

Ontario Respiratory Pathogen Bulletin | 2017-2018

SURVEILLANCE WEEK 9 (February 25, 2018 – March 3, 2018)

This issue of the Ontario Respiratory Pathogen Bulletin provides information on the surveillance period from February 25, 2018 to March 3, 2018 (Week 9). It also provides information on the current influenza season to date, from a start date of September 1, 2017. Unless otherwise specified, **data presented in this issue of the bulletin are for Week 9** and data extraction occurred on Wednesday, March 7, 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	Lower	There were 1127 influenza cases (581 influenza A, 11 influenza A & B, and 535 influenza B) reported in Week 9, which was lower than the 1282 influenza cases reported in Week 8 (683 influenza A, 4 influenza A & B, and 595 influenza B).
Percent positivity for influenza ²	Similar	Percent positivity of laboratory tests for all influenza types in Week 9 was 26.9%, which was similar to the percent positivity in Week 8 (27.9%). In Week 9, percent positivity was 15.2% for influenza A and 11.7% for influenza B.
Institutional influenza outbreaks ³	Similar	There were 52 new influenza outbreaks reported in Week 9, which was the same as the number of influenza outbreaks reported in Week 8 (52).
Influenza activity levels reported by public health units	Lower	In Week 9 , 10 public health units reported 'widespread activity,' 20 public health units reported 'localized' activity, 5 reported 'sporadic' activity, 0 reported no activity and 1 public health unit did not report. In Week 8, 9 public health units reported 'widespread activity,' 23 public health units reported 'localized' activity, 3 reported 'sporadic' activity, 0 reported no activity and 1 public health unit did not report.
OVERALL ASSESSMENT	Lower	Overall, the indicators show that influenza activity for Week 9 was lower when compared to Week 8.

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.

Summary of respiratory pathogen activity for Surveillance Week 9, 2018

Please note that changes in the testing algorithm used by the Public Health Ontario Laboratory (PHOL) will impact the interpretation of respiratory virus reports over time. Please see the [data sources for this report](#) section with regard to the changes to the PHOL testing algorithm.

1. Circulating respiratory viruses in Ontario

Provincial percent positivity was moderate for influenza A and moderate for influenza B, at 15.2% (350/2296) and 11.7% (268/2296) respectively in Week 9 (Figures [1](#) and [3](#)). Of the 221 influenza A positive tests for which subtyping was available, 92.8% (205/221) were H3N2 in week 9; for the season to date, 93.7% (2646/2824) were H3N2. Rhinovirus was the most common circulating non-influenza respiratory virus, with provincial positivity at 7.9% (16/203) (Figure [2](#)).

2. Comparison to previous influenza seasons

For the 2017-2018 surveillance season to date, 13722 laboratory-confirmed influenza cases have been reported in Ontario. Among these cases, 54.3% (7445/13722) were influenza A ([Table 5](#)). Of the 2042 reported influenza A cases with subtype information available, 94.8% (1935/2042) were H3N2 and 5.2% (107/2042) were (H1N1)pdm09. Influenza activity in week 9 was high; influenza B activity continues to be much higher as compared to previous seasons.

3. Institutional respiratory outbreaks

Twenty-six influenza A, one influenza A and B, and 25 influenza B outbreaks were reported in Week 9 ([Table 1](#)). Influenza was detected in 60.7% (891/1469) of institutional respiratory infection outbreaks reported to date in the 2017-2018 season; 3.9% (57/1469) were reported as respiratory syncytial virus (RSV). Most institutional respiratory infection outbreaks were reported from long-term care homes (803/1469 or 54.7% of all reported outbreaks).

4. Respiratory viruses by setting

For week 9 based on PHOL data, influenza A positivity was 15.8% (186/1179) compared to 15.4% (198/1287) for the previous week. Influenza B positivity was 16.0% (188/1178) for week 9 compared to 16.3% (209/1284) for the previous week.

5. By Jurisdiction – Influenza activity

In Week 9, 10 public health units reported 'widespread' activity, 20 reported 'localized' activity, 5 reported 'sporadic' activity, 0 reported 'no activity,' and 1 did not report.

6. By Age – Respiratory viruses

During week 9, of the 186 influenza A positive specimens, influenza A(H3N2) was detected in 121 and influenza A(H1N1)pdm09 was detected in eight specimens. Fifty-seven influenza A positive specimens had subtype testing pending/not performed. Most influenza A and B detections occurred in the 65+ age group.

7. Strain comparisons – circulating influenza strains and vaccine strains

The National Microbiology Laboratory (NML), reported that 803 influenza A(H3N2) viruses from Canada did not grow to sufficient hemagglutination titers for antigenic characterization by hemagglutination inhibition (HI) assays. Sequence analysis of the HA (hemagglutinin) gene of these viruses showed that 719 H3N2 viruses belonged to genetic group 3C.2a, 82 viruses belonged to subclade 3C.2a1, and two viruses belonged to clade 3C.3a. The influenza A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A/H3N2 component of the 2017-18 Northern Hemisphere influenza vaccine, as [recommended by the World Health Organization \(WHO\)](#).

Two hundred and seven influenza A(H3N2) viruses from Canada were antigenically characterized* as A/Hong Kong/4801/2014-like, which is the WHO recommended influenza A(H3N2) component of the 2017-2018 Northern Hemisphere vaccine. Thirty viruses showed reduced titer with ferret antisera raised against cell culture-propagated A/Hong Kong/4801/2014.

One hundred and twenty-three influenza A(H1N1) viruses tested nationally were antigenically similar* to A/Michigan/45/2015, which is the influenza A(H1N1) component of the 2017-2018 Northern Hemisphere influenza vaccine.

Of the 922 influenza B viruses characterized in Canada, NML reported that 44 viruses were antigenically similar* to the vaccine strain B/Brisbane/60/2008 (Victoria lineage), which is the recommended influenza B component for the 2017-18 Northern Hemisphere influenza vaccine. Of the 44 influenza B viruses characterized as B/B/Brisbane/60/2008-like, eight viruses were antigenically similar to the vaccine strain B/Brisbane/60/2008 and 36 viruses showed reduced titer with ferret antisera produced against cell-propagated B/Brisbane/60/2008. Eight hundred and seventy-eight influenza B viruses were characterized as B/Phuket/3073/2013-like, which belongs to the Yamagata lineage and is included as an influenza B component of the 2017-18 Northern Hemisphere quadrivalent influenza vaccine.

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

8. Antiviral resistance / sensitivity in influenza isolates

All influenza A viruses in Canada tested by NML for antiviral resistance in the 2017-2018 season were sensitive to zanamivir. Two influenza A (H3N2) positive isolates from Newfoundland tested by NML were sensitive to amantadine. One influenza A (H1N1)pdm09 positive isolate from Ontario tested by NML was resistant to oseltamivir. All influenza B viruses in Canada were sensitive to oseltamivir. One influenza B positive isolate from Ontario tested by NML was resistant to zanamivir.

9. Bacterial pathogens

One specimen was positive for *Mycoplasma pneumoniae* and no specimen was positive for *Chlamydia pneumoniae* during this week.

