Public Health Ontario | Santé publique Ontario

Ontario Respiratory Pathogen Bulletin | 2018–19

Surveillance Season (September 1, 2018 – August 31, 2019)

- This special issue of the Ontario Respiratory Pathogen Bulletin provides information on the surveillance season from September 1, 2018 to August 31, 2019 unless otherwise stated. Included figures and tables are grouped by type and data source for ease of reference and follow the format of previous summaries of seasonal influenza activity for ease of comparison. Included in this issue is a summary of key highlights intended to provide a narrative of the 2018–19 season. Therefore, referencing of figures and tables in the summary are not in the exact order as they appear in the report. Appendix 1 is included to report data from the National Microbiology Laboratory (NML) and the number of laboratory tests performed for influenza in Ontario. Appendix 2 references the surveillance weeks.
- Data extraction occurred on October 9, 2019.

Summary of Respiratory Pathogen Activity in Ontario, September 1, 2018 to August 31, 2019

- Overall, the 2018–19 influenza season was characterized by two consecutive waves of influenza A activity and very little influenza B activity.
    - The beginning of the season consisted predominantly of elevated influenza A (H1N1) activity. Towards the end of the 2018–19 season, elevated influenza A (H3N2) activity was observed.
- The number of laboratory-confirmed cases of influenza reported in the 2018–19 surveillance season (13,165) was lower than the 2017–18 season (18,253). The 2018–19 season had 584 laboratory-confirmed influenza B cases, which was more than six times lower than the average number of laboratory-confirmed influenza B cases in the previous four seasons (3,833 cases). In the 2018–19 season, influenza activity did not have a distinct peak and was elevated from December 16, 2018 to April 13, 2019 (Weeks 51–15) (Figures 1, 2, 5, 9 and 10).
    - **Laboratory-confirmed influenza cases:** A total of 13,165 laboratory-confirmed influenza cases were reported for the 2018–19 season. The majority of influenza cases in the 2018–19 season were influenza A, which accounted for 95.5% (12,572/13,165) of cases (Table 1). There were 584 cases of influenza B and nine cases of influenza A and B co-infection reported in the 2018–19 season.
    - **Laboratory detection of influenza:** Of the 12,572 laboratory-confirmed influenza A cases, 24.5% (3,082) had subtype information reported in iPHIS. Among the influenza A cases with subtype information reported, 51.1% (1,574/3,082) were A(H1N1) and 48.9% (1,508/3,082) were A(H3N2) (Table 1).

- For the season as a whole, positivity for influenza A was 9.6% (6,428/66,883) and influenza B positivity was 0.5% (311/66,883) (Table 2). Peak percent positivity was 18.7% for influenza A and 1.7% for influenza B in weeks 5 and 21, respectively (Figure 5).

- Among influenza A isolates from Ontario antigenically characterized by the NML, all of the 180 influenza A(H3N2) isolates were antigenically similar to the A/ Singapore/INFIMH-16-0019/2016-like strain. The A/ Singapore/INFIMH-16-0019/2016-like strain was the influenza A(H3N2) component selected for the 2018–19 Northern Hemisphere seasonal influenza vaccine. Of the 706 Ontario influenza A(H1N1)pdm09 isolates, all were antigenically similar to the A/Michigan/45/2015-like strain. The A/Michigan/45/2015-like strain was the influenza A H1N1 strain component selected for the 2018–19 Northern Hemisphere seasonal influenza vaccine (Appendix 1: Table I).

- Of influenza B viruses from Ontario antigenically characterized by NML, 79.1% (68/86) were the B/ Colorado/06/2017-like strain, which belongs to the B Victoria lineage and was the recommended influenza B component of the 2018–19 Northern Hemisphere influenza vaccine (Appendix 1: Table I).

- **Timing of influenza activity:** Determining the timing of influenza activity is dependent on a combination of indicators including laboratory-confirmed influenza cases, percent positivity and outbreaks. Based on those indicators, there was no defined peak of influenza A activity in the 2018–19 season. Influenza activity was elevated from between weeks 51–15 (Figures 1, 5, 9, 10, Appendix 1: Figure I). This duration of elevated influenza A activity was similar to the 2017–18 season, but longer than seasons before 2017–18. In the 2018–19 season, influenza B activity remained low all season compared to previous seasonal values (Figures 2, 5, Appendix 1: Figure I).

- **Geographic distribution:** Overall, the incidence rate of influenza for Ontario was 91.0 cases per 100,000 population. The highest reported incidence rates of influenza were observed in Niagara Region, City of Hamilton and Peterborough, with 185.9, 158.1 and 147.0 cases per 100,000 population, respectively (Figure 3). Influenza A and B activity varied by geographic region. Influenza B activity ranged from 1.0% of influenza cases (4/398) in the North East region to 5.5% (227/4,114) in the Central East region (Table 1).

- **Age distributions:** The highest incidence rates of influenza A were reported among children aged four and under (Figure 4). Generally, influenza A rates decreased with age until those aged 24 and then increased with age for those aged 25 and older, rising to approximately 203 cases per 100,000 population among the oldest age-group. Cases 65 years of age and older accounted for 39.0% (4,908/12,572) of laboratory-confirmed influenza A cases. This reflects the two waves of influenza A activity, with the H1N1 subtype usually having a greater impact on younger age groups and the H3N2 subtype usually having a greater impact among adults aged 65 and older. The highest incidence rates of influenza B were reported among children four and under.

- **Respiratory infection outbreaks in institutions:** There were 1,637 confirmed institutional respiratory infection outbreaks reported in the 2018–19 season. This includes 472 (28.8%) outbreaks that were laboratory-confirmed as influenza A, nine (0.5%) as influenza B and

two (0.1%) as influenza A and B combined (Table 3a). No organism was reported in 48.3% (791/1,637) of outbreaks. This was an increase in outbreaks reporting 'No organism' compared to the 2017–18 season (30.7%).[1]

- The majority of outbreaks were reported in long-term care homes (LTCHs), with 61.0% (999/1,637) reported in this setting, followed by 19.2% (315/1,637) in retirement homes and 8.8% (144/1,637) in hospitals. The exposure setting was not reported for 9.8% (160/1,637) of respiratory infection outbreaks (Table 3b, Figure 7).

- Influenza viruses were the most commonly identified aetiologic agent in respiratory infection outbreaks reported by all types of institutions (Figure 7).

- Of the 144 respiratory infection outbreaks reported in hospitals, 52.1% (75/144) were reported in acute care hospitals, 43.1% (62/144) were reported in chronic care hospitals and 4.9% (7/144) were reported in psychiatric care hospitals (Figure 8).

- **Other respiratory viruses:** Rhinovirus had the highest percent positivity[2] among all circulating respiratory viruses in the 2018–19 season at 14.3% (1,447/10,111), followed by influenza and respiratory syncytial virus (RSV) at 10.1% (6,739/66,883) and 5.4% (3,522/65,446), respectively (Table 2; Figures 5 and 6).

