

December 30, 2018 to January 5, 2019 (Week 01)

Overall Summary

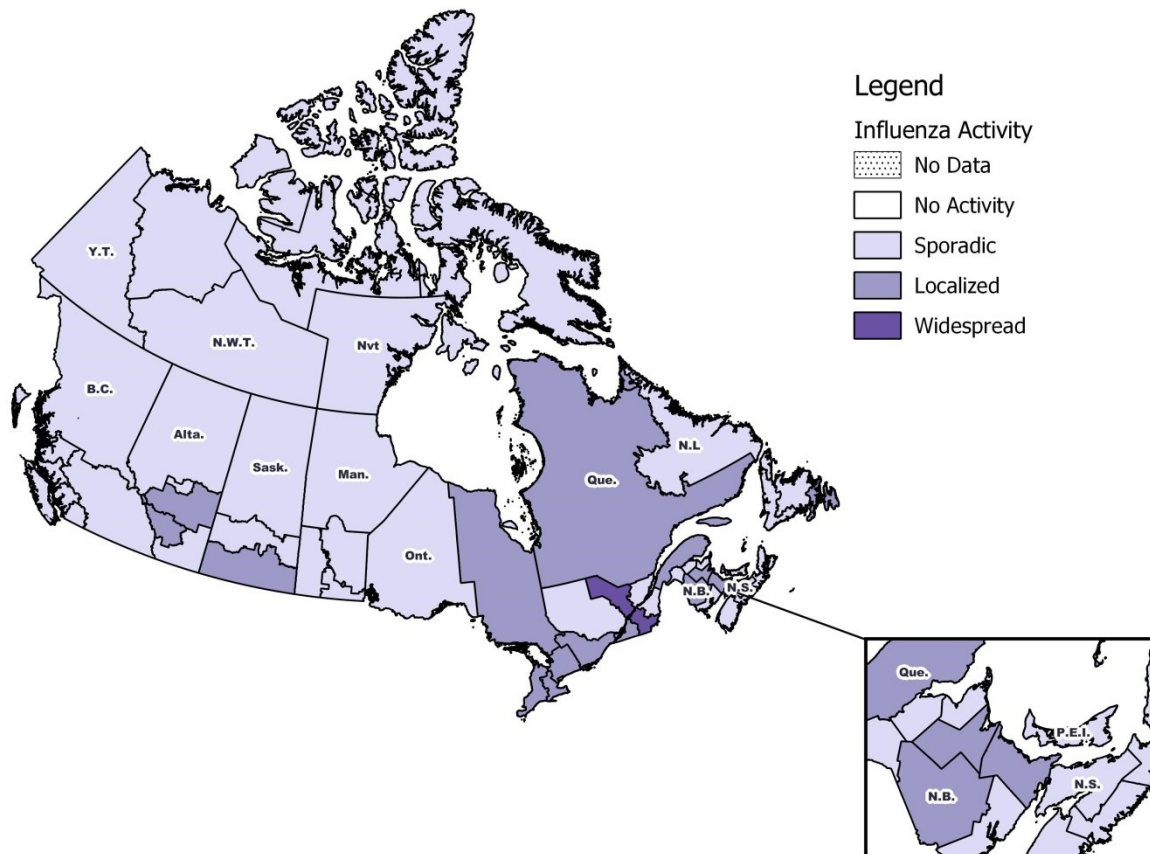
- In week 01, laboratory detections declined from the previous week suggesting that nationally the influenza season may have reached peak levels in the last week of December.
- Overall, influenza activity remains high in Canada.
- Influenza A is the most common influenza virus circulating in Canada, and the majority of these viruses are A(H1N1)pdm09.
- The majority of lab confirmations and hospitalizations have been among individuals under the age of 65.

Influenza/Influenza-like Illness (ILI) Activity (geographic spread)

During week 01, all regions reported some level of influenza activity (Figure 1):

- 1 region reported widespread activity: in Que.(1)
- 15 regions reported localized activity: in Alta.(2), Sask.(1), Ont.(6), Que.(2), N.L.(1) and N.B.(3)
- 31 regions reported sporadic activity: in B.C.(5), Alta.(3), Sask.(2), Man.(5), Ont.(1), Que.(3), N.B.(4), N.S.(4), N.L.(3), P.E.I.(1), Nvt.(3), N.W.T.(2) and Yt.(1).

