Centre for Immunization and Respiratory Infectious Diseases (CIRID)

Notes:

- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

Figure 3. Total number of influenza tests performed and percent of tests positive for influenza A and B by surveillance week: Ontario, October 29, 2017 to October 27, 2018



Source: Centre for Immunization and Respiratory Infectious Diseases (CIRID)

Notes:

- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

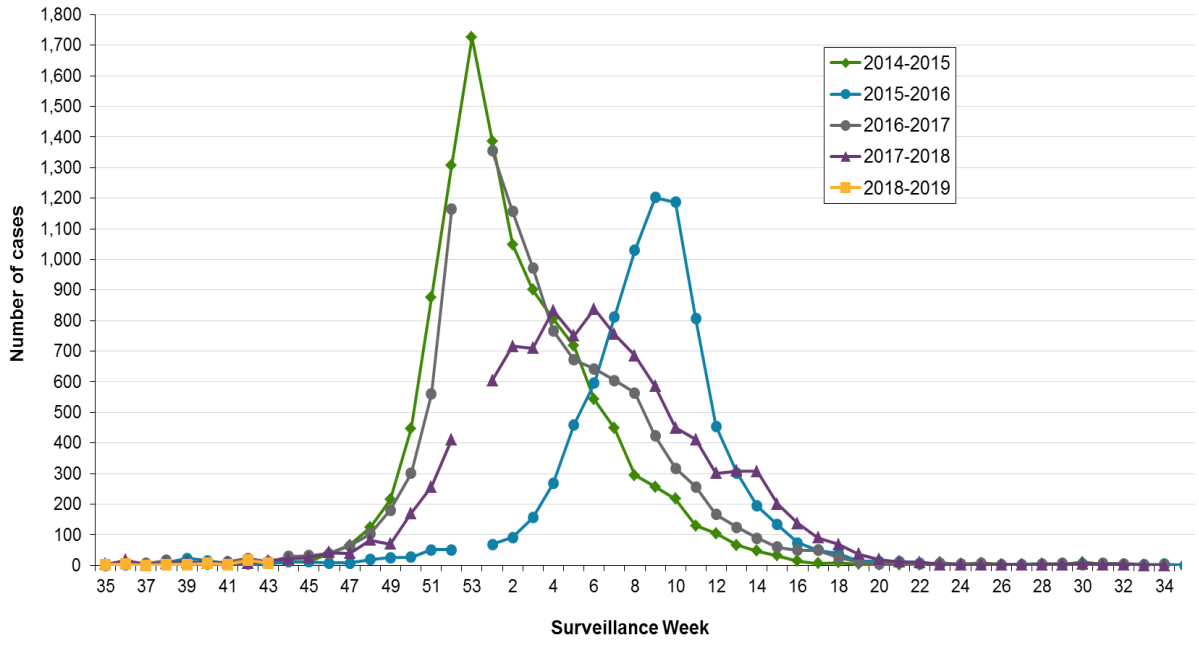
2. Laboratory-confirmed influenza cases

For the 2018-2019 surveillance season to date, 51 laboratory-confirmed influenza cases have been reported in Ontario. Among these cases, 90.2% (46/51) were influenza A (Table 6). Of the 21 reported influenza A cases with subtype information available, 71.4% (15/21) were H3N2 and 28.6% (6/21) were (H1N1)pdm09.

Dominant A Subtype and B Lineage by Season

- 2014-2015: A(H3N2), B Yamagata
- 2015-2016: A(H1N1)pdm09, B Victoria
- 2016-2017: A(H3N2), B Yamagata
- 2017-2018: A(H3N2), B Yamagata
- 2018-2019: To be determined

Figure 4. Number of reported confirmed cases of influenza A by surveillance week and season: Ontario, September 1, 2014 to October 27, 2018

