

January 14 to 20, 2018 (Week 03)

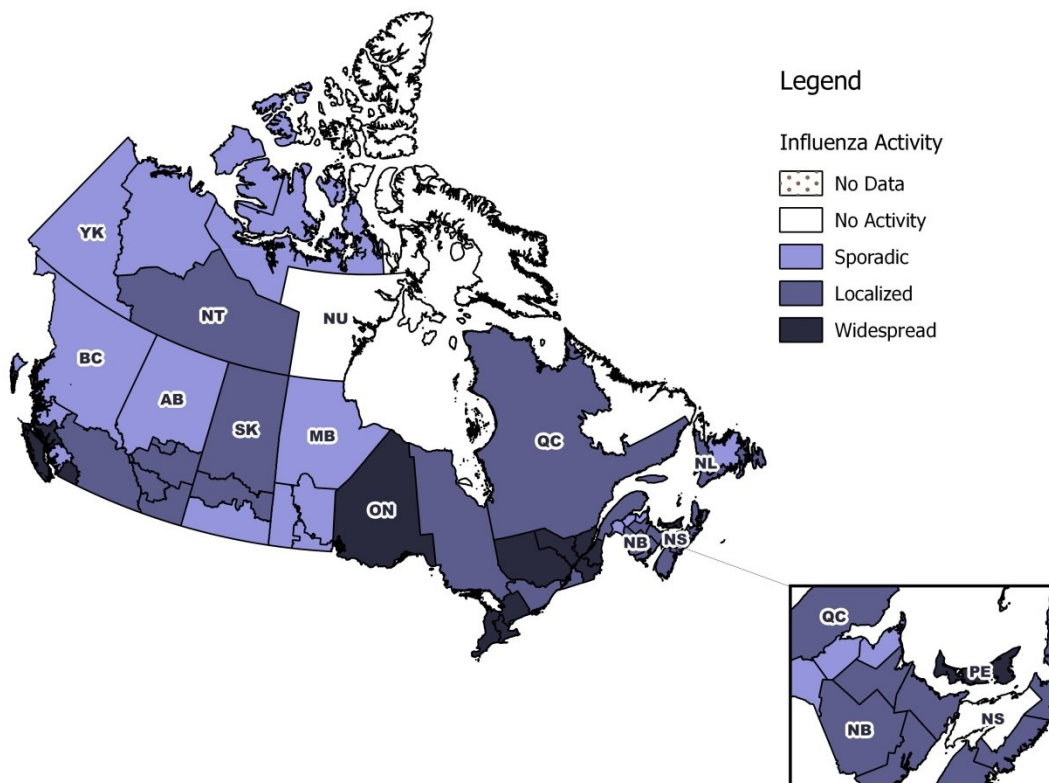
## Overall Summary

- Overall, influenza activity in Canada remains high but there is some indication that activity is starting to slow down.
- Most indicators remain in the higher range of expected levels for this time of year.
- In week 3, the percentage of laboratory test positive for influenza B continued to increase while the percentage of laboratory test positive for influenza A remained stable.
- The majority of influenza detections continue to be A(H3N2), although 40% of detections were influenza B in week 03.
- To date this season, the majority of lab confirmations, hospitalizations and deaths have been among adults 65 years of age and older.
- For more information on the flu, see our [Flu\(influenza\)](#) web page.

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

In week 03, a similar number of regions reported localized or widespread influenza activity compared to the previous week. Among the 53 regions reporting data for week 03, 11 regions (BC(2), ON(4), QC(4), and PE (1)) reported widespread activity, and 23 regions (BC(1), AB(4), SK(2), MB(1), ON(3), QC(2), NB(4), NS(3), NL(2), and NT(1)) reported localized activity.

Figure 1 – Map of overall influenza/ILI activity level by province and territory, Canada, week 2018-03