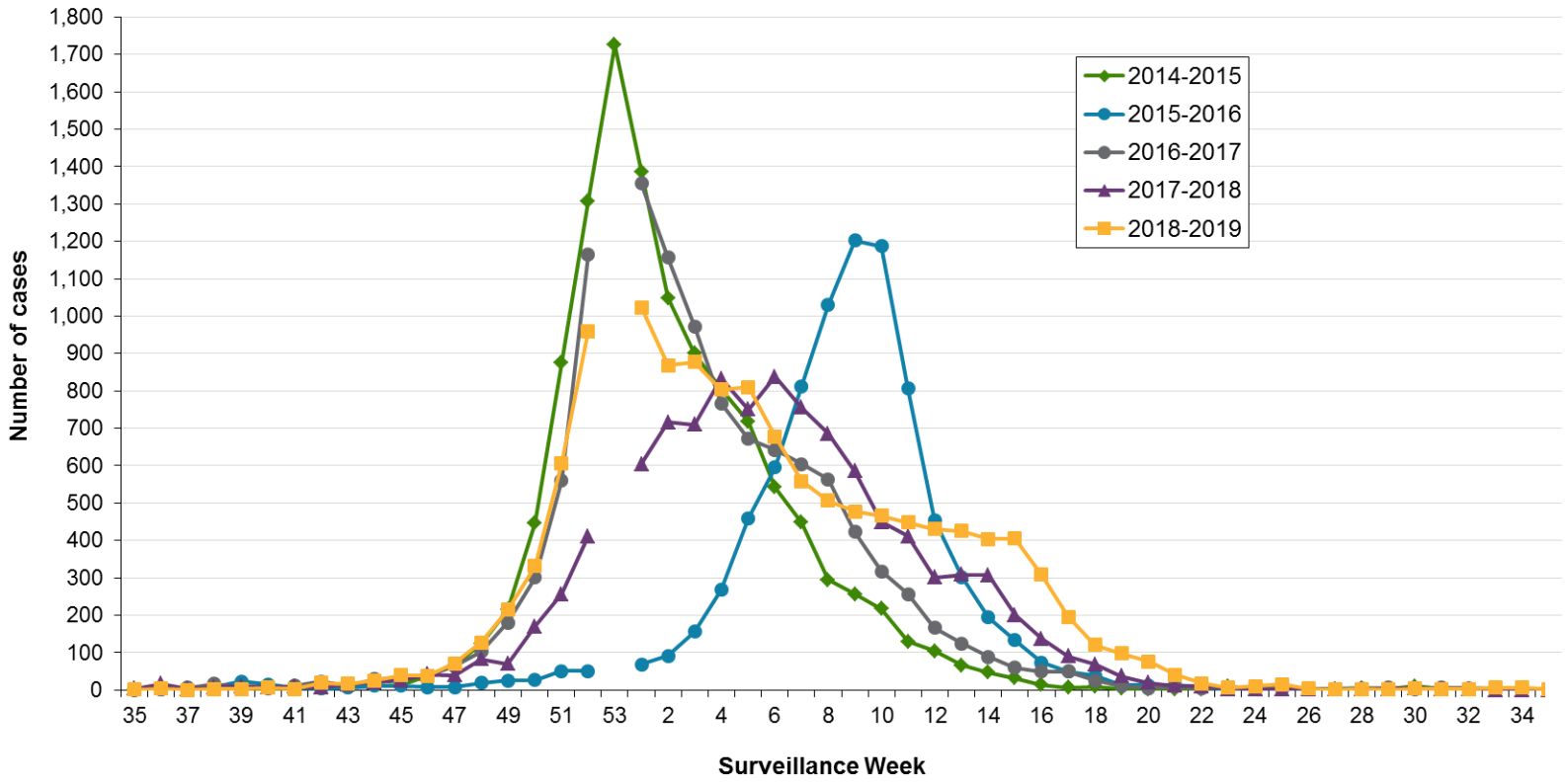
  - Rhinovirus had the highest percent positivity of all circulating respiratory viruses at the beginning of the season (September 2018 to November 2018 – Weeks 35-48) and the end of the season (April 2019 to August 2019 – Weeks 15-35) (Table 2; Figure 6).

Notes:

[1] Changes in the testing algorithm used by Public Health Ontario will impact the interpretation of respiratory virus reports over time.

[2] Positivity among specimens submitted for testing to laboratories reporting to the Centre for Immunization and Respiratory Infectious Diseases (CIRID), Public Health Agency of Canada.

Figure 1. Number of reported laboratory-confirmed cases of influenza A by surveillance week: Ontario, September 1, 2014 to August 31, 2019

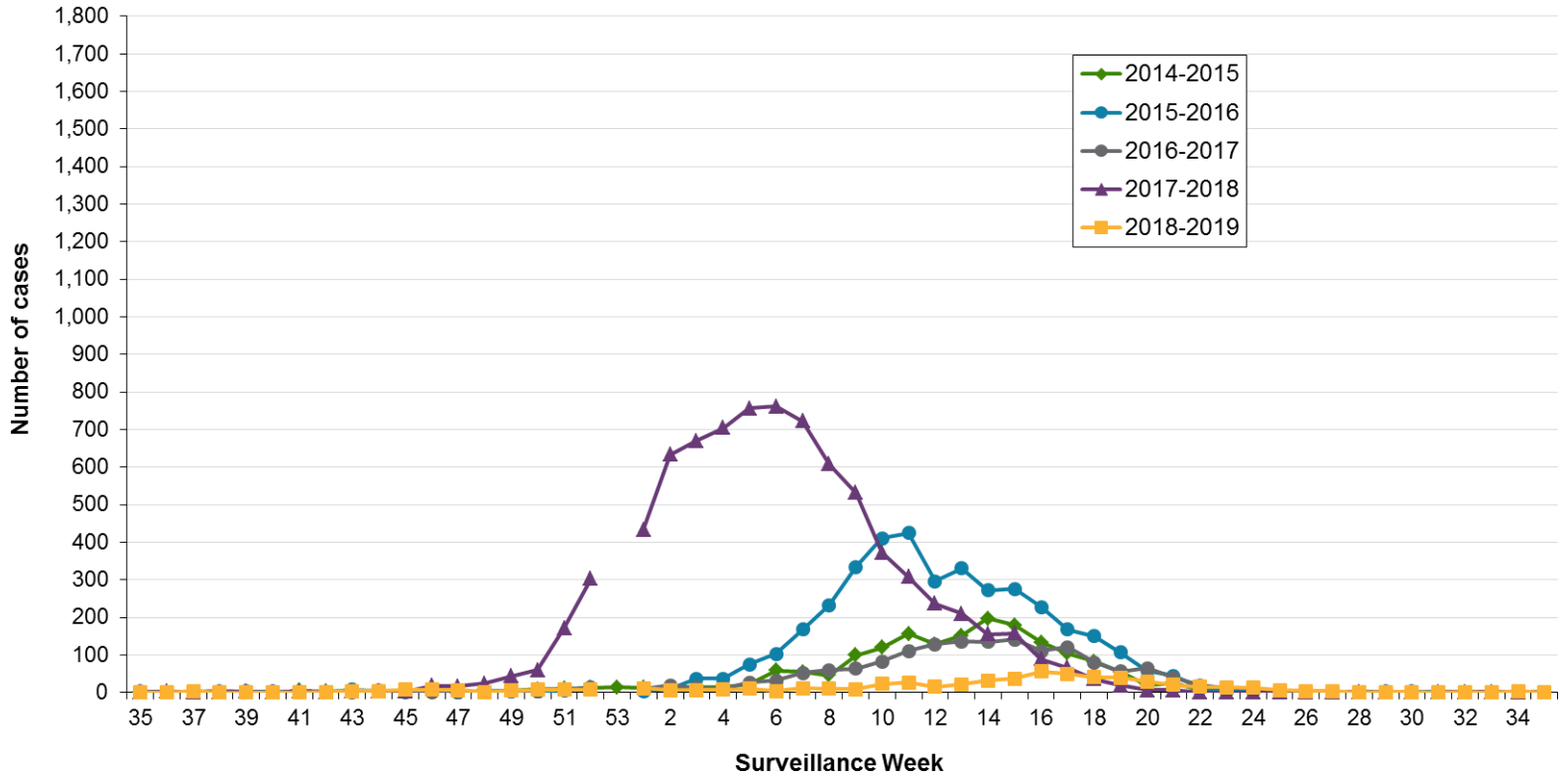


Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:

*Unlike the other seasons presented, the 2014–15 season includes a week 53; a week 53 occurs once every five to six years. 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); Appendix 2.