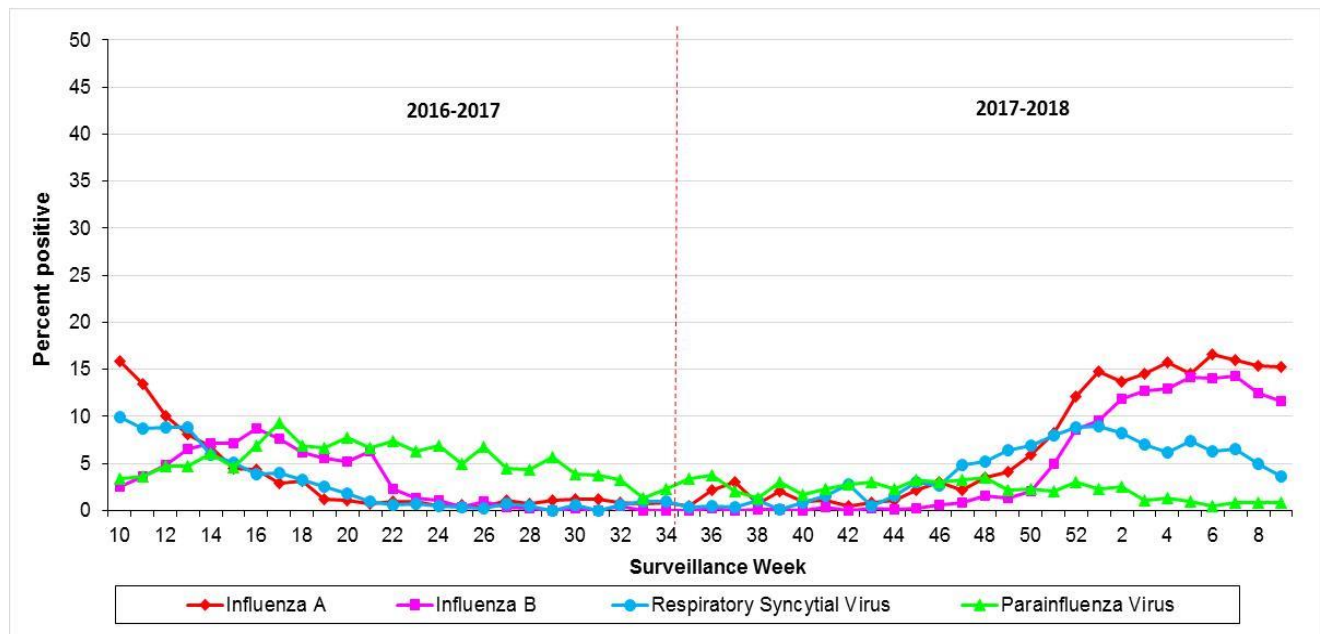
10. Data sources for this report

Provides a list and description of data sources used to prepare this report.

1. Circulating respiratory viruses in Ontario

Provincial percent positivity was moderate for influenza A and moderate for influenza B, at 15.2% (350/2296) and 11.7% (268/2296) respectively in Week 9 (Figures [1](#) and [3](#)). Of the 221 influenza A positive tests for which subtyping was available, 92.8% (205/221) were H3N2 in week 9; for the season to date, 93.7% (2646/2824) were H3N2. Rhinovirus was the most common circulating non-influenza respiratory virus, with provincial positivity at 7.9% (16/203) (Figure [2](#)).

Figure 1: Percentage of respiratory viral pathogens (influenza A, influenza B, respiratory syncytial virus, and parainfluenza virus) detected among specimens tested by all methods: Ontario, March 5, 2017 to March 3, 2018

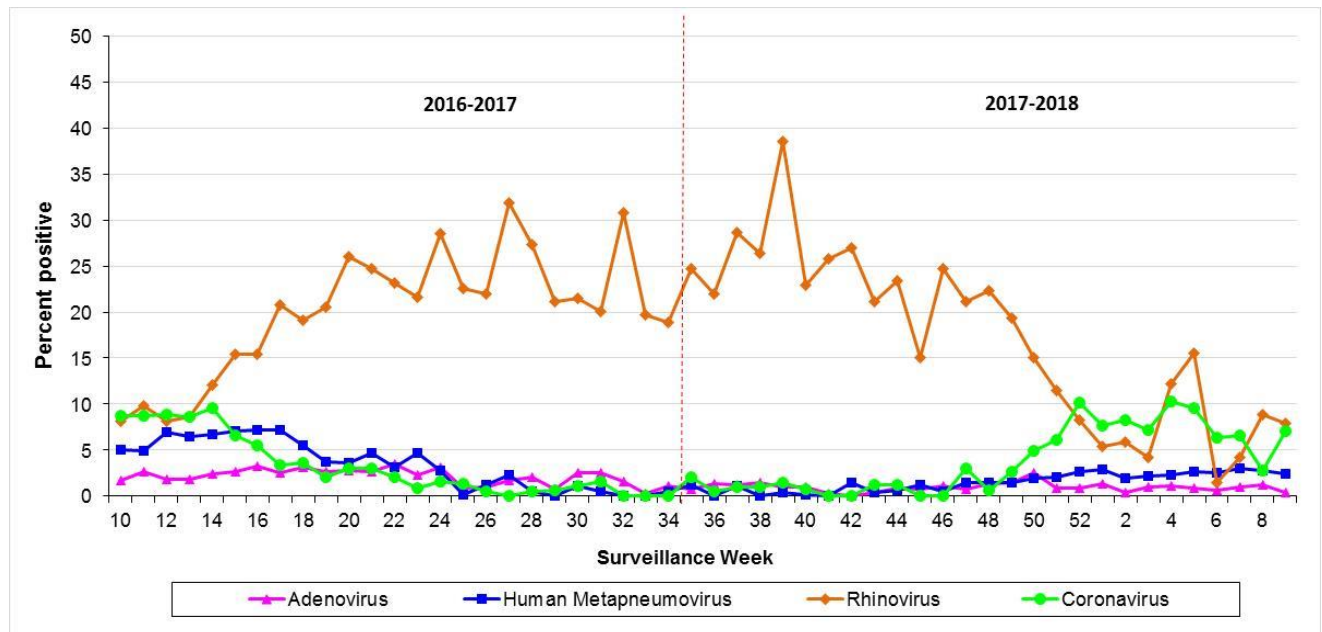


Source: [Centre for Immunization and Respiratory Infectious Diseases \(CIRID\)](#)

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 for this report](#) section with regard to the changes to the Public Health Ontario Laboratory testing algorithm

Figure 2: Percentage of respiratory viral pathogens (adenovirus, human metapneumovirus, rhinovirus and coronavirus) detected among specimens tested by all methods: Ontario, March 5, 2017 to March 3, 2018

