Public Health Ontario | Santé publique Ontario

PARTNERS FOR HEALTH | PARTENAIRES POUR LA SANTÉ

Ontario Respiratory Pathogen Bulletin | 2015-2016

SURVEILLANCE WEEK 46 (November 15, 2015 – November 21, 2015)

This issue of the Ontario Respiratory Pathogen Bulletin provides information on the surveillance period from November 15 to November 21, 2015 (Week 46). Unless otherwise specified, **data presented in this issue of the bulletin are for Week 46** and data extraction occurred on Wednesday, November 25, 2015.

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 8 influenza cases (6 influenza A and 2 influenza B) reported in Week 46, which was lower than the 16 influenza cases reported in Week 45 (13 influenza A and 3 influenza B).
Percent positivity for influenza[2]	Similar	Percent positivity of laboratory tests for all influenza types in Week 46 was 1.3%, which was similar to the percent positivity in Week 45 (1.6%). In Week 46, percent positivity was 1.3% for influenza A and 0.0% for influenza B.
Institutional influenza outbreaks[3]	Similar	There were no new influenza outbreaks reported in Week 46, which was the same as the number of influenza outbreaks reported in Week 45 (0).
Influenza activity levels reported by public health units	Similar	In Week 46, 4 public health units reported 'sporadic' activity and 22 reported 'no activity'. In Week 45, 6 public health units reported 'sporadic' activity and 26 reported 'no activity'.
OVERALL ASSESSMENT	**Similar**	**Overall, the indicators show that influenza activity for Week 46 was similar compared to Week 45.**
Measures of severity for influenza		
Hospitalizations among laboratory-confirmed cases of influenza[4]	There were 7 hospitalized cases reported in Week 46; the number of hospitalized cases reported in Week 45 was 5.	
Deaths among laboratory-confirmed cases of influenza[4]	There were no deaths reported in Week 46 or in Week 45.	

Notes:

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

[2] Positivity among specimens tested by Ontario laboratories that submit results to the Centre for Immunization and Respiratory Infectious Diseases (CIRID).

[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

[4] Hospitalization / death data are based on the date reported to the public health unit. These data are likely under-reported and may not be comparable to prior years. Please see note on page 12.

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Summary of respiratory pathogen activity for Surveillance Week 46, 2015

1. Circulating respiratory viruses in Ontario

Provincial percent positivity for both influenza A and B remains low, at 1.3% and 0.0% respectively in Week 46 (Figures 1 and 3). Rhinovirus was the most common circulating respiratory virus, with provincial positivity at 18.4% (Figure 2).

2. Comparison to previous influenza seasons

For the 2015-2016 surveillance season to date, 119 laboratory-confirmed influenza cases have been reported. Among these cases, 81.5% (97/119) were influenza A (Table 6). Of the 58 reported influenza A cases with subtype information available, 81.0% (47/58) were H3N2 and 19.0% (11/58) were (H1N1)pdm09. Influenza activity in week 46 was low, which is within expected levels for this time of year.

3. Institutional respiratory outbreaks

No influenza outbreaks were reported in Week 46 (Figure 6). Influenza was detected in 0.9% (2/214) of institutional respiratory infection outbreaks reported to date in the 2015-2016 season. 62.6% (134/214) of the outbreaks were reported as entero/rhinovirus. Most respiratory infection outbreaks were reported from long-term care homes (127/214 or 59.3% of all reported outbreaks).

4. Severity - Influenza hospitalizations and deaths, and respiratory viruses by setting

In the season to date, 42 hospitalizations and no deaths have been reported among laboratory-confirmed influenza cases. The majority (39/42 or 92.9%) of hospitalizations occurred in influenza A cases, with the remaining hospitalizations (3/42 or 7.1%) in patients with influenza B. 61.9% (26/42) of the hospitalizations were in individuals 65 years of age and older.

For week 46, influenza A was detected in a few specimens originating mostly from patients in the ambulatory setting. Entero/rhinovirus was the most frequently detected virus detected among individuals from institutional, intensive care unit and ambulatory settings.

5. By Jurisdiction – Influenza activity

Influenza activity remains low across the province, with four public health units reporting ‘sporadic’ activity and 22 reporting ‘no activity’.

6. By Age – Respiratory viruses

For week 46, entero/rhinovirus was the most common virus detected mostly among individuals aged 65 and over and parainfluenza was most commonly detected in infants less than 1 year of age. Information on influenza hospitalizations and deaths by age can be found in Section 4: Severity - Influenza hospitalizations and deaths, and respiratory viruses by setting.

7. Strain comparisons – circulating influenza strains and vaccine strains

Through genetic characterization performed at the National Microbiology Laboratory (NML), sequence analysis showed that the one influenza A(H1N1) virus tested nationally was antigenically similar to

A/California/7/2009, which is the influenza A/H1N1 component recommended by the World Health Organization for the 2015-2016 Northern Hemisphere influenza vaccine.

Only one influenza A(H3N2) virus from Canada grew to sufficient titre for antigenic characterization by haemagglutination inhibition assay and was characterized as antigenically similar to the cell-passaged A/Switzerland/9715293/2013, the World Health Organization recommended influenza A(H3N2) component of the 2015-2016 Northern Hemisphere vaccine.

Of the eight influenza B viruses characterized in Canada, NML reported that six were antigenically similar to the recommended influenza B component for the Northern Hemisphere 2015-2016 vaccine, B/Phuket/3073/2013. Two influenza B viruses were characterized as B/Brisbane/60/2008-like, which is included as an influenza B component of the 2015-2016 quadrivalent vaccine.

8. Antiviral resistance / sensitivity in influenza isolates

All influenza A viruses in Canada tested by the National Microbiology Laboratory (NML) for resistance in the 2015-2016 season were sensitive to oseltamivir and zanamivir. Only one of the influenza A viruses tested was sensitive to amantadine. All influenza B viruses in Canada were sensitive to both oseltamivir and zanamivir.

9. Bacterial pathogens

Three specimens were positive for *Bordetella pertussis* and five specimens were positive for *Mycoplasma pneumoniae* during week 46. No specimen was positive for *Bordetella parapertussis, Bordetella holmesii* or *Chlamydophila pneumoniae* during this week.