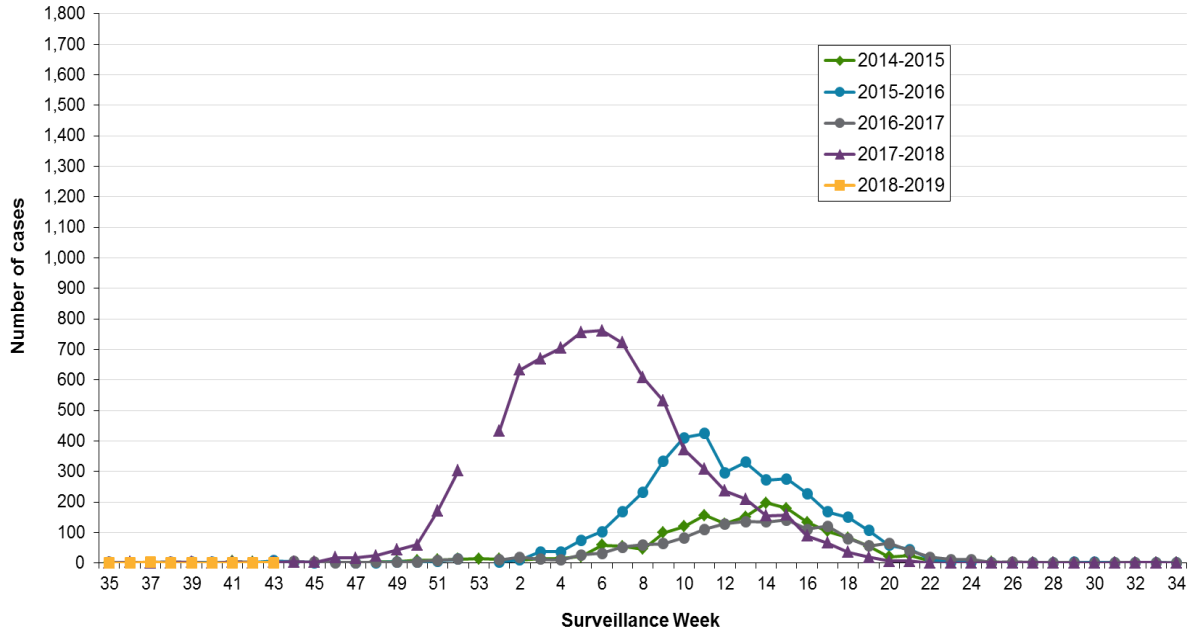


Source: integrated Public Health Information System (iPHIS)

Notes:

- Interpret most recent case counts for the current season with caution due to reporting lags.
- Unlike the other seasons presented, the 2014-2015 season included a week 53; a week 53 occurs once every five to six years. Week 53 in 2014-2015 corresponded to December 28, 2014 to January 3, 2015.
- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

Figure 5. Number of reported confirmed cases of influenza B by surveillance week and season: Ontario, September 1, 2014 to October 27, 2018



Source: integrated Public Health Information System (iPHIS)

Notes:

- Interpret most recent case counts for the current season with caution due to reporting lags.
- Unlike the other seasons presented, the 2014-2015 season included a week 53; a week 53 occurs once every five to six years. Week 53 in 2014-2015 corresponded to December 28, 2014 to January 3, 2015.
- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

3. Institutional respiratory infection outbreaks

Zero influenza A, zero influenza A and B, and zero influenza B outbreaks were reported in Week 43 (Table 1). Influenza was detected in 1.1% (2/174) of institutional respiratory infection outbreaks reported to date in the 2018-2019 season; 0.6% (1/174) were reported as respiratory syncytial virus (RSV). Most institutional respiratory infection outbreaks were reported from long-term care homes (114/174 or 65.5% of all reported outbreaks) (Table 2).

Table 1. Institutional respiratory infection outbreaks: Ontario, Week 43 and total for the 2018-2019 season to date[1]

Virus reported in outbreak	Current week: Number of new outbreaks[2]	Percentage of total for current week	Cumulative: Number of new outbreaks	Percentage of cumulative total
Influenza A[3]	0	0.0%	2	1.1%
Influenza B[3]	0	0.0%	0	0.0%
Both influenza A and B[3]	0	0.0%	0	0.0%
Entero/rhinovirus	2	10.5%	4	2.3%
Parainfluenza (all types)	0	0.0%	2	1.1%
Respiratory syncytial virus (RSV)	0	0.0%	1	0.6%
Human metapneumovirus, adenovirus, coronavirus or other viruses	0	0.0%	1	0.6%
Two or more non-influenza viruses	0	0.0%	0	0.0%
No organism reported	17	89.5%	164	94.3%
TOTAL	***19***	***100.0%***	***174***	***100.0%***

Source: integrated Public Health Information System (iPHIS)

Notes:

[1] Season to date includes all outbreaks in which the date the outbreak was reported to the public health unit (or if unavailable, the date the outbreak was created in iPHIS) occurred between September 1, 2018 (Week 35, 2018) and the current reporting week, as well as outbreaks in which the reported date is missing but the outbreaks were entered into iPHIS during the current season.

[2] New outbreaks are defined as those in which the date the outbreak was reported to the public health unit was in the current surveillance period, i.e. October 21, 2018 – October 27, 2018 (Week 43), and was recorded in iPHIS.

[3] Any outbreak where influenza was identified is reported under the appropriate influenza category ("Influenza A", "Influenza B", or "Both influenza A and B") regardless of what other virus was also identified in the outbreak.

Table 2. Institutional respiratory infection outbreaks by setting type: Ontario, total for the 2018-2019 season to date[1]

Setting type reported	Number of influenza outbreaks (% of total)	Number of other respiratory virus outbreaks (% of total)
Long-Term Care Home	1 (50.0%)	113 (65.7%)
Hospital	0 (0.0%)	5 (2.9%)
Retirement Home	1 (50%)	29 (16.9%)
Other[2]	0 (0.0%)	3 (1.7%)
Unknown	0 (0.0%)	22 (12.8%)
TOTAL	***2 (100.0%)***	***172 (100.0%)***