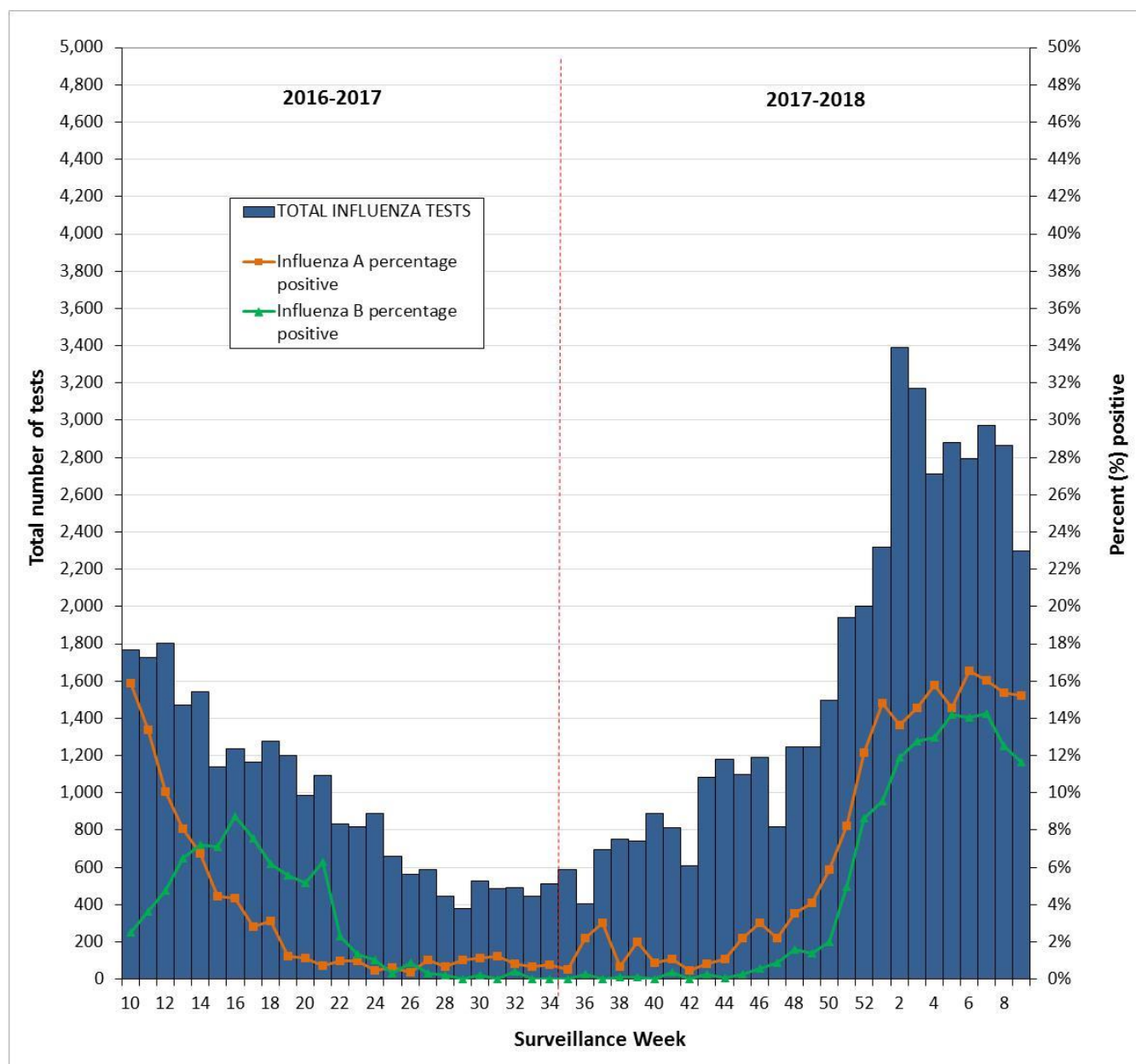


Source: [Centre for Immunization and Respiratory Infectious Diseases \(CIRID\)](#)

Notes:

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Figure 3: Total number of influenza tests performed and percent of positive respiratory tests by surveillance week: Ontario, March 5, 2017 to March 3, 2018



Source: [Centre for Immunization and Respiratory Infectious Diseases \(CIRID\)](#)

Notes:

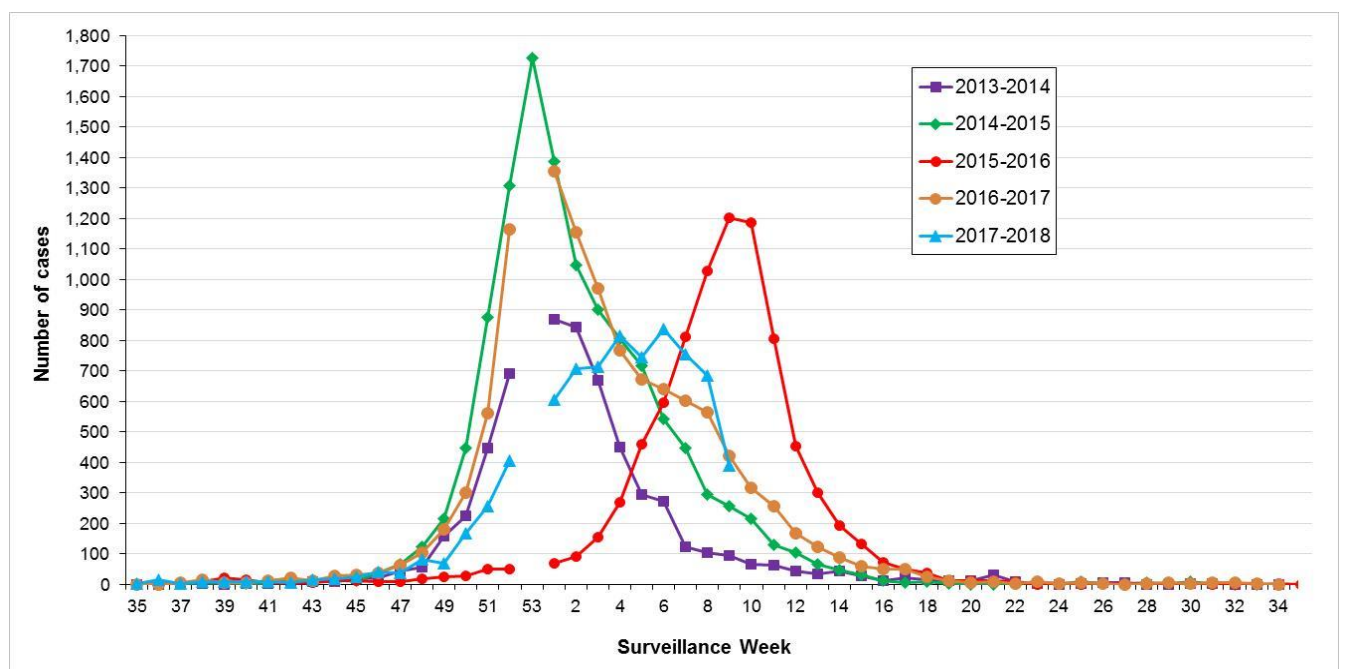
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2. Comparison to previous influenza seasons

For the 2017-2018 surveillance season to date, 13722 laboratory-confirmed influenza cases have been reported in Ontario. Among these cases, 54.3% (7445/13722) were influenza A ([Table 5](#)). Of the 2042 reported influenza A cases with subtype information available, 94.8% (1935/2042) were H3N2 and 5.2% (107/2042) were (H1N1)pdm09. Influenza activity in week 9 was high; influenza B activity continues to be much higher as compared to previous seasons.

Dominant Type/Subtype by Season	
2013-2014:	A(H1N1)pdm09
2014-2015:	A(H3N2)
2015-2016:	A(H1N1)pdm09
2016-2017:	A(H3N2)
2017-2018:	A(H3N2)

Figure 4: Number of reported confirmed cases of influenza A by surveillance week and season: Ontario, September 1, 2013 to March 3, 2018