10. Data sources for this report

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

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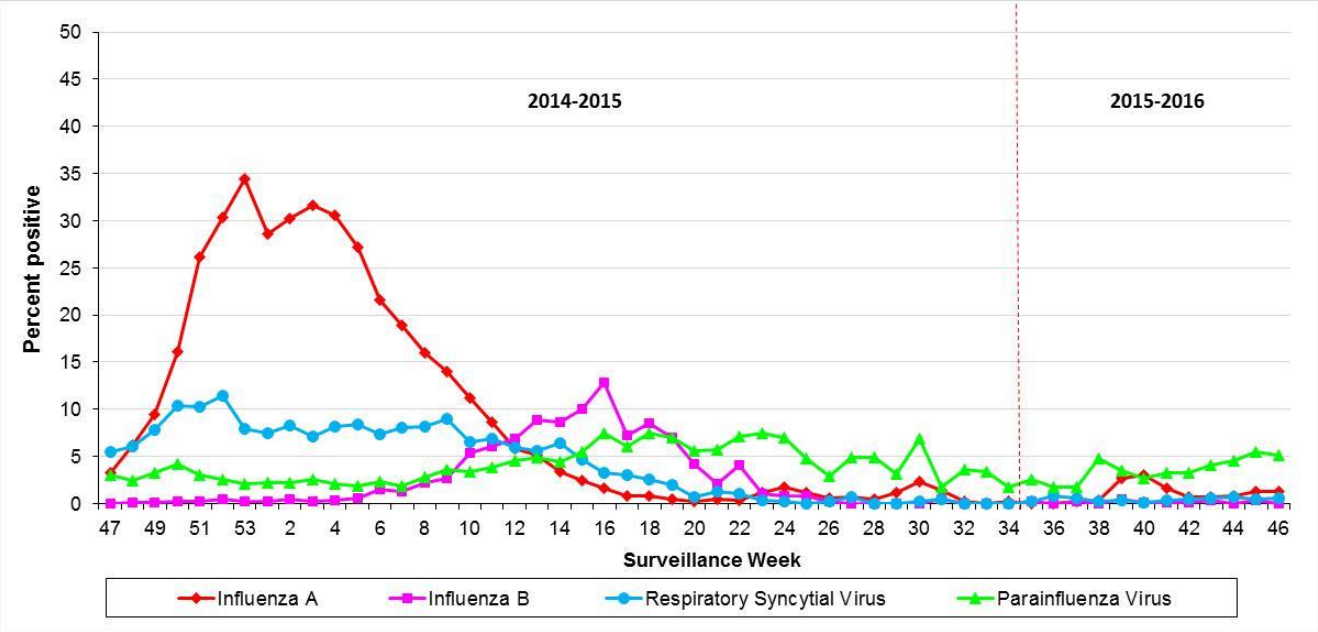
1. Circulating respiratory viruses in Ontario

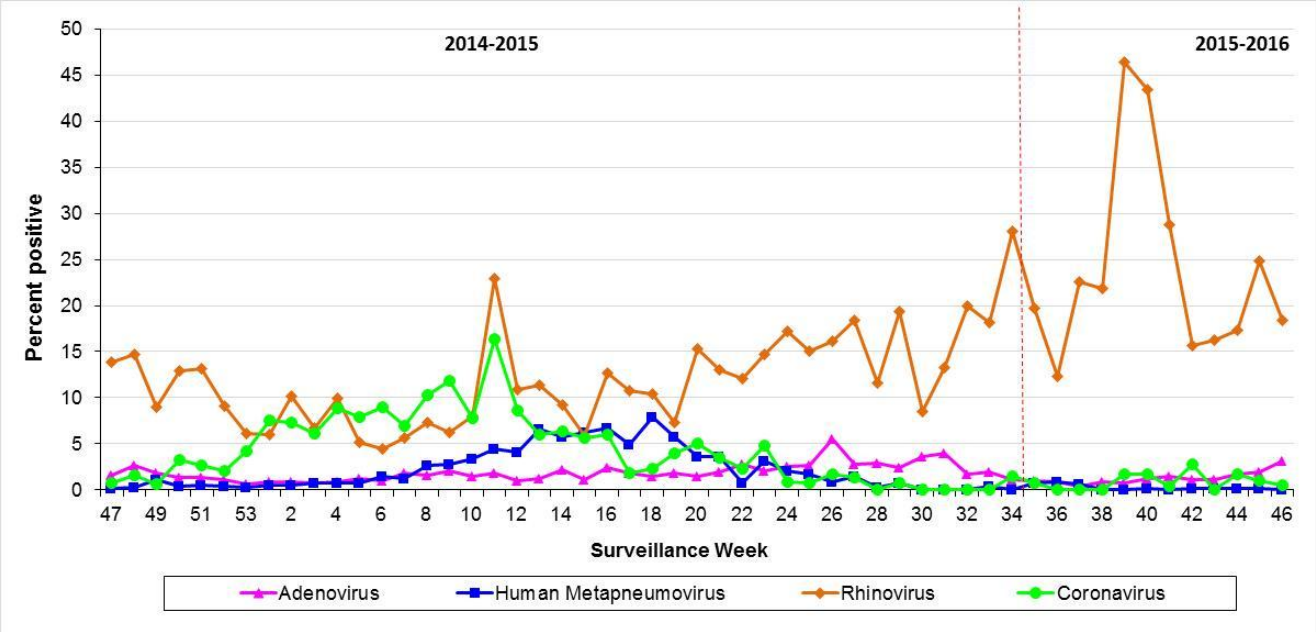
Provincial percent positivity for both influenza A and B remains low, at 1.3% and 0.0% respectively in Week 46 (Figures 1 and 3). Rhinovirus was the most common circulating respiratory virus, with provincial positivity at 18.4% (Figure 2).

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, November 16, 2014 to November 21, 2015



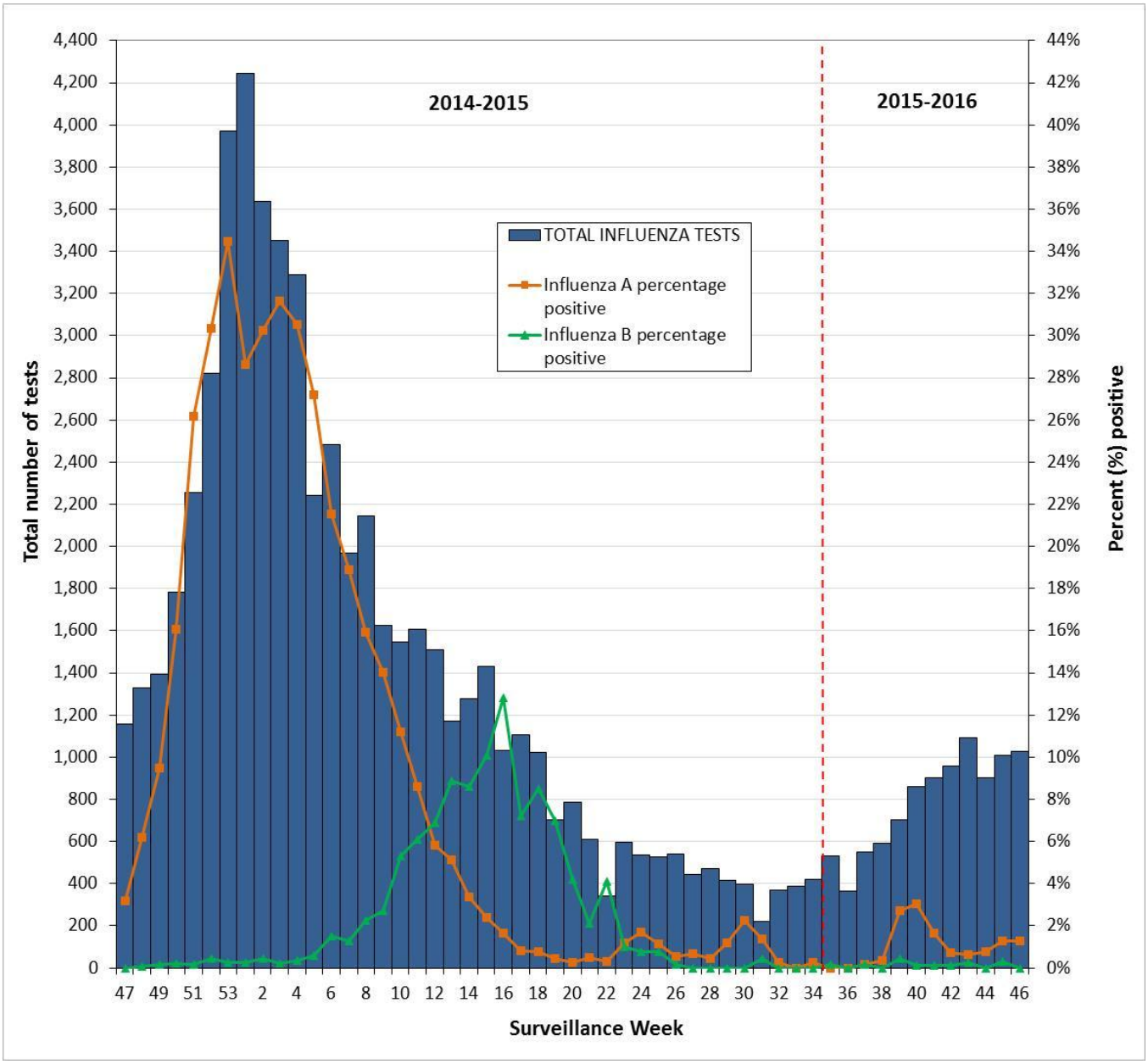
Source: Centre for Immunization and Respiratory Infectious Diseases (CIRID)