Figure 1 – Map of overall influenza/ILI activity by province and territory, Canada, week 2019-01



Laboratory-Confirmed Influenza Detections

In week 01, the following results were reported from sentinel laboratories across Canada (Figure 2):

- The percentage of tests positive for influenza decreased to 25.6% in week 01.
- A total 3,153 laboratory detections of influenza were reported, of which 99% were influenza A.

To date this season 17,743 laboratory-confirmed influenza detections have been reported:

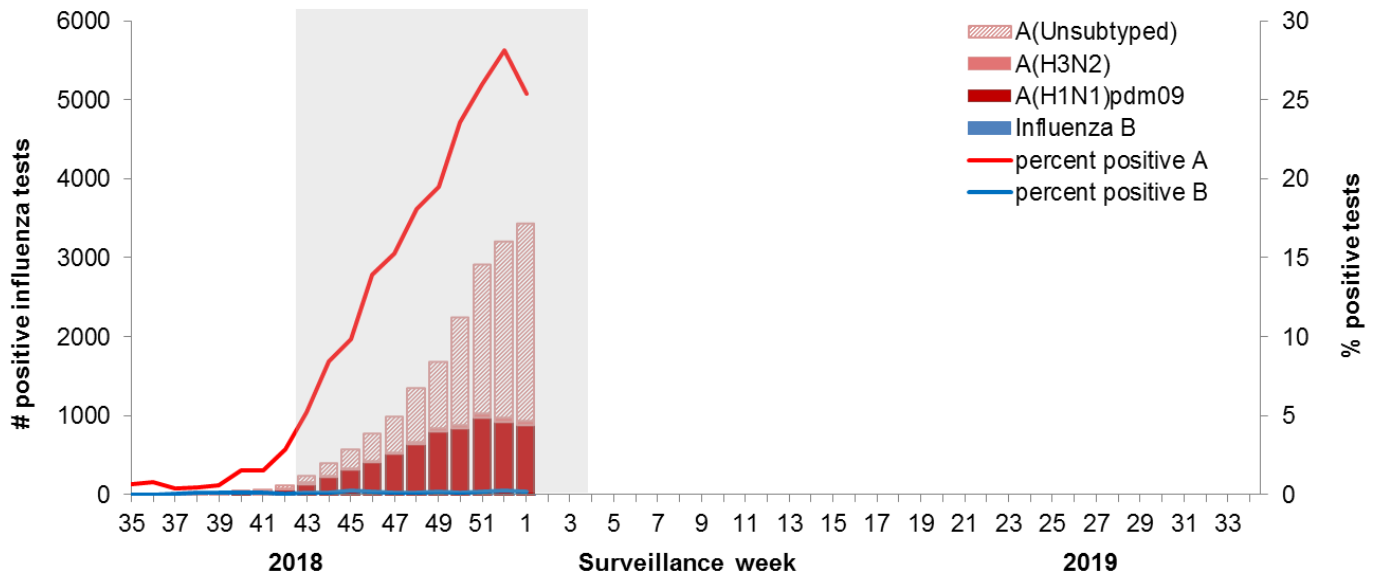
- 99% have been influenza A.
- Among the 6,775 influenza A viruses subtyped, 94% have been A(H1N1)pdm09.
- Provincial and territorial differences in influenza type/subtype distribution are observed (Figure 3).

To date this season, detailed information on age and type/subtype has been received for 14,897 laboratory-confirmed influenza cases (Table 1):

- 68% of all influenza A(H1N1)pdm09 detections have been reported in individuals younger than 45 years of age.
- 61% of all influenza A(H3N2) detections have been reported in adults 65 years of age and older.

For more detailed weekly and cumulative influenza data, see the text descriptions for [Figures 2 and 3](#) or the [Respiratory Virus Detections in Canada Report](#).

Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, weeks 2018-35 to 2019-01



The shaded area indicates weeks where the positivity rate was at least 5% and a minimum of 15 positive tests were observed, signalling the period of [seasonal influenza activity](#).