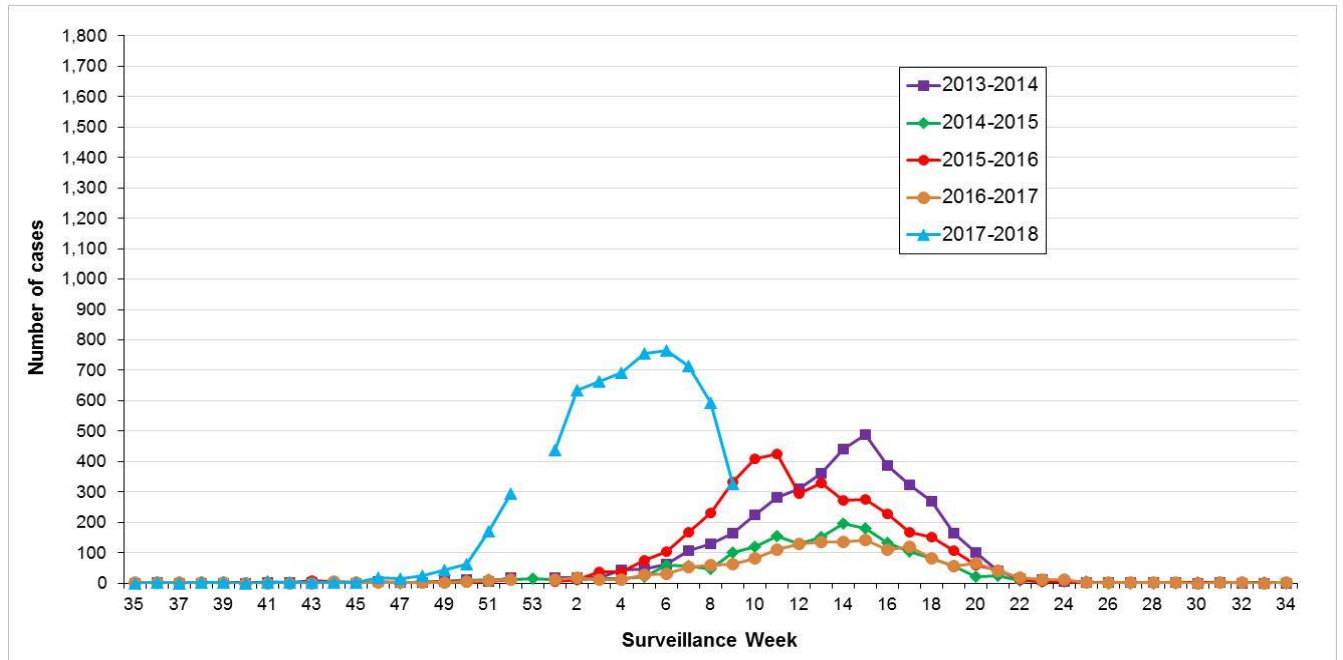


Source: [Integrated Public Health Information System \(iPHIS\)](#)

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 for this report 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, 2013 to March 3, 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 for this report section](#) with regard to the changes to the Public Health Ontario Laboratory testing algorithm.

3. Institutional respiratory infection outbreaks

Twenty-six influenza A, one influenza A and B, and 25 influenza B outbreaks were reported in Week 9 ([Table 1](#)). Influenza was detected in 60.7% (891/1469) of institutional respiratory infection outbreaks reported to date in the 2017-2018 season; 3.9% (57/1469) were reported as respiratory syncytial virus (RSV). Most institutional respiratory infection outbreaks were reported from long-term care homes (803/1469 or 54.7% of all reported outbreaks).

Table 1: Institutional respiratory infection outbreaks: Ontario, Week 9 and total for the 2017-2018 season to date¹

Virus reported in outbreak	CURRENT WEEK		CUMULATIVE	
	Number of new outbreaks ²	Percentage of total for current week	Number of cumulative outbreaks	Percentage of cumulative total
Influenza A ³	26	37.1%	455	31.0%
Influenza B ³	25	35.7%	367	25.0%
Both influenza A and B ³	1	1.4%	69	4.7%
Enterovirus/rhinovirus	0	0.0%	41	2.8%
Parainfluenza (all types)	0	0.0%	39	2.7%
Respiratory syncytial virus (RSV)	4	5.7%	57	3.9%
Human metapneumovirus, adenovirus, coronavirus or other viruses	0	0.0%	22	1.5%
Two or more non-influenza viruses ³	0	0.0%	5	0.3%
No organism reported	14	20.0%	414	28.2%
TOTAL	70	100.0%	1469	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, 2017 (Week 35, 2017) 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. February 25, 2018 – March 3, 2018 (Week 9), 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 2017-2018 season to date¹

Setting type reported	Number of influenza outbreaks (% of total)	Number of other respiratory viruses (% of total)
Long-Term Care Home	420 (47.1%)	383 (66.3%)
Hospital	113 (12.7%)	31 (5.4%)
Retirement Home	240 (26.9%)	89 (15.4%)
Other ²	10 (1.1%)	5 (0.9%)
Unknown	108 (12.1%)	70 (12.1%)
TOTAL	891 (100.0%)	578 (100.0%)

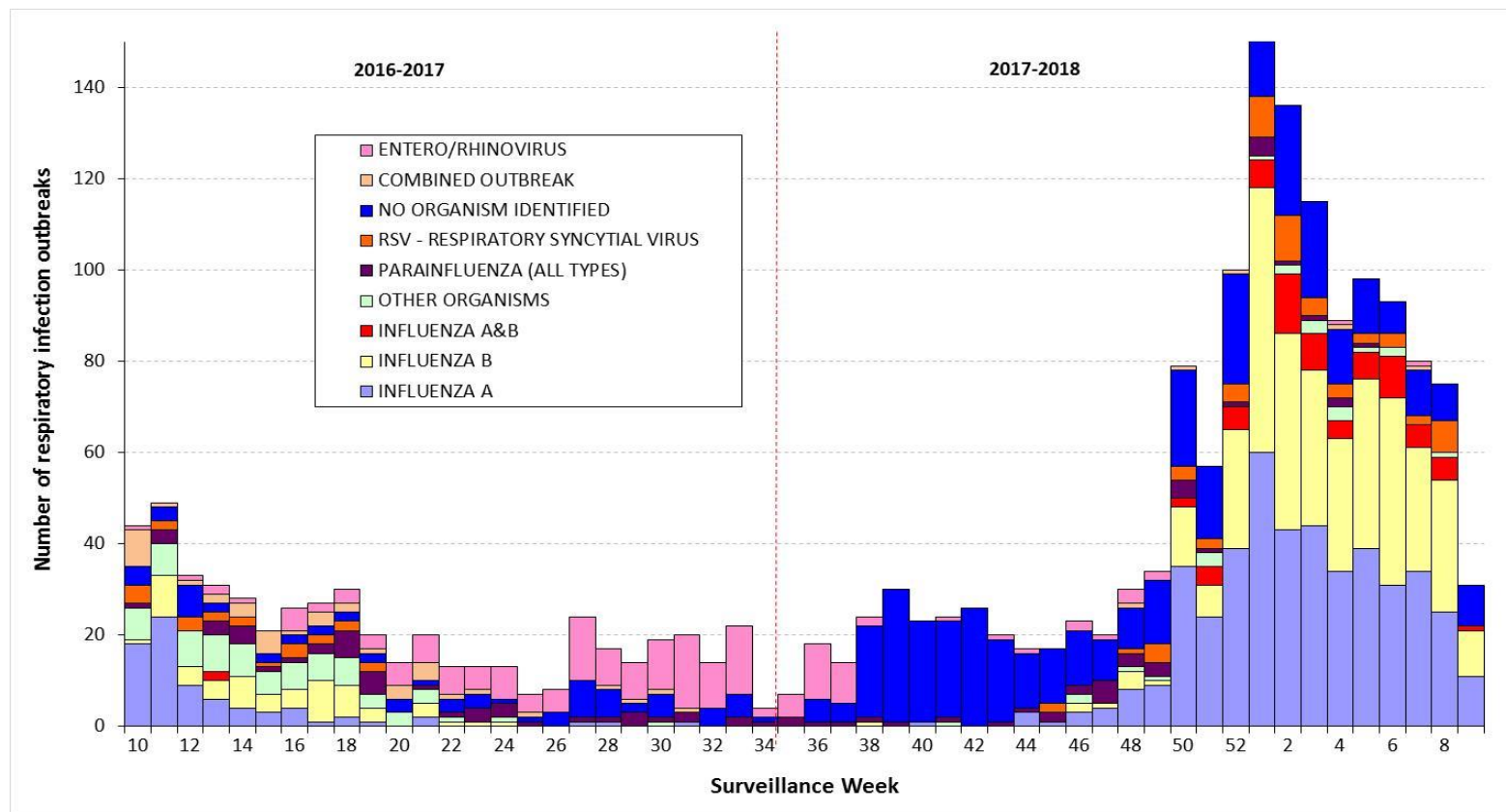
Source: [Integrated Public Health Information System \(iPHIS\)](#)

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, 2017 (Week 35, 2017) 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-based 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, March 5, 2017 to March 3, 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 for this report section](#) with regard to the changes to the Public Health Ontario Laboratory testing algorithm

4. Respiratory viruses by setting

For week 9 based on PHOL data, influenza A positivity was 15.8% (186/1179) compared to 15.4% (198/1287) for the previous week. Influenza B positivity was 16.0% (188/1178) for week 9 compared to 16.3% (209/1284) for the previous week.

