

December 18 to 31, 2016 (Weeks 51 & 52)

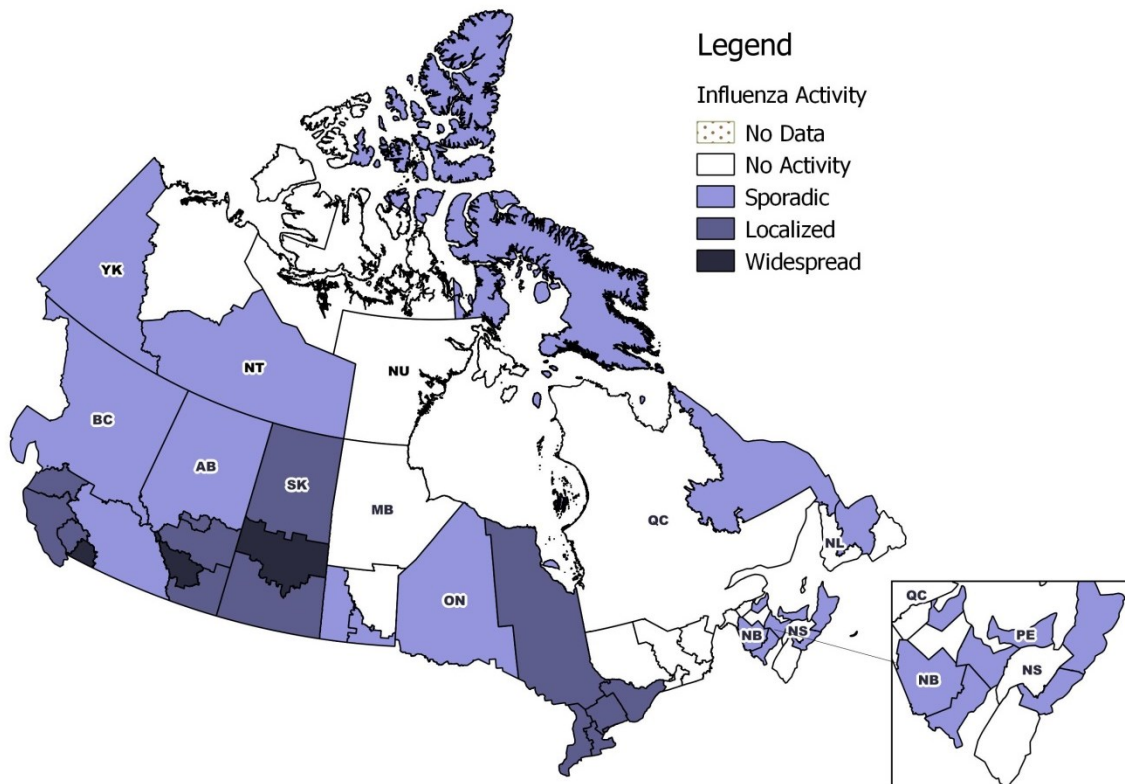
Overall Summary

- Seasonal influenza activity continues to increase in Canada, with greater numbers of influenza detections, hospitalizations and outbreaks being reported in weeks 51 and 52.
- A total of 1,948 positive influenza detections were reported in week 52. Influenza A(H3N2) continues to be the most common subtype detected.
- Seventy-one laboratory-confirmed influenza outbreaks were reported in week 52, with the majority occurring in long-term care facilities.
- Adults aged 65+ years accounted for the largest proportion of hospitalizations and deaths reported from adult sentinel networks and participating Provinces and Territories.
- Influenza activity started early this season, but so far activity has been lower than the 2014-15 season when A(H3N2) was the predominant subtype.
- For more information on the flu, see our [Flu\(influenza\)](#) web page.

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

In week 52, a total of 18 regions in Canada reported no influenza activity. Sporadic influenza activity was reported in 19 regions across all provinces and territories except QC and SK. Localized activity was reported in 13 regions across four provinces (ON, SK, AB and BC). Widespread activity was reported in three regions (one each in SK, AB and BC). For more details on a specific region, click on the map.