Figure 2: Percentage of respiratory viral pathogens (adenovirus, human metapneumovirus, rhinovirus and coronavirus) detected among specimens tested by all methods: Ontario, November 16, 2014 to November 21, 2015



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

Figure 3: Total number of influenza tests performed and percent of positive tests by surveillance week: Ontario, November 16, 2014 to November 21, 2015



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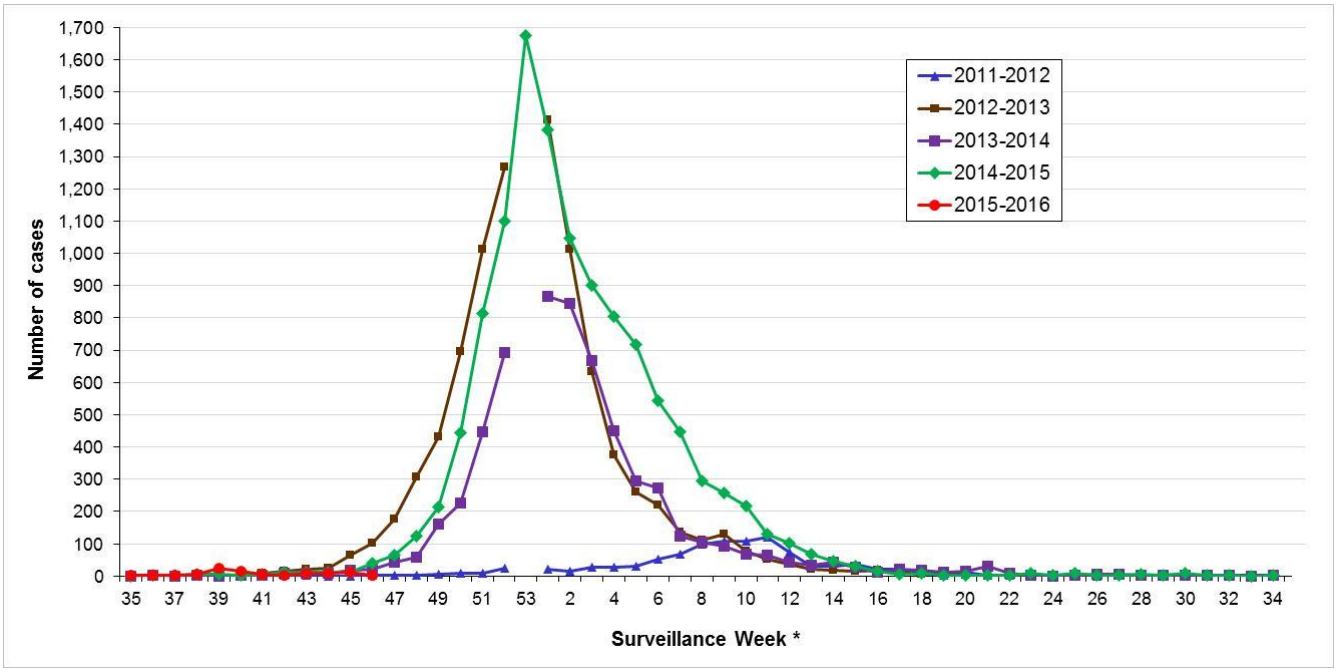
2. Comparison to previous influenza seasons

For the 2015-2016 surveillance season to date, 119 laboratory-confirmed influenza cases have been reported. Among these cases, 81.5% (97/119) were influenza A (Table 6). Of the 58 reported influenza A cases with subtype information available, 81.0% (47/58) were H3N2 and 19.0% (11/58) were (H1N1)pdm09. Influenza activity in week 46 was low, which is within expected levels for this time of year.

Dominant Type/Subtype by Season

2011-2012: B (Yamagata lineage)
2012-2013: A(H3N2)
2013-2014: A(H1N1)pdm09
2014-2015: A(H3N2)
2015-2016: To Be Determined

Figure 4: Number of reported confirmed cases of influenza A by surveillance week: Ontario, September 1, 2011 to November 21, 2015