Table 3: Number (percentage) of specimens with respiratory pathogens detected by patient setting, Public Health Ontario Laboratory, week 9 and cumulative for the 2017-2018 season to date

Respiratory Pathogen Detected	Patient setting when tested									
	Intensive Care Unit (ICU) Number (% positive)		Hospital (Non-ICU) Number (% positive)		Emergency Number (% positive)		Ambulatory/No setting Number (% positive)		Institution Number (% positive)	
	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative
Influenza A (all)	10 (9.0)	137 (6.0)	94 (13.7)	1,312 (9.8)	3 (37.5)	71 (11.7)	32 (16.7)	506 (11.4)	47 (25.8)	688 (20.4)
Influenza A (H3N2)	6	105	69	1,139	1	47	23	411	22	404
Influenza A (H1N1)pdm09	3	19	2	71	0	15	3	30	0	5
Influenza B	17 (15.3)	135 (5.9)	98 (14.3)	1,000 (7.4)	0 (0.0)	22 (3.6)	35 (18.3)	581 (13.1)	38 (20.9)	571 (16.9)
Adenovirus	0 (0.0)	6 (0.3)	2 (0.6)	93 (0.9)	0 (0.0)	11 (2.1)	0 (0.0)	21 (0.8)	0 (0.0)	1 (0.1)
Coronavirus	0 (NA)	1 (0.9)	0 (NA)	2 (6.7)	0 (NA)	3 (10.3)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)
Entero/rhinovirus	0 (NA)	15 (6.9)	0 (NA)	3 (1.1)	0 (NA)	11 (12.5)	0 (NA)	23 (4.3)	0 (NA)	48 (35.0)
Human metapneumovirus	2 (3.6)	15 (0.8)	5 (1.5)	136 (1.3)	1 (50.0)	4 (0.8)	1 (1.7)	19 (0.8)	0 (0.0)	43 (2.4)
Parainfluenza(all types)	0 (0.0)	13 (0.7)	3 (0.9)	182 (1.7)	0 (0.0)	7 (1.3)	0 (0.0)	43 (1.5)	0 (0.0)	63 (3.5)
Respiratory syncytial virus	1 (1.8)	21 (1.1)	19 (5.8)	483 (4.4)	0 (0.0)	9 (1.7)	1 (1.7)	52 (1.9)	4 (6.6)	83 (4.5)
Total positives	30 (27.0)	342 (14.9)	220 (32.1)	3,199 (23.8)	4 (50.0)	131 (21.7)	68 (35.4)	1,241 (28.0)	89 (48.9)	1,488 (44.0)

Source: [Public Health Ontario Laboratory \(PHOL\)](#)

Notes:

- The percentages in this table 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. For example, if 40 respiratory specimens were tested for influenza B from patients in intensive care unit (ICU) settings and 4 tested positive, the cell for influenza B in the ICU setting would indicate "4 (10%)".
- Institution includes retirement homes, correctional facilities, and undefined institutions.

- 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 A(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 for this report 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.

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5. By Jurisdiction – Influenza activity

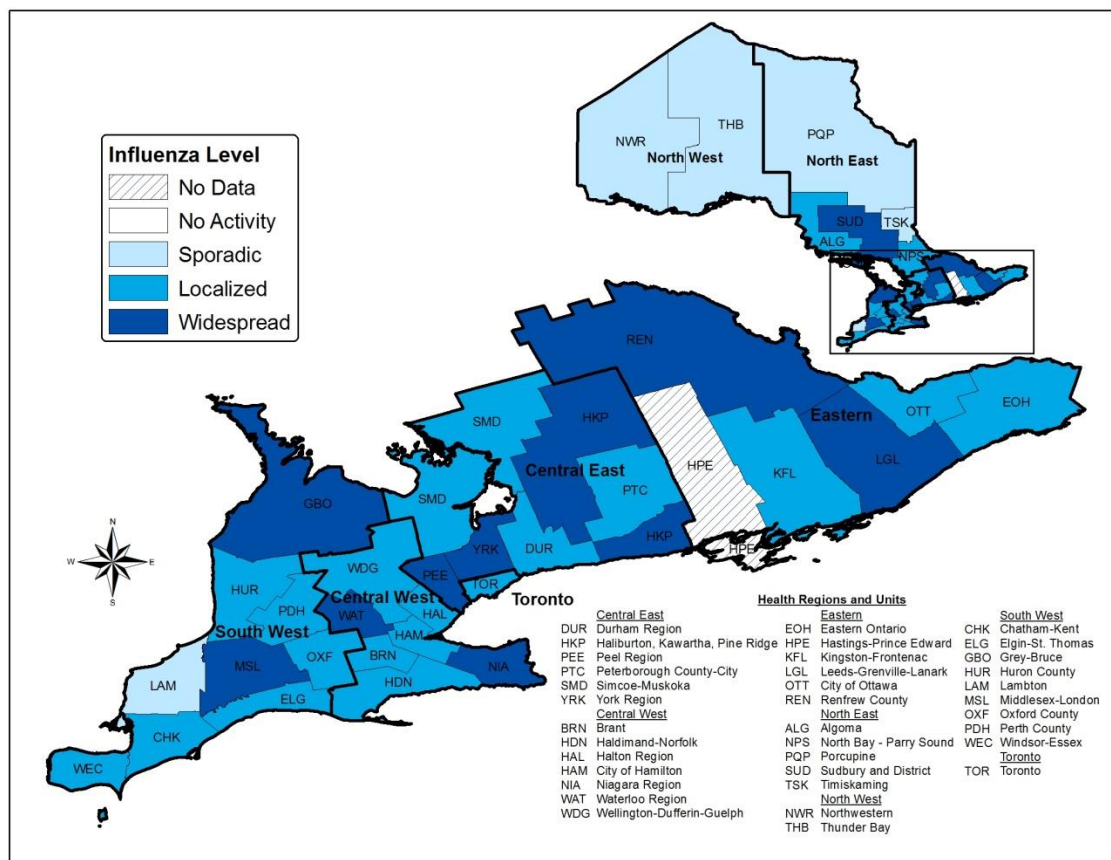
In Week 9, 10 public health units reported ‘widespread’ activity, 20 reported ‘localized’ activity, 5 reported ‘sporadic’ activity, 0 reported ‘no activity,’ and 1 did not report.

Notes:

Tables 4 and 5 below present information by public health unit.

- [Table 4](#) 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 may not be reliable due to small numbers.
- [Table 5](#) is information 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.

Figure 7: Influenza activity levels reported by public health units: Ontario, February 25, 2018 to March 3, 2018 (Week 9)



Source: [Public Health Ontario from public health units](#)

Table 4: Specimens submitted to Public Health Ontario Laboratory for influenza testing and positive results by public health unit; number for week 9 and (cumulative total) for the 2017-2018 season to date.