Figure 3 – Cumulative numbers of positive influenza specimens by type/subtype and province/territory, Canada, weeks 2018-35 to 2019-01

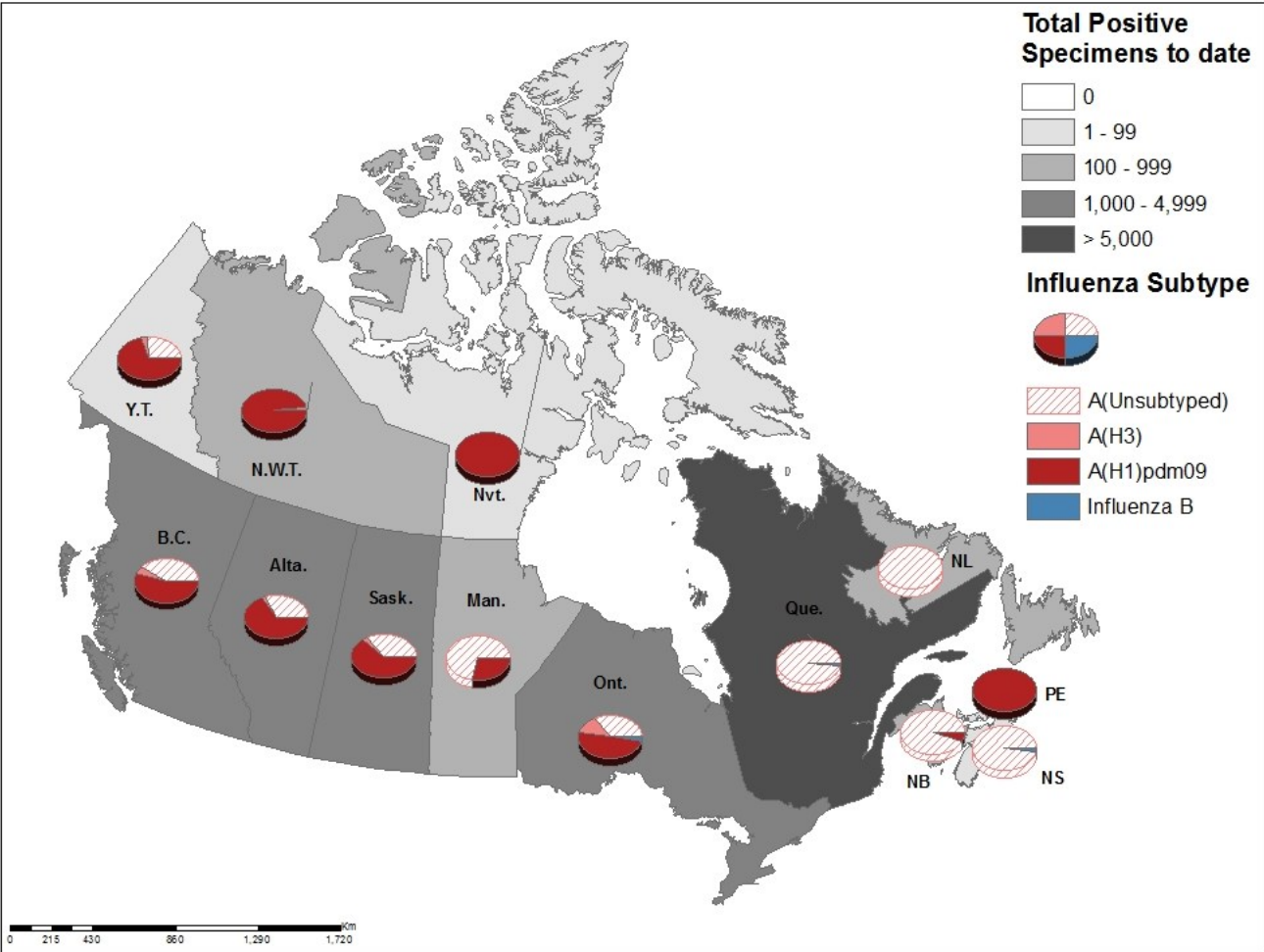


Table 1 – Cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting, Canada, weeks 2018-35 to 2019-01

Age groups (years)	Cumulative (August 26, 2018 to January 5, 2019)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1N1)pdm09	A(H3N2)	A (UnS) ¹	Total	#	%
0-4	3175	1239	15	1921	24	3199	21%
5-19	2498	1108	15	1375	26	2524	17%
20-44	3277	1294	55	1928	20	3297	22%
45-64	3020	1077	70	1873	22	3042	20%
65+	2792	673	246	1873	43	2835	19%
Total	14762	5391	401	8970	135	14897	100%

