FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

June 23 to July 20, 2019 (Weeks 26-29)

Overall Summary

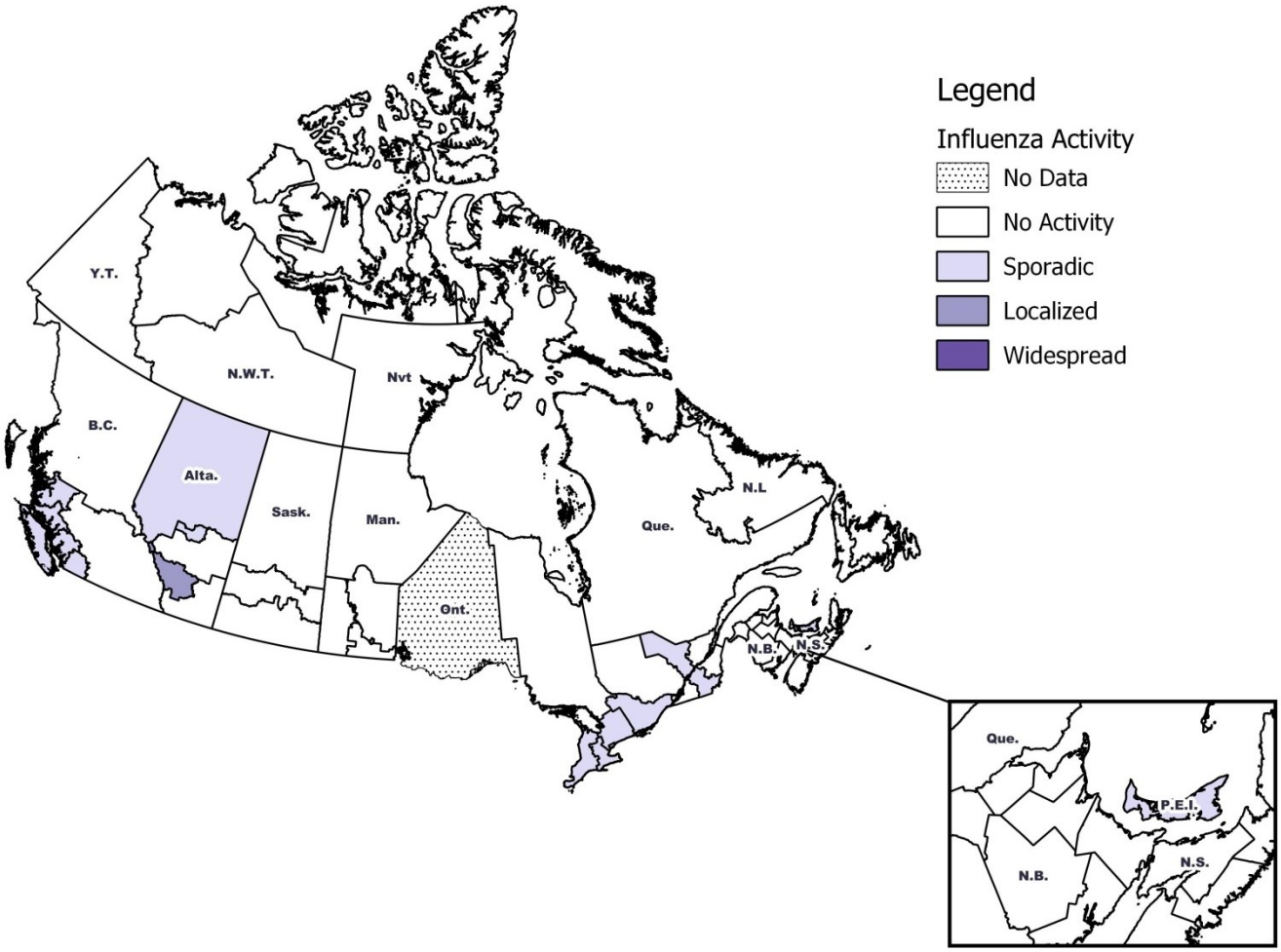
- Influenza activity is at interseasonal levels across the country.
- The majority of regions in Canada are reporting no influenza activity.
- Influenza A is the most common influenza virus circulating in Canada.
- The next FluWatch report will be published on August 30, 2019. Weekly reporting of laboratory detections of respiratory viruses continues via our Respiratory Virus Detections Surveillance System.

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

During week 29, the following influenza activity levels were reported (Figure 1):

- One region in Alta. reported localized activity
- 13 regions reported sporadic activity: B.C.(3), Alta.(2), Ont.(5), Que.(2), and P.E.I. (1)
- 38 regions in 12 provinces and territories reported no activity.