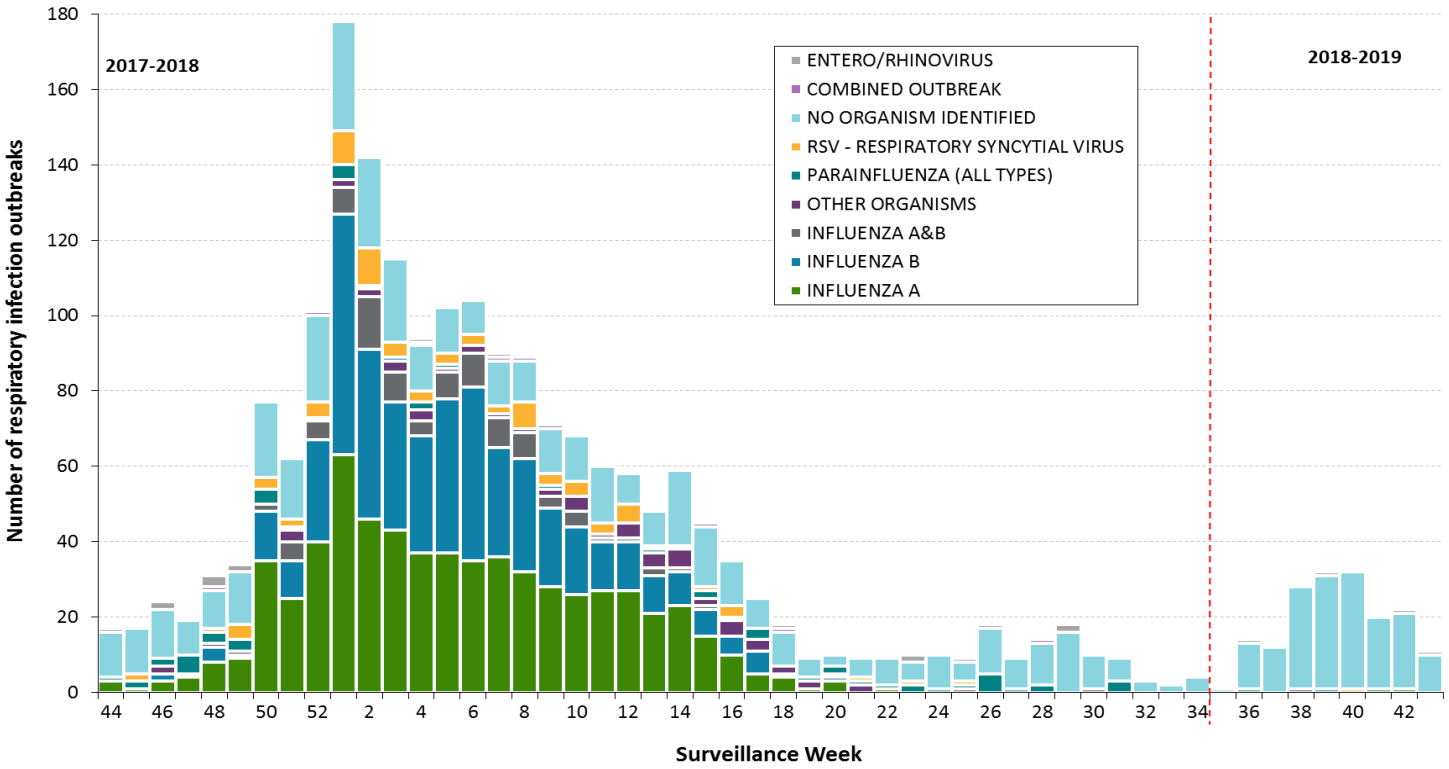
Source:integrated Public Health Information System (iPHIS)

Notes:

[1] Season to date includes all outbreaks in which the date the outbreak was reported to the public health unit (or if unavailable, the date the outbreak was created in iPHIS) occurred between September 1, 2018 (Week 35, 2018) and the current reporting week, as well as outbreaks in which the reported date is missing but the outbreaks were entered into iPHIS during the current season.

[2] Other types of institutions include: correctional facilities, group homes, shelters, and facilities operating under the Developmental Services Act. Note that school and child care centre respiratory outbreaks are not captured in this table.

Figure 6. Institutional respiratory infection outbreaks by week of illness onset in the first case: Ontario, October 28, 2017 to October 27, 2018



Source: integrated Public Health Information System (iPHIS)

Notes:

- Interpret most recent outbreak counts for the current season with caution due to reporting lags
- Institutional respiratory infection outbreaks for which the date of onset of illness for the first case is missing are excluded in this figure. However, these outbreaks are counted in the cumulative outbreaks section of Table 1.
- Any outbreak where influenza was identified is reported under the appropriate influenza category (“Influenza A”, “Influenza B”, or “Both influenza A & B”) regardless of what other virus is also identified in the outbreak.
- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

4. Respiratory viruses by setting and age

For week 43 based on Public Health Ontario Laboratory (PHOL) data, influenza A positivity was 0.7% (3/456) compared to 1.3% (8/609) for the previous week. Influenza B positivity was 0.4% (2/456) for week 43 compared to 0.0% (0/609) for the previous week (Table 3). Most influenza A detections occurred in the 65+ years age group. Due to low level of circulation of influenza B virus no age trend can be determined at this time.