Figure 1 – Map of overall influenza/ILI activity level by province and territory, Canada, Week 52

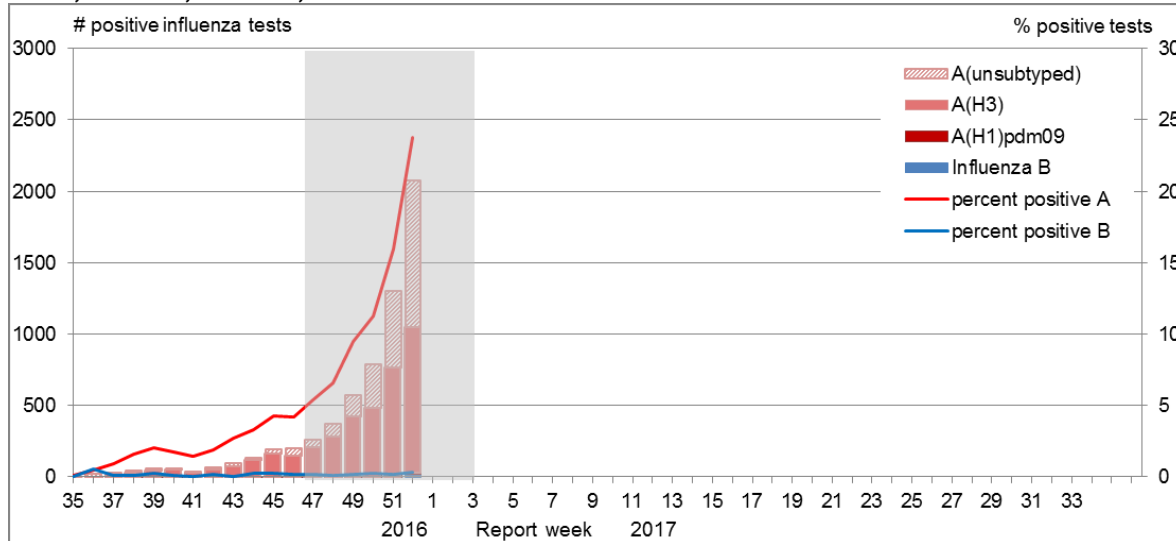


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available in the mapping feature found in the [Weekly Influenza Reports](#).

Laboratory Confirmed Influenza Detections

The percentage of tests positive for influenza increased from 16% in week 51 to 24% in week 52. Compared to the previous influenza A(H3N2)-predominant season in 2014-15, the percent positive in week 52 (24%) was lower than the percent positive reported in week 52 of the 2014-15 season (34%). For data on other respiratory virus detections, see the [Respiratory Virus Detections in Canada Report](#) on the Public Health Agency of Canada (PHAC) website.

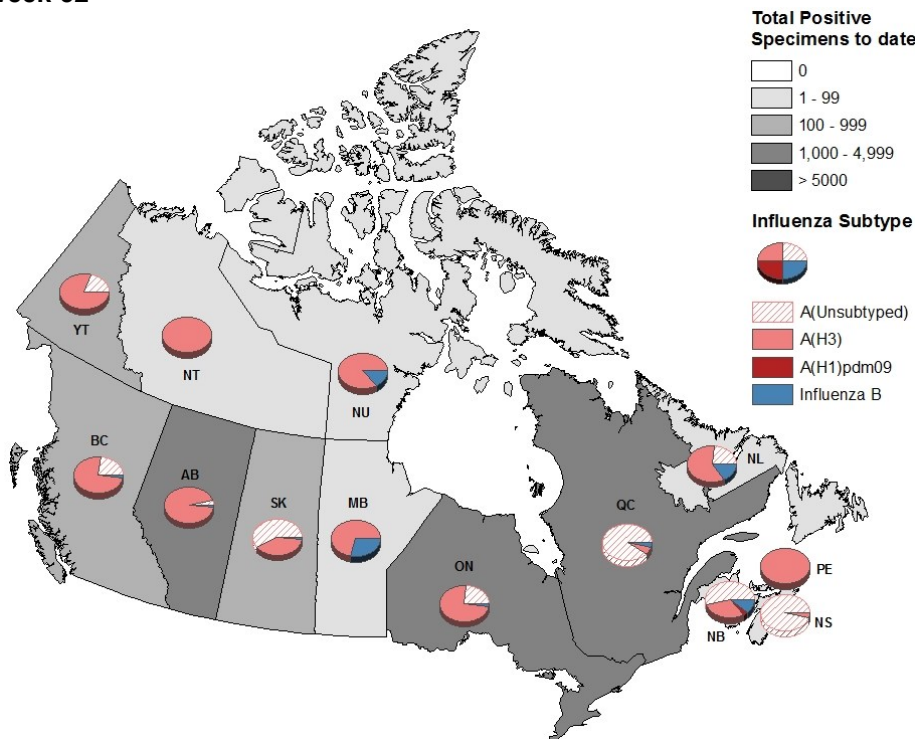
Figure 2 – Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2016-17, Week 52



