

March 17 to March 23, 2019 (Week 12)

## Overall Summary

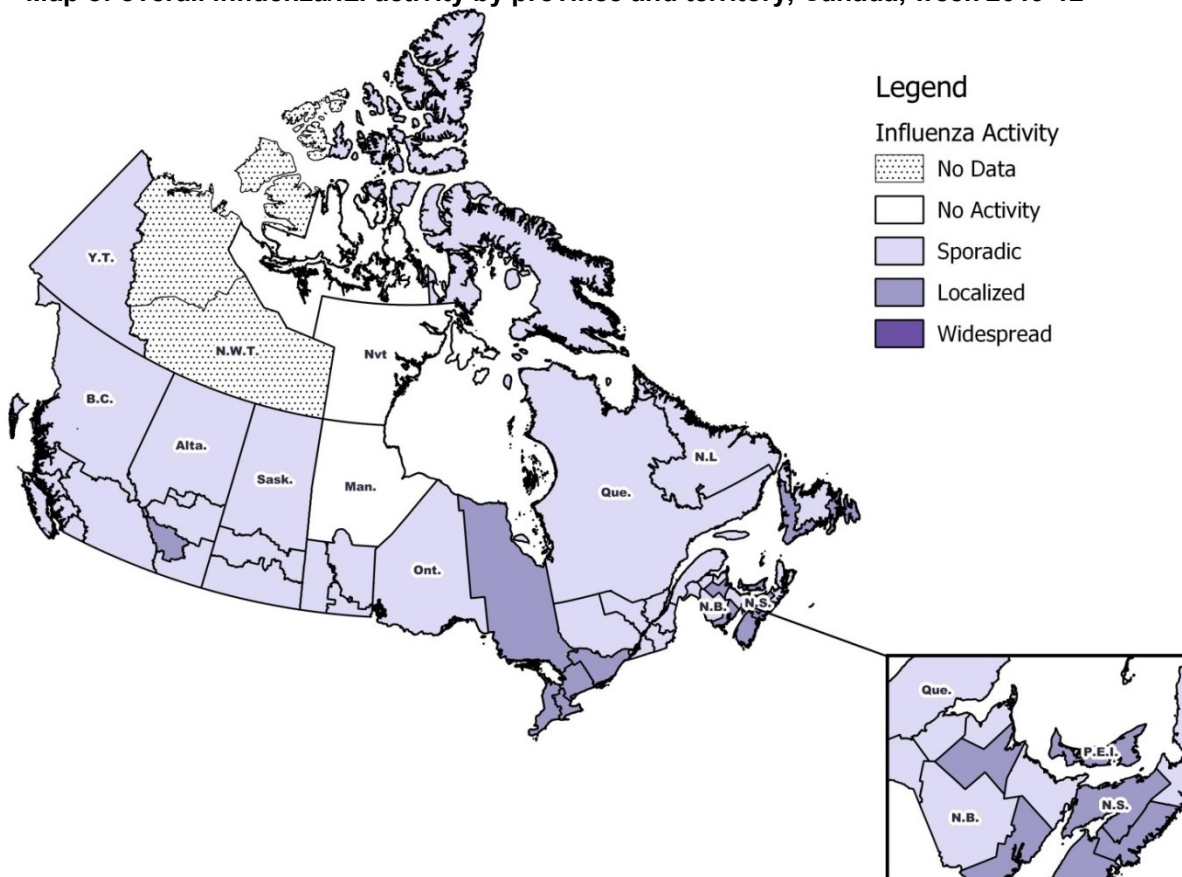
- Influenza activity continues to be reported in almost all regions in Canada but is circulating at higher levels in some eastern regions.
- Though A(H1N1) peaked at end of December, over the past four weeks a second smaller wave, dominated by A(H3N2), is being observed in most regions of the country.
- Detections of influenza A(H3N2) have been steadily increasing since mid-January and accounted for 72% of subtyped influenza A detections this week; however, influenza A(H1N1)pdm09 remains the predominant subtype to date this season.
- Detections of influenza A continue to be greater than those of influenza B. There is currently very little influenza B circulation compared to previous seasons.