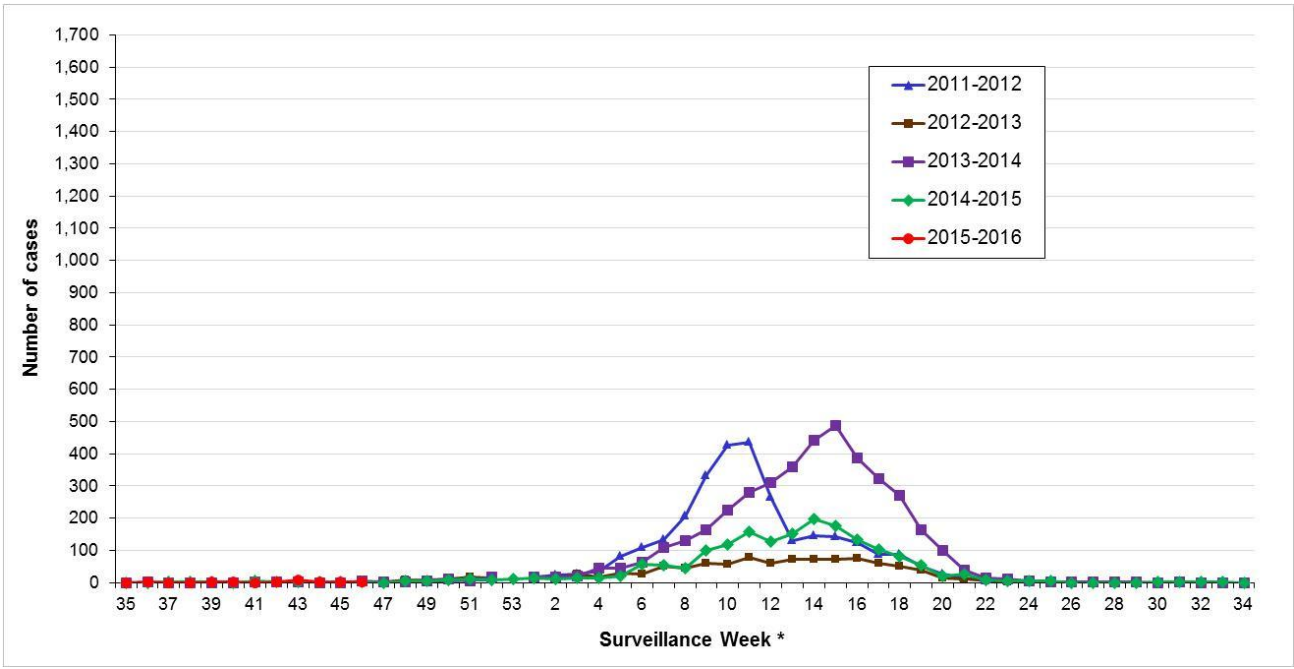


Source: Integrated Public Health Information System (iPHIS)

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 2014-15 corresponded to December 28, 2014 to January 3, 2015.

Figure 5: Number of reported confirmed cases of influenza B by surveillance week: Ontario, September 1, 2011 to November 21, 2015



Source: Integrated Public Health Information System (iPHIS)

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- Interpret most recent case counts for the current season with caution due to reporting lags.
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3. Institutional respiratory outbreaks

No influenza outbreaks were reported in Week 46 (Figure 6). Influenza was detected in 0.9% (2/214) of institutional respiratory infection outbreaks reported to date in the 2015-2016 season. 62.6% (134/214) of the outbreaks were reported as entero/rhinovirus. Most respiratory infection outbreaks were reported from long-term care homes (127/214 or 59.3% of all reported outbreaks).

Table 1: Institutional respiratory infection outbreaks: Ontario, Week 46 and total for the 2015-2016 season to date[1]

Virus reported in outbreak	CURRENT WEEK		CUMULATIVE	
	Number of new outbreaks[2]	Percentage of total for current week	Number of outbreaks cumulative	Percentage of total for cumulative
Influenza A[3]	0	0.0%	2	0.9%
Influenza B[3]	0	0.0%	0	0.0%
Both influenza A and B[3]	0	0.0%	0	0.0%
Entero/rhinovirus	0	0.0%	134	62.6%
Parainfluenza (all types)	0	0.0%	12	5.6%
Respiratory syncytial virus (RSV)	0	0.0%	0	0.0%
Human metapneumovirus, adenovirus, coronavirus or other viruses	0	0.0%	2	0.9%
Two or more non-influenza viruses[3]	0	0.0%	12	5.6%
No organism reported	5	100.0%	52	24.3%
TOTAL	*5*	*100.0%*	*214*	*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, 2015 (Week 35, 2015) 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. November 15, 2015 – November 21, 2015 (Week 46), 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 2015-2016 season to date[1]

Setting type reported	Number of influenza outbreaks (% of total)	Number of other respiratory viruses (% of total)
Long-Term Care Home	0 (0.0%)	127 (59.9%)
Hospital	0 (0.0%)	8 (3.8%)
Retirement Home	1 (50.0%)	32 (15.1%)
Other[2]	0 (0.0%)	0 (0.0%)
Unknown	1 (50.0%)	45 (21.2%)
TOTAL	***2 (100.0%)***	***212 (100.0%)***

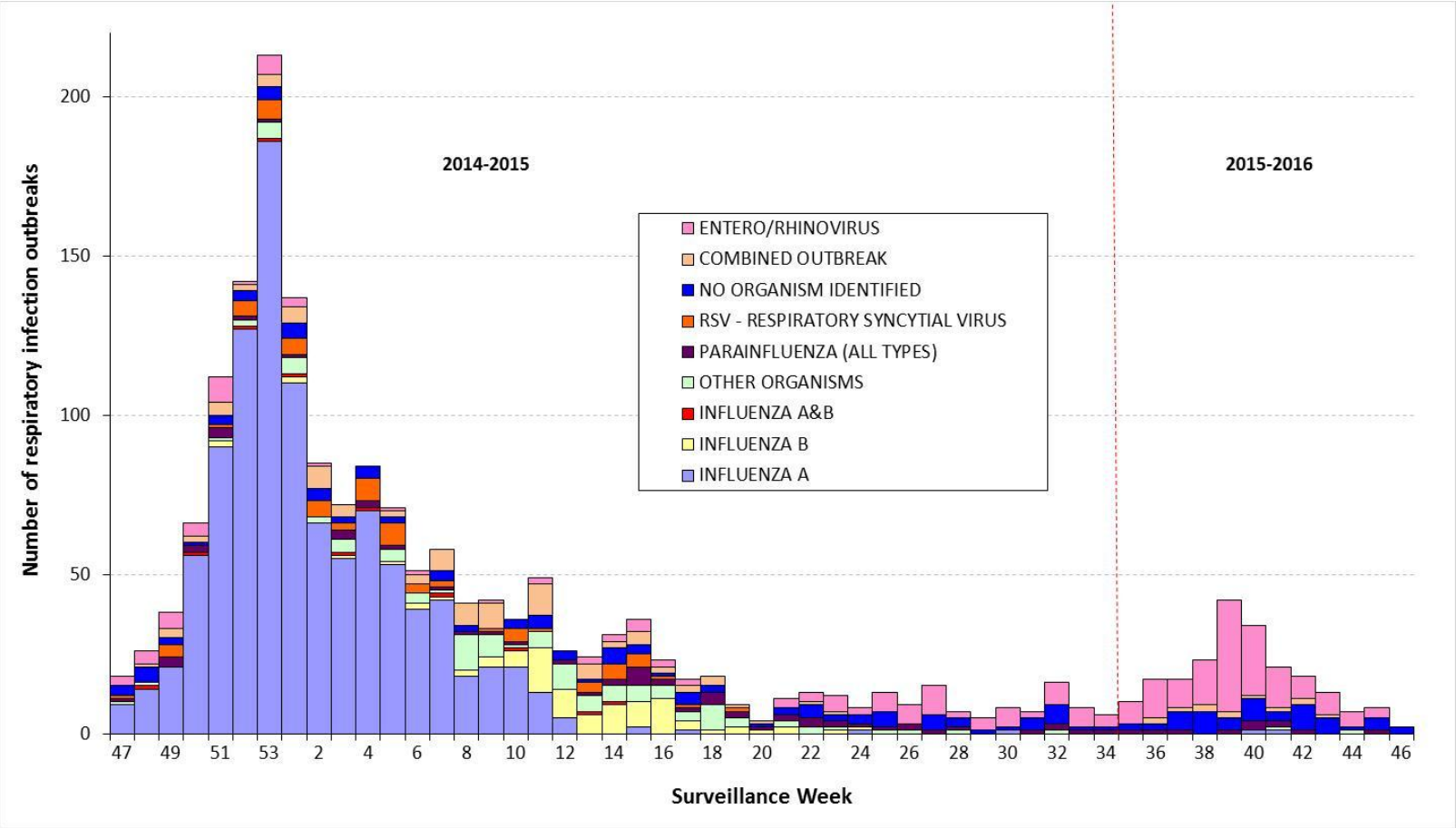
Source: Integrated Public Health Information System (iPHIS)