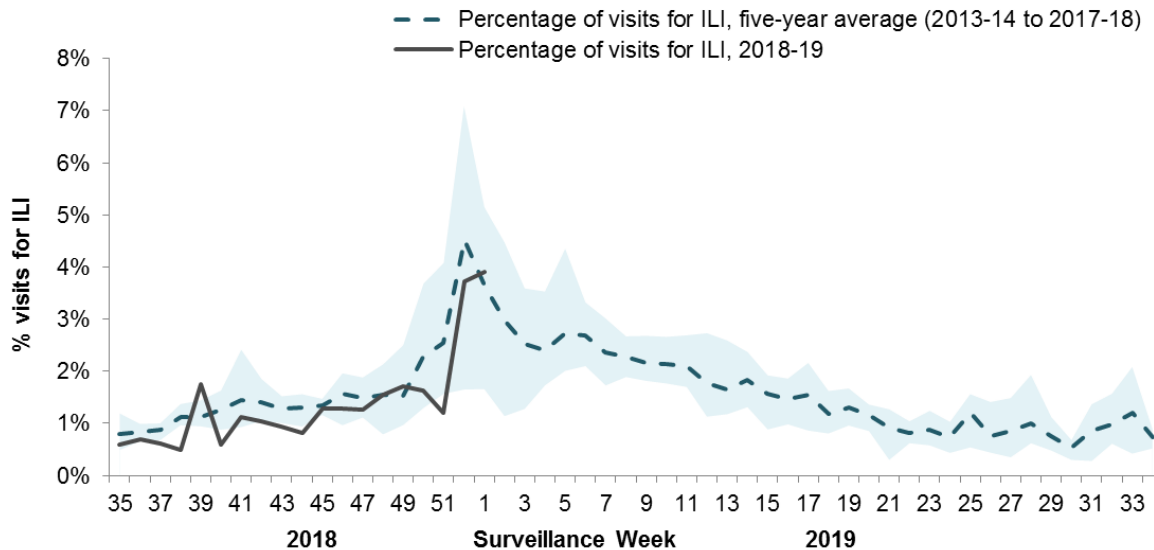
¹UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Syndromic / Influenza-like Illness Surveillance

Healthcare Practitioners Sentinel Syndromic Surveillance

In week 1, 3.9% of visits to healthcare professionals were due to influenza-like illness (ILI) (Figure 4). The percentage of visits for ILI is within expected levels.

Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, weeks 2018-35 to 2019-01
Number of Sentinels Reporting in Week 01: 77



The shaded area represents the maximum and minimum percentage of visits for ILI reported by week from seasons 2013-14 to 2017-18

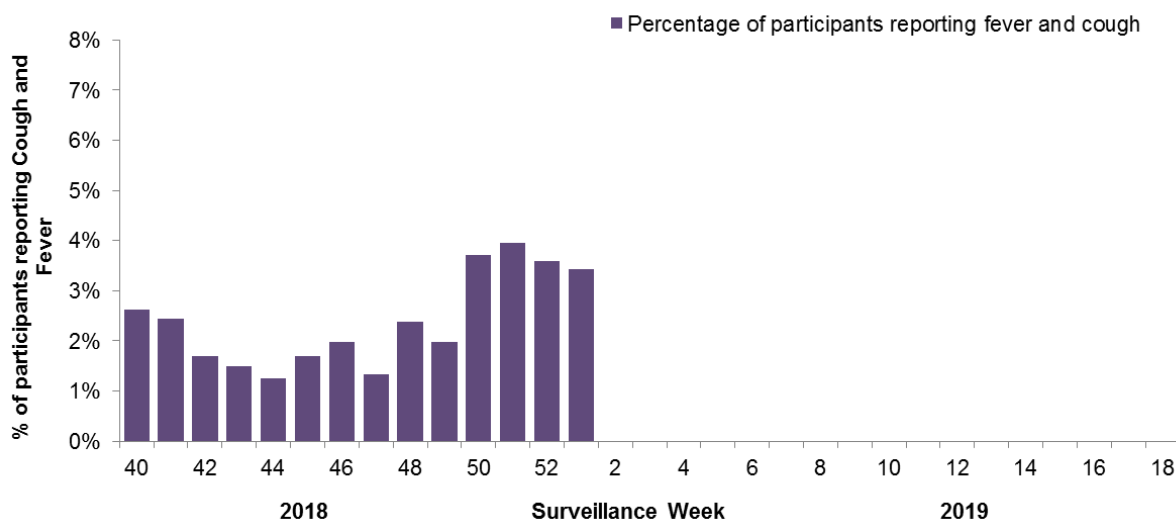
Participatory Syndromic Surveillance

In week 01, 2,240 participants reported to FluWatchers, of which 77 (3.4%) reported symptoms of cough and fever (Figure 5).