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

During week 12, the following influenza activity levels were reported (Figure 1):

- 15 regions reported localized activity: in Alta.(1), Ont.(6), N.S.(3), N.B.(2), P.E.I.(1) and N.L.(2).
- 33 regions reported sporadic activity: in B.C.(5), Alta.(4), Sask.(3), Man.(4), Ont.(1), Que.(6), N.B.(5), N.L.(2), N.S.(1), Y.T.(1) and Nvt.(1)
- Three regions: in Man.(1) and Nvt.(2) reported no activity.

Figure 1 – Map of overall influenza/ILI activity by province and territory, Canada, week 2019-12



## Laboratory-Confirmed Influenza Detections

In week 12, the following results were reported from sentinel laboratories across Canada (Figures 2 and 3):

- The percentage of tests positive for influenza continued to increase slightly to 21.8%.
- A total 1,735 laboratory detections of influenza were reported, of which 93% were influenza A.
- Influenza A(H3N2) accounted for 72% of subtyped influenza A detections.
- Detections of influenza A(H3N2) have been steadily increasing, from 93 detections in week 4 (mid-January) to 342 this week.

To date this season, 39,297 laboratory-confirmed influenza detections have been reported:

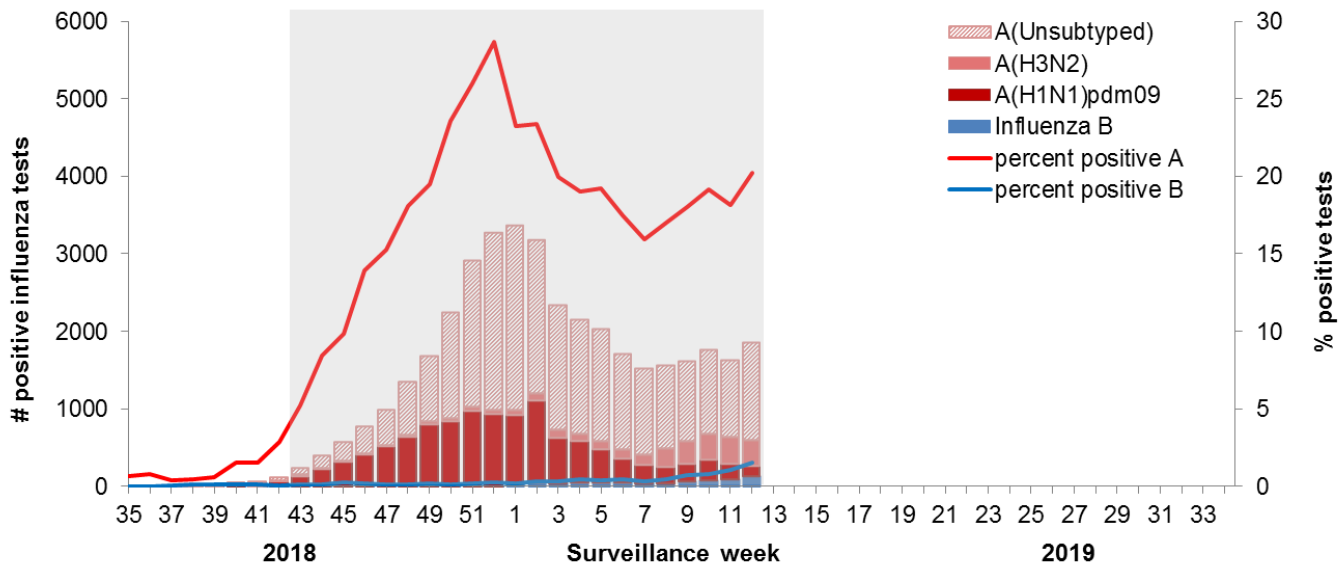
- 98% have been influenza A.
- Among the 13,414 influenza A viruses subtyped, 81% have been A(H1N1)pdm09.
- Influenza B often circulates later in the season in Canada (Feb-Apr). Fewer influenza B detections have been reported this season compared to recent seasons at this time of year.