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](#).

Nationally in week 52, 1,948 positive influenza tests were reported, up from 1,229 tests reported in week 51. To date, a total of 6,180 laboratory confirmed influenza detections have been reported. Influenza A(H3N2) is the most common subtype detected, representing 99% of subtyped influenza A detections (3812/3835). 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, 2016-17, Week 52



To date this season, detailed information on age and type/subtype has been received for 5,008 laboratory confirmed influenza cases. Adults aged 65+ were the age group that accounted for the largest proportion of reported influenza cases (>45%) and the largest proportion of influenza A (H3N2) cases. Compared to the cases reported in the 2014-15 season at week 52, adults aged 65+ account for a smaller proportion of cases this season (approximately 45% in 2016-17 compared to 62% in 2014-15). Adults aged 45-64 account for a greater proportion of cases this season (approximately 23% in 2016-17 compared to 12% in 2014-15).

Table 1 – Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting¹, Canada, 2016-17, Week 52

Age groups (years)	Weeks (Dec. 18 to Dec. 31, 2016)					Cumulative (Aug. 28, 2016 to Dec. 31, 2016)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS) ³		A Total	A(H1) pdm09	A(H3)	A (UnS) ³		Total	#
0-4	190	0	92	98	6	>359	<5	207	152	28	>387	x%
5-19	228	0	124	104	<5	>594	<5	430	164	21	>615	x%
20-44	325	0	190	135	<5	782	5	568	209	21	803	16%
45-64	>525	<5	273	252	9	1147	8	678	461	19	1166	23%
65+	>1056	<5	493	563	7	>2011	<5	1207	804	20	>2031	x%
Total	2327	<5	1172	1152	27	4899	19	3090	1790	109	5008	100%
Percentage²	99%	0%	50%	50%	1%	98%	0%	63%	37%	2%		

¹Table 1 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported. Cumulative data include updates to previous weeks.

²Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.

³UnS: unsubtype: The specimen was typed as influenza A, but no result for subtyping was available.

x: Suppressed to prevent residual disclosure

Specimens from NT, YT, and NU are sent to reference laboratories in the provinces

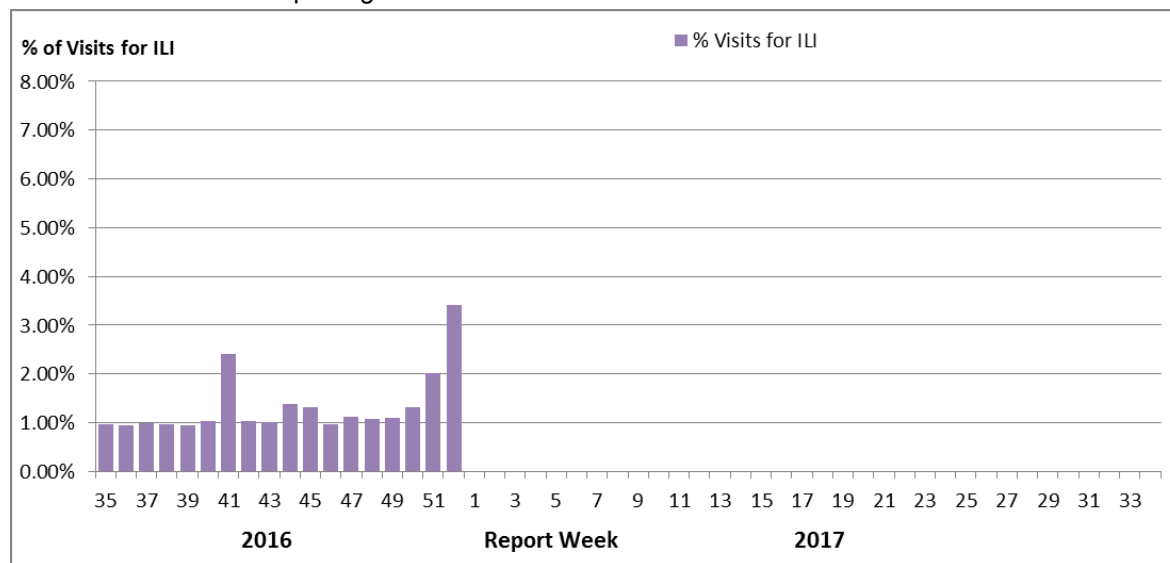
Syndromic/Influenza-like Illness Surveillance