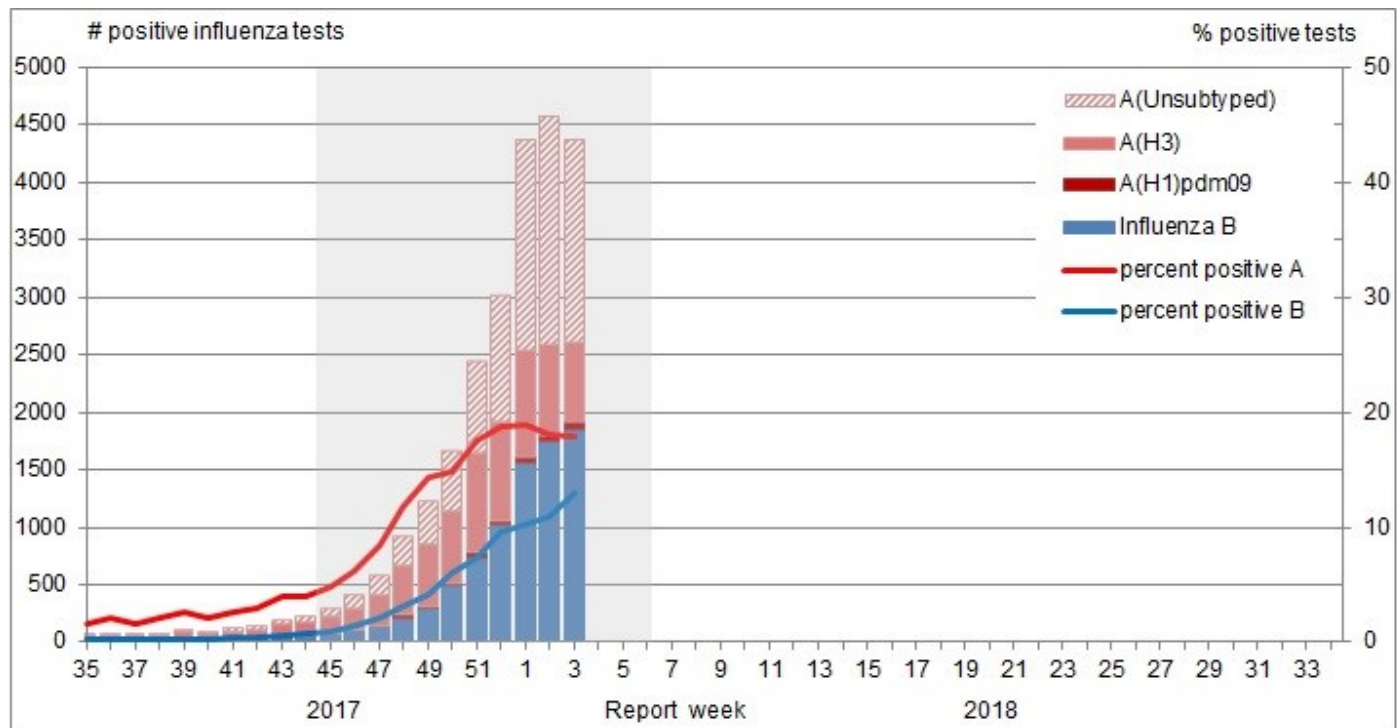
## Laboratory-Confirmed Influenza Detections

In week 03, the percentage of tests positive for influenza increased slightly from 29% in week 02 to 31% in week 03. This increase is mainly driven by influenza B activity: the percentage of test positive for influenza B increased from 11% in week 02 to 13% in week 03. Influenza B detections to date are higher than has been observed over the past seven seasons.

The percentage of test positive for influenza A remained stable at 18% since week 02. The stabilization of influenza A detections over the past two weeks may indicate that the peak of the season for influenza A detections occurred in week 01.

The number (2,533) and percentage (18%) of influenza A detections for week 03 are within the range of expected levels for this time of year. The number (1,835) and percentage of tests (13%) positive for influenza B in week 03 continue to be well above expected levels for this time of year. For data on other respiratory virus detections, see the [Respiratory Virus Detections in Canada Report](#).

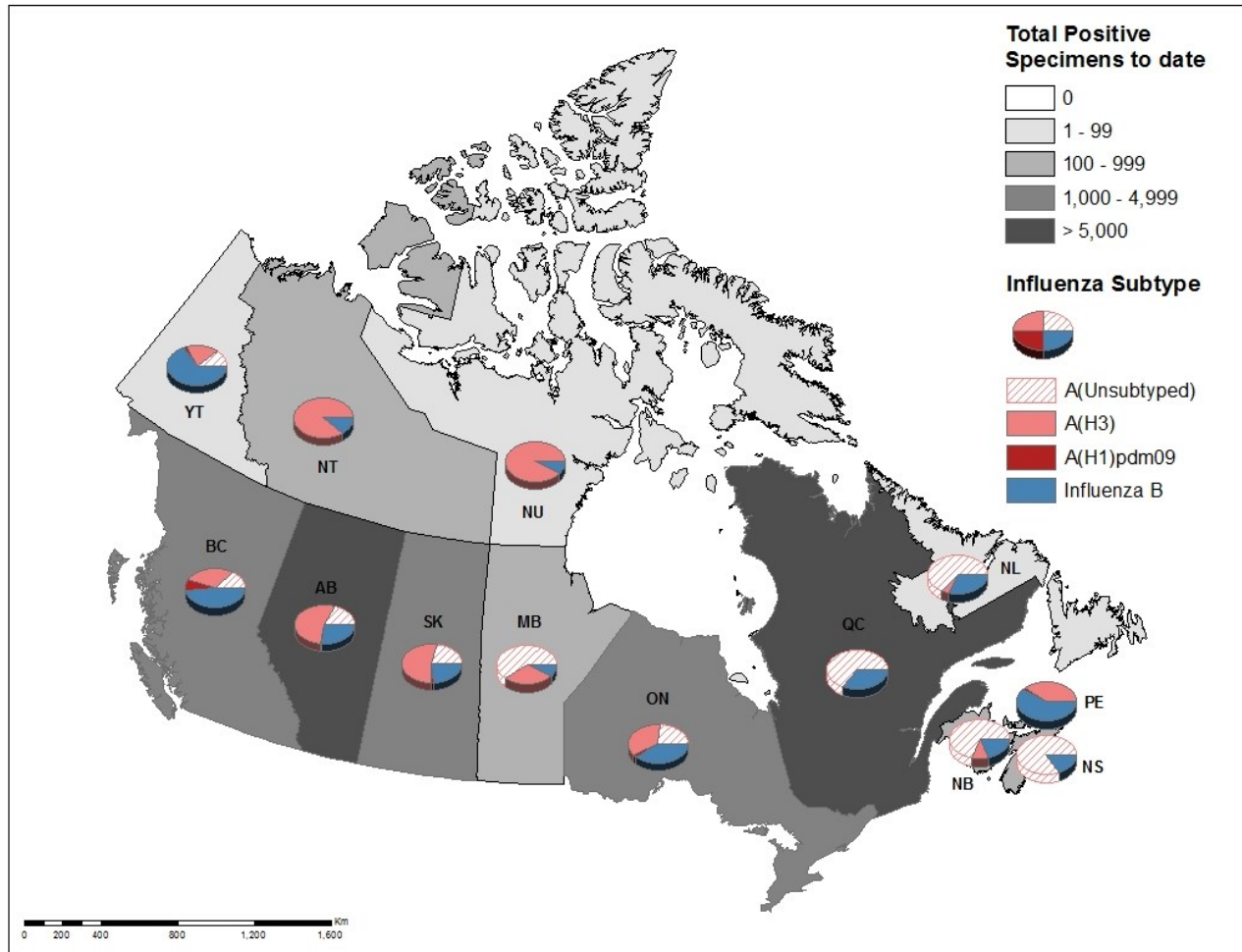
**Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, weeks 2017-35 to 2018-03**