Figure 2. Number of reported laboratory-confirmed cases of influenza B by surveillance week: Ontario, September 1, 2014 to August 31, 2019



Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:
*Unlike the other seasons presented, the 2014–15 season includes a week 53; a week 53 occurs once every five to six years. 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); Appendix 2.

Table 1. Number of reported laboratory-confirmed influenza cases by public health unit and geographic region: Ontario, September 1, 2018 to August 31, 2019

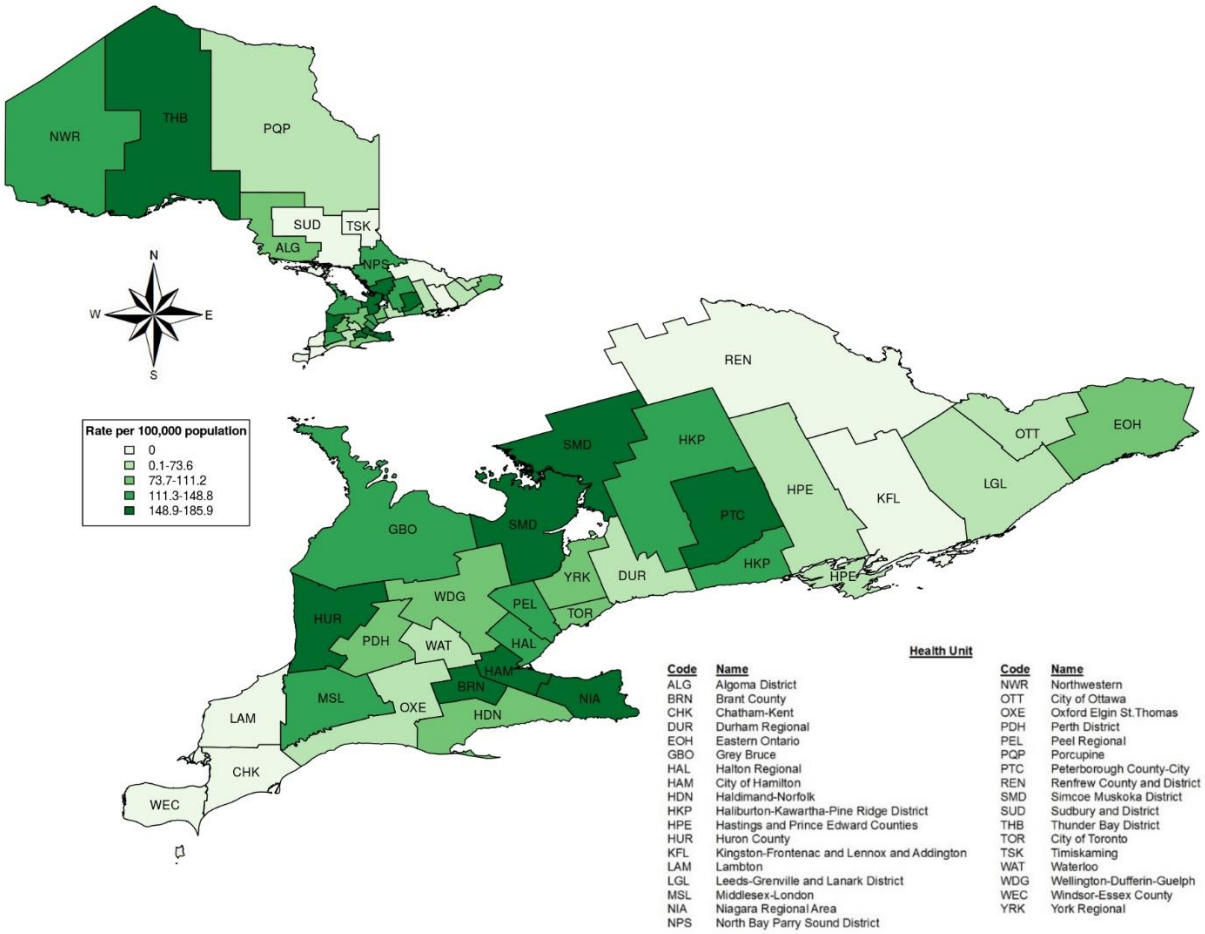
Public Health Unit and Region	Influenza A (H1N1) pdm09	Influenza A H3	Influenza A All subtypes	Influenza A & B	Influenza B	TOTAL
Northwestern	29	34	81	0	1	82
Thunder Bay District	77	72	195	0	6	201
TOTAL NORTH WEST	**106**	**106**	**276**	**0**	**7**	**283**
Algoma	41	37	87	0	1	88
North Bay Parry Sound District	33	25	123	0	2	125
Porcupine	39	2	52	0	0	52
Sudbury & District	14	9	115	0	1	116
Timiskaming	13	3	17	0	0	17
TOTAL NORTH EAST	**140**	**76**	**394**	**0**	**4**	**398**
City of Ottawa	21	18	660	3	23	1,187
Eastern Ontario	27	21	145	0	10	155
Hastings & Prince Edward Counties	25	34	92	0	10	102
Kingston, Lennox, Frontenac & Addington	7	9	103	0	7	110
Leeds, Grenville and Lanark District	30	21	113	0	7	120
Renfrew County and District	17	16	48	0	1	89
TOTAL EASTERN	**127**	**119**	**1,161**	**3**	**58**	**1,222**
Durham Region	43	27	420	1	34	455
Haliburton, Kawartha, Pine Ridge	27	53	215	0	5	220
Peel Region	127	68	1,396	0	106	1,502
Peterborough County-City	4	12	204	0	7	211
Simcoe Muskoka District	82	80	697	0	19	716

Public Health Unit and Region	Influenza A (H1N1) pdm09	Influenza A H3	Influenza A All subtypes	Influenza A & B	Influenza B	TOTAL
York Region	229	196	953	1	56	1,010
TOTAL CENTRAL EAST	**512**	**436**	**3,885**	**2**	**227**	**4,114**
Toronto	156	368	2,551	1	120	2,672
TOTAL TORONTO	**156**	**368**	**2,551**	**1**	**120**	**2,672**
Chatham-Kent	20	7	42	0	0	42
Grey Bruce	13	15	193	0	2	195
Huron County	8	3	79	0	0	79
Lambton County	22	7	46	0	1	47
Middlesex-London	56	35	511	0	10	521
Perth District	6	22	67	0	0	67
Southwestern	39	40	136	2	1	139
Windsor-Essex County	106	21	151	0	4	155
TOTAL SOUTH WEST	**270**	**150**	**1,225**	**2**	**18**	**1,245**
Brant County	7	14	204	0	4	176
City of Hamilton	33	28	854	0	59	1,094
Haldimand-Norfolk	13	21	89	0	6	108
Halton Region	52	39	557	0	37	699
Niagara Region	68	44	830	1	29	1,065
Waterloo Region	18	34	325	0	10	492
Wellington-Dufferin-Guelph	72	73	221	0	5	340
TOTAL CENTRAL WEST	**263**	**253**	**3,080**	**1**	**150**	**3,231**
TOTAL ONTARIO	**1,574**	**1,508**	**12,572**	**9**	**584**	**13,165**

Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

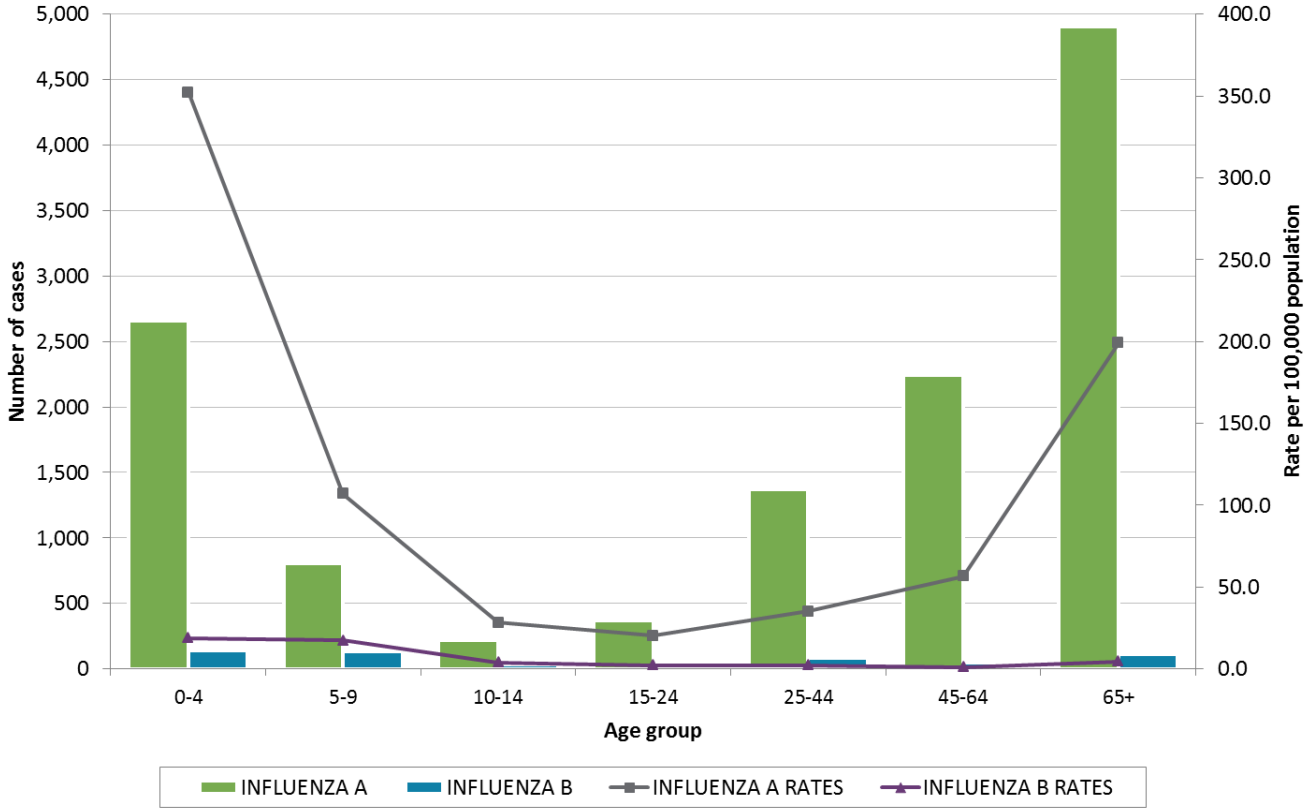
Notes: The cumulative count includes laboratory-confirmed cases with an 'Episode Date' between September 1, 2018 and August 31, 2019. 'Influenza A All subtypes' includes influenza A isolates that were classified as (H1N1)pdm09, H3, Other and those that were classified as not subtyped, untypeable or indeterminate.

Figure 3. Rate of reported laboratory-confirmed influenza per 100,000 population by public health unit: Ontario, September 1, 2018 to August 31, 2019



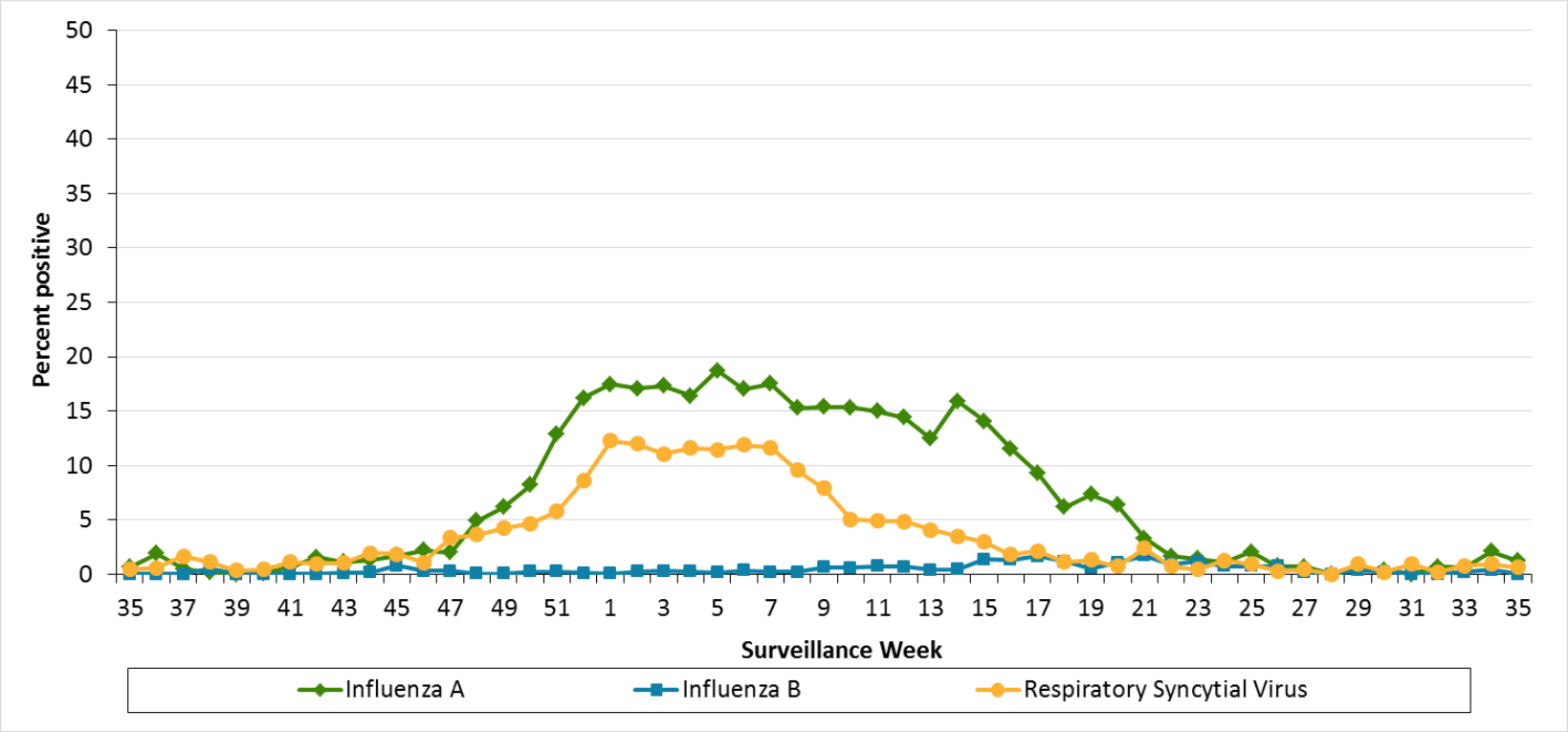
Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9]. Population Projections [2018–19], Ontario Ministry of Health, IntelliHEALTH ONTARIO, Date extracted: [2017/10/24].

Figure 4. Rate of laboratory-confirmed cases of influenza per 100,000 population, by age group and type: Ontario, September 1, 2018 to August 31, 2019



Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9]. Population Projections [2017–18], Ontario Ministry of Health, IntelliHEALTH ONTARIO, Date extracted: [2017/10/24].

Figure 5. Percentage of respiratory viral pathogens (influenza A, influenza B, and respiratory syncytial virus) detected among specimens tested for that pathogen by all testing methods: Ontario, August 26, 2018 to August 31, 2019



Source: These data have been obtained from the Public Health Agency of Canada's (PHAC) Centre for Immunization and Respiratory Infectious Diseases (CIRID) respiratory virus detection tables as of September 4, 2019; they are based on data submitted to PHAC from 16 laboratories in Ontario.