Among the 77 participants who reported fever and cough:

- 13% consulted a healthcare professional;
- 77% reported days missed from work or school, resulting in a combined total of 159 missed days of work or school.

Figure 5 – Percentage of participants reporting cough and fever, Canada, weeks 2018-40 to 2019-01
Number of Participants Reporting in Week 01: 2,240



Influenza Outbreak Surveillance

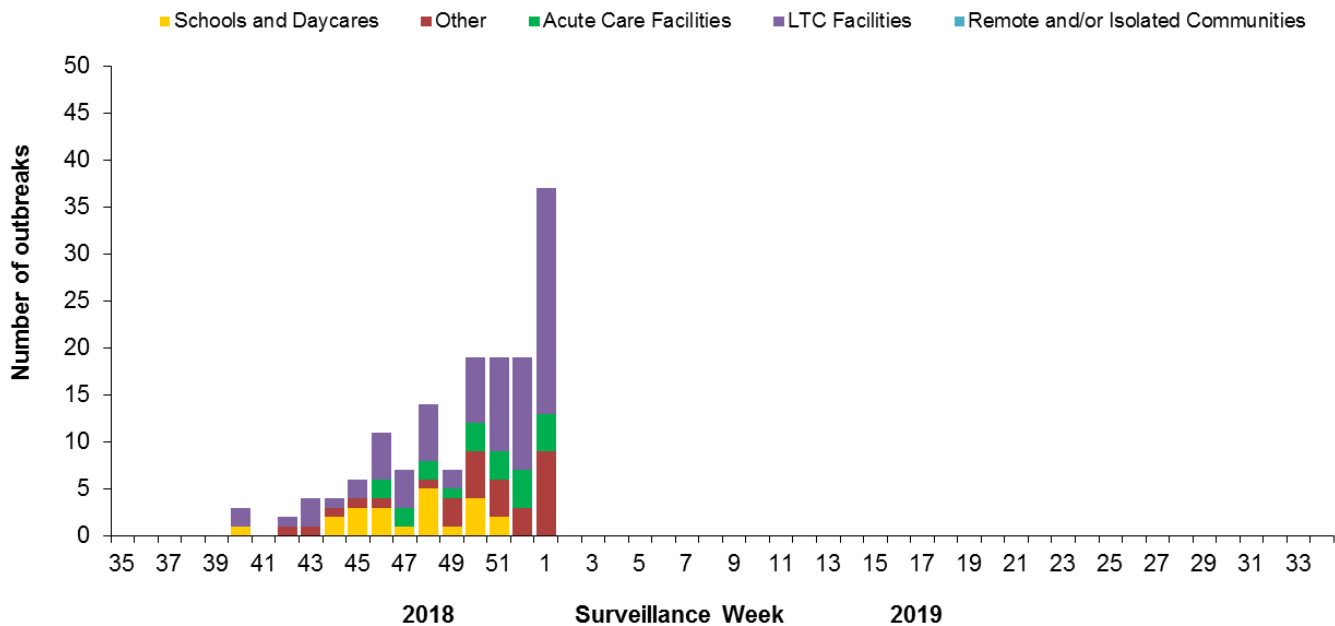
In week 01, 37 new laboratory-confirmed influenza outbreaks were reported: long-term care facilities (LTCF) (24), acute care facilities (4), and other settings (9). One new ILI outbreak in a LTCF was also reported reported in week 01.

To date this season, 152 laboratory-confirmed influenza outbreaks have been reported (Figure 6):

- 79 outbreaks were in LTCF, 22 were in schools, 21 in acute care facilities, and 30 were in other settings.
- All of the 119 outbreaks for which the influenza type was available were associated with influenza A.
- Among the 76 outbreaks for which the influenza A subtype was available:
 - 86% (65) were associated with influenza A(H1N1)pdm09;
 - 14% (11) were associated with A(H3N2),

To date this season, 39 ILI outbreaks have been reported; 29 occurred in LTCF, seven in schools, and three in acute care facilities.

Figure 6 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2018-35 to 2019-01



Severe Outcomes Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

To date this season, 1348 influenza-associated hospitalizations have been reported by participating provinces and territories¹.