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, 2015 (Week 35, 2015) 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, November 16, 2014 to November 21, 2015



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.

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4. Severity – Influenza hospitalizations and deaths, and respiratory viruses by setting

In the season to date, 42 hospitalizations and no deaths have been reported among laboratory-confirmed influenza cases. The majority (39/42 or 92.9%) of hospitalizations occurred in influenza A cases, with the remaining hospitalizations (3/42 or 7.1%) in patients with influenza B. 61.9% (26/42) of the hospitalizations were in individuals 65 years of age and older.

For week 46, influenza A was detected in a few specimens originating mostly from patients in the ambulatory setting. Entero/rhinovirus was the most frequently detected virus detected among individuals from institutional, intensive care unit and ambulatory settings.

Table 3: Hospitalizations and deaths among confirmed influenza cases by age group: Ontario, Week 46 and cumulative for the 2015-2016 influenza season

	HOSPITALIZATIONS		DEATHS	
Age Group	Weekly Count	Cumulative count (rate per 100,000)	Weekly count	Cumulative count (rate per 100,000)
<1	0	0 (0.0)	0	0 (0.0)
1 – 4	2	3 (0.5)	0	0 (0.0)
5 – 14	0	0 (0.0)	0	0 (0.0)
15 – 24	0	1 (0.1)	0	0 (0.0)
25 – 44	0	4 (0.1)	0	0 (0.0)
45 – 64	0	8 (0.2)	0	0 (0.0)
65+	5	26 (1.3)	0	0 (0.0)
Total	**7**	**42 (0.3)**	**0**	**0 (0.0)**

Source: Integrated Public Health Information System (iPHIS) and IntelliHEALTH Ontario

Notes:

- Reported deaths in any laboratory-confirmed influenza case are included; the contribution of influenza to the death is not able to be determined.
- The numbers of hospitalizations and deaths provided in iPHIS need to be interpreted with caution due to delays between the onset of illness, hospital admission or death, and when this information is reported to public health. During periods of increased influenza activity, there may be additional delays in the reporting of hospitalizations and deaths beyond the expected reporting time lag.
- The numbers of hospitalizations and deaths reported in iPHIS are likely an underestimation of the true experience in the Ontario population for many reasons, including underreporting because influenza is not suspected as the source of infection so testing is not done.
- In addition, public health units were advised in December 2014 and August 2015 that only 20% of laboratory confirmed cases require follow-up, as opposed to all cases. As a result, there will likely be more under-reporting of hospitalization and deaths in the 2014-2015 and 2015-2016 seasons than in prevous seasons so comparisons to prior years should be done with caution.

Table 4: Number and percentage of specimens (in brackets)[1] with respiratory pathogens detected by patient setting, week 46 and cumulative for the 2015-2016 influenza season

Respiratory Pathogen Detected	Patient setting when tested									
	Intensive Care Unit (ICU) Number (% positive)[1]		**Hospital (Non-ICU)** Number (% positive)[1]		**Emergency** Number (% positive)[1]		**Ambulatory/No setting** Number (% positive)[1]		**Institution[2]** Number (% positive)[1]	
	Current	**Cumulative**	**Current**	**Cumulative**	**Current**	**Cumulative**	**Current**	**Cumulative**	**Current**	**Cumulative**
Influenza A (all)[3]	0 (0)	0 (0)	1 (1)	10 (1)	0 (0)	42 (3)	5 (2)	32 (1)	0 (0)	3 (1)
Influenza A/ (H3)[4]	0	0	1	8	0	26	3	22	0	2
Influenza A/(H1N1)pdm09[4]	0	0	0	2	0	11	0	3	0	0
Influenza B	0 (0)	0 (0)	0 (0)	1 (0)	1 (1)	3 (0)	0 (0)	5 (0)	0 (0)	0 (0)
Adenovirus	0 (0)	4 (1)	1 (1)	14 (1)	2 (2)	32 (2)	4 (2)	44 (2)	0 (0)	0 (0)
Coronavirus	0 (0)	1 (0)	0 (0)	1 (1)	0 (0)	8 (10)	0 (0)	4 (1)	0 (0)	2 (1)
Entero/rhinovirus	5 (26)	76 (18)	0 (0)	26 (14)	0 (0)	23 (15)	5 (15)	140 (21)	5 (56)	223 (62)
Human metapneumovirus	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	2 (0)	0 (0)	7 (0)	0 (0)	1 (0)
Parainfluenza(all types)	0 (0)	15 (3)	3 (2)	54 (4)	11 (8)	72 (5)	6 (3)	84 (4)	1 (6)	27 (5)
Respiratory syncytial virus	0 (0)	0 (0)	0 (0)	11 (1)	0 (0)	3 (0)	1 (1)	10 (0)	0 (0)	2 (0)
Total positives[5]	**5 (12)**	**96 (21)**	**5 (3)**	**118 (7)**	**14 (10)**	**185 (13)**	**21 (10)**	**326 (15)**	**6 (29)**	**258 (48)**

Source: Public Health Ontario Laboratory (PHOL)

Notes:

[1] 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%)".

[2] Institution includes retirement homes, correctional facilities, and undefined institutions

[3] The "Influenza A (all)" row includes the numbers in the "Influenza A (H3)" and "Influenza A/(H1N1)pdm09" rows as well as Influenza A positives that were not subtyped.

[4] Percent positivity is not calculated for Influenza A (H3) and Influenza A/(H1N1)pdm09 because subtyping is only done on select influenza A samples, precluding an accurate calculation.

[5] When calculating the "Total Positives", the "Influenza A (H3)" and "Influenza A/(H1N1)pdm09" rows are not counted as these numbers are already included in the "Influenza A (all)" row.