Notes:
The numbers reported in this figure represent results submitted to the CIRID by 16 participating laboratories in Ontario, including 11 Public Health Ontario Laboratories and five hospital-based laboratories. Not all 16 Ontario laboratories report every week. Results above 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.

Figure 6. Percentage of respiratory viral pathogens (adenovirus, human metapneumovirus, rhinovirus, coronavirus and parainfluenza virus) detected among specimens tested for that pathogen by all testing methods: Ontario, August 26, 2018 to August 31, 2019

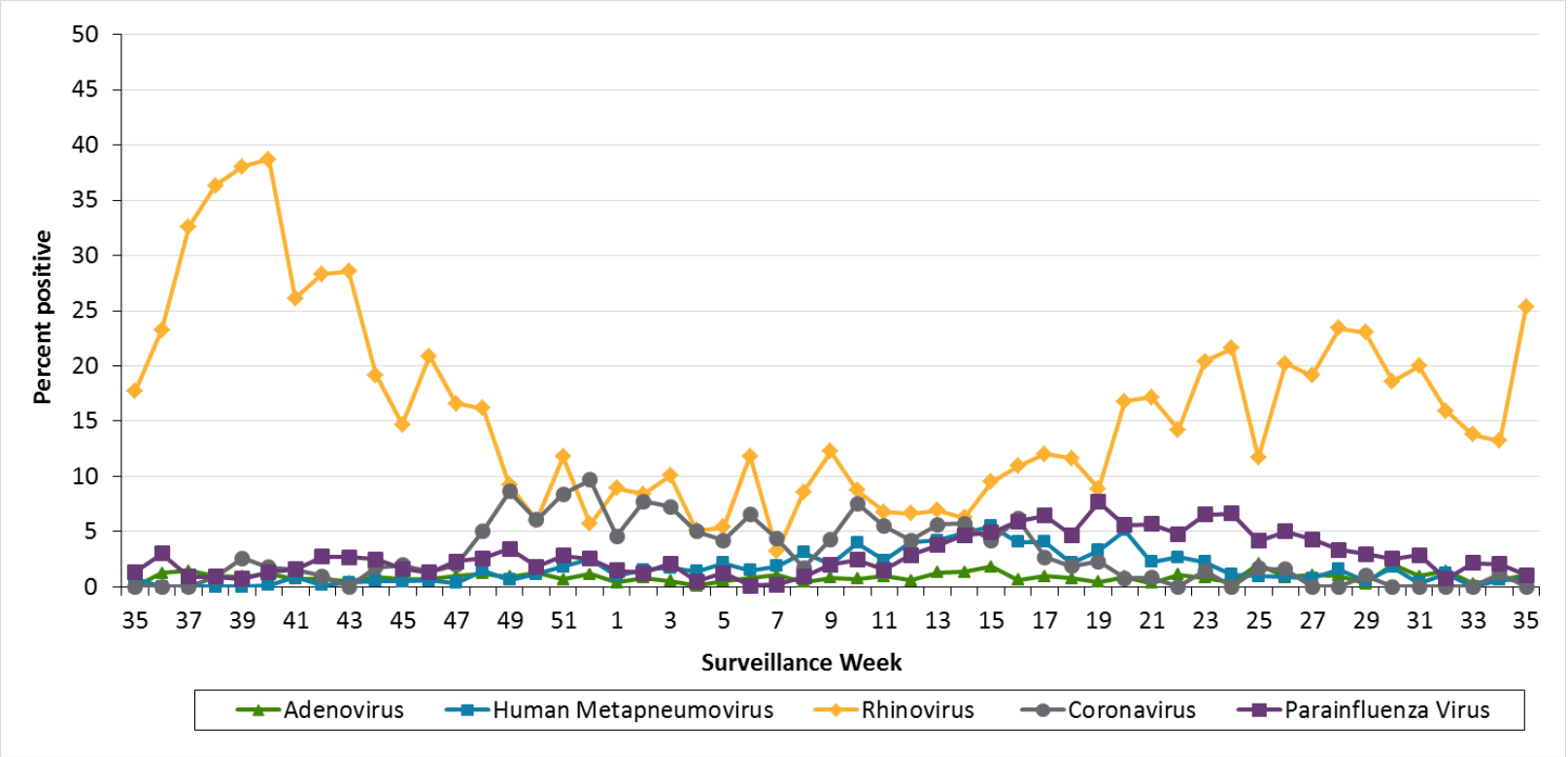


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Table 2. Number and percent positivity of respiratory specimens tested by all methods for influenza and other respiratory viruses: Ontario, August 26, 2018 to August 31, 2019

Detected viruses	Number positive	Number tested	Percent positive
Influenza (All)	6,739	66,883	10.1%
Influenza A	6,428	66,883	9.6%
Influenza B	311	66,883	0.5%
Rhinovirus	1447	10,111	14.3%
Parainfluenza virus	1,035	35,415	2.9%
Respiratory syncytial virus	3,522	65,446	5.4%
Human metapneumovirus	656	34,410	1.9%
Adenovirus	304	34,592	0.9%
Coronavirus	311	8,241	3.8%

Source: These data have been obtained from the Public Health Agency of Canada's (PHAC) Centre for Immunization and Respiratory Infectious Diseases (CIRID) respiratory virus detection tables as of September 4, 2019; they are based on data submitted to PHAC from 16 participating laboratories in Ontario and contain data representing cumulative counts.

Notes:
The data in this table are based on the date on which test results are reported. 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.

Table 3A. Institutional respiratory infection outbreaks: Ontario, September 1, 2018 to August 31, 2019

Virus reported in outbreak	Number of outbreaks	Percentage of total
Influenza A[1]	472	28.8%
Influenza B[1]	9	0.5%
Both influenza A and B[1]	2	0.1%
Entero/rhinovirus	19	1.2%
Parainfluenza (All types)	74	4.5%
Respiratory syncytial virus (RSV)	200	12.2%
Human metapneumovirus, adenovirus or coronavirus	62	3.8%
Two or more non-influenza viruses	8	0.5%
No organism identified	791	48.3%
TOTAL	***1637***	***100.0%***

Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:
[1] 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 3B. Institutional respiratory infection outbreaks by setting type: Ontario, September 1, 2018 to August 31, 2019

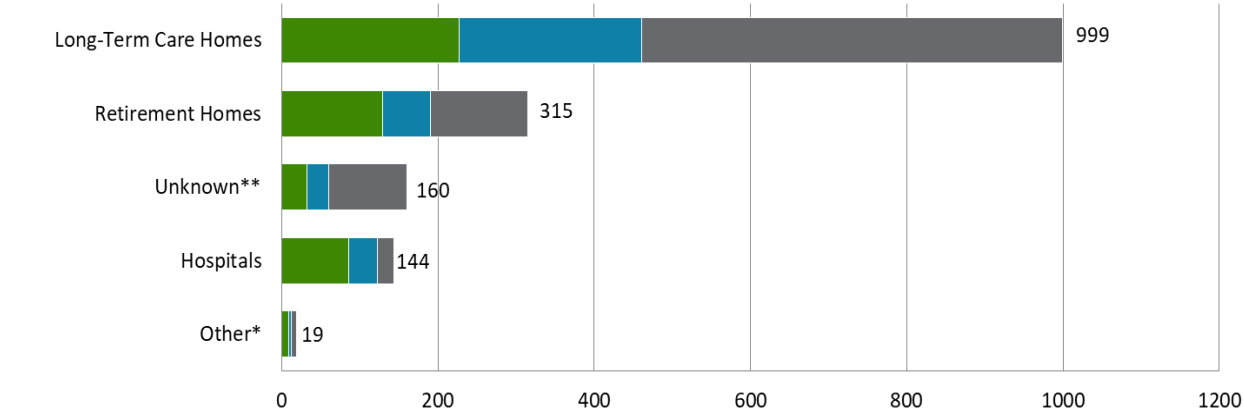
Setting type reported	Number of influenza outbreaks (% of total)	Number of other respiratory virus outbreaks (% of total)
Long-Term Care Home	227 (47.0%)	772 (66.9%)
Hospital	86 (17.8%)	58 (5.0%)
Retirement Home	129 (26.7%)	186 (16.1%)
Other[1]	9 (1.9%)	10 (0.9%)
Unknown	32 (6.6%)	128 (11.1%)
TOTAL	***483 (100.0%)***	***1154 (100.0%)***

Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:

[1] 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 7. Respiratory infection outbreaks by organism reported and institution type: Ontario, September 1, 2018 to August 31, 2019

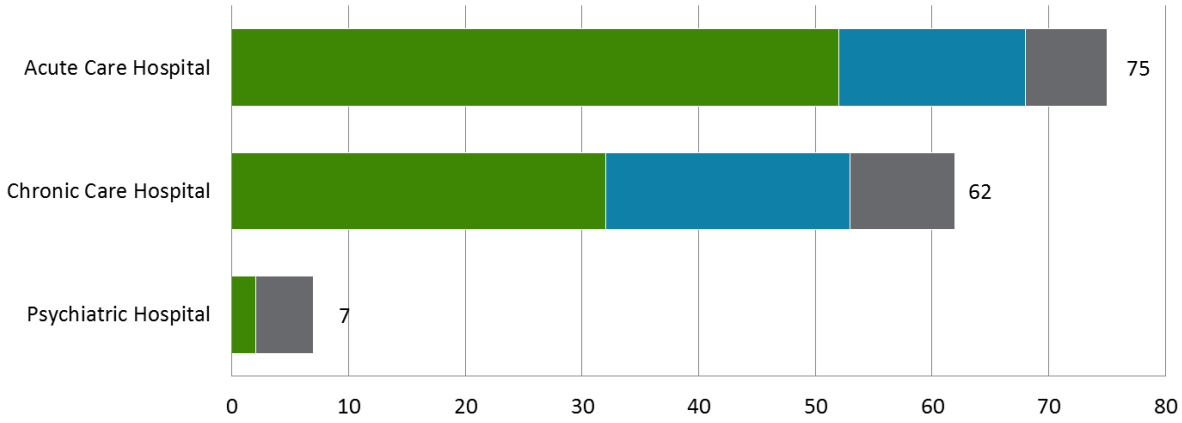


	Other*	Hospitals	Unknown**	Retirement Homes	Long-Term Care Homes
Influenza	9	86	32	129	227
Other Respiratory Viruses	3	37	28	61	234
No Organism Identified	7	21	100	125	538

Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:
*Includes those respiratory infection outbreaks for which 'Other' was reported in the Exposure Setting Type field in iPHIS.
** Unknown includes those respiratory infection outbreaks for which either no Exposure Setting Type was entered or was reported as 'Unknown' in iPHIS.

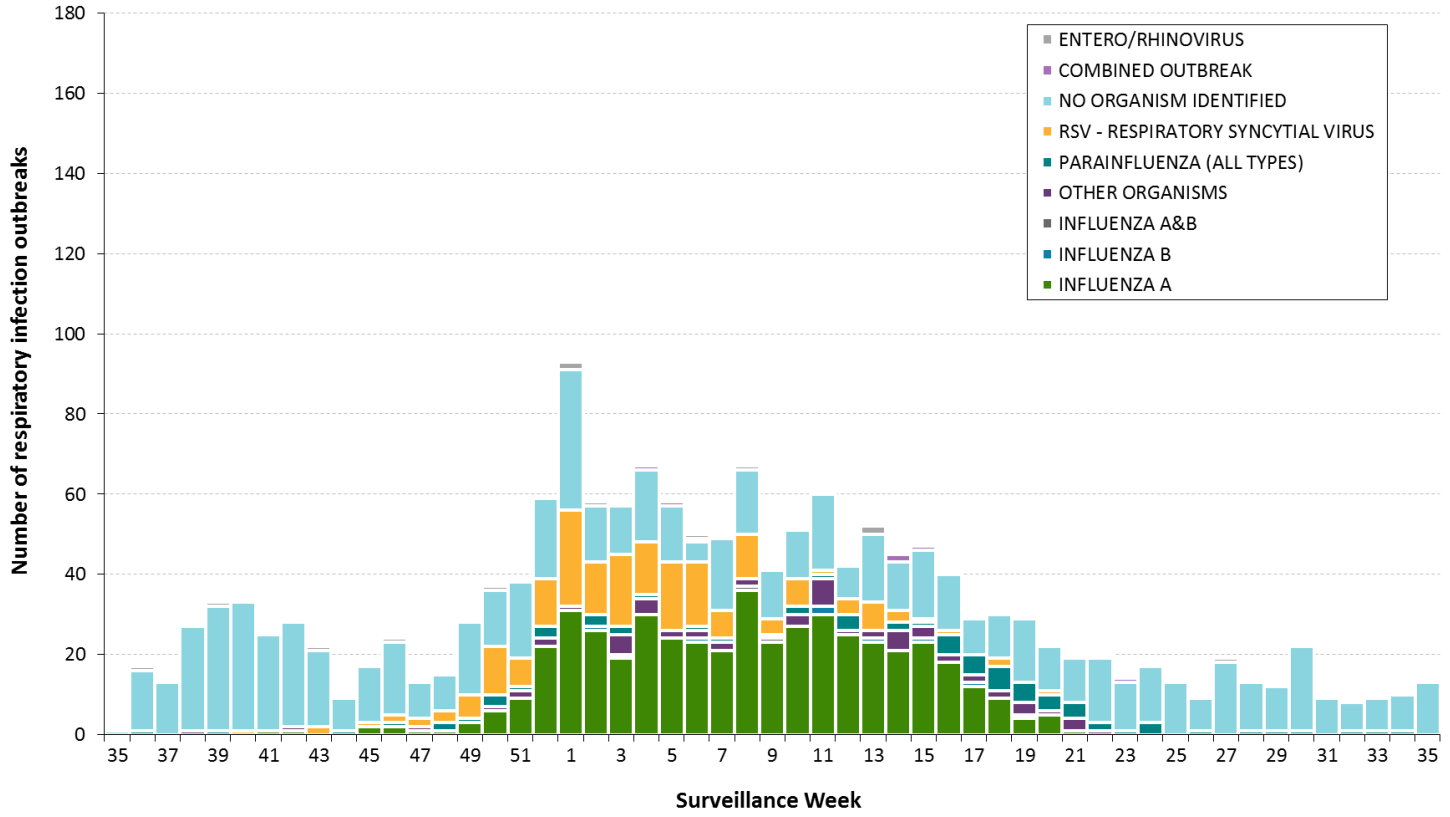
Figure 8. Respiratory infection outbreaks, by organism reported and type of hospital: Ontario, September 1, 2018 to August 31, 2019



	Psychiatric Hospital	Chronic Care Hospital	Acute Care Hospital
Influenza	2	32	52
Other Respiratory Viruses	0	21	16
No Organism Identified	5	9	7

Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

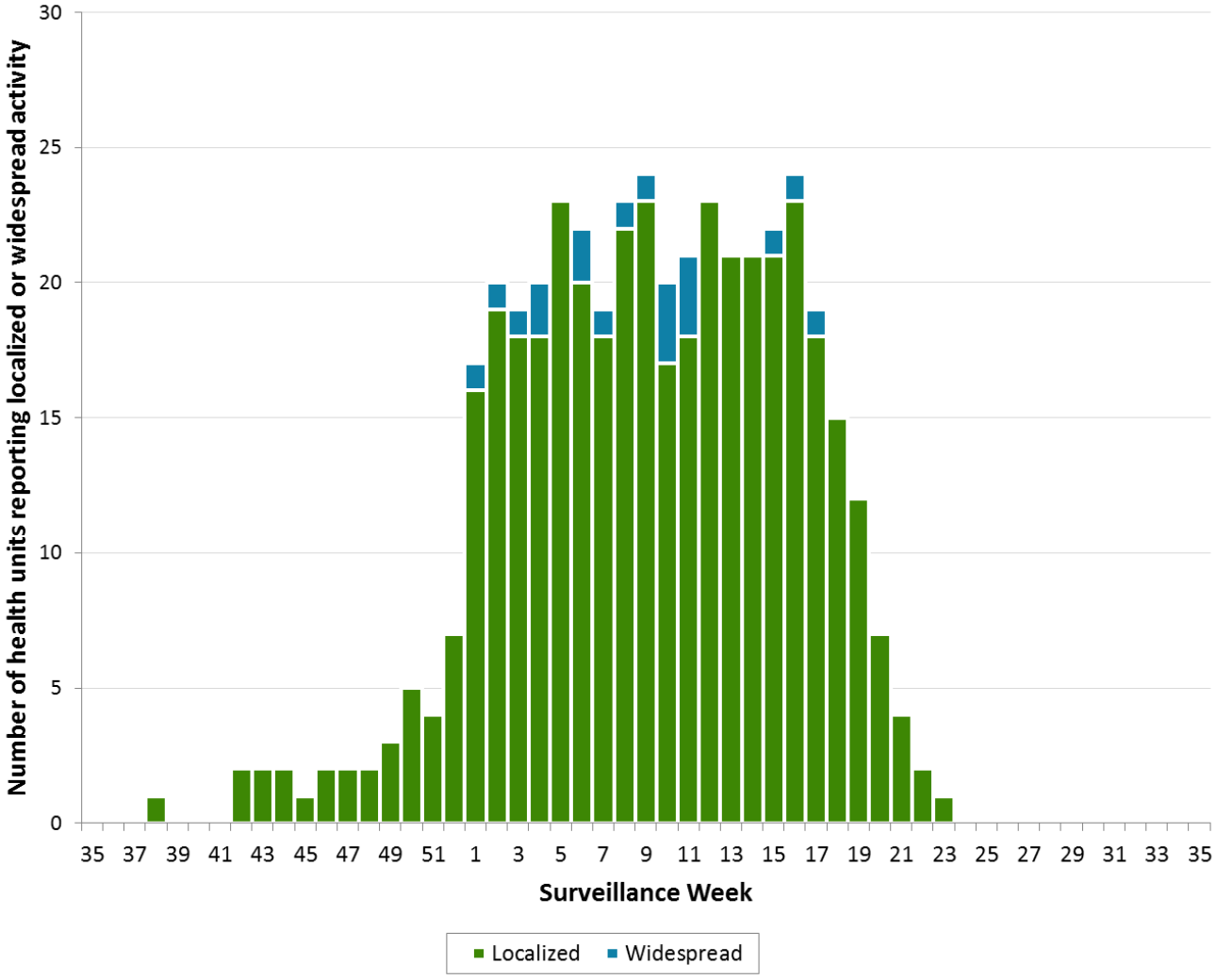
Figure 9. Institutional respiratory infection outbreaks by week of illness onset in the first case: Ontario, September 1, 2018 to August 31, 2019



Source: Ontario Ministry of Health, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2019/10/9].

Notes:
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 4. Week 35, 2018 excludes outbreaks with an onset date prior to September 1, 2018, while week 35, 2019 excludes outbreaks with an onset date after August 31, 2019. 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

Figure 10. 'Localized' and 'Widespread' influenza activity levels reported by public health units, by reporting week: Ontario, September 1, 2018 (Week 35) to August 31, 2019 (Week 35)



Source: Public Health Ontario [Provincial Influenza Activity Report (Appendix C) Database].

Notes:
Influenza activity levels are assigned by local public health units and reported to Public Health Ontario by the Tuesday following the end of each surveillance week at 4 p.m. Activity levels are assigned based on laboratory confirmations, ILI reports from various sources and laboratory-confirmed institutional respiratory infection outbreaks. See detailed definitions for the 2018-19 season.

Activity levels reported for a particular surveillance week may not necessarily correspond to the number of new outbreaks reported in the same week because ongoing outbreaks from previous weeks, as well as laboratory-confirmed outbreaks in schools, may be included in the assessment of the activity level.

Appendix 1

Table 1. Strain characterization completed on influenza positive isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to August 29, 2019

Influenza strains	Ontario	Canada
Influenza A (H3N2) A/Singapore/INFIMH-16-0019/2016-like	180	378
Influenza A (H1N1) A/Michigan/45/2015-like	706	1656
Influenza B B/Colorado/06/2017-like	68	214
Influenza B B/Phuket/3073/13-like	18	26

Source: Influenza and Respiratory Viruses Section, National Microbiology Laboratory (NML). Received: August 29, 2019.

Notes:

271 influenza A(H3N2) viruses did not grow to sufficient hemagglutination titer for antigenic characterization by hemagglutination inhibition (HI) assay. Therefore, NML has performed genetic characterization to determine the genetic group identity of these viruses. Sequence analysis of the HA gene of the viruses showed that 20 viruses belonged to genetic group 3C.2a, 242 viruses belonged to subclade 3C.2a1 and eight viruses belonged to 3C.3a. One isolate could not be sequenced. 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. Through antigenic characterization performed at the National Microbiology Laboratory (NML), 212 influenza A (H3N2) viruses were antigenically characterized as A/Singapore/INFIMH-16-0019/2016-like by HI testing using antiserum raised against egg-propagated A/Singapore/INFIMH-16-0019/2016. A/Singapore/INFIMH-16-0019/2016 is the influenza A/H3N2 component of the 2018-19 Northern Hemisphere influenza vaccine. 166 viruses showed reduced titer with ferret antisera raised against egg-propagated A/Singapore/INFIMH-16-0019/2016.145 influenza A (H3N2) viruses characterized belonged to genetic group 3C.2a1. 20 viruses belonged to genetic group 3C.2a and 210 to 3C.3a. Sequencing is pending for the remaining isolates. 1,612 H1N1 viruses characterized were antigenically similar to A/Michigan/45/2015, which is the influenza A/H1N1 component of the 2018–19 Northern Hemisphere influenza vaccine. 44 viruses showed reduced titer with ferret antisera raised against cell culture-propagated A/Michigan/45/2015.

46 influenza B viruses were characterized as B/Colorado/06/2017, which belongs to the Victoria lineage and is included as an influenza B component of the 2018–19 Northern Hemisphere influenza vaccine. 168 viruses showed reduced titer with ferret antisera raised against cell culture-propagated B/Colorado/06/2017. Sequence analysis showed that 162 viruses that showed reduced titer had a three amino acid deletion (162-164) in the HA gene.

26 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 2018–19 Northern Hemisphere quadrivalent influenza vaccine.