Table 3. Number (percentage) of specimens with respiratory pathogens detected by patient setting, Public Health Ontario Laboratory, week 43 and cumulative for the 2018-2019 season to date

Respiratory Pathogen Detected	ICU Current	ICU Cumulative	Hospitalized non-ICU Current	Hospitalized non-ICU Cumulative	Emergency Department Current	Emergency Department Cumulative	Ambulatory/ No Setting Current	Ambulatory/ No Setting Cumulative	Institution Current	Institution Cumulative
Influenza A (all)	0 (0.0)	0 (0.0)	1 (0.3)	4 (0.2)	1 (9.1)	8 (6.8)	1 (1.5)	5 (0.7)	0 (0.0)	6 (1.4)
Influenza A (H3N2)	0	0	0	3	0	6	1	1	0	6
Influenza A (H1N1)pdm09	0	0	0	0	1	2	0	4	0	0
Influenza B	0 (0.0)	1 (0.3)	2 (0.7)	3 (0.2)	0 (0.0)	1 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Adenovirus	0 (0.0)	1 (0.3)	0 (0.0)	11 (0.6)	1 (10.0)	1 (0.9)	0 (0.0)	1 (0.2)	0 (0.0)	0 (0.0)
Entero/rhinovirus	0 (0.0)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)
Human metapneumovirus	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.1)	1 (0.2)
Parainfluenza (all types)	0 (0.0)	2 (0.6)	8 (2.8)	43 (2.3)	0 (0.0)	2 (1.8)	2 (3.3)	6 (0.9)	0 (0.0)	2 (0.5)
Respiratory syncytial virus	0 (0.0)	1 (0.3)	7 (2.5)	29 (1.5)	0 (0.0)	1 (0.9)	2 (3.3)	4 (0.6)	0 (0.0)	0 (0.0)
Total positives	**0 (0.0)**	**5 (1.5)**	**18 (6.3)**	**93 (4.9)**	**2 (18.2)**	**13 (11.1)**	**5 (7.6)**	**16 (2.3)**	**1 (1.9)**	**9 (2.1)**

Source: Public Health Ontario Laboratory

Table 4. Number (percentage) of specimens with respiratory pathogens detected by age group (years), Public Health Ontario Laboratory, week 43 and cumulative for the 2018-2019 season to date

Respiratory Pathogen Detected	<1 Current	<1 Cumulative	1-4 Current	1-4 Cumulative	5-19 Current	5-19 Cumulative	20-64 Current	20-64 Cumulative	65+ Current	65+ Cumulative
Influenza A (all)	1 (2.4)	2 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	8 (0.8)	2 (0.8)	13 (0.7)
Influenza A (H3N2)	0	1	0	0	0	0	0	4	1	11
Influenza A (H1N1)pdm09	1	1	0	0	0	0	0	4	0	1
Influenza B	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (8.3)	1 (0.7)	0 (0.0)	2 (0.2)	1 (0.4)	2 (0.1)
Adenovirus	1 (2.4)	6 (2.5)	0 (0.0)	2 (0.9)	0 (0.0)	1 (0.8)	0 (0.0)	2 (0.2)	0 (0.0)	3 (0.2)
Entero/rhinovirus	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (0.0)	0 (0.0)
Human metapneumovirus	0 (0.0)	2 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)	2 (0.1)
Parainfluenza (all types)	4 (9.8)	10 (4.2)	0 (0.0)	9 (3.9)	1 (8.3)	5 (3.8)	3 (2.5)	10 (1.0)	2 (0.8)	21 (1.1)
Respiratory syncytial virus	5 (12.2)	18 (7.5)	2 (10.0)	13 (5.6)	0 (0.0)	0 (0.0)	1 (0.8)	2 (0.2)	1 (0.4)	2 (0.1)
Total positives	**11 (26.2)**	**38 (15.8)**	**2 (10.0)**	**24 (10.3)**	**2 (16.7)**	**7 (5.1)**	**4 (3.3)**	**24 (2.4)**	**7 (2.7)**	**43 (2.3)**

Source: Public Health Ontario Laboratory (PHOL)

Notes:

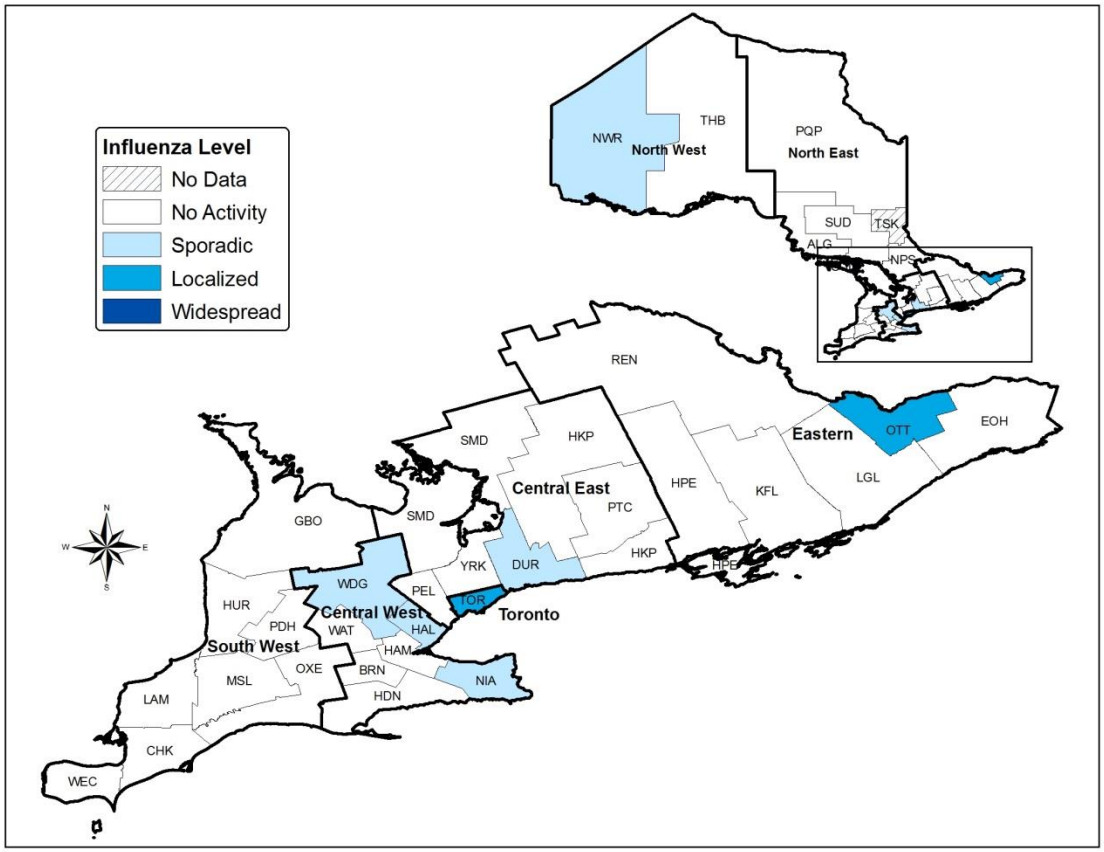
- The percentages in Table 3 and Table 4 are calculated as number of specimens with the respiratory pathogen detected divided by total number of specimens tested for that particular pathogen within the patient setting/same age category. Following the implementation of the new respiratory virus testing algorithm on September 20, 2017, no routine respiratory virus testing is offered to ambulatory and emergency department patients.
- Institution includes retirement homes, long term care facilities, correctional facilities, and undefined institutions. Excludes hospitals.
- Ambulatory/No Setting includes specimens where setting was missing, as well as specimens from sentinels in the Sentinel Practitioner Surveillance Network or specimens with special approval.
- Current respiratory testing does not test for coronavirus and parainfluenza virus 4.
- The "Influenza A (all)" row includes the numbers in the "Influenza A(H3N2)" and "Influenza A (H1N1)pdm09" rows as well as Influenza A positives that were not subtyped.
- Percent positivity is not calculated for Influenza A(H3N2) and Influenza /(H1N1)pdm09 because subtyping is only done on select influenza A samples, precluding an accurate calculation.

- Total number of positives represents unique specimens that have at least one virus detected. Therefore, it may not correspond to the sum of viruses detected per each setting as some specimens may have more than one organism detected. When calculating the “Total Positives”, the “Influenza A(H3N2)” and “Influenza A(H1N1)pdm09” rows are not counted as these numbers are already included in the “Influenza A (all)” row.
- Changes in the testing algorithm used by the Public Health Ontario Laboratory will impact the interpretation of respiratory virus reports over time. Please see the data sources section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.
- NA-Not applicable- Indicates no specimens were tested in that setting; therefore percent positivity was not calculated.

5. By Jurisdiction – Influenza activity

In Week 43, 0 public health units reported 'widespread activity,' 2 public health units reported 'localized' activity, 5 reported 'sporadic' activity, 27 reported no activity and 1 public health unit did not report.

Figure 7: Influenza activity levels reported by public health units: Ontario, October 21, 2018 to October 27, 2018 (Week 43)



Source: Public Health Ontario from public health units

Notes:
Tables 5 and 6 below present information by public health unit.

- Table 5 is information from PHOL. It allows for the calculation of percent positivity because PHOL tests the samples and knows the numbers of positive and negative results. Percent positivity for public health units that had less than 40 respiratory specimens tested for the current week may not be reliable due to small numbers. Note that PHOL only performs a portion of the overall influenza testing for the province.
- Table 6 is information from the integrated Public Health Information System (iPHIS) based on positive influenza cases reported to the public health unit. These tests are done by multiple laboratories and because negative results are not reported to the public health unit, the percent positivity cannot be calculated.

