

2017/18 Influenza Season Summary

April 2019

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Contents

Key Findings	2
Influenza Rates over Time.....	2
Influenza Activity by Surveillance Week	5
Influenza Types, Subtypes, & Strains	6
Influenza Rates by Age.....	7
Influenza-Related Hospitalizations and Deaths	8
Respiratory Infection and Influenza Outbreaks.....	8
Influenza Immunization	8
Influenza Immunization Administered by the Health Unit.....	9
Influenza Immunization among Staff at Hospitals and Long-Term Care Homes.....	11
Adverse Events Following Immunization.....	13
References	13
Definitions and data sources	13

Key Findings

- In the 2017/18 influenza season, 297 cases of laboratory confirmed influenza occurred within the North Bay Parry Sound District Health Unit (Health Unit) region, with one of the highest reported influenza rates within Ontario (Public Health Ontario, 2018). This high rate could be partially attributed to the comparatively higher rate of specimens submitted for influenza testing within the Health Unit region, which was triple the Ontario rate.
- Within the past five influenza seasons (2013/14 to 2017/18), children aged 4 years or younger, and seniors aged 65 years or older had the highest lab-confirmed influenza rates of all age groups in the Health Unit region. Age-specific rates across all age groups in the Health Unit region are double the Ontario rates.
- In 2015/16, about three of every ten individuals aged 12 years or older in the Health Unit region reported receiving a seasonal influenza immunization within the previous year, similar to the Ontario population.
- The median percentage of hospital staff immunized with the seasonal influenza vaccines continues to be higher in the Health Unit region compared to Ontario. The median percentage of long-term care home staff immunized continues to be similar between the Health Unit region and Ontario.
- Most of the respiratory outbreaks in 2017/18 in the Health Unit region occurred in long-term care homes, as in previous seasons.

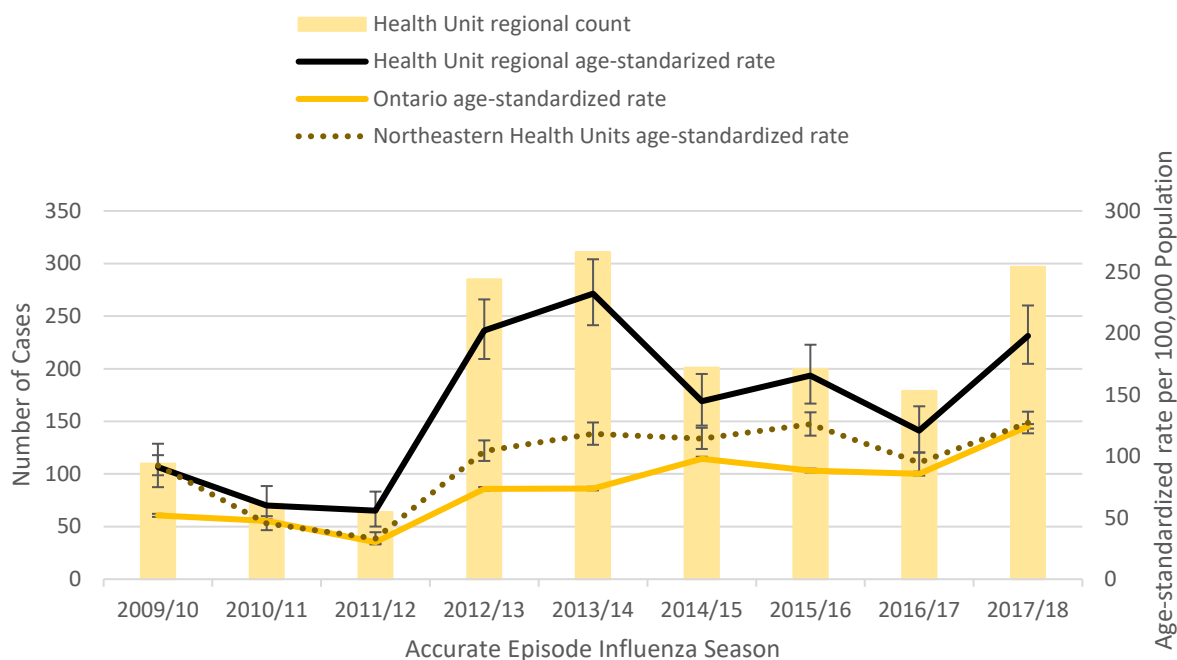
Influenza Rates over Time

From September 1, 2017 to August 31, 2018 (i.e., the 2017/18 influenza season), 297 cases of laboratory (lab) confirmed influenza occurred in the North Bay Parry Sound District Health Unit (Health Unit) region (Figure 1; Table 1).