Figure 1 – Map of overall influenza/ILI activity by province and territory, Canada, week 2019-29



Laboratory-Confirmed Influenza Detections

During weeks 26-29, the following results were reported from sentinel laboratories across Canada (Figures 2 and 3):

- The percentage of tests positive for influenza continued to decrease from 3.1% in week 26 to 1.6% in week 29.
- A total of 181 laboratory detections of influenza were reported during these four weeks, of which 71% were influenza A. Influenza A(H3N2) accounted for 93% of subtyped influenza A detections during these five weeks.

To date this season, 48,694 laboratory-confirmed influenza detections have been reported:

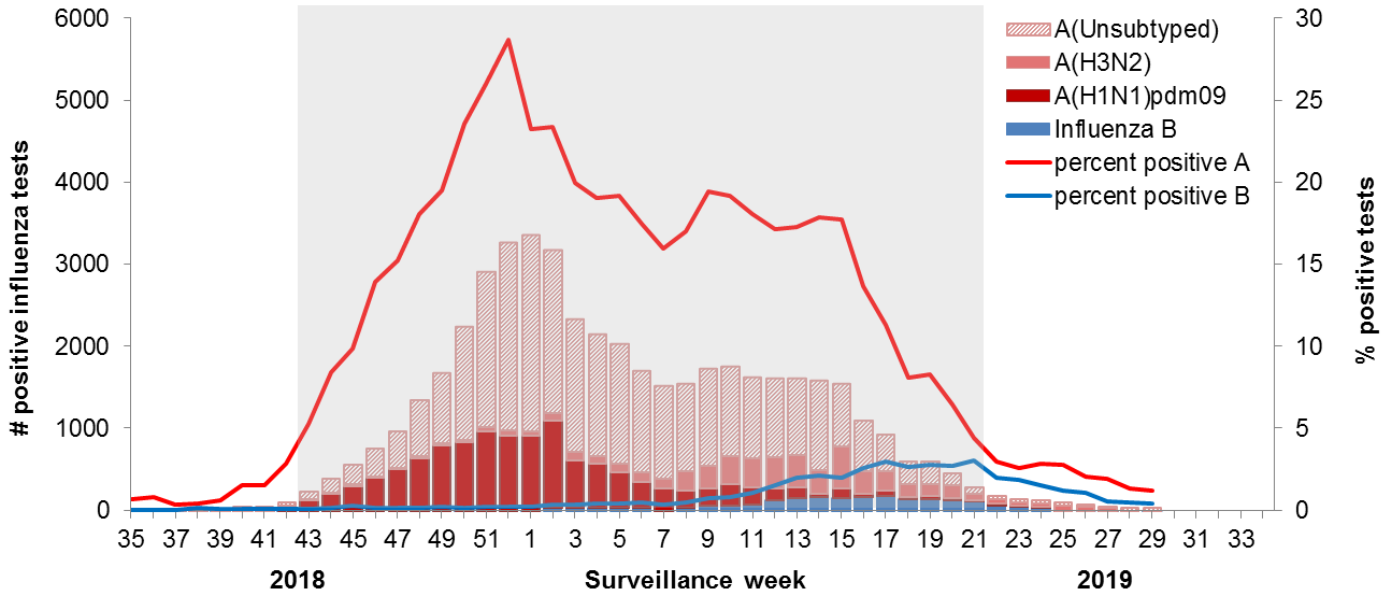
- 95% have been influenza A. Overall, among the 16,528 influenza A viruses subtyped this season, 69% have been A(H1N1)pdm09.
- In the earlier part of the season (weeks 43-7) influenza A(H1N1)pdm09 was the predominant circulating subtype, followed by a smaller late-season wave of influenza A(H3N2) (weeks 8-21).
- Fewer influenza B detections have been reported this season compared to recent seasons.

To date this season, detailed information on age and type/subtype has been received for 39,111 laboratory-confirmed influenza cases (Table 1):

- 83% of all influenza A(H1N1)pdm09 detections have been reported in individuals younger than 65 years of age.
- 58% 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 2019-29



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.

Data for week 14 excludes subtyping results from one jurisdiction due to batch reporting of subtype information. The results for week 14 should be interpreted with caution.