Hospitalizations (Table 2):

- 99.6% (1342) were associated with influenza A
- The highest estimated rate of hospitalization is among children under 5 years of age.

Intensive Care Unit (ICU) cases and deaths:

- To date this season 196 ICU admissions and 37 deaths have been reported.
 - 41% (80) of reported ICU admissions were in adults aged 45-64 years.
 - All reported deaths were associated with influenza A.

Table 2 – Cumulative number and estimated rate of hospitalizations by age-group reported by participating provinces and territories¹, Canada, weeks 2018-35 to 2019-01

Age Groups (years)	Cumulative (August 26, 2018 to January 5, 2019)		
	Influenza A	Influenza B	Rate per 100,000 population
0-4	225	2	47.69
5-19	139	0	10.02
20-44	194	0	6.82
45-64	360	0	16.54
65+	424	4	35.18
Total	1342	6	
%	99.6	0.4	

¹Influenza-associated hospitalizations are reported by Alberta, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Prince Edward Island and Yukon. Only hospitalizations that require intensive medical care are reported by Saskatchewan. The cumulative rate of hospitalizations is calculated using the total population by age-group in participating provinces and territories.

Pediatric Influenza Hospitalizations and Deaths

In week 01, 87 pediatric (≤ 16 years of age) hospitalizations with influenza have been reported by the Immunization Monitoring Program Active (IMPACT) network (Figure 7).

To date this season, 540 pediatric hospitalizations have been reported (Figure 8):

- 99% (535) of cases have been associated with influenza A.
- Among the 228 cases for which the influenza subtype was available, 222 (97%) were associated with A(H1N1)pdm09.

To date this season, 95 ICU admissions, and six deaths have been reported.

- 88% (83) of ICU admissions were in children under the age of 10
- 99% (93) of ICU admissions have been associated with influenza A.
- All deaths occurred in children under the age of 10

Figure 7 – Number of pediatric (≤16 years of age) hospitalizations reported by the IMPACT network, by week, Canada, weeks 2018-35 to 2019-01