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](#).

To date this season, 24,749 laboratory-confirmed influenza detections have been reported, of which 67% have been influenza A. Influenza A(H3N2) has been the most common subtype detected this season, representing 94% of subtyped influenza A detections. 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 3 – Cumulative numbers of positive influenza specimens by type/subtype and province/territory, Canada, weeks 2017-35 to 2018-03**



To date this season, detailed information on age and type/subtype has been received for 21,369 laboratory-confirmed influenza cases (Table 1). Among all influenza cases with reported age and type/subtype information, 50% have been reported in adults 65 years of age and older. Among cases of influenza A(H3N2), adults 65 years of age and older represented 53% of cases. Cases of influenza B this season were distributed more evenly across all age-groups, but the largest proportion of cases was still among adults 65 years of age and older (46%), followed by adults 45-64 years of age (22%).

**Table 1 – Cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting, Canada, weeks 2017-35 to 2018-03**

Age groups (years)	Cumulative (August 27, 2017 to January 20, 2018)						
	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS) <sup>1</sup>	Total	#	%
0-4	1208	64	469	675	391	1599	7%
5-19	1117	55	512	550	808	1925	9%
20-44	2323	101	1001	1221	971	3294	15%
45-64	2436	88	1059	1289	1522	3958	19%
65+	7454	47	3475	3932	3139	10593	50%
<b>Total</b>	<b>14538</b>	<b>355</b>	<b>6516</b>	<b>7667</b>	<b>6831</b>	<b>21369</b>	<b>100%</b>

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

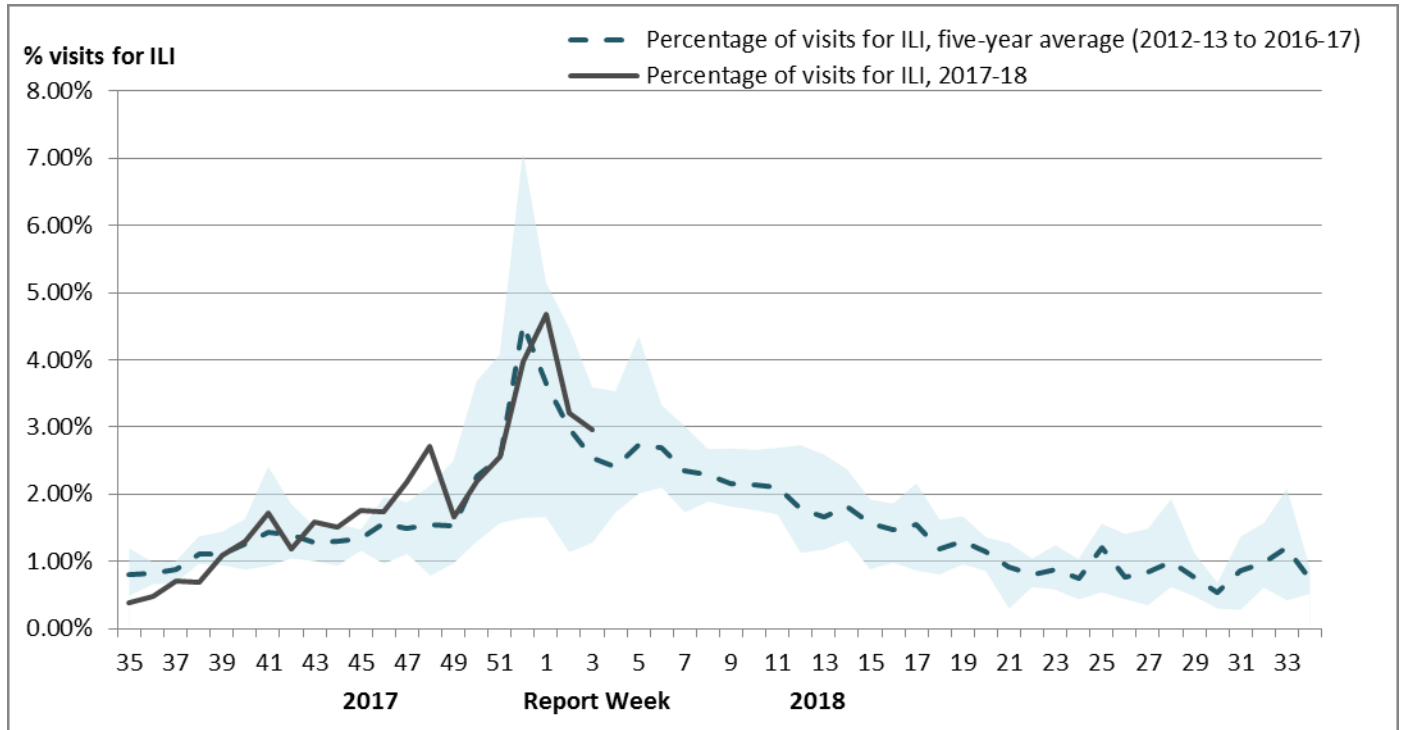
## Syndromic / Influenza-like Illness Surveillance