Figure 3 – Cumulative numbers of positive influenza specimens by type/subtype and province/territory, Canada, weeks 2018-35 to 2019-29

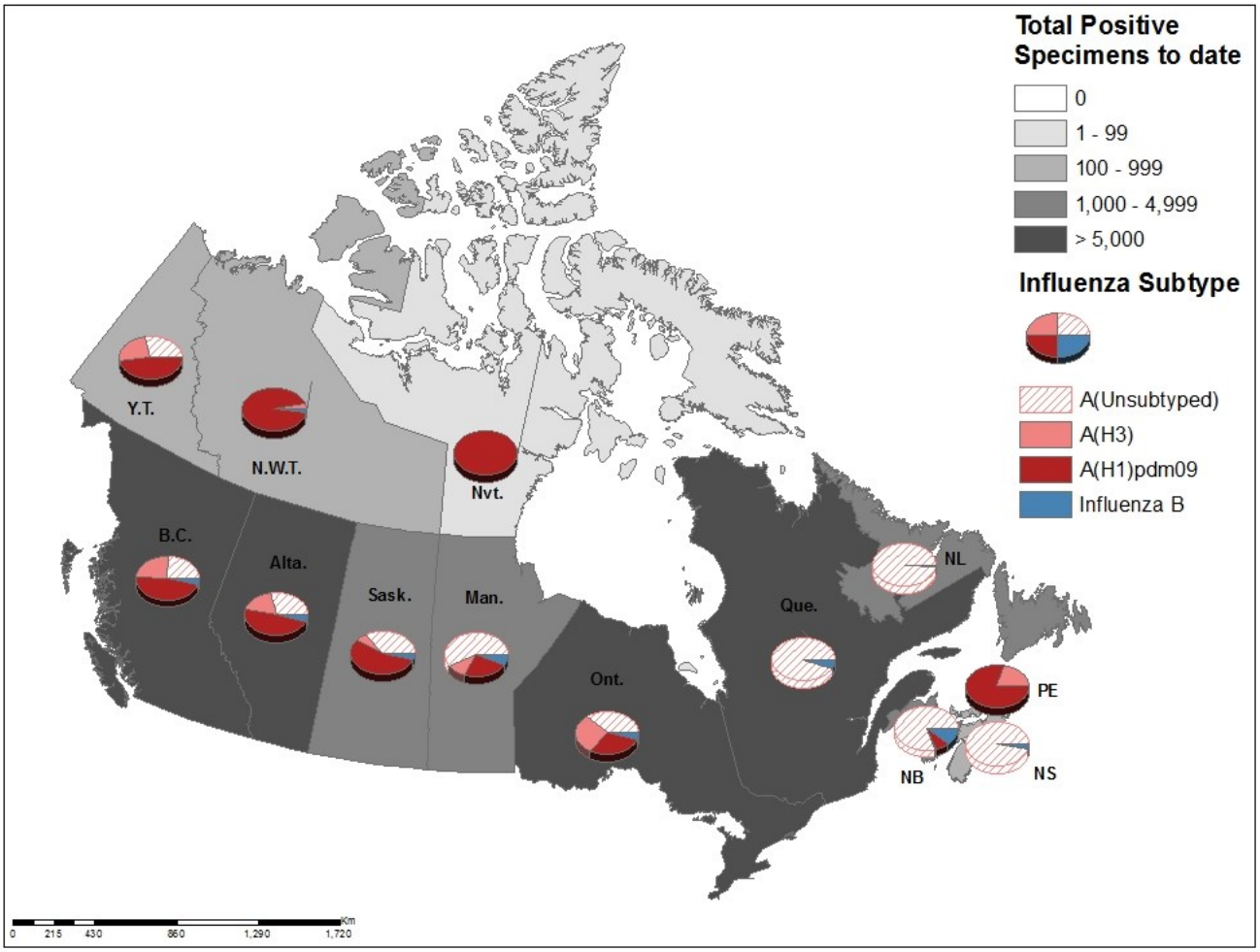


Table 1 – Cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting, Canada, weeks 2018-35 to 2019-29

Age groups (years)	Cumulative (August 26, 2018 to July 20, 2019)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1N1) pdm09	A(H3N2)	A (UnS)[1]	Total	#	%
0-4	6790	1694	275	4821	376	7166	18%
5-19	5196	1393	505	3298	631	5827	15%
20-44	6973	2028	655	4290	428	7401	19%
45-64	7118	1985	716	4417	142	7260	19%
65+	11183	1494	2924	6765	274	11457	29%
Total	37260	8594	5075	23591	1851	39111	100%