To date this season, detailed information on age and type/subtype has been received for 30,844 laboratory-confirmed influenza cases (Table 1):

- 84% of all influenza A(H1N1)pdm09 detections have been reported in individuals younger than 65 years of age.
- 57% of all influenza A(H3N2) detections have been reported in adults 65 years of age and older.

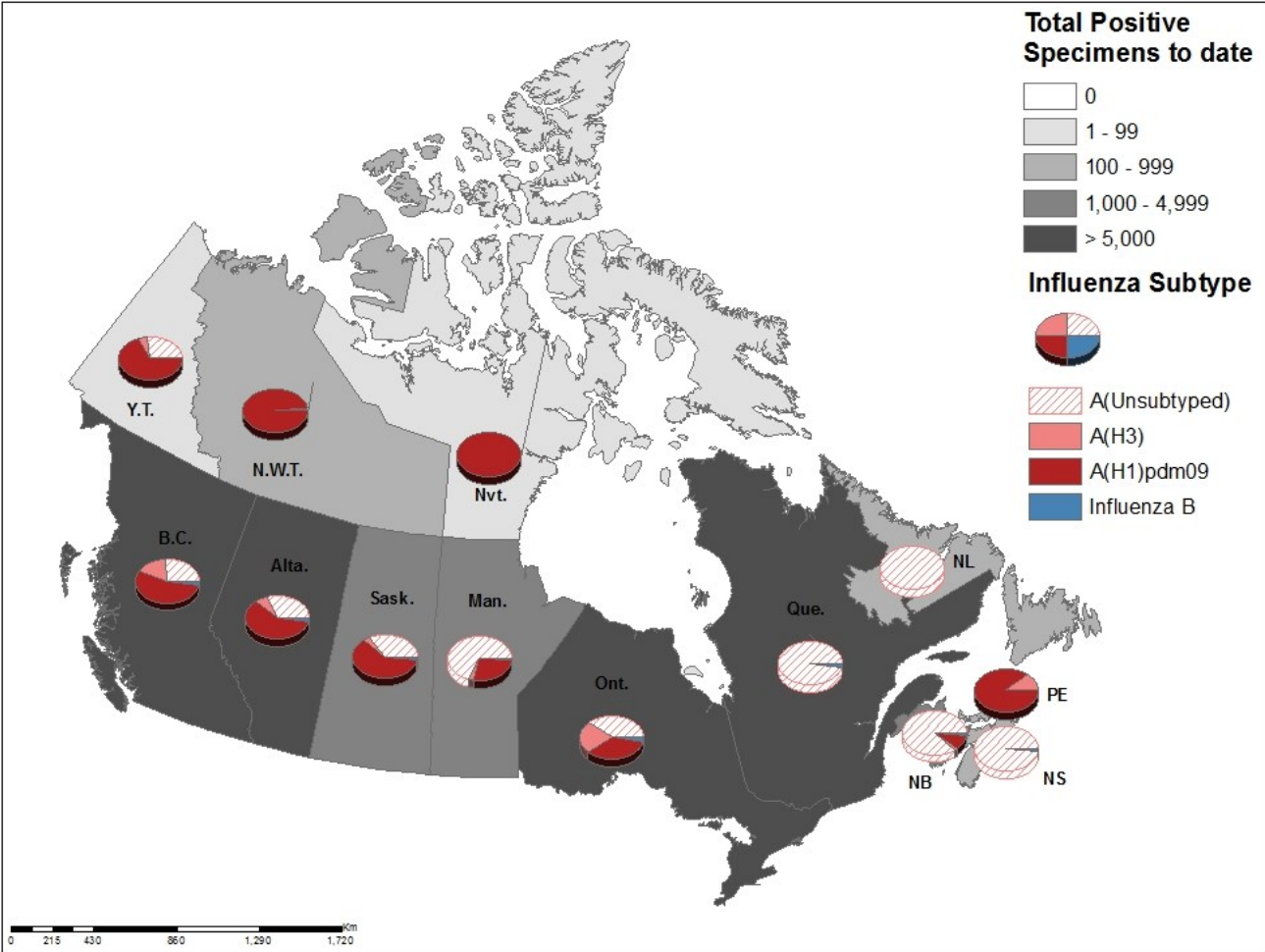
For more detailed weekly and cumulative influenza data, see the text descriptions for [Figures 2 and 3](#) or the [Respiratory Virus Detections in Canada Report](#).

**Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, weeks 2018-35 to 2019-12**



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 2019-12**



**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 2019-12**

Age groups (years)	Cumulative (August 26, 2018 to March 23, 2019)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1N1) pdm09	A(H3N2)	A (UnS) <sup>1</sup>		Total	#
0-4	6093	1639	106	4348	115	6208	20%
5-19	4425	1359	240	2826	176	4601	15%
20-44	5905	1882	298	3725	117	6022	20%
45-64	5915	1800	292	3823	70	5985	19%
65+	7852	1320	1265	5267	176	8028	26%
<b>Total</b>	<b>30190</b>	<b>8000</b>	<b>2201</b>	<b>19989</b>	<b>654</b>	<b>30844</b>	<b>100%</b>

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

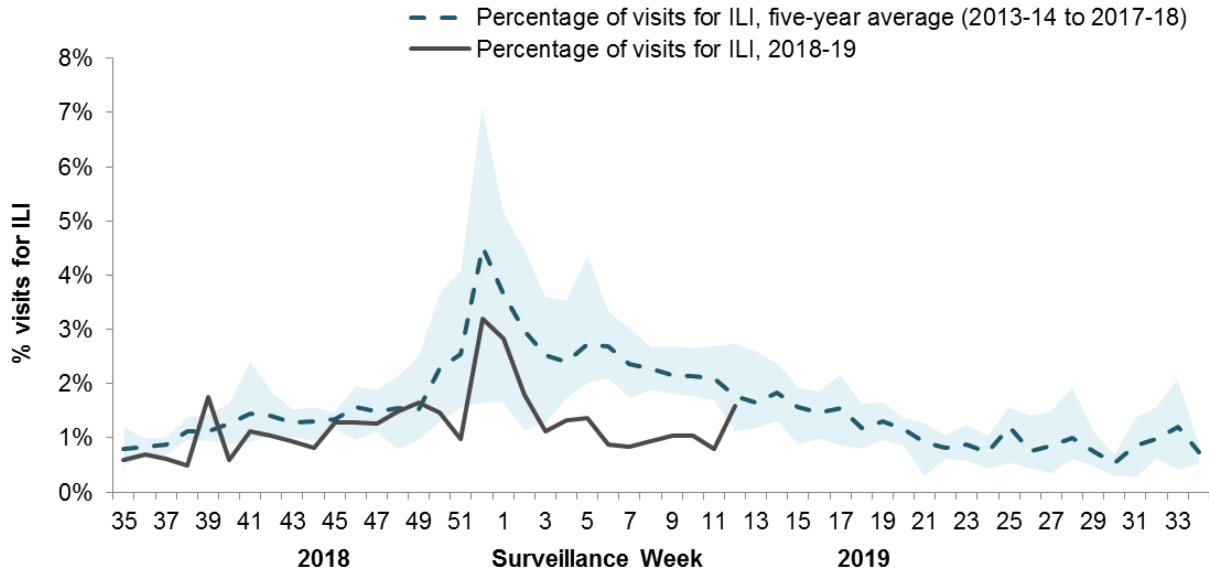
## Syndromic / Influenza-like Illness Surveillance

### Healthcare Practitioners Sentinel Syndromic Surveillance

In week 12, 1.6% of visits to healthcare professionals were due to influenza-like illness (ILI) (Figure 4).

**Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, weeks 2018-35 to 2019-12**

Number of Sentinels Reporting in Week 12: 86



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

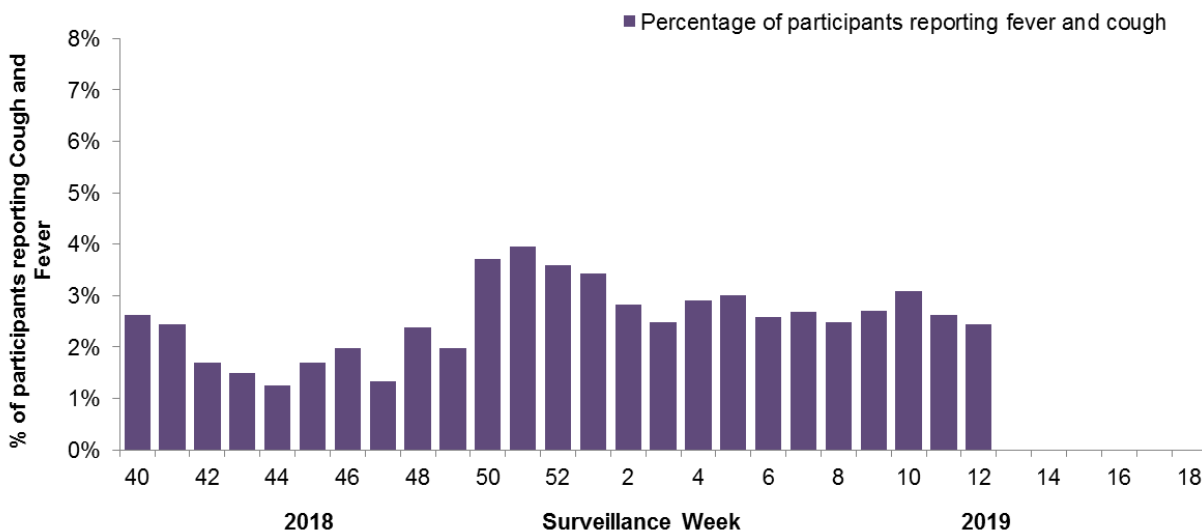
In week 12, 2,056 participants reported to FluWatchers, of which 50 (2.4%) reported symptoms of cough and fever (Figure 5).

Among the 50 participants who reported fever and cough:

- 30% consulted a healthcare professional;
- 92% reported days missed from work or school, resulting in a combined total of 136 missed days of work or school.

**Figure 5 – Percentage of participants reporting cough and fever, Canada, weeks 2018-40 to 2019-12**

Number of Participants Reporting in Week 12: 2,056



## Influenza Outbreak Surveillance

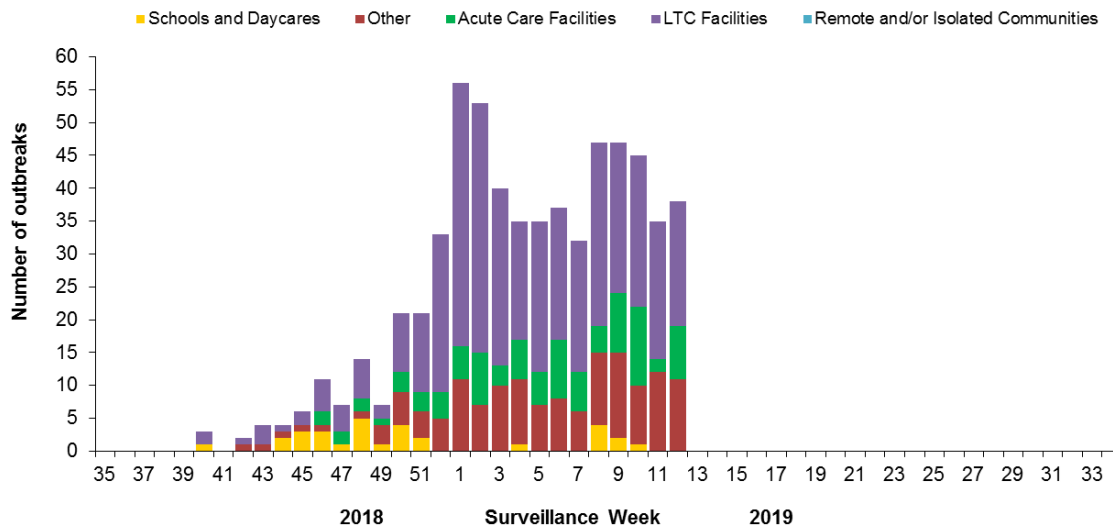
In week 12, 38 new laboratory-confirmed influenza outbreaks were reported: long-term care facilities (LTCF) (19), acute care facilities (8) and other settings (11). Eleven new ILI outbreaks (LTCF (8) and schools and daycares (3)) were also reported in week 12. Among the outbreaks with available subtype information (12), 92% (11) were associated with influenza A(H3N2).