Table 5. Specimens submitted to Public Health Ontario Laboratory for influenza testing and positive results by public health unit; number for week 43 and (cumulative total) for the 2018-2019 season to date

Public Health Unit and Region	Number of specimens submitted	Number of specimens tested	Number of influenza A positive specimens	% positivity influenza A	Influenza A(H1N1)pdm09	Influenza A H3N2	Number of influenza B positive specimens	% positivity influenza B
Northwestern	2 (20)	1 (15)	1 (1)	100.0 (6.7)	1 (1)	0 (0)	0 (0)	0.0 (0.0)
Thunder Bay District	2 (18)	1 (13)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
TOTAL NORTH WEST	**4 (38)**	**2 (28)**	**1 (1)**	**50.0 (3.6)**	**1 (1)**	**0 (0)**	**0 (0)**	**0.0 (0.0)**
Algoma	18 (61)	16 (57)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
North Bay Parry Sound District	5 (60)	4 (57)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Porcupine	5 (19)	2 (13)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Sudbury & District	1 (30)	1 (27)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Timiskaming	3 (26)	1 (24)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
TOTAL NORTH EAST	**32 (196)**	**24 (178)**	**0 (0)**	**0.0 (0.0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0.0 (0.0)**
City of Ottawa	6 (32)	5 (32)	0 (3)	0.0 (9.4)	0 (0)	0 (3)	0 (0)	0.0 (0.0)
Eastern Ontario	12 (37)	7 (34)	0 (1)	0.0 (2.9)	0 (0)	0 (1)	0 (0)	0.0 (0.0)
Hastings & Prince Edward Counties	11 (53)	9 (50)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Kingston, Frontenac, Lennox & Addington	9 (83)	6 (73)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Leeds, Grenville And Lanark District	6 (26)	4 (22)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Renfrew County And District	1 (14)	0 (12)	0 (0)	NA (0.0)	0 (0)	0 (0)	0 (0)	NA (0.0)
TOTAL EASTERN	**45 (245)**	**31 (223)**	**0 (4)**	**0.0 (1.8)**	**0 (0)**	**0 (4)**	**0 (0)**	**0.0 (0.0)**
Durham Region	30 (208)	14 (186)	0 (4)	0.0 (2.2)	0 (0)	0 (4)	0 (1)	0.0 (0.5)
Haliburton, Kawartha, Pine Ridge	10 (59)	7 (51)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Peel Region	88 (468)	55 (427)	0 (1)	0.0 (0.2)	0 (0)	0 (1)	2 (4)	3.6 (0.9)
Peterborough County-City	6 (34)	6 (33)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Simcoe Muskoka District	26 (161)	13 (146)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
York Region	59 (386)	40 (356)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
TOTAL CENTRAL EAST	**219 (1,316)**	**135 (1,199)**	**0 (5)**	**0.0 (0.4)**	**0 (0)**	**0 (5)**	**2 (5)**	**1.5 (0.4)**
Toronto	202 (1,138)	124 (991)	1 (9)	0.8 (0.9)	0 (2)	1 (7)	0 (0)	0.0 (0.0)

Public Health Unit and Region	Number of specimens submitted	Number of specimens tested	Number of influenza A positive specimens	% positivity influenza A	Influenza A(H1N1)pdm09	Influenza A H3N2	Number of influenza B positive specimens	% positivity influenza B
TOTAL TORONTO	**202 (1,138)**	**124 (991)**	**1 (9)**	**0.8 (0.9)**	**0 (2)**	**1 (7)**	**0 (0)**	**0.0 (0.0)**
Chatham-Kent	2 (12)	1 (9)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Elgin-St. Thomas	5 (28)	4 (24)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Grey Bruce	5 (31)	2 (28)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Huron County	2 (13)	0 (12)	0 (0)	NA (0.0)	0 (0)	0 (0)	0 (0)	NA (0.0)
Lambton County	8 (30)	10 (30)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Middlesex-London	4 (61)	2 (52)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Oxford County	4 (28)	2 (25)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Perth District	0 (32)	3 (32)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Windsor-Essex County	21 (108)	23 (101)	0 (2)	0.0 (2.0)	0 (2)	0 (0)	0 (0)	0.0 (0.0)
TOTAL SOUTH WEST	**51 (343)**	**47 (313)**	**0 (2)**	**0.0 (0.6)**	**0 (2)**	**0 (0)**	**0 (0)**	**0.0 (0.0)**
Brant County	8 (68)	8 (64)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
City Of Hamilton	3 (32)	2 (29)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Haldimand-Norfolk	7 (34)	5 (30)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Halton Region	50 (199)	34 (187)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Niagara Region	13 (78)	12 (68)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Waterloo Region	10 (70)	8 (62)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Wellington-Dufferin-Guelph	31 (118)	24 (105)	1 (2)	4.2 (1.9)	0 (1)	0 (0)	0 (0)	0.0 (0.0)
TOTAL CENTRAL WEST	**122 (599)**	**93 (545)**	**1 (2)**	**1.1 (0.4)**	**0 (1)**	**0 (0)**	**0 (0)**	**0.0 (0.0)**
OUT OF PROVINCE	0 (0)	0 (0)	0 (0)	NA (NA)	0 (0)	0 (0)	0 (0)	NA (NA)
TOTAL ONTARIO	**675 (3,875)**	**456 (3,477)**	**3 (23)**	**0.7 (0.7)**	**1 (6)**	**1 (16)**	**2 (5)**	**0.4 (0.1)**

Source: Public Health Ontario Laboratory (PHOL)

Notes:

- Cumulative numbers are from September 1, 2018 to the current week and are displayed in brackets.
- The difference between submissions and testing is due to lags in testing time. In addition, number of specimens submitted is determined based on the date specimens were received at lab for testing, while number of specimens tested is determined based on the date specimens were collected from the patient.
- "Public Health Unit" reflects the jurisdiction where the patient resides. In the event this is not available, the public health unit of the specimen submitter is used.
- NA-Not applicable- Indicates public health units with no specimens tested; therefore percent positivity was not calculated.