Healthcare Professionals Sentinel Syndromic Surveillance

In week 52, 3.4% of visits to healthcare professionals were due to ILI, up from week 51 where 2.0% of visits were due to ILI.

Figure 4 – Percentage of visits for ILI reported by sentinels by report week, Canada, 2016-17

Number of Sentinels Reporting Week 52: 60



Delays in the reporting of data may cause data to change retrospectively. In BC, AB, and SK, data are compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.

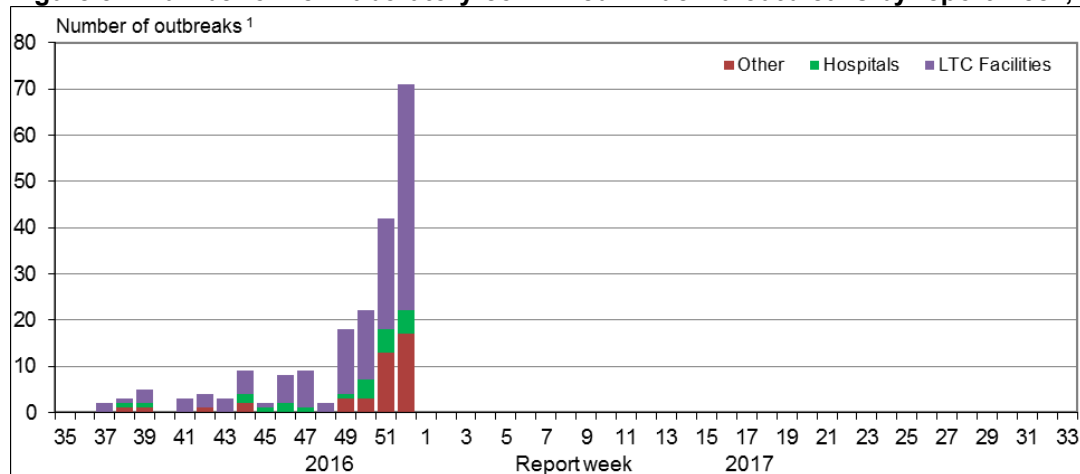
Are you a primary healthcare practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel? Please visit our [Influenza Sentinel page](#) for more details.

Influenza Outbreak Surveillance

In week 52, 71 laboratory confirmed influenza outbreaks were reported: 49 in long-term care (LTC) facilities, five in hospitals and 17 in institutional or community settings. Of the outbreaks with known strains or subtypes: 57 outbreaks were due to influenza A of which 17 were due to influenza A(H3N2) (15 in LTC facilities and two in institutional or community settings), 40 were due to influenza A(UnS) (24 in LTC facilities, three in hospitals and 13 in institutional or community settings) and one was due to influenza B (in a LTC facility).

To date this season, 206 outbreaks have been reported and the majority (67%) have occurred in LTC facilities. In comparison at week 52 in the 2014-15 season, the previous influenza A(H3N2)-predominant season, 457 outbreaks were reported, of which 76% occurred in LTC facilities.

Figure 5 – Number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2016-17, Week 52



¹All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of this report.

Provincial/Territorial Influenza Hospitalizations and Deaths

In week 52, 185 influenza-associated hospitalizations were reported by participating provinces and territories^{*}. Influenza A accounted for all but two of the reported hospitalizations. Adults aged 65+ accounted for the largest proportion of hospitalizations (72%).