### Healthcare Practitioners Sentinel Syndromic Surveillance

In week 03, 3% of visits to healthcare professionals were due to influenza-like illness (ILI); a decrease compared to the previous week, and slightly above the 5-year average.

**Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, weeks 2017-35 to 2018-03**

Number of Sentinels Reporting in Week 03: 153



The shaded area represents the maximum and minimum percentage of visits for ILI reported by week from seasons 2012-13 to 2016-17

### Participatory Syndromic Surveillance

FluWatchers is a participatory ILI surveillance system that relies on weekly voluntary submissions of syndromic information from Canadians across Canada.

In week 03, 1,469 participants reported to FluWatchers, of which 5% reported symptoms of cough and fever, and 31% of these consulted a healthcare professional. Among participants who reported cough and fever, 90% reported days missed from work or school, resulting in a combined total of 223 missed days of work or school.

**Table 2 – Summary of influenza-like illness symptoms reported by participating Canadians, Canada, week 2018-03**

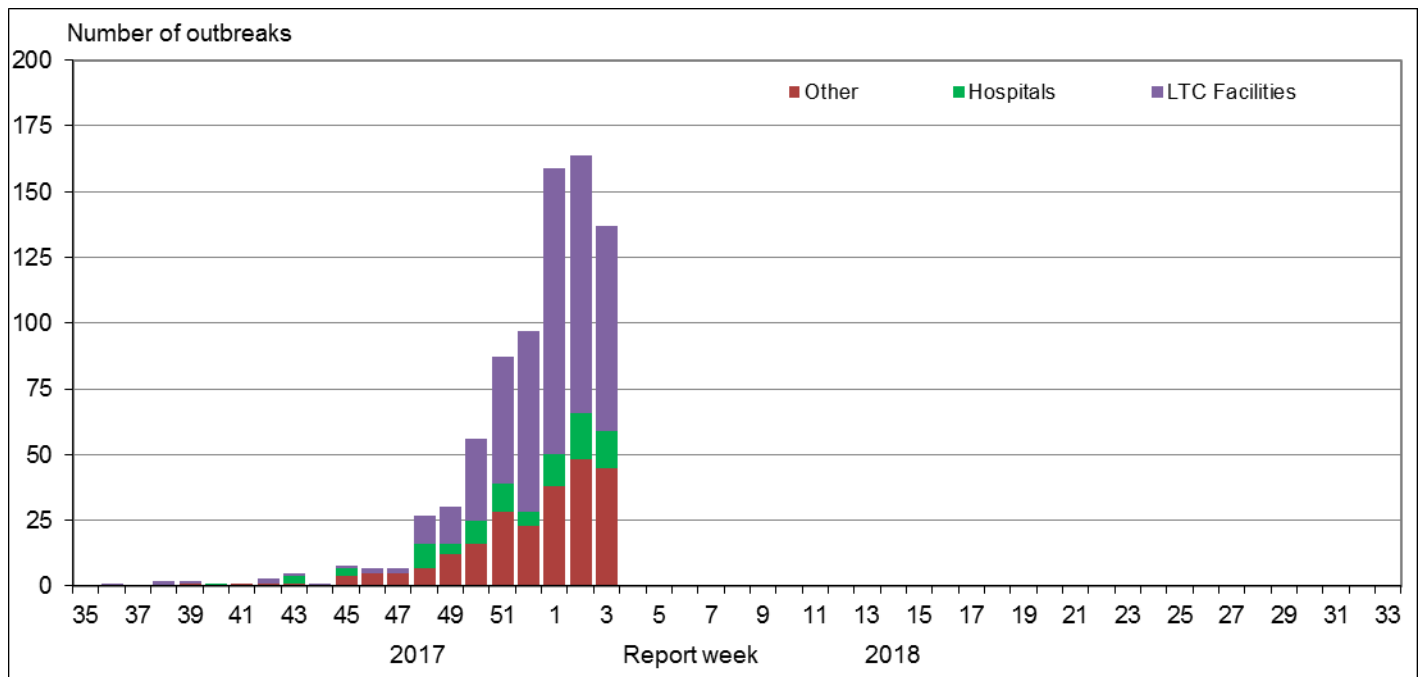
Number of Participants Reporting	Percentage participants reporting Cough and Fever	Percentage of participants with cough and fever who consulted a healthcare professional	Percentage of participants with cough and fever who reported missed days from work or school	Number of missed days from work or school
1469	5%	31%	90%	223