Public Health Unit and Region	Number of specimens submitted	Number of specimens tested	Influenza A				Influenza B	
			Number of influenza A positive specimens	% positivity influenza A	A(H1N1) pdm09	H3N2	Number of influenza B positive specimens	% positivity influenza B
Northwestern	16 (256)	21 (241)	0 (41)	0.0 (17.0)	0 (0)	0 (34)	10 (26)	47.6 (10.8)
Thunder Bay District	33 (746)	26 (681)	1 (165)	3.8 (24.2)	0 (0)	1 (153)	5 (20)	19.2 (2.9)
TOTAL NORTH WEST	49 (1,002)	47 (922)	1 (206)	2.1 (22.3)	0 (0)	1 (187)	15 (46)	31.9 (5.0)
Algoma	39 (540)	38 (487)	5 (92)	13.2 (18.9)	0 (1)	4 (82)	6 (30)	15.8 (6.2)
North Bay Parry Sound District	47 (820)	40 (772)	6 (99)	15.0 (12.8)	0 (3)	2 (89)	5 (38)	12.5 (4.9)
Porcupine	25 (272)	21 (214)	7 (46)	33.3 (21.5)	0 (6)	5 (37)	2 (12)	9.5 (5.6)
Sudbury & District	32 (256)	29 (204)	3 (25)	10.3 (12.3)	0 (0)	3 (25)	14 (29)	48.3 (14.2)
Timiskaming	10 (161)	8 (140)	2 (30)	25.0 (21.4)	0 (0)	1 (25)	0 (17)	0.0 (12.1)
TOTAL NORTH EAST	153 (2,049)	136 (1,817)	23 (292)	16.9 (16.1)	0 (10)	15 (258)	27 (126)	19.9 (6.9)
City of Ottawa	25 (415)	20 (328)	7 (78)	35.0 (23.8)	0 (1)	5 (48)	5 (54)	25.0 (16.5)
Eastern Ontario	12 (252)	9 (200)	1 (27)	11.1 (13.5)	0 (1)	1 (17)	6 (25)	66.7 (12.5)
Hastings & Prince Edward Counties	21 (456)	17 (398)	0 (43)	0.0 (10.8)	0 (3)	0 (33)	4 (32)	23.5 (8.0)
Kingston, Frontenac, Lennox & Addington	15 (294)	10 (243)	1 (44)	10.0 (18.1)	0 (0)	1 (30)	1 (14)	10.0 (5.8)
Leeds, Grenville And Lanark District	21 (216)	18 (188)	5 (36)	27.8 (19.1)	0 (1)	5 (25)	3 (37)	16.7 (19.7)
Renfrew County And District	18 (166)	16 (137)	9 (22)	56.3 (16.1)	0 (0)	6 (19)	3 (17)	18.8 (12.4)
TOTAL EASTERN	112 (1,799)	90 (1,494)	23 (250)	25.6 (16.7)	0 (6)	18 (172)	22 (179)	24.4 (12.0)
Durham Region	37 (1,047)	33 (846)	6 (73)	18.2 (8.6)	1 (3)	3 (51)	3 (76)	9.1 (9.0)
Haliburton, Kawartha, Pine Ridge	21 (533)	15 (467)	4 (44)	26.7 (9.4)	0 (1)	1 (28)	1 (55)	6.7 (11.8)
Peel Region	119 (2,735)	114 (2,497)	5 (117)	4.4 (4.7)	0 (15)	4 (88)	10 (104)	8.8 (4.2)
Peterborough County-City	15 (435)	11 (421)	2 (25)	18.2 (5.9)	0 (1)	1 (16)	0 (14)	0.0 (3.3)
Simcoe Muskoka District	89 (1,930)	75 (1,387)	10 (207)	13.3 (14.9)	0 (10)	6 (146)	9 (106)	12.0 (7.6)
York Region	192 (2,972)	159 (2,768)	29 (345)	18.2 (12.5)	3 (24)	22 (292)	31 (311)	19.5 (11.2)
TOTAL CENTRAL EAST	473 (9,652)	407 (8,386)	56 (811)	13.8 (9.7)	4 (54)	37 (621)	54 (666)	13.3 (7.9)
Toronto	258 (5,473)	205 (4,790)	27 (378)	13.2 (7.9)	1 (31)	22 (299)	36 (387)	17.6 (8.1)
TOTAL TORONTO	258 (5,473)	205 (4,790)	27 (378)	13.2 (7.9)	1 (31)	22 (299)	36 (387)	17.6 (8.1)
Chatham-Kent	11 (404)	13 (376)	0 (43)	0.0 (11.4)	0 (0)	0 (40)	4 (60)	30.8 (16.0)
Elgin-St. Thomas	11 (248)	11 (234)	4 (18)	36.4 (7.7)	0 (1)	1 (13)	3 (47)	27.3 (20.1)
Grey Bruce	20 (357)	13 (264)	2 (39)	15.4 (14.8)	0 (2)	2 (28)	0 (19)	0.0 (7.2)
Huron County	4 (148)	3 (142)	0 (11)	0.0 (7.7)	0 (0)	0 (8)	1 (17)	33.3 (12.0)
Lambton County	16 (357)	14 (334)	0 (43)	0.0 (12.9)	0 (0)	0 (42)	2 (41)	14.3 (12.3)

Public Health Unit and Region	Number of specimens submitted	Number of specimens tested	Influenza A				Influenza B	
			Number of influenza A positive specimens	% positivity influenza A	A(H1N1) pdm09	H3N2	Number of influenza B positive specimens	% positivity influenza B
Middlesex-London	20 (442)	14 (388)	2 (75)	14.3 (19.3)	0 (1)	1 (60)	0 (95)	0.0 (24.6)
Oxford County	15 (282)	15 (265)	3 (36)	20.0 (13.6)	0 (0)	2 (33)	2 (57)	13.3 (21.5)
Perth District	15 (301)	10 (279)	0 (30)	0.0 (10.8)	0 (2)	0 (22)	1 (34)	10.0 (12.2)
Windsor-Essex County	51 (1,014)	46 (900)	10 (112)	21.7 (12.4)	0 (6)	6 (77)	0 (153)	0.0 (17.0)
TOTAL SOUTH WEST	163 (3,553)	139 (3,182)	21 (407)	15.1 (12.8)	0 (12)	12 (323)	13 (523)	9.4 (16.4)
Brant County	8 (311)	6 (271)	2 (16)	33.3 (5.9)	0 (2)	1 (10)	0 (11)	0.0 (4.1)
City Of Hamilton	14 (317)	6 (261)	1 (28)	16.7 (10.7)	0 (5)	1 (18)	0 (33)	0.0 (12.6)
Haldimand-Norfolk	15 (231)	9 (200)	3 (21)	33.3 (10.5)	0 (0)	2 (18)	1 (29)	11.1 (14.5)
Halton Region	48 (1,180)	50 (1,073)	10 (90)	20.0 (8.3)	2 (8)	4 (64)	11 (94)	22.0 (8.8)
Niagara Region	24 (555)	20 (456)	7 (71)	35.0 (15.6)	0 (1)	0 (36)	1 (63)	5.0 (13.8)
Waterloo Region	17 (421)	13 (380)	5 (60)	38.5 (15.8)	0 (2)	3 (36)	4 (38)	30.8 (10.0)
Wellington-Dufferin-Guelph	64 (1,079)	51 (930)	7 (84)	13.7 (9.0)	1 (9)	5 (64)	4 (114)	7.8 (12.3)
TOTAL CENTRAL WEST	190 (4,094)	155 (3,571)	35 (370)	22.6 (10.3)	3 (27)	16 (246)	21 (382)	13.5 (10.7)
OUT OF PROVINCE	3 (106)	0 (1)	0 (0)	NA (0.0)	0 (0)	0 (0)	0 (0)	NA (0.0)
TOTAL ONTARIO	1,401 (27,728)	1,179 (24,163)	186 (2,714)	15.8 (11.2)	8 (140)	121 (2,106)	188 (2,309)	16.0 (9.6)

Source: [Public Health Ontario Laboratory \(PHOL\)](#)

Notes:

- Cumulative numbers are from September 1, 2017 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.