To date this season, 892 hospitalizations have been reported, of which 98% were due to influenza A. Among cases for which the subtype of influenza A was reported, almost all (576/578) were influenza A(H3N2). Adults 65+ accounted for approximately 66% of the hospitalizations. Thirty-two intensive care unit (ICU) admissions and 20 deaths have been reported. The majority of deaths (80%) were reported in adults aged 65+ years.

Table 2 – Cumulative number of hospitalizations, ICU admissions and deaths by age and influenza type reported by participating provinces and territories, Canada, 2016-17, Week 52

Age Groups (years)	Cumulative (Aug. 28, 2016 to Dec. 31, 2016)						
	Hospitalizations			ICU Admissions		Deaths	
	Influenza A Total	Influenza B Total	Total [# (%)]	Influenza A and B Total	%	Influenza A and B Total	%
0-4	53	<5	>53 (x%)	<5	x%	0	0%
5-19	56	<5	>56 (x%)	<5	x%	<5	x%
20-44	57	<5	>57 (x%)	<5	x%	0	0%
45-64	126	<5	>126 (x%)	9	28%	<5	x%
65+	585	7	592 (66%)	16	50%	16	80%
Total	877	15	892 (100%)	32	100%	20	100%

x: Suppressed to prevent residual disclosure

^{*}Note: Influenza-associated hospitalizations are not reported to PHAC by BC, NU, and QC. Only hospitalizations that require intensive medical care are reported by SK. ICU admissions are not distinguished among hospital admissions reported from ON. The hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Sentinel Hospital Influenza Surveillance

Pediatric Influenza Hospitalizations and Deaths

In weeks 51 and 52, a total 48 laboratory-confirmed influenza-associated pediatric (≤ 16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network. All but one case was due to influenza A. The number of hospitalizations reported in week 51 and 52 were below the six-year average number of hospitalizations for those weeks.

To date this season, 117 laboratory-confirmed influenza-associated pediatric hospitalizations were reported by the IMPACT network. Children aged 0-2 years accounted for approximately 36% of hospitalizations. Influenza A accounted for 89% (n=104) of the reported hospitalizations, of which 53% (n=55) were influenza A(H3N2) and the remainder were A(UnS). Additionally, 18 intensive care unit (ICU) admissions have been reported, of which 67% were reported in children aged five years and older. No deaths have been reported this season.

Compared to 2014-15, the previous influenza A(H3N2)-predominant season, where 262 hospitalizations were reported as of week 52, there has been approximately half the number of cases reported to date in the current season.

Figure 6 – Cumulative numbers of pediatric hospitalizations (≤ 16 years of age) with influenza by age-group reported by the IMPACT network, Canada, 2016-17, Week 52