## Influenza Outbreak Surveillance

In week 03, the number of reported laboratory-confirmed outbreaks of influenza decreased compared to the previous week. In week 03, 137 new influenza outbreaks were reported: 78 in long-term care facilities, 14 in hospitals, and 45 in other settings. In addition, one ILI outbreak was reported in a school. Among the 129 outbreaks with influenza type/subtype reported, 52 (40%) were associated with influenza B, and 72 were associated with influenza A, of which 22 were influenza A(H3N2) and 50 influenza A(unsubtyped). Five outbreaks were associated with a mix of influenza A and B.

To date this season, 802 influenza/ILI outbreaks have been reported, of which 471 (59%) occurred in LTC facilities. Among the 696 outbreaks for which the influenza type/subtype was reported, 436 were associated with influenza A (of which 197 were A(H3N2), 238 were A(unsubtyped) and one was A(H1N1)pdm09), 232 were associated with influenza B, and 28 were associated with a mix of A and B. Compared to recent influenza A(H3N2) seasons at week 03, the number of cumulative outbreaks reported this season has been greater than during the 2016-17 and 2012-13 seasons, and lower compared to the 2014-15 season.

**Figure 5 – Number of new outbreaks of laboratory-confirmed influenza by report week, Canada, weeks 2017-35 to 2018-03**



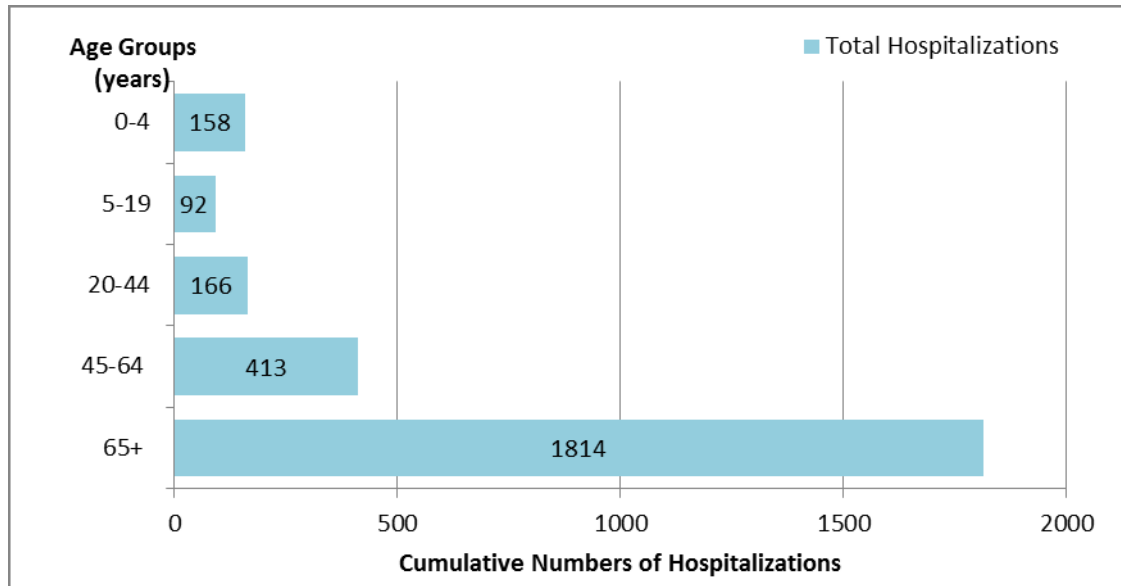
## Severe Outcomes Influenza Surveillance

### Provincial/Territorial Influenza Hospitalizations and Deaths

In week 03, 182 influenza-associated hospitalizations were reported by participating provinces and territories<sup>1</sup>. In keeping with the early influenza activity this season, the number of hospitalizations is considerably elevated relative to the same period in the previous two seasons.

To date this season, 2,643 influenza-associated hospitalizations have been reported, 80% of which were associated with influenza A, and 1,814 cases (69%) were in adults 65 years of age or older. To date, 241 ICU admissions and 110 deaths have been reported.