Table 2. Amantadine susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to August 29, 2019

Influenza strains	Ontario R	Ontario S	Canada R	Canada S
Influenza A (H3N2)	51	0	135	0
Influenza A (H1N1)pdm09	97	0	391	0

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

Table 3. Oseltamivir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to August 29, 2019

Influenza strains	Ontario R	Ontario S	Canada R	Canada S
Influenza A (H3N2)	0	114	0	222
Influenza A (H1N1)pdm09	4	383	4	1,080
Influenza B	0	51	0	142

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

Table 4. Zanamivir susceptibility assays completed on influenza isolates at the National Microbiology Laboratory: Ontario and Canada, September 1, 2018 to August 29, 2019

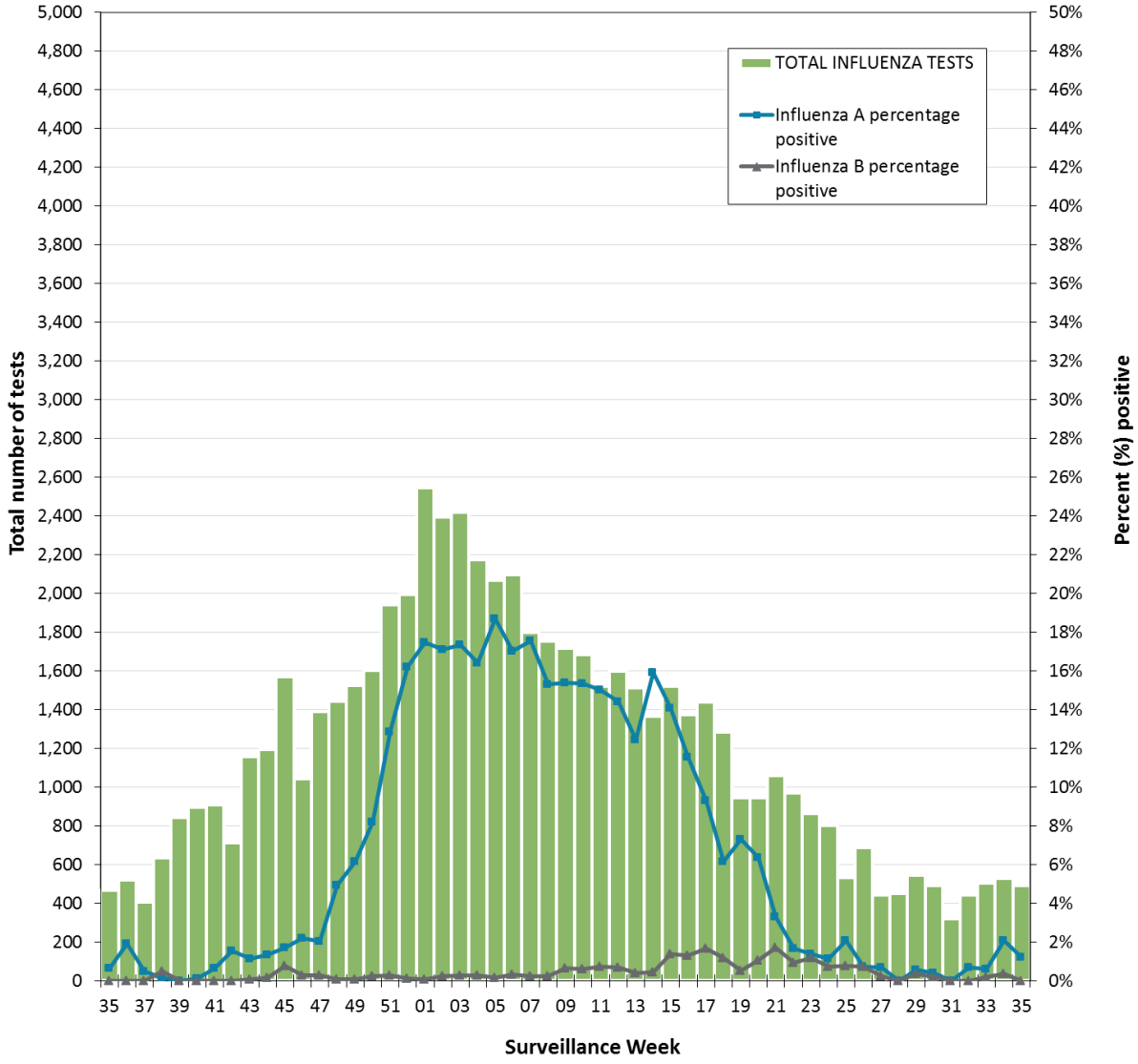
Influenza strains	Ontario R	Ontario S	Canada R	Canada S
Influenza A (H3N2)	0	114	0	222
Influenza A (H1N1)pdm09	0	385	0	1,082
Influenza B	0	51	0	142

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

Source: Influenza and Respiratory Viruses Section, National Microbiology Laboratory (NML). Received: August 29, 2019.

Notes:
All influenza A viruses in Canada tested by the National Microbiology Laboratory (NML) for antiviral resistance in the 2018–19 season were resistant to amantadine. Four influenza A(H1N1)pdm09 virus, tested nationally were resistant to oseltamivir; the four resistant influenza viruses tested were from Ontario. All influenza A H3N2 viruses and influenza B viruses tested nationally were sensitive to oseltamivir. All influenza viruses were sensitive to zanamivir.

Figure 1. Total number of influenza tests performed and percent of positive tests by report week: Ontario, August 26, 2018 to August 29, 2019



Source: These data have been obtained from the Public Health Agency of Canada's (PHAC) Centre for Immunization and Respiratory Infectious Diseases (CIRID) respiratory virus detection tables as of September 4, 2019; they are based on data submitted to PHAC from 16 laboratories in Ontario.

Notes:
The numbers reported in this figure represent results submitted to the CIRID by 16 participating laboratories in Ontario, including 11 Public Health Ontario Laboratories and five hospital-based laboratories. Not all 16 Ontario laboratories report every week. Results above 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.

Appendix 2

Reporting Weeks for the 2018–19 Surveillance Season

Weeks	Start	End
WK35	26-Aug-18	01-Sept-18
WK36	02-Sept-18	08-Sept-18
WK37	09-Sept-18	15-Sept-18
WK38	16-Sept-18	22-Sept-18
WK39	23-Sept-18	29-Sept-18
WK40	30-Sept-18	06-Oct-18
WK41	07-Oct-18	13-Oct-18
WK42	14-Oct-18	20-Oct-18
WK43	21-Oct-18	27-Oct-18
WK44	28-Oct-18	03-Nov-18
WK45	04-Nov-18	10-Nov-18
WK46	11-Nov-18	17-Nov-18
WK47	18-Nov-18	24-Nov-18
WK48	25-Nov-18	01-Dec-18
WK49	02-Dec-18	08-Dec-18
WK50	09-Dec-18	15-Dec-18
WK51	16-Dec-18	22-Dec-18
WK52	23-Dec-18	29-Dec-18
WK1	30-Dec-18	05-Jan-19
WK2	06-Jan-19	12-Jan-19
WK3	13-Jan-19	19-Jan-19

Weeks	Start	End
WK4	20-Jan-19	26-Jan-19
WK5	27-Jan-19	02-Feb-19
WK6	03-Feb-19	09-Feb-19
WK7	10-Feb-19	16-Feb-19
WK8	17-Feb-19	23-Feb-19
WK9	24-Feb-19	02-Mar-19
WK10	03-Mar-19	09-Mar-19
WK11	10-Mar-19	16-Mar-19
WK12	17-Mar-19	23-Mar-19
WK13	24-Mar-19	30-Mar-19
WK14	31-Mar-19	06-Apr-19
WK15	07-Apr-19	13-Apr-19
WK16	14-Apr-19	20-Apr-19
WK17	21-Apr-19	27-Apr-19
WK18	28-Apr-19	04-May-19
WK19	05-May-19	11-May-19
WK20	12-May-19	18-May-19
WK21	19-May-19	25-May-19
WK22	26-May-19	01-Jun-19
WK23	02-Jun-19	08-Jun-19
WK24	09-Jun-19	15-Jun-19
WK25	16-Jun-19	22-Jun-19
WK26	23-Jun-19	29-Jun-19
WK27	30-Jun-19	06-Jul-19
WK28	07-Jul-19	13-Jul-19

Weeks	Start	End
WK29	14-Jul-19	20-Jul-19
WK30	21-Jul-19	27-Jul-19
WK31	28-Jul-19	03-Aug-19
WK32	04-Aug-19	10-Aug-19
WK33	11-Aug-19	17-Aug-19
WK34	18-Aug-19	24-Aug-19
WK35	25-Aug-19	31-Aug-19

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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