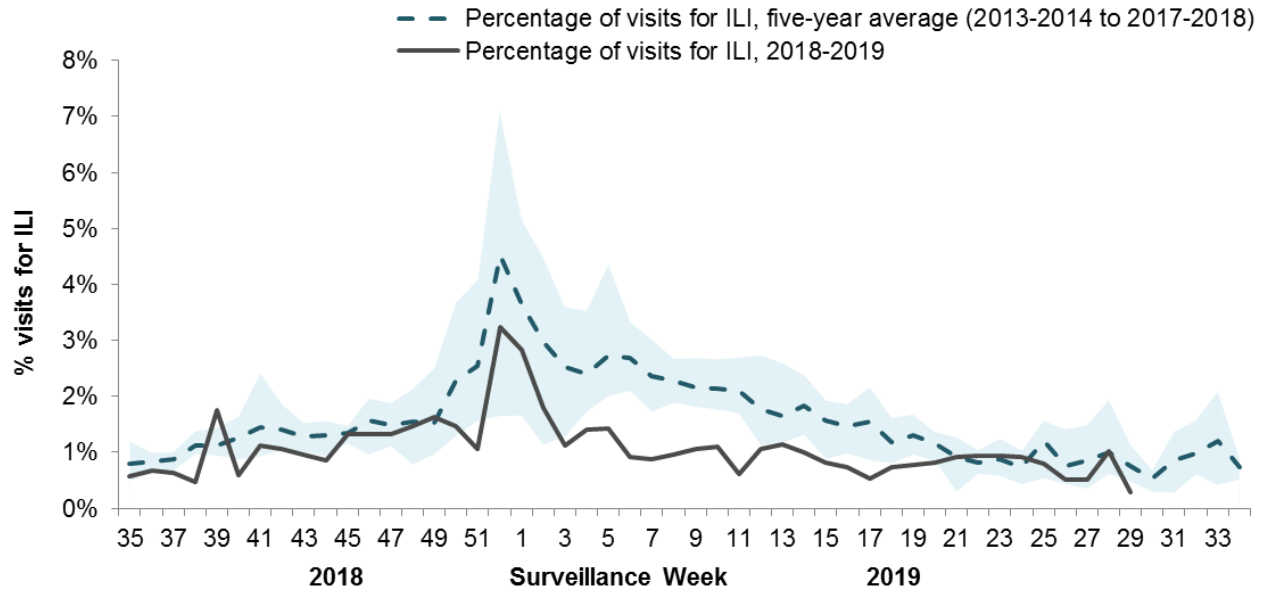
[1]UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Syndromic / Influenza-like Illness Surveillance

Healthcare Practitioners Sentinel Syndromic Surveillance

In week 29, 0.3% 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 2019-29
Number of Sentinels Reporting in Week 29: 77

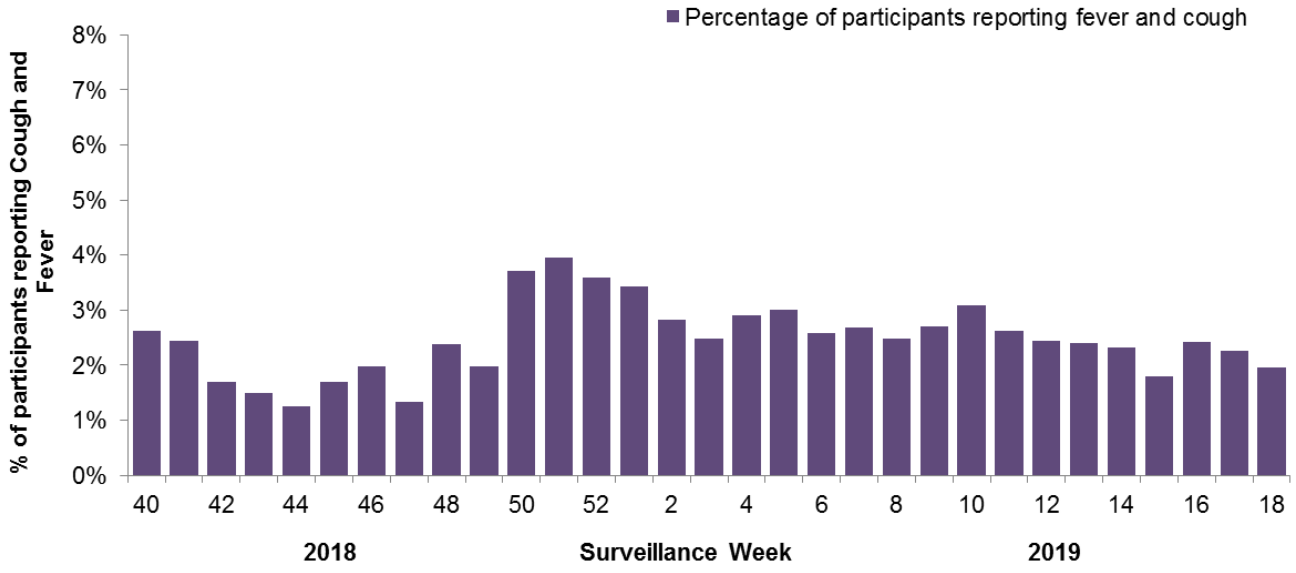


The shaded area represents the maximum and minimum percentage of visits for ILI reported by week from seasons 2013-2014 to 2017-2018