In 2017/18, the age-standardized rate (ASR) of lab-confirmed influenza cases within the Health Unit region was 41% higher than the Ontario rate, and significantly higher (by about 27%) than the ASR for all health units in northeastern Ontario. The difference in rates between 2012/13 and 2017/18 may have been driven by a disproportionately higher number of specimens submitted for influenza testing among the Health Unit region population. In 2017/18, the rate of specimens submitted for influenza testing among residents of Health Unit region was triple the Ontario rate (Figure 2; Table 2).

The Health Unit ASR has varied considerably between 2012/13 and 2017/18, while in northeastern Ontario and Ontario as a whole, the ASR is slowly increasing.

Figure 1. Number of Laboratory Confirmed Influenza Cases and Age-Standardized Rates per 100,000 Population, by Health Region, 2009/10 to 2017/18 Influenza Seasons



Note: Northern health units include Timiskaming Health Unit, North Bay Parry Sound District Health Unit, Algoma Public Health, Sudbury and District Health Unit, and Porcupine Health Unit.

Table 1. Number of Laboratory Confirmed Influenza Cases and Age-Standardized Rates per 100,000 Population (95% CI), by Health Region, 2009/10 to 2017/18 Influenza Seasons

Influenza Season	Number of Confirmed Cases – Health Unit Region	Age-Standardized Rate (95% CI) – Health Unit Region	Age-Standardized Rate (95% CI) - Northeastern Health Unit Regions	Age-Standardized Rate (95% CI) - Ontario
2009/10	110	91.4 (75.0, 110.4)	92.6 (84.7, 101.1)	52 (50.8, 53.3)
2010/11	72	60.1 (46.9, 75.9)	45.4 (40, 51.3)	47.5 (46.3, 48.7)
2011/12	64	55.8 (42.9, 71.4)	33.1 (28.4, 38.3)	30.2 (29.2, 31.1)
2012/13	285	202.5 (179.4, 227.9)	104.4 (96.3, 113.1)	73.6 (72.1, 75.1)
2013/14	311	231.6 (206.9, 260.6)	118.3 (109.5, 127.7)	73.8 (72.4, 75.3)
2014/15	201	145.0 (125.2, 167.2)	114.5 (106.1, 123.4)	98.1 (96.5, 99.8)
2015/16	200	165.8	126.2	88.5

Influenza Season	Number of Confirmed Cases – Health Unit Region	Age-Standardized Rate (95% CI) – Health Unit Region	Age-Standardized Rate (95% CI) - Northeastern Health Unit Regions	Age-Standardized Rate (95% CI) - Ontario
		(143.1, 191)	(116.9, 136)	(86.9, 90.1)
2016/17	179	121.0 (103.3, 140.9)	95.1 (87.5, 103.1)	85.9 (84.4, 87.4)
2017/18	297	198.1 (175.5, 223)	127.4 (118.8, 136.5)	124.5 (122.7, 126.4)

Figure 2. Crude Rate of Influenza Test Specimens Submitted per 100,000 Population, by Health Region, 2009/10 to 2017/18 Influenza Seasons