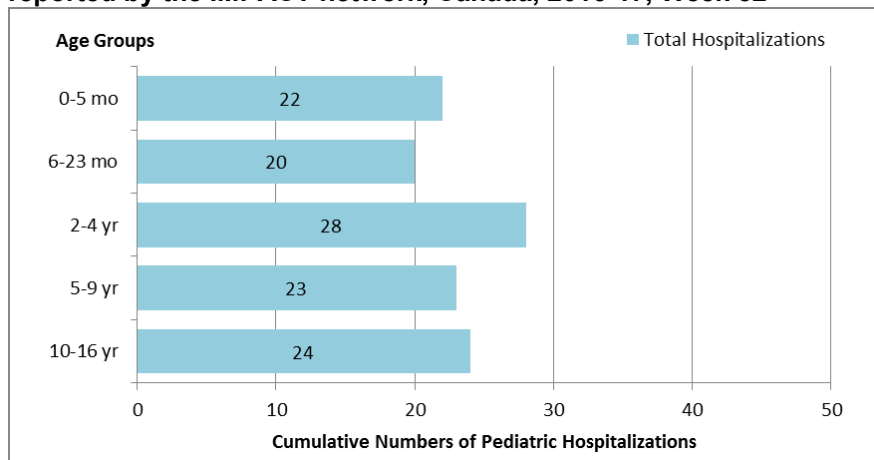
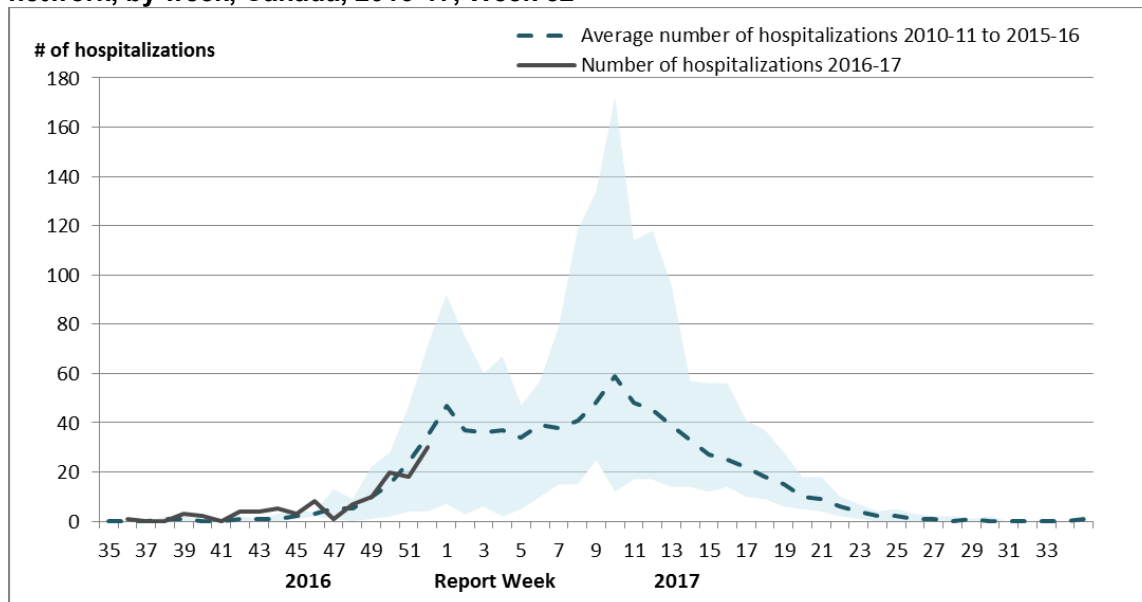


Figure 7 – Number of pediatric hospitalizations (≤ 16 years of age) with influenza reported by the IMPACT network, by week, Canada, 2016-17, Week 52



The shaded area represents the maximum and minimum number of cases reported by week from seasons 2010-11 to 2015-16

The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated pediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths

In weeks 51 and 52, a total of 151 laboratory-confirmed influenza-associated adult (≥ 20 years of age) hospitalizations were reported by the Canadian Immunization Research Network (CIRN). All but two cases were due to influenza A and the greatest proportion of cases (67%) occurred in adults aged 65+.

To date this season, 209 laboratory-confirmed influenza-associated adult (≥ 20 years of age) hospitalizations have been reported by CIRN. All but two hospitalized cases were due to influenza A. Adults aged 65+ accounted for approximately 68% of hospitalizations. To date, greater than nine ICU admissions and less than five deaths have been reported.

Figure 8 - Cumulative numbers of adult hospitalizations (≥ 20 years of age) with influenza by type and age-group reported by CIRN, Canada, 2016-17, Week 52