**Figure 6 - Cumulative numbers of hospitalizations by age-group reported by participating provinces and territories<sup>1</sup>, weeks 2017-35 to 2018-03**



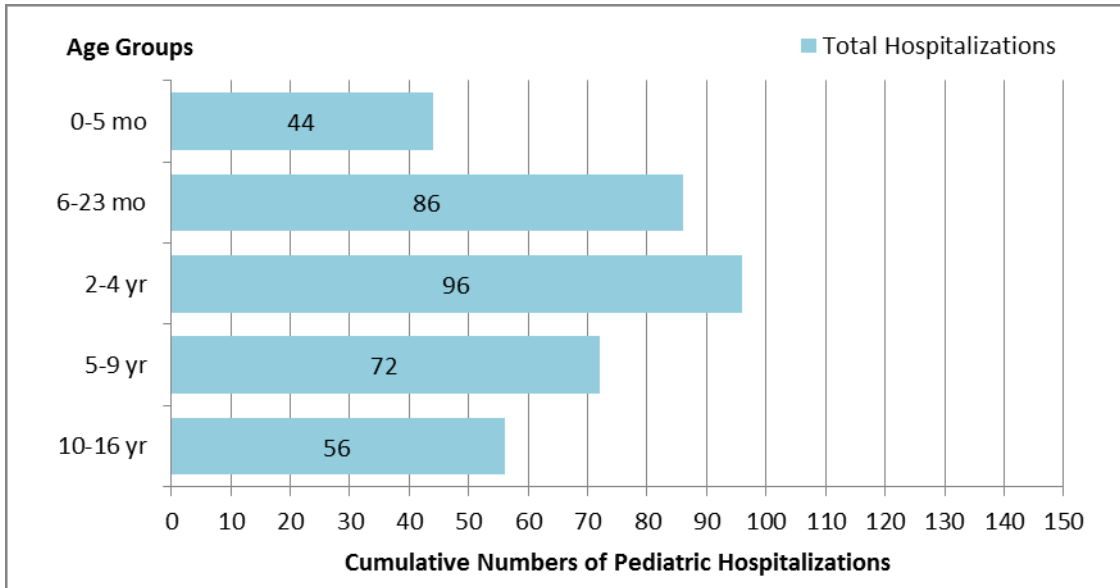
<sup>1</sup>Influenza-associated hospitalizations are reported by NL, PE, NS, NB, MB, AB, YT and NT. Only hospitalizations that require intensive medical care are reported by SK.

### Pediatric Influenza Hospitalizations and Deaths

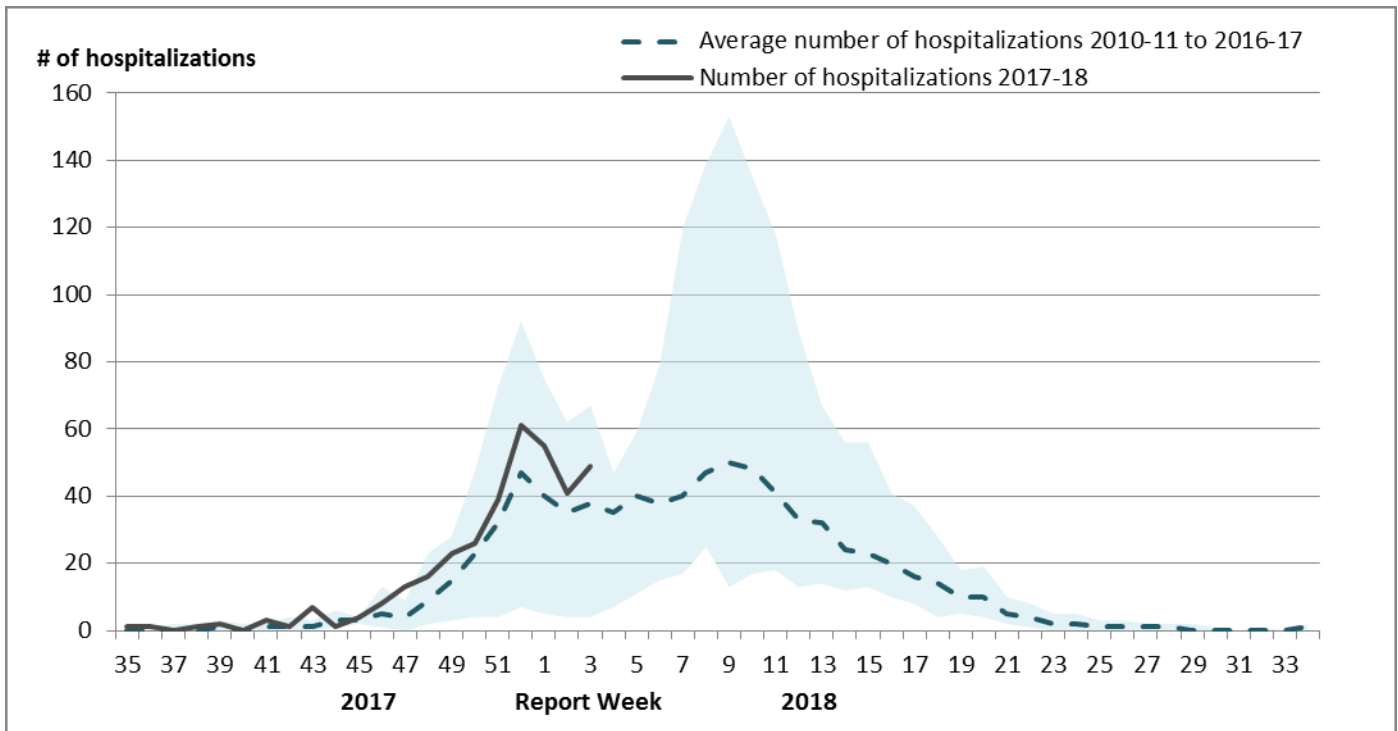
In week 03, the number of laboratory-confirmed influenza-associated pediatric ( $\leq 16$  years of age) hospitalizations reported by the Immunization Monitoring Program Active (IMPACT) network increased compared to the previous week. In week 03, 49 hospitalizations were reported, of which 40 (82%) were due to influenza A. The number of weekly hospitalizations has been above the seven-season average since week 45, but following seasonal patterns.