Participatory Syndromic Surveillance

FluWatchers surveillance has ended for the 2018-19 influenza season. On average 2,097 participants reported to FluWatchers each week, resulting in 64,672 questionnaires completed this season. The proportion of participants reporting fever and cough peaked in week 51 at 3.9% (Figure 5). Approximately 63% of FluWatchers participants reported being vaccinated for influenza in the 2018-19 season.

Figure 5 – Percentage of participants reporting cough and fever, Canada, weeks 2018-40 to 2019-18
Number of Participants Reporting in Week 18: 1,951



Influenza Outbreak Surveillance

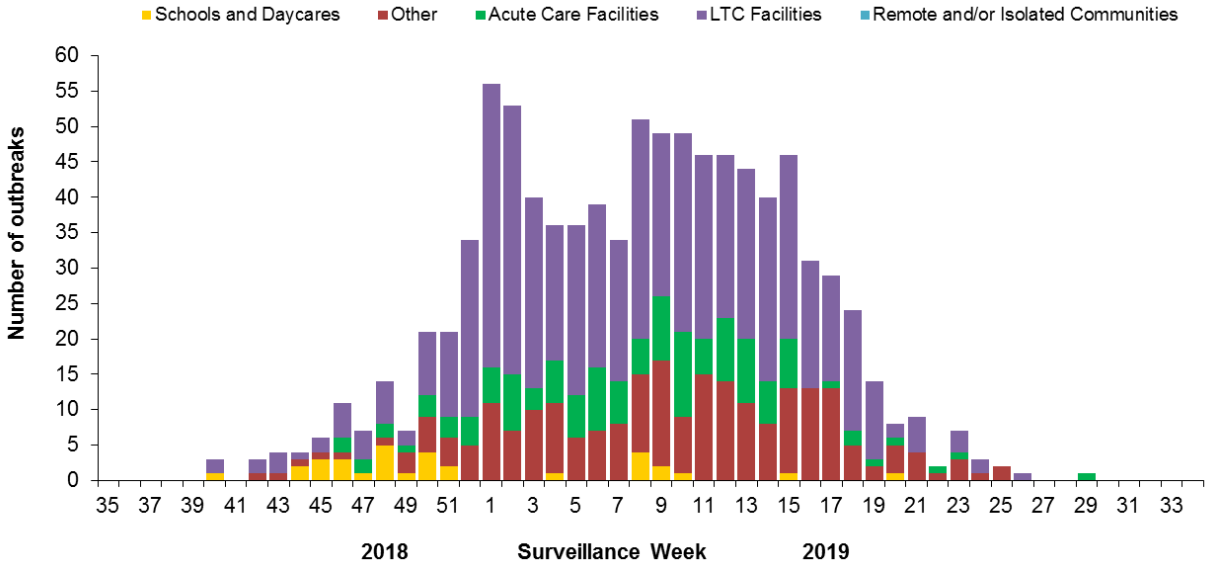
In weeks 26 to 29, two new laboratory-confirmed influenza outbreaks were reported: one in a long-term care facility (LTCF) (1) and one in an acute care facility(1). Both outbreaks were associated with influenza A.

To date this season, 931 laboratory-confirmed influenza outbreaks have been reported (Figure 6):

- 545 (59%) outbreaks were in LTCF, 32 were in schools and daycares, 130 in acute care facilities, and 224 were in other settings.
- Among the 844 outbreaks for which the influenza type was available, 98% (824) were associated with influenza A.
- Among the 387 outbreaks for which the influenza A subtype was available, 65% (253) were associated with influenza A(H3N2);

To date this season, 176 ILI outbreaks have been reported; 108 occurred in LTCF, 62 in schools, five in acute care facilities, and one in other settings.

Figure 6 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2018-35 to 2019-29



Severe Outcomes Influenza Surveillance

Provincial/Territorial Influenza Hospitalizations and Deaths

To date this season, 3,634 influenza-associated hospitalizations have been reported by participating provinces and territories[1].