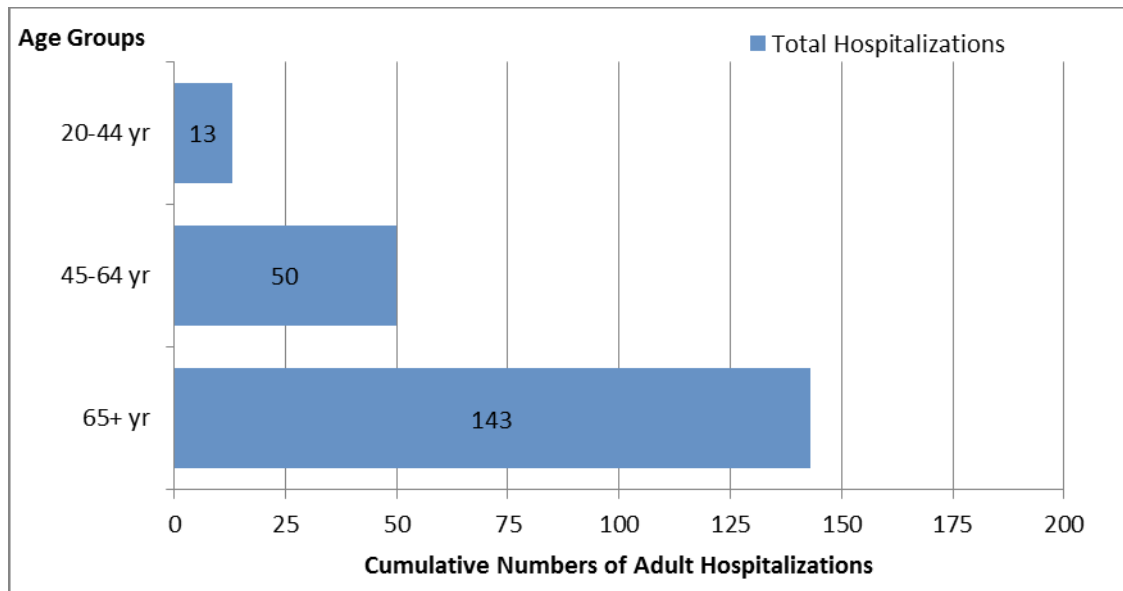
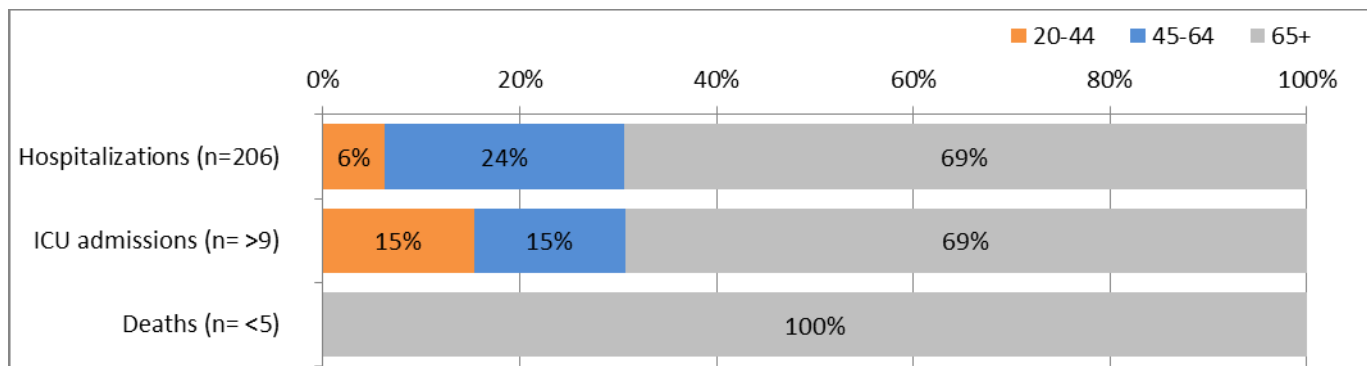


Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group (≥ 20 years of age) reported by CIRN, Canada 2016-17, Week 52



The number of hospitalizations reported through CIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Influenza Strain Characterizations

During the 2016-17 influenza season, the National Microbiology Laboratory (NML) has characterized 199 influenza viruses [175 A(H3N2), 7 A(H1N1), 17 influenza B]. All but one influenza A virus (n=174) and 9 influenza B viruses characterized were antigenically or genetically similar to the vaccine strains included in both the trivalent and quadrivalent vaccines. Eight influenza B viruses were similar to the strain which is included only in the quadrivalent vaccine.