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5. By Jurisdiction – Influenza activity

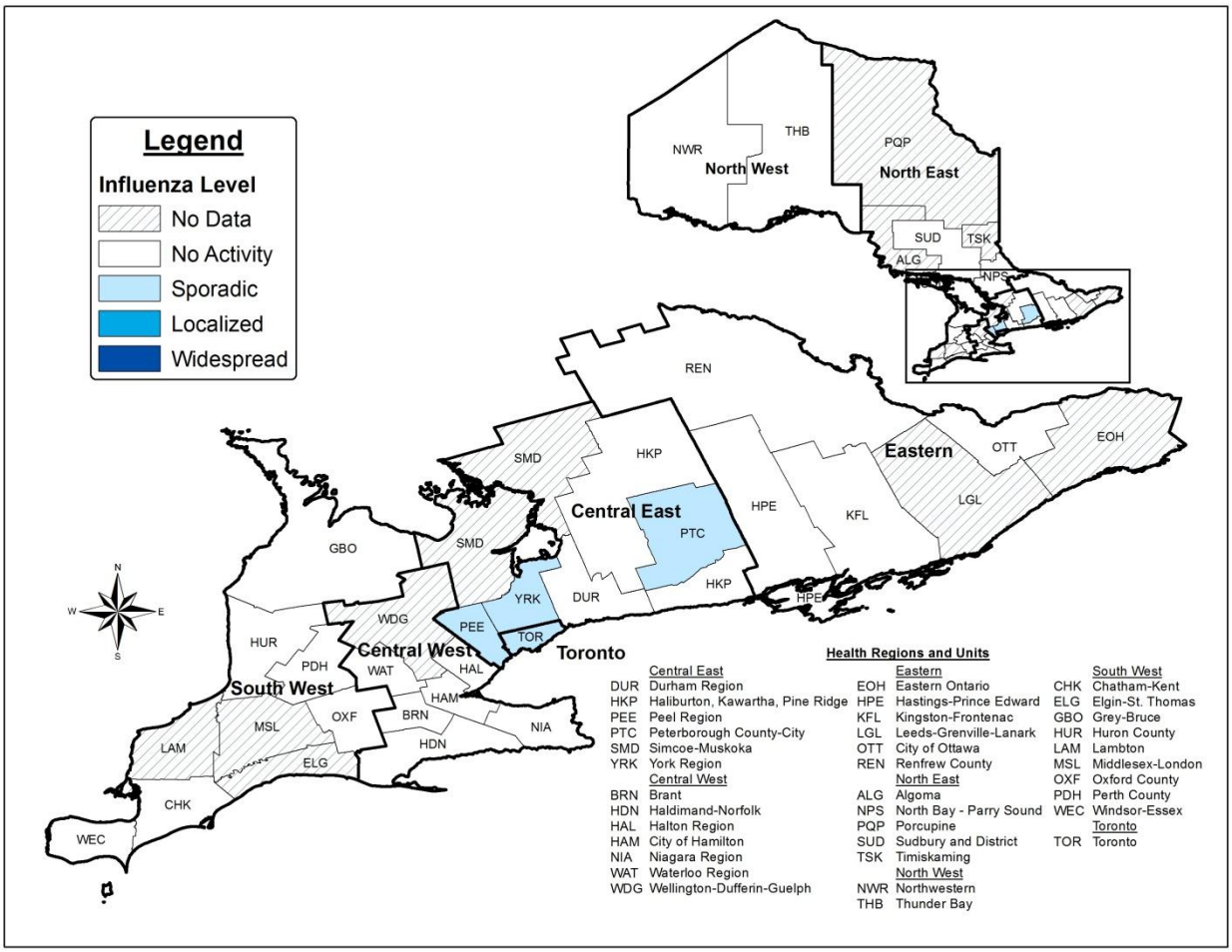
Influenza activity remains low across the province, with four public health units reporting 'sporadic' activity and 22 reporting 'no activity'.

Notes:

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

- Table 5 is information from Public Health Ontario Laboratories (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 6 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, November 15, 2015 to November 21, 2015 (Week 46)



Source: Public Health Ontario from public health units

Table 5: Specimens submitted to Public Health Ontario Laboratories for influenza testing and positive results by public health unit; Number for week 46 and cumulative total for the 2015-2016 influenza season (in brackets)

Public Health Unit and Region	Number of specimens submitted	Number of specimen tested	Influenza A				Influenza B	
			Number of influenza A positive specimens	H3	A(H1N1) pdm09	% positivity influenza A	Number of influenza B positive specimens	% positivity influenza B
Northwestern	11 (107)	10 (105)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Thunder Bay District	14 (106)	9 (95)	0 (1)	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)
TOTAL NORTH WEST	**25 (213)**	**19 (200)**	**0 (1)**	**0 (0)**	**0 (0)**	**0 (1)**	**0 (0)**	**0 (0)**
Algoma	9 (75)	8 (74)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
North Bay Parry Sound District	13 (121)	11 (118)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Porcupine	10 (85)	7 (81)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Sudbury & District	14 (80)	12 (77)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Timiskaming	5 (35)	5 (35)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
TOTAL NORTH EAST	**51 (396)**	**43 (385)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**
City of Ottawa	2 (64)	2 (59)	0 (3)	0 (2)	0 (0)	0 (5)	0 (0)	0 (0)
Eastern Ontario	9 (78)	7 (76)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Hastings & Prince Edward Counties	10 (79)	8 (76)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Kingston, Frontenac, Lennox & Addington	19 (137)	15 (131)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Leeds, Grenville And Lanark District	0 (39)	0 (38)	0 (0)	0 (0)	0 (0)	NA (0)	0 (0)	NA (0)
Renfrew County And District	2 (25)	2 (24)	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)	0 (4)
TOTAL EASTERN	**42 (422)**	**34 (404)**	**0 (3)**	**0 (2)**	**0 (0)**	**0 (1)**	**0 (1)**	**0 (0)**
Durham Region	46 (402)	40* (383)	0 (11)	0 (10)	0 (0)	0 (3)	0 (0)	0 (0)
Haliburton, Kawartha, Pine Ridge	19 (169)	18 (167)	0 (2)	0 (2)	0 (0)	0 (1)	0 (0)	0 (0)
Peel Region	63 (703)	60* (693)	1 (21)	0 (8)	0 (9)	2 (3)	1 (5)	2 (1)
Peterborough County-City	11 (85)	11 (82)	0 (1)	0 (1)	0 (0)	0 (1)	0 (0)	0 (0)
Simcoe Muskoka District	74 (576)	35 (528)	2 (15)	2 (14)	0 (0)	6 (3)	0 (0)	0 (0)
York Region	49 (417)	43* (403)	0 (5)	0 (2)	0 (3)	0 (1)	0 (1)	0 (0)
TOTAL CENTRAL EAST	**262 (2352)**	**207 (2256)**	**3 (55)**	**2 (37)**	**0 (12)**	**1 (0)**	**1 (6)**	**0 (0)**
Toronto	117 (1,374)	98* (1,323)	0 (11)	0 (8)	0 (2)	0 (1)	0 (0)	0 (0)
TOTAL TORONTO	**117 (1,374)**	**98 (1,323)**	**0 (11)**	**0 (8)**	**0 (2)**	**0 (1)**	**0 (0)**	**0 (0)**
Chatham-Kent	9 (40)	9 (39)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Elgin-St. Thomas	0 (45)	0 (44)	0 (0)	0 (0)	0 (0)	NA (0)	0 (0)	NA (0)
Grey Bruce	11 (94)	9 (90)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Huron County	4 (25)	4 (25)	0 (1)	0 (1)	0 (0)	0 (4)	0 (0)	0 (0)
Lambton County	3 (67)	3 (66)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middlesex-London	8 (69)	7 (68)	0 (2)	0 (2)	0 (0)	0 (3)	0 (0)	0 (0)
Oxford County	8 (42)	3 (36)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Perth District	6 (43)	4 (40)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Public Health Unit and Region	Number of specimens submitted	Number of specimen tested	Influenza A				Influenza B	
			Number of influenza A positive specimens	H3	A(H1N1) pdm09	% positivity influenza A	Number of influenza B positive specimens	% positivity influenza B
Windsor-Essex County	18 (191)	15 (186)	0 (1)	0 (1)	0 (0)	0 (1)	0 (0)	0 (0)
TOTAL SOUTH WEST	**67 (616)**	**54 (594)**	**0 (4)**	**0 (4)**	**0 (0)**	**0 (1)**	**0 (0)**	**0 (0)**
Brant County	16 (139)	13 (134)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
City Of Hamilton	10 (92)	8 (87)	0 (1)	0 (0)	0 (1)	0 (1)	0 (0)	0 (0)
Haldimand-Norfolk	10 (50)	8 (47)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Halton Region	23 (200)	18 (191)	1 (3)	0 (0)	0 (1)	6 (2)	0 (0)	0 (0)
Niagara Region	33 (255)	27 (240)	0 (2)	0 (2)	0 (0)	0 (1)	0 (2)	0 (1)
Waterloo Region	20 (202)	14 (193)	0 (4)	0 (2)	0 (0)	0 (2)	0 (0)	0 (0)
Wellington-Dufferin-Guelph	14 (156)	13 (153)	2 (3)	2 (3)	0 (0)	15 (2)	0 (0)	0 (0)
TOTAL CENTRAL WEST	**126 (1,094)**	**101 (1,045)**	**3 (13)**	**2 (7)**	**0 (2)**	**3 (1)**	**0 (2)**	**0 (0)**
OUT OF PROVINCE	**2 (44)**	**2 (44)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**	**0 (0)**
TOTAL ONTARIO	**692 (6,511)**	**558 (6,251)**	**6 (87)**	**4 (58)**	**0 (16)**	**1 (1)**	**1 (9)**	**0 (0)**