Hospitalizations (Table 2):

- 96% (3,503) were associated with influenza A
- Among the 2,135 cases for which the influenza subtype was available, 1,453 (68%) 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 613 ICU admissions and 221 deaths have been reported.
    - 38% (241) of reported ICU admissions were in adults aged 45-64 years.
    - 97% (595) of ICU admissions were associated with influenza A.
    - All but four 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[1], Canada, weeks 2018-35 to 2019-29

Age Groups (years)	Cumulative (August 26, 2018 to July 20, 2019)		
	Influenza A	Influenza B	Rate per 100,000 population
0-4	422	39	96.9
5-19	266	34	21.6
20-44	386	20	14.9
45-64	857	15	40.1
65+	1572	23	131.1
Total	3503	131	
	96.4%	3.6%	

[1]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

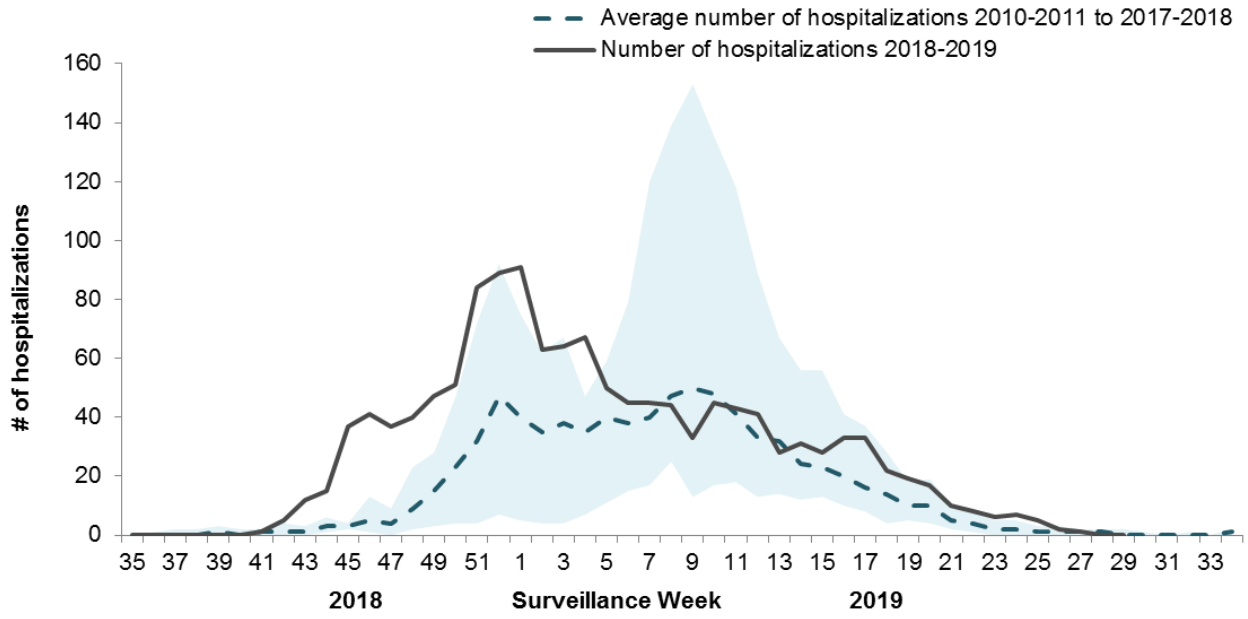
To date this season, 1,340 pediatric hospitalizations have been reported (Figure 7 & 8):

- 66% of cases were in children under 5 years of age.
- 91% (1,217) of cases have been associated with influenza A.
- Among the 384 cases for which the influenza subtype was available, 307 (80%) were associated with A(H1N1)pdm09.

To date this season, 265 ICU admissions, and 10 deaths have been reported.