To date this season, 633 laboratory-confirmed influenza outbreaks have been reported (Figure 6):

- 371 (59%) outbreaks were in LTCF, 30 were in schools and daycares, 94 in acute care facilities, and 138 were in other settings.
- Among the 563 outbreaks for which the influenza type was available, 98% (550) were associated with influenza A.
- Among the 243 outbreaks for which the influenza A subtype was available, 55% (125) were associated with influenza A(H1N1)pdm09;

To date this season, 134 ILI outbreaks have been reported; 75 occurred in LTCF, 55 in schools, and four in acute care facilities.

**Figure 6 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2018-35 to 2019-12**



## Severe Outcomes Influenza Surveillance

### Provincial/Territorial Influenza Hospitalizations and Deaths

To date this season, 2,592 influenza-associated hospitalizations have been reported by participating provinces and territories<sup>1</sup>.

#### Hospitalizations (Table 2):

- 98.7% (2,558) were associated with influenza A
- Among the 1,555 cases for which the influenza subtype was available, 1,366 (88%) were associated with A(H1N1)pdm09.
- The highest estimated rate of hospitalization is among adults over 65 years of age.

#### Intensive Care Unit (ICU) cases and deaths:

- To date this season 464 ICU admissions and 127 deaths have been reported.
  - 43% (199) of reported ICU admissions were in adults aged 45-64 years.
  - All but four ICU admissions were associated with influenza A.
  - All but one of the deaths were associated with influenza A.

**Table 2 – Cumulative number and estimated rate of hospitalizations by age-group reported by participating provinces and territories<sup>1</sup>, Canada, weeks 2018-35 to 2019-12**

Age Groups (years)	Cumulative (August 26, 2018 to March 23, 2019)		
	Influenza A	Influenza B	Rate per 100,000 population
0-4	354	12	76.89
5-19	210	10	15.85
20-44	317	4	11.28
45-64	688	3	31.75
65+	989	5	81.70
<b>Total</b>	<b>2558</b>	<b>34</b>	
	98.7%	1.3%	

<sup>1</sup>Influenza-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 12, 41 pediatric ( $\leq 16$  years of age) hospitalizations with influenza have been reported by the Immunization Monitoring Program Active (IMPACT) network (Figure 7). Of the 41 hospitalizations, 34 (83%) were due to influenza A.

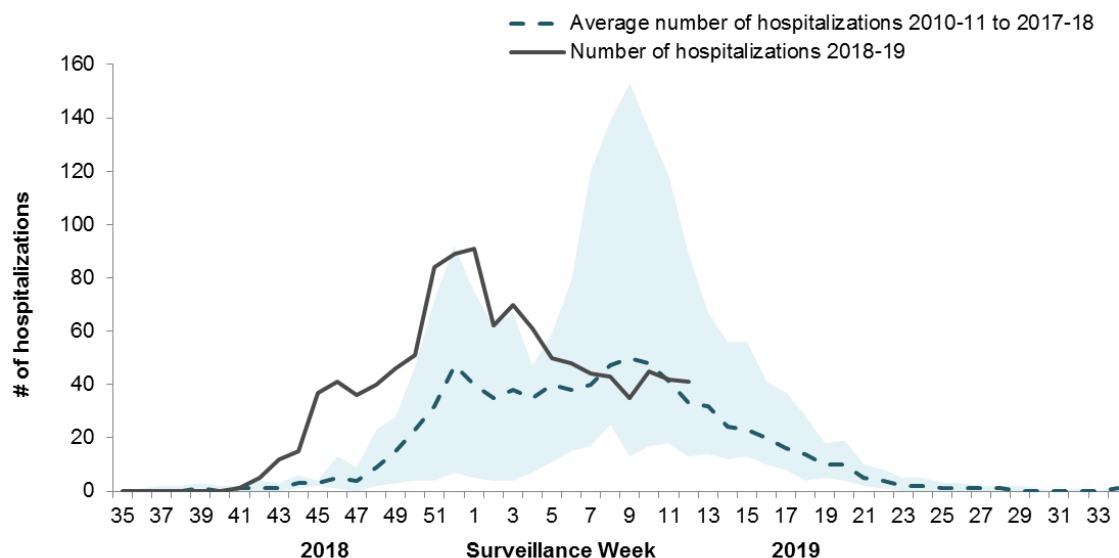
To date this season, 1,089 pediatric hospitalizations have been reported (Figure 8):