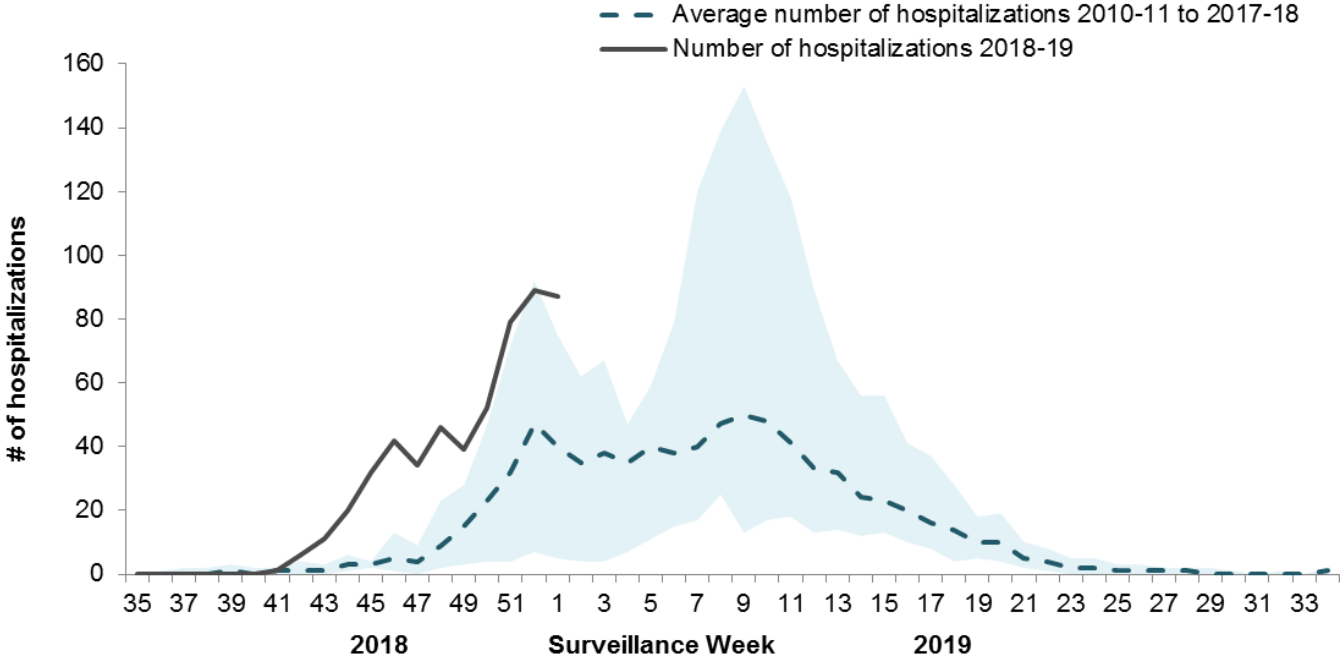
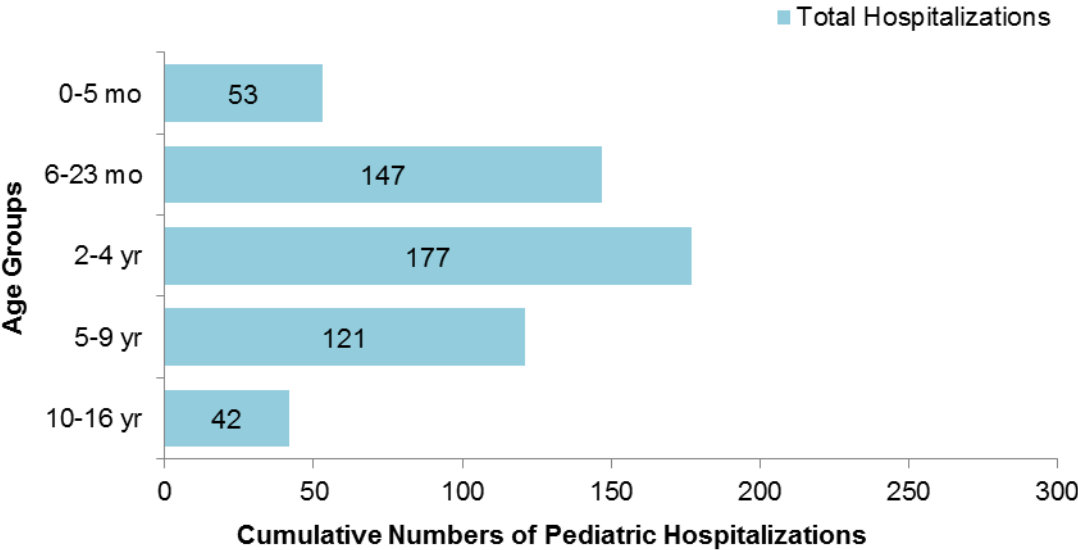


Figure 8 - Cumulative numbers of pediatric hospitalizations (≤16 years of age) with influenza by age-group reported by the IMPACT network, Canada, weeks 2018-35 to 2019-01



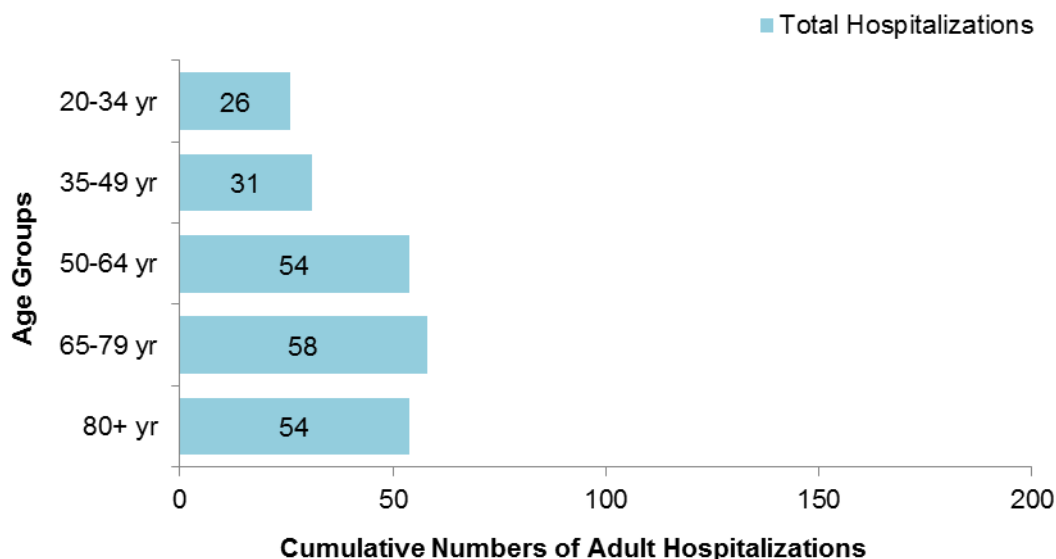
Adult Influenza Hospitalizations and Deaths

Surveillance of laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations by the Canadian Immunization Research Network (CIRN) Serious Outcomes Surveillance (SOS) network began on November 1st for the 2018-19 season.