To date this season, 354 pediatric hospitalizations have been reported by the IMPACT network, 250 (71%) of which were associated with influenza A. Fifty-eight ICU admissions and fewer than five deaths have been reported. Compared to the cumulative number of pediatric hospitalizations reported up to week 03 during recent influenza A(H3N2)-dominant seasons, the cumulative number of pediatric hospitalizations reported this season has been greater than the 2016-17 season, but below the 2014-15 and 2012-13 seasons.

**Figure 7 - Cumulative numbers of pediatric hospitalizations ( $\leq 16$  years of age) with influenza by type and age-group reported by the IMPACT network, Canada, weeks 2017-35 to 2018-03**



**Figure 8 – Number of pediatric hospitalizations ( $\leq 16$  years of age) with influenza reported by the IMPACT network, by week, Canada, weeks 2017-35 to 2018-03**



The shaded area represents the maximum and minimum number of cases reported by week from seasons 2010-11 to 2016-17

## Influenza Strain Characterizations

During the 2017-18 influenza season, the National Microbiology Laboratory (NML) has characterized 583 influenza viruses [318 A(H3N2), 42 A(H1N1)pdm09 and 223 B viruses] that were received from Canadian laboratories.

### Antigenic Characterization

Among influenza viruses characterized by hemagglutination inhibition assay during the 2017-18 season, most viruses were antigenically similar to the cell-culture propagated reference strains recommended by WHO.

**Table 3 – Influenza antigenic strain characterizations, Canada, weeks 2017-35 to 2018-03**

Strain Characterization Results	Count	Description
<b>Influenza A (H3N2)</b>		
A/Hong Kong/4801/2014-like	83	Viruses antigenically similar to A/Hong Kong/4801/2014, the A(H3N2) component of the 2017-18 Northern Hemisphere's trivalent and quadrivalent vaccine.
Reduced titer to A/Hong Kong/4801/2014	1	These A(H3N2) viruses reacted poorly with antisera raised against cell-propagated A/Hong Kong/4801/2014, suggesting some antigenic differences.
<b>Influenza A (H1N1)</b>		
A/Michigan/45/2015-like	42	Viruses antigenically similar to A/Michigan/45/2015, the A(H1N1) component of the 2017-18 Northern Hemisphere's trivalent and quadrivalent influenza vaccine.
<b>Influenza B</b>		
B/Brisbane/60/2008-like (Victoria lineage)	5	Viruses antigenically similar to B/Brisbane/60/2008. B/Brisbane/60/2008 is the influenza B component of the 2017-18 Northern Hemisphere's <b>trivalent</b> and <b>quadrivalent</b> influenza vaccine.
Reduced titer to B/Brisbane/60/2008 (Victoria lineage)	6	These B/Victoria lineage viruses reacted poorly with antisera raised against cell-propagated B/Brisbane/60/2008, suggesting some antigenic differences.
B/Phuket/3073/2013-like (Yamagata lineage)	212	Viruses antigenically similar to B/Phuket/3073/2013, the additional influenza B component of the 2017-18 Northern Hemisphere <b>quadrivalent</b> influenza vaccine.

### Genetic Characterization of A(H3N2) viruses

During the 2017-18 season, 234 A(H3N2) viruses did not grow to sufficient titers for antigenic characterization by HI assay. Therefore, genetic characterization was performed to determine to which genetic group they belong. Sequence analysis showed that 191 A(H3N2) viruses belonged to genetic group 3C.2a, 42 viruses belonged to subclade 3C.2a1 and one virus belonged to the clade 3C.3a.

Additionally, of the 83 influenza A(H3N2) viruses that were characterized antigenically as similar to A/Hong Kong/4801/2014, 60 belonged to genetic group 3C.2a and 11 viruses belonged to subclade 3C.2a1. The virus that showed reduced titer belonged to genetic clade 3C.3a. Sequencing is pending for the remaining 12 virus isolates.

A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A/H3N2 component of the 2017-18 Northern Hemisphere influenza vaccine.

### Genetic Characterization of Influenza B viruses

Among the viruses characterized antigenically as having reduced titer to ferret antisera produced against cell-propagated B/Brisbane/60/2008, sequence analysis showed that all six viruses had a two amino acid deletion in the HA gene.