- Percent positivity for health units that had less than 40 respiratory specimens tested for the current week may not be reliable due to small numbers.
- Public Health Ontario Laboratory performs testing for influenza and other respiratory viruses, but other microbiology laboratories also perform these tests. Therefore, it is important to note that the numbers reported here do not represent the total number of influenza viruses identified in Ontario.

Table 6. Number of reported confirmed influenza cases by public health unit and geographic region for week 43 and (cumulative total) for the 2018-2019 influenza season

Public Health Unit and Region	Influenza A (H1N1)pdm09	Influenza A H3	Influenza A All subtypes[1]	Influenza A & B	Influenza B	TOTAL
Northwestern	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Thunder Bay District	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL NORTH WEST	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**
Algoma	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
North Bay Parry Sound District	0 (0)	0 (1)	0 (1)	0 (0)	0 (0)	0 (1)
Porcupine	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Sudbury & District	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Timiskaming	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL NORTH EAST	**0 (0)**	**0 (1)**	**0 (1)**	**0 (0)**	**0 (0)**	**0 (1)**
City of Ottawa	0 (0)	4 (4)	5 (8)	0 (0)	0 (0)	5 (8)
Eastern Ontario	0 (0)	0 (1)	0 (1)	0 (0)	0 (0)	0 (1)
Hastings & Prince Edward Counties	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Kingston, Frontenac, Lennox & Addington	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Leeds, Grenville And Lanark District	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Renfrew County And District	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL EASTERN	**0 (0)**	**4 (5)**	**5 (10)**	**0 (0)**	**0 (0)**	**5 (10)**
Durham Region	0 (0)	0 (3)	0 (3)	0 (0)	1 (2)	1 (5)
Haliburton, Kawartha, Pine Ridge	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Peel Region	0 (0)	0 (0)	0 (2)	0 (0)	0 (2)	0 (4)
Peterborough County-City	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Simcoe Muskoka District	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
York Region	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
TOTAL CENTRAL EAST	**0 (0)**	**0 (3)**	**0 (6)**	**0 (0)**	**1 (4)**	**1 (10)**
Toronto	2 (5)	5 (6)	14 (21)	0 (0)	0 (0)	14 (21)
TOTAL TORONTO	**2 (5)**	**5 (6)**	**14 (21)**	**0 (0)**	**0 (0)**	**14 (21)**
Chatham-Kent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Elgin-St. Thomas	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Grey Bruce	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Huron County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Lambton County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middlesex-London	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Oxford County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Perth District	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Windsor-Essex County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL SOUTH WEST	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**
Brant County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
City Of Hamilton	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Haldimand-Norfolk	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Halton Region	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	1 (4)
Niagara Region	0 (0)	0 (0)	0 (2)	0 (0)	1 (1)	1 (3)
Waterloo Region	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Wellington-Dufferin-Guelph	1 (1)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)
TOTAL CENTRAL WEST	**1 (1)**	**0 (0)**	**2 (8)**	**0 (0)**	**1 (1)**	**3 (9)**
TOTAL ONTARIO	**3 (6)**	**9 (15)**	**21 (46)**	**0 (0)**	**2 (5)**	**23 (51)**

Source: Integrated Public Health Information System (iPHIS)

Note:[1] Includes influenza A positive cases for whom no subtype was reported

6. Strain comparison – circulating influenza strains and vaccine strains

Genetic Characterization of Influenza A

The National Microbiology Laboratory (NML) reported that one influenza A(H3N2) virus from Canada did not grow to sufficient hemagglutination titers for antigenic characterization by hemagglutination inhibition (HI) assays. Sequence analysis of the hemagglutinin (HA) gene of this virus showed that the H3N2 virus belonged to genetic group 3C.2a1. The influenza A/Singapore/INFIMH-16-0019/2016-like virus belongs to genetic group 3C.2a1 and is the influenza A/H3N2 component of the 2018-19 Northern Hemisphere influenza vaccine as recommended by the World Health Organization (WHO).

Antigenic Characterization of Influenza A

One influenza A(H3N2) virus from Canada was antigenically characterized* as A/Singapore/INFIMH-16-0019/2016-like, which is the WHO recommended influenza A(H3N2) component of the 2018-2019 Northern Hemisphere vaccine.

Sixteen influenza A(H1N1) viruses tested nationally were antigenically similar* to A/Michigan/45/2015, which is the influenza A(H1N1) component of the 2018-2019 Northern Hemisphere influenza vaccine.