Notes:

- Cumulative numbers are from September 1, 2015 to the current week and are displayed in brackets.
- The difference between submissions and testing is due to lags in testing time.
- "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.

Source: Public Health Ontario Laboratory (PHOL)

Table 6. Number of reported confirmed influenza cases by public health unit and health region; Number for week 46 and cumulative total for the 2015-2016 influenza season (in brackets)

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)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Thunder Bay District	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
TOTAL NORTH WEST	**0 (0)**	**0 (0)**	**0 (1)**	**0 (0)**	**0 (0)**	**0 (1)**
Algoma	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
North Bay Parry Sound District	0 (0)	0 (1)	0 (2)	0 (1)	0 (1)	0 (4)
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 (2)**	**0 (1)**	**0 (1)**	**0 (4)**
City of Ottawa	0 (0)	0 (1)	0 (7)	0 (0)	0 (0)	0 (7)
Eastern Ontario	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
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 (0)	0 (0)	0 (0)	0 (0)
Renfrew County And District	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)	0 (1)
TOTAL EASTERN	**0 (0)**	**0 (1)**	**0 (7)**	**0 (0)**	**0 (1)**	**0 (8)**
Durham Region	0 (0)	0 (7)	0 (7)	0 (0)	0 (0)	0 (7)
Haliburton, Kawartha, Pine Ridge	0 (0)	0 (2)	0 (2)	0 (0)	0 (0)	0 (2)
Peel Region	0 (3)	0 (4)	0 (16)	0 (0)	1 (10)	1 (26)
Peterborough County-City	0 (0)	1 (1)	1 (1)	0 (0)	0 (0)	1 (1)
Simcoe Muskoka District	0 (0)	1 (12)	1 (14)	0 (0)	0 (0)	1 (14)
York Region	0 (1)	0 (2)	0 (5)	0 (0)	1 (1)	1 (6)
TOTAL CENTRAL EAST	**0 (4)**	**2 (28)**	**2 (45)**	**0 (0)**	**2 (11)**	**4 (56)**
Toronto	0 (4)	1 (10)	2 (17)	0 (0)	0 (5)	2 (22)
TOTAL TORONTO	**0 (4)**	**1 (10)**	**2 (17)**	**0 (0)**	**0 (5)**	**2 (22)**
Chatham-Kent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Elgin-St. Thomas	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Grey Bruce	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Huron County	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Lambton County	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)	0 (1)
Middlesex-London	0 (0)	0 (2)	0 (4)	0 (0)	0 (0)	0 (4)
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 (1)	0 (1)	0 (0)	0 (0)	0 (1)
TOTAL SOUTH WEST	**0 (0)**	**0 (3)**	**0 (8)**	**0 (0)**	**0 (0)**	**0 (8)**
Brant County	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
City Of Hamilton	0 (2)	0 (0)	0 (4)	0 (0)	0 (0)	0 (4)
Haldimand-Norfolk	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Halton Region	0 (1)	0 (0)	0 (3)	0 (0)	0 (0)	0 (3)
Niagara Region	0 (0)	0 (2)	0 (3)	0 (0)	0 (3)	0 (6)
Waterloo Region	0 (0)	0 (1)	0 (5)	0 (0)	0 (0)	0 (5)
Wellington-Dufferin-Guelph	0 (0)	1 (1)	2 (2)	0 (0)	0 (0)	2 (2)
TOTAL CENTRAL WEST	**0 (3)**	**1 (4)**	**2 (17)**	**0 (0)**	**0 (3)**	**2 (20)**
TOTAL ONTARIO	**0 (11)**	**4 (47)**	**6 (97)**	**0 (1)**	**2 (21)**	**8 (119)**

Source: Integrated Public Health Information System (iPHIS)

Note:

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

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6. By Age – Respiratory viruses

For week 46, entero/rhinovirus was the most common virus detected mostly among individuals aged 65 and over and parainfluenza was most commonly detected in infants less than 1 year of age. Information on influenza hospitalizations and deaths by age can be found in Section 4: Severity - Influenza hospitalizations and deaths, and respiratory viruses by setting.