Table 5. Number of reported confirmed influenza cases by public health unit and health region; number for week 9 and (cumulative total) for the 2017-2018 influenza season

Public Health Unit and Region	Number of influenza A positive cases			Influenza A & B	Influenza B	TOTAL
	(H1N1) pdm09	H3	Influenza A All subtypes ¹			
Northwestern	0 (0)	1 (32)	1 (44)	0 (0)	7 (22)	8 (66)
Thunder Bay District	0 (0)	1 (147)	2 (162)	0 (0)	4 (15)	6 (177)
TOTAL NORTH WEST	0 (0)	2 (179)	3 (206)	0 (0)	11 (37)	14 (243)
Algoma	0 (1)	8 (59)	10 (88)	0 (0)	16 (28)	26 (116)
North Bay Parry Sound District	0 (2)	3 (95)	9 (140)	0 (0)	7 (82)	16 (222)
Porcupine	0 (6)	6 (33)	8 (45)	0 (0)	1 (13)	9 (58)
Sudbury & District	0 (0)	4 (19)	7 (128)	0 (3)	12 (80)	19 (211)
Timiskaming	0 (0)	2 (25)	2 (30)	0 (0)	1 (19)	3 (49)
TOTAL NORTH EAST	0 (9)	23 (231)	36 (431)	0 (3)	37 (222)	73 (656)
City of Ottawa	0 (1)	3 (45)	51 (495)	1 (5)	52 (342)	104 (842)
Eastern Ontario	0 (1)	0 (20)	15 (127)	1 (1)	18 (64)	34 (192)
Hastings & Prince Edward Counties	0 (2)	2 (28)	2 (46)	0 (0)	5 (29)	7 (75)
Kingston, Frontenac, Lennox & Addington	0 (0)	0 (27)	6 (116)	4 (4)	4 (69)	14 (189)
Leeds, Grenville And Lanark District	0 (1)	1 (25)	11 (77)	0 (0)	3 (51)	14 (128)
Renfrew County And District	0 (0)	8 (14)	12 (28)	0 (0)	4 (26)	16 (54)
TOTAL EASTERN	0 (5)	14 (159)	97 (889)	6 (10)	86 (581)	189 (1480)
Durham Region	0 (1)	4 (52)	20 (180)	0 (1)	10 (176)	30 (357)
Haliburton, Kawartha, Pine Ridge ²	0 (2)	0 (24)	4 (60)	0 (0)	10 (84)	14 (144)
Peel Region	0 (15)	9 (159)	48 (755)	0 (0)	58 (665)	106 (1420)
Peterborough County-City	0 (1)	1 (16)	2 (112)	0 (1)	0 (87)	2 (200)
Simcoe Muskoka District	0 (6)	9 (142)	24 (453)	0 (0)	23 (266)	47 (719)
York Region	1 (26)	22 (287)	37 (453)	1 (1)	36 (414)	74 (868)
TOTAL CENTRAL EAST	1 (51)	45 (680)	135 (2013)	1 (3)	137 (1692)	273 (3708)
Toronto	0 (14)	18 (252)	130 (1600)	1 (15)	125 (1483)	256 (3098)
TOTAL TORONTO	0 (14)	18 (252)	130 (1600)	1 (15)	125 (1483)	256 (3098)
Chatham-Kent	0 (0)	0 (17)	0 (39)	0 (2)	1 (55)	1 (96)
Elgin-St. Thomas	0 (1)	1 (10)	1 (15)	0 (0)	1 (52)	2 (67)
Grey Bruce	0 (1)	2 (22)	4 (69)	0 (1)	9 (83)	13 (153)
Huron County	0 (0)	0 (8)	1 (20)	0 (0)	1 (28)	2 (48)
Lambton County	0 (0)	2 (35)	3 (47)	0 (1)	3 (45)	6 (93)
Middlesex-London	0 (0)	0 (30)	18 (305)	1 (6)	5 (383)	24 (694)
Oxford County	0 (0)	4 (24)	4 (39)	1 (2)	4 (61)	9 (102)
Perth District	0 (1)	0 (12)	0 (36)	1 (1)	1 (48)	2 (85)
Windsor-Essex County	0 (4)	6 (63)	13 (110)	0 (1)	4 (151)	17 (262)
TOTAL SOUTH WEST	0 (7)	15 (221)	44 (680)	3 (14)	29 (906)	76 (1600)
Brant County	0 (2)	0 (9)	6 (71)	0 (0)	5 (66)	11 (137)
City Of Hamilton	0 (2)	1 (13)	21 (455)	0 (5)	23 (390)	44 (850)
Haldimand-Norfolk	0 (0)	5 (11)	8 (42)	0 (1)	6 (43)	14 (86)
Halton Region	1 (6)	4 (62)	24 (274)	0 (0)	29 (258)	53 (532)
Niagara Region	0 (1)	1 (30)	40 (437)	0 (2)	24 (281)	64 (720)
Waterloo Region	0 (2)	3 (29)	29 (240)	0 (0)	13 (123)	42 (363)
Wellington-Dufferin-Guelph	0 (8)	6 (59)	8 (107)	0 (1)	10 (141)	18 (249)
TOTAL CENTRAL WEST	1 (21)	20 (213)	136 (1626)	0 (9)	110 (1302)	246 (2937)
TOTAL ONTARIO	2 (107)	137 (1935)	581 (7445)	11 (54)	535 (6223)	1127 (13722)

Source: [Integrated Public Health Information System \(iPHIS\)](#)

Note:

¹ Includes influenza A positive cases for whom no subtype was reported

6. By Age – Respiratory viruses

During week 9, of the 186 influenza A positive specimens, influenza A(H3N2) was detected in 121 and influenza A(H1N1)pdm09 was detected in eight specimens. Fifty-seven influenza A positive specimens had subtype testing pending/not performed. Most influenza A and B detections occurred in the 65+ age group.

Table 6: Number (percentage) of specimens with respiratory pathogens detected by age group, Public Health Ontario Laboratory, week 9 and cumulative for the 2017-2018 season to date

Respiratory Pathogen Detected	Age groups									
	<1 Number (% positive)		1-4 Number (% positive)		5-19 Number (% positive)		20-64 Number (% positive)		65+ Number (% positive)	
	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative
Influenza A (all)	4 (7.0)	36 (2.9)	8 (14.0)	98 (8.2)	4 (11.1)	96 (11.6)	29 (10.2)	545 (8.7)	141 (19.0)	1,933 (13.3)
Influenza A(H3N2)	4	33	6	62	0	65	17	425	94	1,516
Influenza A(H1N1)pdm09	0	2	1	27	1	23	4	61	2	27
Influenza B	2 (3.5)	20 (1.6)	7 (12.3)	71 (5.9)	6 (16.7)	166 (20.0)	57 (20.0)	550 (8.8)	116 (15.6)	1,494 (10.2)
Adenovirus	0 (0.0)	13 (1.1)	2 (10.5)	63 (6.4)	0 (0.0)	13 (2.5)	0 (0.0)	33 (0.7)	0 (0.0)	10 (0.1)
Coronavirus	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	0 (0.0)	0 (NA)	4 (3.0)	0 (NA)	2 (1.1)
Enterovirus	0 (NA)	3 (2.5)	0 (NA)	7 (8.9)	0 (NA)	0 (0.0)	0 (NA)	27 (5.6)	0 (NA)	63 (12.6)
Human metapneumovirus	0 (0.0)	19 (1.7)	0 (0.0)	20 (2.1)	0 (0.0)	4 (0.9)	1 (0.8)	28 (0.6)	8 (2.5)	145 (1.4)
Parainfluenza	0 (0.0)	37 (3.2)	1 (5.3)	56 (5.7)	0 (0.0)	12 (2.3)	0 (0.0)	32 (0.7)	2 (0.6)	171 (1.6)
Respiratory syncytial virus	13 (44.8)	261 (22.7)	3 (15.8)	119 (12.2)	1 (8.3)	7 (1.4)	1 (0.8)	37 (0.8)	7 (2.2)	222 (2.1)
Total positives	19 (33.3)	386 (31.1)	21 (36.8)	433 (36.2)	11 (30.6)	296 (35.6)	87 (30.5)	1,247 (20.0)	273 (36.7)	4,022 (27.6)