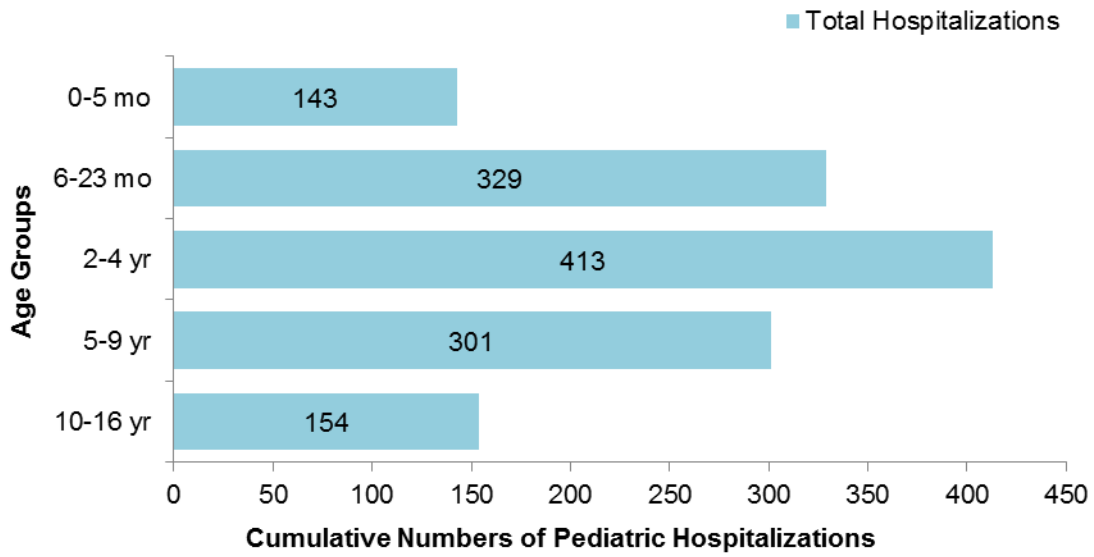
- 60% (158) of ICU admissions were in children under 5 years of age.
- 92% (244) of ICU admissions have been associated with influenza A; 81% of the 108 cases for which the influenza A subtype was available were associated with A(H1N1)pdm09.
- 80% (8) of deaths occurred in children 2 to 4 years of age.
- All deaths have been associated with influenza A.

Figure 7 – Number of pediatric (≤16 years of age) hospitalizations reported by the IMPACT network, by week, Canada, weeks 2018-35 to 2019-29



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 2019-29



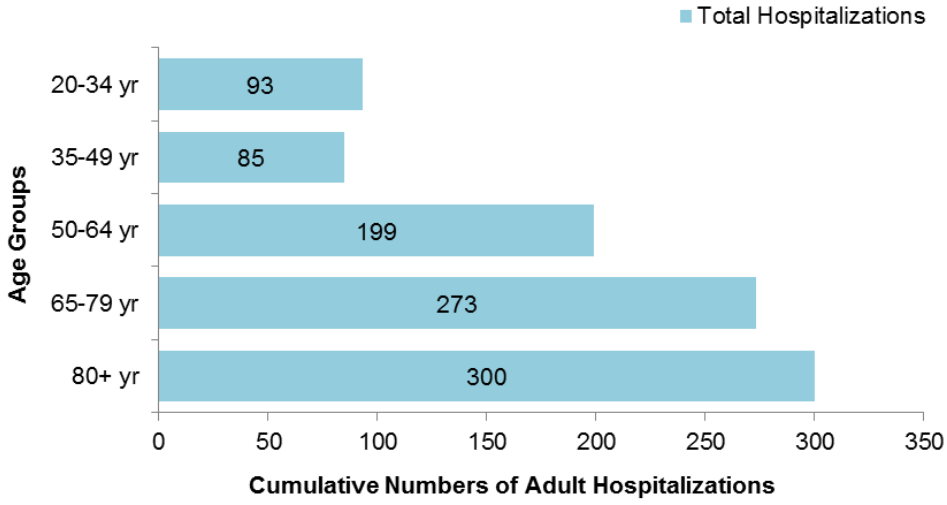
Adult Influenza Hospitalizations and Deaths

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 and ended May 30th for the 2018-19 season.

This season, 950 hospitalizations, 127 ICU admissions and 57 deaths have been reported (Figure 9):

- 876 (92%) hospitalizations were associated with influenza A.
- A greater proportion of hospitalizations have been reported among adults ≥65 years of age (60%) compared to adults <65 years of age (40%).
- Among the 208 cases for which the influenza subtype was available, 107 (51%) 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 88% 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 2019-25



Influenza Strain Characterizations

From September 1, 2018 to July 20, 2019, the National Microbiology Laboratory (NML) has characterized 2,526 influenza viruses (639 A(H3N2), 1,652 A(H1N1) and 235 B) that were received from Canadian laboratories.

Genetic Characterization of Influenza A(H3N2):

270 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.
- 241 viruses belonged to subclade 3C.2a1.
- 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.

Antigenic Characterization:

Influenza A (H3N2):

- 207 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.
- 162 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.
- 200 influenza A(H3N2) viruses characterized belonged to genetic group 3C.3a, 140 viruses to 3C.2a1. and 20 viruses belonged to genetic group 3C.2a . Sequencing is pending for the remaining isolates.

Influenza A(H1N1):

- 1,608 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.
- 44 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).