*Please note that antigenic similarity may not be reflective of influenza vaccine effectiveness.

Table 7. Strain characterization completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to November 1, 2018

Influenza strains	Ontario	Canada
Influenza A (H3N2) A/Singapore/INFIMH-16-0019/2016-like	0	1
Influenza A (H1N1) A/Michigan/45/2015-like	0	16
Influenza B	0	0

Source: National Microbiology Laboratory (NML)

7. Antiviral resistance/ sensitivity for influenza

All influenza A viruses in Canada tested by NML for antiviral resistance in the 2018-2019 season were resistant to amantadine, but sensitive to zanamivir and oseltamivir.

Table 8. Amantadine susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to November 1, 2018

Influenza strains	Ontario: Resistant	Ontario: Susceptible	Canada: Resistant	Canada: Susceptible
Influenza A (H3N2)	0	0	3	0
Influenza A (H1N1)pdm09	0	0	14	0
Influenza B	NA	NA	NA	NA

Source: National Microbiology Laboratory (NML)
NA = Not Applicable

Table 9. Oseltamivir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to November 1, 2018

Influenza strains	Ontario: Resistant	Ontario: Susceptible	Canada: Resistant	Canada: Susceptible
Influenza A (H3N2)	0	1	0	4
Influenza A (H1N1)pdm09	0	0	0	15
Influenza B	0	0	0	0

Source: National Microbiology Laboratory (NML)
NA = Not Applicable

Table 10. Zanamavir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to November 1, 2018

Influenza strains	Ontario: Resistant	Ontario: Susceptible	Canada: Resistant	Canada: Susceptible
Influenza A (H3N2)	0	1	0	4
Influenza A (H1N1)pdm09	0	0	0	15
Influenza B	0	0	0	0

Source: National Microbiology Laboratory (NML)
NA = Not Applicable

8. Data sources for this report

- **Integrated Public Health Information System (iPHIS):** provides information on laboratory-confirmed cases of influenza reported to local public health units, and institutional outbreaks of influenza and other respiratory pathogens reported to local public health units. iPHIS is administered by the Ontario Ministry of Health and Long-Term Care; data for this issue was extracted by Public Health Ontario on October 31, 2018.

  Cases of influenza A and B are included in the report based on the 'Reported Date', which was the date the public health unit was notified of the case. For Figure 4 and Figure 5, cases are assigned to a particular surveillance week based on the episode date entered in iPHIS to better reflect influenza activity. Episode date for a case corresponds to the earliest date on record for the case according to the iPHIS hierarchy (Symptom Onset Date > Specimen Collection Date > Lab Test Date > Reported Date). Cases are excluded from these counts if the episode date is based on reported date, and the reported date occurs after the latest surveillance week.

- **Centre for Immunization and Respiratory Infectious Diseases (CIRID) of the Public Health Agency of Canada (PHAC):** provides information on the number of influenza tests and number that are positive based on submissions from 16 participating laboratories in Ontario including 11 Public Health Ontario Laboratories (PHOLs) and five hospital-based laboratories. The results are assigned to a particular surveillance week based on when test results are reported to PHAC; these data are not updated when results are submitted late for previous surveillance weeks. These data represent the number of specimens tested, which may not necessarily correspond with the number of patients as more than one specimen may have been submitted per patient. Cumulative numbers for the season to date are also available through FluWatch.

- **Public Health Ontario's laboratory:** provides specimen level information from the 11 PHO laboratory sites located in Ontario; data for this issue was extracted from the Laboratory Information Management System by PHO on November 1, 2018. A detailed summary of PHO laboratory data is available on the PHO website here. More details about the new testing algorithm can be found here.

- **National Microbiology Laboratory (NML), Influenza and Respiratory Viruses Section:** provides testing results for influenza strain identification and influenza antiviral resistance / susceptibility.

- **Public Health Ontario from public health units:** Public health units provide Public Health Ontario with weekly reports of influenza activity levels in their areas [Provincial Influenza Activity Report (Appendix C) Database]. Influenza activity levels are assigned by local public health units and reported to Public Health Ontario by 4:00 pm on the Tuesday following the end of each surveillance week. Activity levels are assigned based on laboratory confirmations, ILI reports from various sources, and laboratory-confirmed institutional respiratory infection outbreaks. Please refer to the detailed definitions for the 2018-2019 season for more information. Activity levels reported for a particular surveillance week may not necessarily correspond to the number of new outbreaks reported in the same week in Table 1 because ongoing outbreaks from previous weeks, as well as laboratory confirmed outbreaks in schools, may be included in the assessment of the activity level.

Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication.

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Public Health Ontario provides expert scientific and technical support to government, local public health units and health care providers relating to the following:

- communicable and infectious diseases
- infection prevention and control
- environmental and occupational health
- emergency preparedness
- health promotion, chronic disease and injury prevention
- public health laboratory services

Public Health Ontario's work also includes surveillance, epidemiology, research, professional development and knowledge services. For more information about PHO, visit: publichealthontario.ca.

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