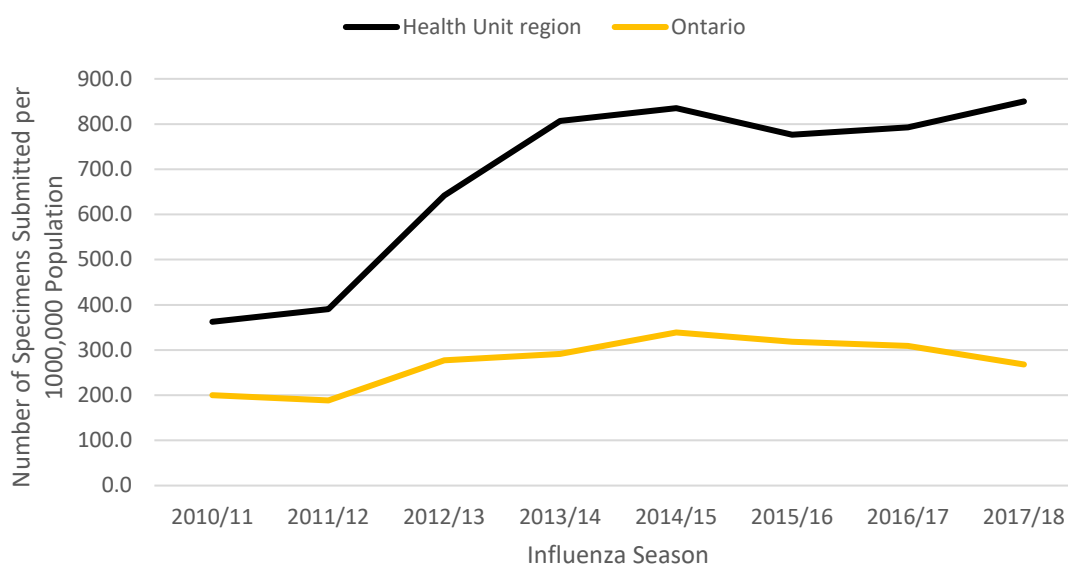


Table 2. Crude Rate of Influenza Test Specimens Submitted per 100,000 Population, by Health Region, 2009/10 to 2017/18 Influenza Seasons

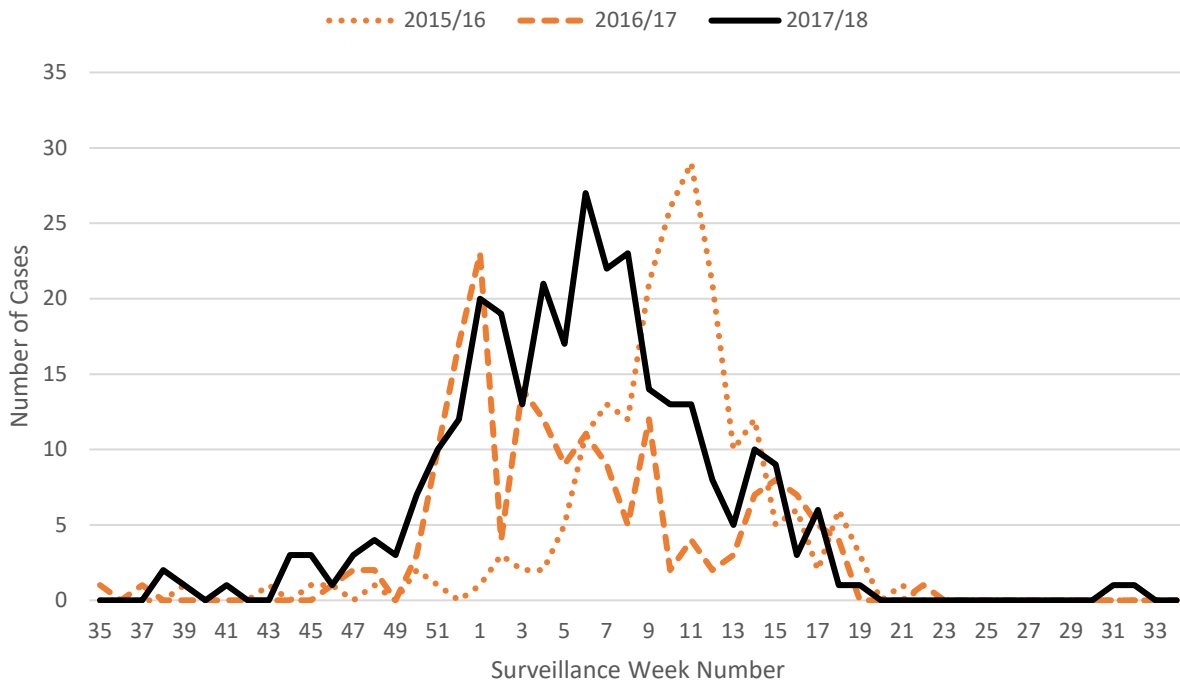
Influenza Season	Health Unit Region	Ontario
2010/11	362.4	199.7
2011/12	390.5	188.4
2012/13	641.9	277.1
2013/14	806.5	291.2
2014/15	835.3	338.8