- 45 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.
- 164 viruses showed reduced titer with ferret antisera raised against cell culture-propagated B/Colorado/06/2017. Sequence analysis showed that 158 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.

Antiviral Resistance

Antiviral Resistance – Amantadine:

519 influenza A (121 A(H3N2) and 380 A(H1N1)) viruses were tested for resistance to amantadine and it was found that:

- All 519 influenza A viruses were resistant to amantadine.

Antiviral Resistance – Oseltamivir:

1,431 influenza viruses (214 A(H3N2), 1,080 A(H1N1) and 137 B) were tested for resistance to oseltamivir and it was found that:

- All 214 A(H3N2) viruses were sensitive to oseltamivir.
- Of the 1,080 A(H1N1) viruses tested, 1,076 were sensitive to oseltamivir and four viruses were resistant to oseltamivir with a H275Y mutation.
- All 137 B viruses were sensitive to oseltamivir.

Antiviral Resistance – Zanamivir:

1,429 influenza viruses (214 A(H3N2), 1,078 H1N1 and 137 B) were tested for resistance to zanamivir and it was found that:

- All 1,429 influenza viruses were sensitive to zanamivir.

Vaccine Monitoring

Vaccine monitoring refers to activities related to the monitoring of influenza vaccine coverage and effectiveness.

Vaccine Coverage

The Seasonal Influenza Immunization Coverage Survey is an annual telephone survey conducted between January and February that collects information related to the influenza vaccine in Canada. This survey measures vaccine coverage, which is the percentage of people who received the annual seasonal influenza vaccine in a specific influenza season.

In the 2018-19 influenza season, coverage was:

- 34% among adults aged 18 to 64 years.
    - 31% among adults aged 18-64 without chronic diseases.
    - 43% among adults aged 18 to 64 years with chronic diseases.
- 70% among seniors (aged 65 years and older).

Table 3 – Influenza vaccine coverage among adults (≥ 18 years of age) by age group, gender and chronic disease[1], Seasonal Influenza Vaccination Coverage Survey, Canada, September 2018-February 2019

	Male		Female		Combined	
Age group (years)	Total	Vaccine Coverage (%)	Total	Vaccine Coverage (%)	Total	Vaccine Coverage (%)
All adults (≥18)	1568	36.6	2150	46.8	3726	41.8
18-64	1252	28.6	1640	39.9	2898	34.3
without chronic diseases	*948*	*25.8*	*1171*	*36.1*	*2124*	*30.8*
with chronic diseases	*304*	*36.3*	*465*	*48.5*	*770*	*42.8*
≥65	316	69.0	510	70.9	828	69.9

[1]Excluded from stratified analysis: eight people who did not disclose their gender and four people (18-64 years old) who did not disclose whether they had any chronic diseases.

Vaccine Effectiveness

Vaccine effectiveness (VE) is a measure of how well the influenza vaccine is able to prevent influenza illness. Throughout the influenza season, surveillance networks estimate how well the influenza vaccine is working. Estimates can vary depending on several factors such as the study methods; the population, setting and outcomes that are being studied; the type and mix of vaccine products; the stage of the season and the kinds of influenza viruses that are circulating when the study is conducted.

The community-based Canadian Sentinel Practitioner Surveillance Network (SPSN) published an interim VE estimate in January 2019 for A(H1N1)pdm09. Subsequently, given an atypical late-season wave of influenza A(H3N2),SPSN has undertaken an additional interim analysis to assess effectiveness of the 2018/19 influenza vaccine against medically-attended outpatient A(H3N2) illness. Vaccine effectiveness (VE) monitoring methods and results are available at the SPSN website.

Based on data collected as of March 30th, 2019 from more than 2800 patients from B.C., Alta., Ont., and Que., the 2018/19 northern hemisphere vaccine effectiveness has varied depending on the strain.

- **A(H1N1)pdm09**: In the first interim analysis, VE against A(H1N1)pdm09 was 72% (95% CI: 60 to 81) overall, with substantial protection observed in all age groups. In the most recent analysis as of March 30th, estimates against A(H1N1)pmd09 have remained stable at approximately 70%.
- **A(H3N2)**: In the most recent analysis, VE against A(H3N2) was 23% (95% CI: -9 to 46) overall. As the confidence interval crosses zero, this estimate does not provide evidence of vaccine protection against medically-attended outpatient A(H3N2) illness.

The SPSN continues to monitor and will further update VE estimates at end of season.

Provincial and International Surveillance Links

- Alberta – Influenza Surveillance
- British Columbia – Influenza Surveillance; Vaccine Effectiveness Monitoring
- 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.