Source: [Public Health Ontario Laboratory \(PHOL\)](#)

Notes:

- The percent positivity in this table is calculated as number of specimens with the respiratory virus detected divided by total number of specimens tested for that particular respiratory virus within the age group. For example, if 50 respiratory specimens were tested for influenza B from patients in the 5-19 year age group and 10 tested positive, the cell for influenza B in 5-19 years olds would indicate "10 (20%)".
- 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 A(H1N1)pdm09 because subtyping is only done on select influenza A samples, precluding an accurate calculation.
- 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)”
- 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 for this report section with regard to the changes to the Public Health Ontario Laboratory testing algorithm.
- NA-Not applicable- Indicates age group with no specimens tested; therefore percent positivity was not calculated.

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7. Strain comparisons – circulating influenza strains and vaccine strains

The National Microbiology Laboratory (NML), reported that 803 influenza A(H3N2) viruses from Canada did not grow to sufficient hemagglutination titers for antigenic characterization by hemagglutination inhibition (HI) assays. Sequence analysis of the HA (hemagglutinin) gene of these viruses showed that 719 H3N2 viruses belonged to genetic group 3C.2a, 82 viruses belonged to subclade 3C.2a1, and two viruses belonged to clade 3C.3a. The influenza A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A/H3N2 component of the 2017-18 Northern Hemisphere influenza vaccine, as [recommended by the World Health Organization \(WHO\)](#).

Two hundred and seven influenza A(H3N2) viruses from Canada were antigenically characterized* as A/Hong Kong/4801/2014-like, which is the WHO recommended influenza A(H3N2) component of the 2017-2018 Northern Hemisphere vaccine. Thirty viruses showed reduced titer with ferret antisera raised against cell culture-propagated A/Hong Kong/4801/2014.

One hundred and twenty-three influenza A(H1N1) viruses tested nationally were antigenically similar* to A/Michigan/45/2015, which is the influenza A(H1N1) component of the 2017-2018 Northern Hemisphere influenza vaccine.

Of the 922 influenza B viruses characterized in Canada, NML reported that 44 viruses were antigenically similar* to the vaccine strain B/Brisbane/60/2008 (Victoria lineage), which is the recommended influenza B component for the 2017-18 Northern Hemisphere influenza vaccine. Of the 44 influenza B viruses characterized as B/ B/Brisbane/60/2008-like, eight viruses were antigenically similar to the vaccine strain B/Brisbane/60/2008 and 36 viruses showed reduced titer with ferret antisera produced against cell-propagated B/Brisbane/60/2008. Eight hundred and seventy-eight influenza B viruses were characterized as B/Phuket/3073/2013-like, which belongs to the Yamagata lineage and is included as an influenza B component of the 2017-18 Northern Hemisphere quadrivalent 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, 2017 to March 8, 2018

Influenza strains	Ontario	Canada
Influenza A (H3N2) A/Hong Kong/4801/2014-like	113	237
Influenza A (H1N1) A/Michigan/45/2015-like	49	123
Influenza B B/Brisbane/60/2008-like	5	44
B/Phuket/3073/13-like	339	878

Source: [National Microbiology Laboratory \(NML\)](#)

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8. Antiviral resistance / sensitivity for influenza

All influenza A viruses in Canada tested by NML for antiviral resistance in the 2017-2018 season were sensitive to zanamivir. Two influenza A (H3N2) positive isolates from Newfoundland tested by NML were sensitive to amantadine. One influenza A (H1N1)pdm09 positive isolate from Ontario tested by NML was resistant to oseltamivir. All influenza B viruses in Canada were sensitive to oseltamivir. One influenza B positive isolate from Ontario tested by NML was resistant to zanamivir.

Table 8: Amantadine, oseltamivir and zanamivir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2017 to March 8, 2018

	Amantadine				Oseltamivir				Zanamivir			
Influenza strains	ONTARIO		CANADA		ONTARIO		CANADA		ONTARIO		CANADA	
	R	S	R	S	R	S	R	S	R	S	R	S
Influenza A (H3N2)	438	0	1034	2	0	159	0	435	0	159	0	431
Influenza A (H1N1)pdm09	42	0	101	0	1	38	1	88	0	39	0	89
Influenza B	NA	NA	NA	NA	0	133	0	389	1	132	1	388

Source: [National Microbiology Laboratory \(NML\)](#)

R = Resistant, S = Susceptible, NA = Not Applicable

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9. Bacterial pathogens

One specimen was positive for *Mycoplasma pneumoniae* and no specimen was positive for *Chlamydomphila pneumoniae* during this week.

Table 9: Number and percent positivity of respiratory specimens tested for *Mycoplasma pneumoniae* or *Chlamydomphila pneumoniae*, Public Health Ontario Laboratory, week 9.

Pathogens	Positive		Tested	
	Current n (%)	Cumulative n (%)	Current n	Cumulative n
<i>Mycoplasma pneumoniae</i>	1 (3.2)	74 (5.4)	31	1,370
<i>Chlamydomphila pneumoniae</i>	0 (0.0)	0 (0.0)	31	1,370

Source: [Public Health Ontario Laboratory \(PHOL\)](#)

Notes:

- Cumulative numbers (in brackets) for *Mycoplasma* and *Chlamydomphila* are from September 1, 2017.

10. 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 March 7, 2018.

Case counts for influenza A and B cases are based on the 'Reported Date', which was the date the public health unit was notified of the case; however, cases are assigned to a particular surveillance week based on the episode date entered in iPHIS for the case. Episode date for a case corresponds to the earliest date on record for the case according to the iPHIS hierarchy (Symptom Date > Clinical Diagnosis 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 Laboratory:** provides specimen level information from the 11 PHOL sites located in Ontario; data for the issue was extracted from the Laboratory Information Management System by PHO on March 8, 2018. A detailed summary of PHOL lab data is available on the PHO website [here](#).

For the 2016-2017 influenza season, a multiplex PCR test was used that tested for 19 viruses/strains. Starting September 20th, 2017, a new testing algorithm was implemented at PHOL for respiratory viruses. All respiratory specimens will first be tested for influenza by PCR and those that test negative will undergo Rapid Viral Culture; multiplex PCR will not be used this season. This change will impact comparability with reports from previous seasons for the following reasons:

- The Rapid Viral Culture test does not detect coronavirus, parainfluenza virus 4 or entero/rhinoviruses;

- For the viruses it tests for, the Rapid Viral Culture is less sensitive than the multiplex PCR;
- No routine respiratory virus testing is offered to ambulatory and emergency department patients;
- Influenza-positive specimens tested by influenza PCR do not undergo further testing to determine if other pathogens are also present.

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 2017-2018 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 3 because ongoing outbreaks from previous weeks, as well as laboratory confirmed outbreaks in schools, may be included in the assessment of the activity level.