Influenza Season	Health Unit Region	Ontario
2015/16	776.5	318.6
2016/17	793.0	308.9
2017/18	850.0	268.0

Influenza Activity by Surveillance Week

In the 2017/18 influenza season, lab-confirmed influenza cases peaked in February (weeks 6- 8), which was later compared to the 2016/17 season (peaked during late March) (Figure 3). In Ontario, overall peak influenza A and B activity occurred between weeks 1 and 7 (January to February 2018) (Public Health Ontario, 2018).

Figure 3. Number of Confirmed Influenza Cases, by Surveillance Week, Health Unit Region, 2015/16, 2016/17, and 2017/18 Influenza Seasons



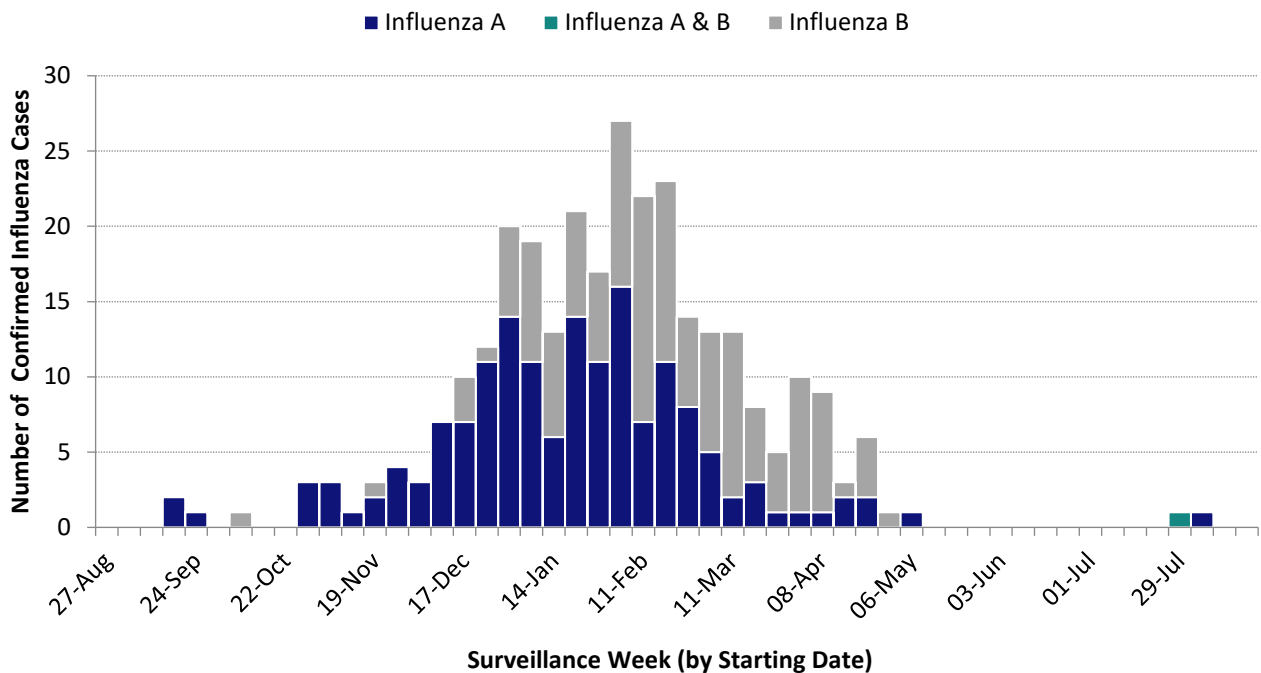
Note: The surveillance week number for when each case occurred is determined by the episode accurate date.