## Antiviral Resistance

During the 2017-18 season, the National Microbiology Laboratory (NML) has tested 521 influenza viruses for resistance to oseltamivir and 516 viruses for resistance to zanamivir. All but one of the A(H1N1) viruses were sensitive to oseltamivir and all viruses were sensitive to zanamivir (Table 4).

**Table 4 – Antiviral resistance by influenza virus type and subtype, Canada, weeks 2017-35 to 2018-03**

Virus type and subtype	Oseltamivir		Zanamivir	
	# tested	# resistant (%)	# tested	# resistant (%)
<b>A (H3N2)</b>	299	0 (0%)	295	0 (0%)
<b>A (H1N1)</b>	39	1 (2.6%)	39	0 (0%)
<b>B</b>	183	0 (0%)	182	0 (0%)
<b>TOTAL</b>	521	1 (0.2%)	516	0 (0%)

Note: Since the 2009 pandemic, all circulating influenza A viruses have been resistant to amantadine, and it is therefore not currently recommended for use in the treatment of influenza. During the 2017-18 season, the subset of influenza A viruses that were tested for resistance to amantadine were resistant.

## Provincial and International Influenza Reports

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

## FluWatch Surveillance for the 2017-2018 Season – Notes and Definitions

The FluWatch report is compiled from a number of data sources. Surveillance information contained in this report is a reflection of the surveillance data available to FluWatch at the time of production. Delays in reporting of data may cause data to change retrospectively

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

Influenza/ILI activity levels, as represented on the map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, primary care consultations for ILI and reported outbreaks. ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls, and the determination of an increase is based on the assessment of the provincial/territorial epidemiologist. Maps from previous weeks, including any retrospective updates, are available in the mapping feature found in the [Weekly Influenza Reports](#).

### **Influenza/ILI Activity Level definitions**

- 1 = No activity:** no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported
- 2 = Sporadic:** sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†
- 3 = Localized:** (1) evidence of increased ILI\* ; (2) lab confirmed influenza detection(s); (3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†
- 4 = Widespread:** (1) evidence of increased ILI\*; (2) lab confirmed influenza detection(s); (3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†;

\* More than just sporadic as determined by the provincial/territorial epidemiologist.

†Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist

### **Laboratory-Confirmed Influenza Detections**

Provincial, regional and some hospital laboratories report the weekly number of tests and detections of influenza and other respiratory viruses. Provincial public health laboratories submit demographic information for cases of influenza. This case-level data represents a subset of influenza detections reported through aggregate reporting. Specimens from NT, YT, and NU are sent to reference laboratories in the provinces for testing. Cumulative data includes updates to previous weeks. Discrepancies in values in Figures 2 and 3 may be attributable to differing data sources.

### **Syndromic/Influenza-like Illness Surveillance**

FluWatch maintains a network of primary care practitioners who report the weekly proportion of ILI cases seen in their practice. Independent sentinel networks in BC, AB, and SK compile their data for reporting to FluWatch. Not all sentinel physicians report every week.

**Definition of Influenza-like-illness (ILI):** Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5 years of age, gastrointestinal symptoms may also be present. In patients under 5 or 65 years and older, fever may not be prominent.

### **Influenza Outbreak Surveillance**

Outbreaks of influenza or ILI are reported from all provinces and territories, according to the definitions below. However, reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions. All provinces and territories with the exception of NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals.

#### **Outbreak definitions:**

**Schools:** Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI.

**Hospitals and residential institutions:** two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza. Residential institutions include but are not limited to long-term care facilities (LTCF) and prisons.

**Workplace:** Greater than 10% absenteeism on any day which is most likely due to ILI.

**Other settings:** two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case of influenza; i.e. closed communities.

### **Serious Outcome Influenza Surveillance**

#### **Provincial/Territorial Influenza Hospitalizations and Deaths**

Influenza-associated hospitalizations and deaths are reported by 8 Provincial and Territorial Ministries of Health (excluding BC, NU, ON and QC). The hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting. Only hospitalizations that require intensive medical care are reported by SK.

Due to changes in participating provinces and territories, comparisons to previous years should be done with caution.

#### **Pediatric Influenza Hospitalizations and Deaths**

The Immunization Monitoring Program Active (IMPACT) network reports the weekly number of hospitalizations with influenza among children admitted to one of the 12 participating paediatric hospitals in 8 provinces. These represent a subset of all influenza-associated pediatric hospitalizations in Canada.

### **Influenza Strain Characterizations and Antiviral Resistance**

Provincial public health laboratories send a subset of influenza virus isolates to the National Microbiology Laboratory for strain characterization and antiviral resistance. These represent a subset of all influenza detections in Canada and the proportion of isolates of each type and subtype is not necessarily representative of circulating viruses.

Antigenic strain characterization data reflect the results of hemagglutination inhibition (HI) testing compared to the reference influenza strains recommended by [WHO](#). Genetic strain characterization data are based on analysis of the sequence of the viral hemagglutinin (HA) gene.

Antiviral resistance testing is conducted by phenotypic and genotypic methods on influenza virus isolates submitted to the National Microbiology Laboratory. All isolates are tested for oseltamivir and zanamivir and a subset are tested for resistance to amantadine.

**Abbreviations:** Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

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.*