Table 7: Number and percentage of specimens (in brackets)[1] with respiratory pathogens detected by age group by Public Health Ontario Laboratories, week 46 and cumulative for the 2015-2016 influenza season

Respiratory Pathogen Detected	Age groups									
	<1 Number (% positive)[1]		1-4 Number (% positive)[1]		5-19 Number (% positive)[1]		20-64 Number (% positive)[1]		65+ Number (% positive)[1]	
	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative	Current	Cumulative
Influenza A (all)[2]	0 (0)	3 (0)	1 (3)	2 (1)	1 (4)	7 (2)	3 (1)	39 (2)	1 (0)	36 (1)
Influenza A (H3)[3]	0	2	1	2	0	4	2	22	1	28
Influenza A(H1N1)pdm09[3]	0	1	0	0	0	1	0	10	0	4
Influenza B	0 (0)	1 (0)	1 (3)	1 (0)	0 (0)	0 (0.0)	0 (0)	6 (0)	0 (0)	1 (0)
Adenovirus	0 (0)	23 (3)	3 (9)	18 (6)	2 (8)	20 (6)	2 (1)	25 (1)	0 (0)	8 (0)
Coronavirus	0 (0)	0 (0.0)	0 (0)	0 (0.0)	0 (0)	0 (0.0)	0 (0)	6 (1)	0 (0)	11 (1)
Entero/rhinovirus	0 (0)	11 (13)	0 (0)	1 (6)	0 (0)	7 (17)	5 (28)	111 (16)	10 (22)	358 (36)
Human metapneumovirus	0 (0)	3 (0)	0 (0)	0 (0.0)	0 (0)	0 (0.0)	0 (0)	3 (0)	0 (0)	5 (0)
Parainfluenza	10 (15)	90 (11)	3 (9)	33 (12)	2 (8)	18 (5)	2 (1)	38 (2)	4 (2)	73 (3)
Respiratory syncytial virus	1 (1)	16 (2)	0 (0)	3 (1)	0 (0)	1 (0)	0 (0)	1 (0)	0 (0)	5 (0)
Total positives[4]	**11 (15)**	**147 (17)**	**8 (23)**	**58 (20)**	**5 (18)**	**53 (16)**	**12 (6)**	**229 (10)**	**15 (7)**	**497 (19)**

Source: Public Health Ontario Laboratory (PHOL) ***Notes:***

[1] The percent positivity in this table is calculated as number of specimens with the respiratory pathogen detected divided by total number of specimens tested for that particular pathogen 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%)".

[2] The "Influenza A (all)" row includes the numbers in the "Influenza A (H3)" and "Influenza A/(H1N1)pdm09" rows as well as Influenza A positives that were not subtyped.

[3] Percent positivity is not calculated for Influenza A (H3) and "Influenza A/(H1N1)pdm09 because subtyping is only done on select influenza A samples, precluding an accurate calculation.

[4] When calculating the "Total Positives", the "Influenza A (H3)" and "Influenza A/(H1N1)pdm09" rows are not counted as these numbers are already included in the "Influenza A (all)" row.

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7. Strain comparisons – circulating influenza strains and vaccine strains

Through genetic characterization performed at the National Microbiology Laboratory (NML), sequence analysis showed that the one influenza A(H1N1) virus tested nationally was antigenically similar to A/California/7/2009, which is the influenza A/H1N1 component recommended by the World Health Organization for the 2015-2016 Northern Hemisphere influenza vaccine.

Only one influenza A(H3N2) virus from Canada grew to sufficient titre for antigenic characterization by haemagglutination inhibition assay and was characterized as antigenically similar to the cell-passaged A/Switzerland/9715293/2013, the World Health Organization recommended influenza A(H3N2) component of the 2015-2016 Northern Hemisphere vaccine.

Of the eight influenza B viruses characterized in Canada, NML reported that six were antigenically similar to the recommended influenza B component for the Northern Hemisphere 2015-2016 vaccine, B/Phuket/3073/2013. Two influenza B viruses were characterized as B/Brisbane/60/2008-like, which is included as an influenza B component of the 2015-2016 quadrivalent vaccine.

Table 8: Strain characterization completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2015 to November 26, 2015

Influenza strains	Ontario	Canada
Influenza A (H3N2) A/Switzerland/9715293/13-like	1	1
Influenza A (H1N1) A/California/07/09-like	0	1
Influenza B B/Brisbane/60/08-like	0	2
B/Phuket/3073/13-like	1	6

Source: National Microbiology Laboratory (NML)

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8. Antiviral resistance / sensitivity for influenza

All influenza A viruses in Canada tested by the National Microbiology Laboratory (NML) for resistance in the 2015-2016 season were sensitive to oseltamivir and zanamivir. Only one of the influenza A viruses tested was sensitive to amantadine. All influenza B viruses in Canada were sensitive to both oseltamivir and zanamivir.

Table 9: Amantadine, oseltamivir and zanamivir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2015 to November 26, 2015

Influenza strains	Amantadine				Oseltamivir				Zanamivir			
	ONTARIO		CANADA		ONTARIO		CANADA		ONTARIO		CANADA	
	R	S	R	S	R	S	R	S	R	S	R	S
Influenza A (H3N2)	8	0	33	1	0	9	0	34	0	9	0	34
Influenza A (H1N1)pdm09	0	0	1	0	0	0	0	1	0	0	0	1
Influenza B	NA	NA	NA	NA	0	1	0	8	0	1	0	8

Source: National Microbiology Laboratory (NML)
R = Resistant, S = Susceptible, NA = Not Applicable

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9. Bacterial pathogens

Three specimens were positive for *Bordetella pertussis* and five specimens were positive for *Mycoplasma pneumoniae* during week 46. No specimen was positive for *Bordetella parapertussis, Bordetella holmesii* or *Chlamydophila pneumoniae* during this week.

Table 10: Number and percent positivity of respiratory specimens tested for any *Bordetella* species, *Mycoplasma pneumoniae* or *Chlamydophila pneumoniae*, Public Health Ontario Laboratories, week 46

Pathogens	Tested	Positives	% positivity
	Current (Cumulative)	Current (Cumulative)	Current (Cumulative)
Bordetella pertussis	130 (3675)	3 (256)	2 (7)
Bordetella parapertussis	130 (3675)	0 (14)	0 (0)
Bordetella holmesii	130 (3675)	0 (3)	0 (0)
Mycoplasma pneumoniae	44 (574)	5 (36)	11 (6)
Chlamydophila pneumoniae	44 (574)	0 (2)	0 (0)

Source: Public Health Ontario Laboratory (PHOL)

***Notes**:*

- Cumulative numbers (in brackets) for *Bordetella* are from January 1, 2015.
- Cumulative numbers (in brackets) for *Mycoplasma* and *Chlamydophila* are from September 1, 2015.
- Note that not all laboratory-confirmed *Bordetella pertussis* patients meet the Ontario case definition for pertussis.

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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 November 25, 2015.

  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 (PHOL):** provides specimen level information from the 11 Public Health Ontario Laboratory sites located in Ontario; data for the issue was extracted from the Laboratory Information Management System by Public Health Ontario on November 24, 2015

- **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 2015-2016 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.

- **IntelliHEALTH Ontario**: provides information on population counts based on 2013 estimates. The information was obtained from the Ontario Ministry of Health and Long-Term Care, and extracted by Public Health Ontario on July 3, 2014.