- 67% of cases were in children under 5 years of age.
- 97% (1,054) of cases have been associated with influenza A.
- Among the 324 cases for which the influenza subtype was available, 289 (89%) were associated with A(H1N1)pdm09.

To date this season, 194 ICU admissions, and 10 deaths have been reported.

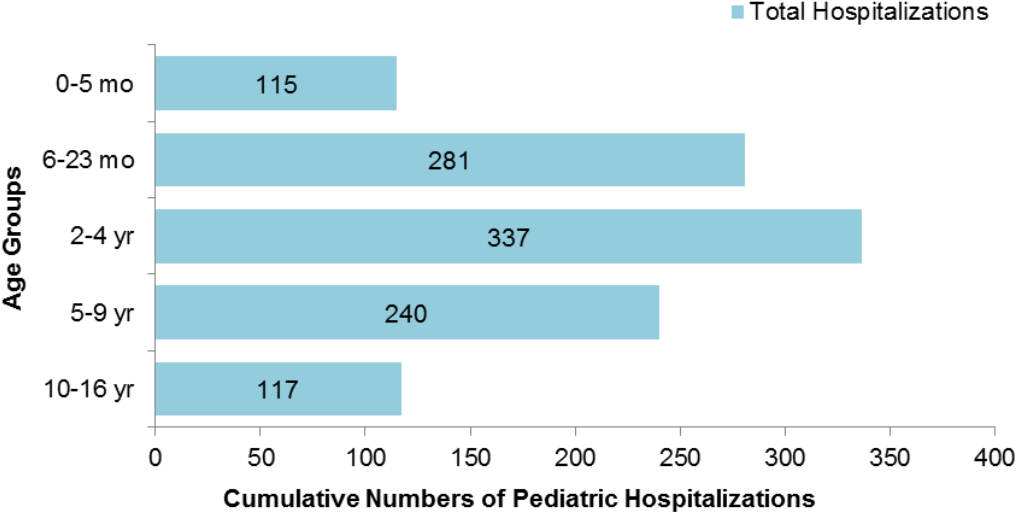
- 60% (117) of ICU admissions were in children under 5 years of age.
- All but two of the ICU admissions have been associated with influenza A.
- 80% (8) of deaths occurred in children 2 to 4 years of age.
- All deaths have been associated with influenza A.

**Figure 7 – Number of pediatric ( $\leq 16$  years of age) hospitalizations reported by the IMPACT network, by week, Canada, weeks 2018-35 to 2019-12**



The shaded area represents the maximum and minimum number of cases reported by week from seasons 2010-11 to 2017-18