Table 3 – Influenza strain characterizations, Canada, 2016-17, Week 52

Strain Characterization Results ¹	Count	Description
Influenza A (H3N2)		
Antigenically A/Hong Kong/4801/2014-like	62	Viruses antigenically similar to A/Hong Kong/4801/2014, the A(H3N2) component of the 2016-17 Northern Hemisphere's trivalent and quadrivalent vaccine.
Genetically ² A/Hong Kong/4801/2014-like	112	Viruses belonging to genetic group 3C.2a. A/Hong Kong/4801/2014-like virus belongs to genetic group 3C.2a and is the influenza A(H3N2) component of the 2016-17 Northern Hemisphere's trivalent and quadrivalent vaccine. Additionally, genetic characterization of the 62 influenza A (H3N2) viruses that underwent HI testing determined that 48 viruses belonged to genetic group 3C.2a and 10 viruses belonged to genetic group 3C.3a. Sequencing is pending for the remaining four isolates. The majority of viruses belonging to genetic group 3C.3a are inhibited by antisera raised against A/Hong Kong/4801/2014 ³ .
Antigenically A/Indiana/10/2011-like ⁴	1	Viruses antigenically similar to A/Indiana/10/2011, a candidate H3N2v vaccine virus.
Influenza A (H1N1)		
A/California/7/2009-like	7	Viruses antigenically similar to A/California/7/2009, the A(H1N1) component of the 2016-17 Northern Hemisphere's trivalent and quadrivalent influenza vaccine.
Influenza B		
B/Brisbane/60/2008-like (Victoria lineage)	9	Viruses antigenically similar to B/Brisbane/60/2008, the influenza B component of the 2016-17 Northern Hemisphere's trivalent and quadrivalent influenza vaccine
B/Phuket/3073/2013-like (Yamagata lineage)	8	Viruses antigenically similar to B/Phuket/3073/2013, the additional influenza B component of the 2016-17 Northern Hemisphere quadrivalent influenza vaccine.

¹The NML receives a proportion of the influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Strain characterization data reflect the results of hemagglutination inhibition (HI) testing compared to the reference influenza strains recommended by [WHO](#).

²Determined by sequence analysis

³[WHO](#) - Recommended composition of the influenza virus vaccines for use in the 2016-17 northern hemisphere influenza season.

⁴Detected in epidemiological week 50. For more details, see [Week 50 report](#)

Antiviral Resistance

During the 2016-17 season, the National Microbiology Laboratory (NML) has tested 182 influenza viruses for resistance to oseltamivir and zanamivir and 89 influenza viruses for resistance to amantadine. All viruses were sensitive to oseltamivir and zanamivir. All 89 influenza A viruses were resistant to amantadine (Table 4).

Table 4 – Antiviral resistance by influenza virus type and subtype, Canada, 2016-17, Week 52

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	159	0 (0%)	159	0 (0%)	82	82 (100%)
A (H3N2v)	1	0 (0%)	1	0 (0%)	1	1 (100%)
A (H1N1)	6	0 (0%)	6	0 (0%)	6	6 (100%)
B	16	0 (0%)	16	0 (0%)	NA ¹	NA ¹
TOTAL	182	0 (0%)	182	0 (0%)	89	89 (100%)

¹NA: Not Applicable

Provincial and International Influenza Reports

- [World Health Organization influenza update](#)
- [World Health Organization FluNet](#)
- [WHO Influenza at the human-animal interface](#)
- [Centers for Disease Control and Prevention seasonal influenza report](#)
- [European Centre for Disease Prevention and Control - epidemiological data](#)
- [South Africa Influenza surveillance report](#)
- [New Zealand Public Health Surveillance](#)
- [Australia Influenza Report](#)
- [Pan-American Health Organization Influenza Situation Report](#)
- [Alberta Health – Influenza Surveillance Report](#)
- [BC - Centre for Disease Control \(BCCDC\) - Influenza Surveillance](#)
- [New Brunswick – Influenza Surveillance Reports](#)
- [Newfoundland and Labrador – Surveillance and Disease Reports](#)
- [Nova Scotia - Flu Information](#)
- [Public Health Ontario – Ontario Respiratory Pathogen Bulletin](#)
- [Quebec - Système de surveillance de la grippe](#)
- [Manitoba – Epidemiology and Surveillance – Influenza Reports](#)
- [Saskatchewan – influenza Reports](#)
- [PEI – Influenza Summary](#)

FluWatch Definitions for the 2016-2017 Season

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).

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, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

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. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Residential institutions include but 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; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

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†**

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** 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.

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

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