To date this season, 223 hospitalizations have been reported (Figure 9):

- 212 (95%) were associated with influenza A.
- The distribution of cases among adults <65 years of age is similar to adults ≥65 years of age
- The most commonly reported comorbidity among hospitalized cases was endocrine disorders, which were reported in 70% of hospitalized cases.

Figure 9 - Cumulative numbers of adult hospitalizations (>20 years of age) with influenza by age-group reported by CIRN, Canada, 2018-19, weeks 2018-44 to 2019-01



Influenza Strain Characterizations

Since September 1, 2018, the National Microbiology Laboratory (NML) has characterized 481 influenza viruses (45 A(H3N2), 420 A(H1N1) and 16 B) that were received from Canadian laboratories.

Genetic Characterization of Influenza A(H3N2):

33 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:

- Five viruses belonged to genetic group 3C.2a.
- 27 viruses belonged to subclade 3C.2a1.

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.

Antigenic Characterization:

Influenza A (H3N2):

- 12 influenza A(H3N2) virus was 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-like virus is the influenza A(H3N2) component of the 2018-19 Northern Hemisphere influenza vaccine.
- Four influenza A (H3N2) viruses characterized belonged to genetic group 3C.2a1. Sequencing is pending for the remaining three viruses.

Influenza A(H1N1):

- 415 A(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.
- Five viruses showed reduced titer with ferret antisera raised against cell culture-propagated A/Michigan/45/2015

Influenza B:

Influenza B viruses can be divided into two antigenically distinct lineages represented by B/Yamagata/16/88 and B/Victoria/2/87 viruses. The recommended influenza B components for the 2018-19 Northern Hemisphere influenza vaccine are B/Colorado/06/2017 (Victoria lineage) and B/Phuket/3073/2013 (Yamagata lineage).

- Two influenza B virus was 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
- 14 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.

Antiviral Resistance

Antiviral Resistance – Amantadine:

278 influenza A (37 A(H3N2) and 241 A(H1N1)) viruses were tested for resistance to amantadine and it was found that:

- All 278 influenza A viruses were resistant to amantadine.

Antiviral Resistance – Oseltamivir:

403 influenza viruses (40 A(H3N2), 348 A(H1N1) and 15 B) were tested for resistance to oseltamivir and it was found that:

- All 403 influenza viruses were sensitive to oseltamivir

Antiviral Resistance – Zanamivir:

403 influenza viruses (40 A(H3N2), 348 H1N1 and 15 B) were tested for resistance to zanamivir and it was found that:

- All 403 influenza viruses were sensitive to zanamivir.

Provincial and International Surveillance Links

- Alberta – [Influenza Surveillance](#)
- British Columbia – [Influenza Surveillance](#)
- Manitoba - [Seasonal Influenza Reports](#)
- New Brunswick – [Influenza Surveillance Reports](#)
- Newfoundland and Labrador – [Surveillance and Disease Reports](#)
- Nova Scotia – [Respiratory Watch Report](#)
- Ontario – [Ontario Respiratory Pathogen Bulletin](#)
- Prince Edward Island – [Influenza Summary](#)
- Saskatchewan – [Influenza Reports](#)
- Québec – [Système de surveillance de la grippe](#)
- Australia – [Influenza Surveillance Report and Activity Updates](#)
- European Centre for Disease Prevention and Control – [Surveillance reports and disease data on seasonal influenza](#)
- New Zealand – [Influenza Weekly Update](#)
- United Kingdom -- [Weekly Influenza Activity Reports](#)
- Pan-American Health Organization – [Influenza Situation Report](#)
- United States Centres for Disease Control and Prevention – [Weekly Influenza Summary Update](#)
- World Health Organization – [FluNet](#)

Notes

To learn more about definitions, descriptions and the FluWatch program in general, see the [Overview of influenza monitoring in Canada](#) page. For more information on the flu, see our [Flu \(influenza\)](#) web page.

This [report](#) is available on the Government of Canada Influenza webpage.
Ce [rapport](#) est disponible dans les deux langues officielles.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.