**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 2019-12**



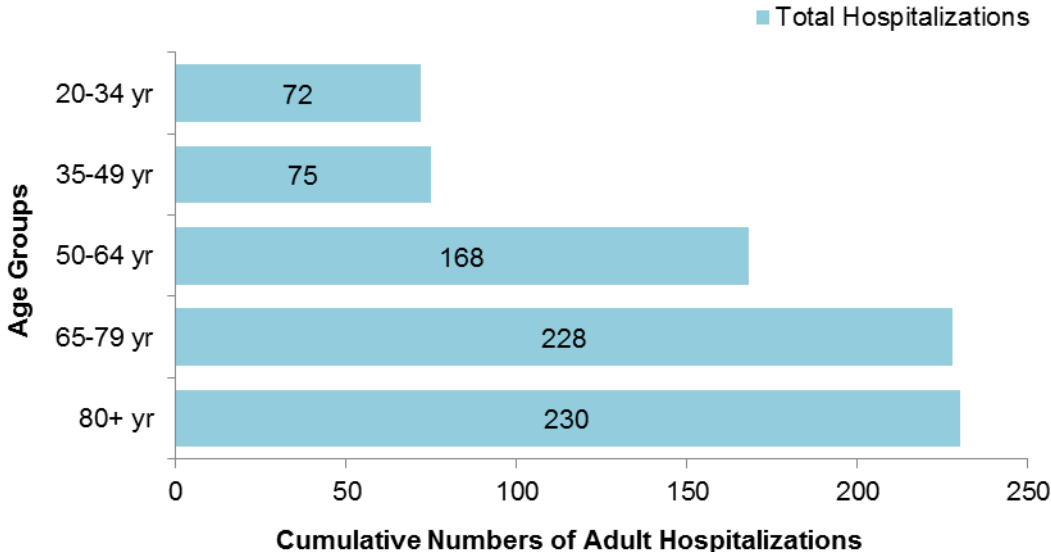
**Adult Influenza Hospitalizations and Deaths**

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 1<sup>st</sup> for the 2018-19 season.

To date this season, 773 hospitalizations, 90 ICU admissions and 40 deaths have been reported (Figure 9):

- 718 (93%) hospitalizations were associated with influenza A.
- A greater proportion of hospitalizations have been reported among adults ≥65 years of age (59%) compared to adults <65 years of age (41%).
- Among the 167 cases for which the influenza subtype was available, 103 (62%) were associated with A(H1N1)pdm09.
- 88% of hospitalized cases reported more than one type of comorbid condition.
- The most commonly reported comorbidity was endocrine disorders, which were reported in 83% 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 2019-12**



## Influenza Strain Characterizations

Since September 1, 2018, the National Microbiology Laboratory (NML) has characterized 1,700 influenza viruses (233 A(H3N2), 1,415 A(H1N1) and 52 B) that were received from Canadian laboratories.

### Genetic Characterization of Influenza A(H3N2):

124 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:

- 18 viruses belonged to genetic group 3C.2a.
- 102 viruses belonged to subclade 3C.2a1.
- Three 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.

### Antigenic Characterization:

#### Influenza A (H3N2):

- 82 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.
- 27 viruses showed reduced titer with ferret antisera 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.
- 63 influenza A(H3N2) viruses characterized belonged to genetic group 3C.2a1. 17 viruses belonged to genetic group 3C.2a and 29 to 3C.3a. Sequencing is pending for the remaining isolates.

#### Influenza A(H1N1):

- 1,375 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.
- 40 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).

- 18 influenza B viruses were characterized as B/Colorado/06/2017, which belong to the Victoria lineage and are included as an influenza B component of the 2018-19 Northern Hemisphere influenza vaccine.
- 12 viruses showed reduced titer with ferret antisera raised against cell culture-propagated B/Colorado/06/2017.
- 22 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:

388 influenza A (64 A(H3N2) and 324 A(H1N1)) viruses were tested for resistance to amantadine and it was found that:

- All 388 influenza A viruses were resistant to amantadine.

### Antiviral Resistance – Oseltamivir:

1,017 influenza viruses (103 A(H3N2), 879 A(H1N1) and 35 B) were tested for resistance to oseltamivir and it was found that:

- All 103 A(H3N2) viruses were sensitive to oseltamivir.
- Of the 879 A(H1N1) viruses tested, 875 were sensitive to oseltamivir and four viruses were resistant to oseltamivir with a H275Y mutation.
- All 35 B viruses were sensitive to oseltamivir.

### Antiviral Resistance – Zanamivir:

1,016 influenza viruses (103 A(H3N2), 878 H1N1 and 35 B) were tested for resistance to zanamivir and it was found that:

- All 1,016 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.*