Influenza Types, Subtypes, & Strains

In the 2017/18 influenza season, lab-confirmed influenza cases of both type A and B peaked in February (weeks 6 - 8) (Figure 4). Of the 297 lab-confirmed influenza cases in 2017/18, 54% were of type influenza A and 46% were of type influenza B. Of the influenza A cases, 47% were of subtype influenza A H3. One of every two cases in the Health Unit region (57%) did not have a subtype (Influenza A) or lineage/strain (Influenza B) identified. In Ontario, the dominant circulating influenza A subtype was H3N2 (93% of influenza A cases with a reported subtype) (Public Health Ontario, 2018).

Of the Ontario influenza A isolates characterized by the National Microbiology Laboratory, all of the influenza A (H3N2) viruses were antigenically similar to the A/Hong Kong/4801/2014 strain, which is the influenza A (H3N2) component of the 2017-18 Northern Hemisphere seasonal influenza vaccine (Public Health Ontario, 2018).

Figure 4. Number of Laboratory Confirmed Influenza Cases, by Type and Surveillance Week, Health Unit Region, 2017/18 Influenza Season



Note: Accurate episode date was used to determine surveillance week.

Influenza Rates by Age

In 2017/18, over half of the cases in the Health Unit region were seniors aged 65 years or older (58%; 173 cases) and about 29% (86 cases) were adults aged 20 to 64 years old in the Health Unit region. For cases occurring between the influenza seasons of 2013/14 to 2017/18, the age-specific influenza rate was highest among children aged 4 years or younger, and seniors aged 65 years and older in both the Health Unit region and Ontario (Figure 5; Table 3). Rates in the Health Unit region were about double Ontario rates across all age groups.

Figure 5. Crude Lab-Confirmed Influenza Rate per 100,000 Population, by Age Group (Years) and Health Region, 2013/14 to 2017/18 Influenza Seasons Combined

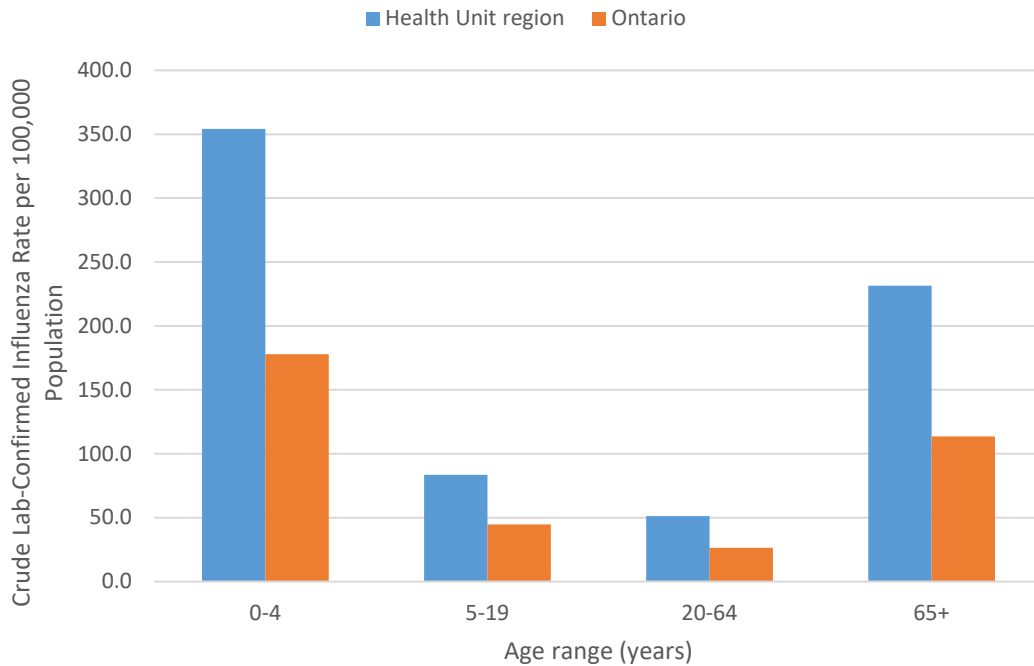


Table 3. Crude Lab-Confirmed Influenza Rate per 100,000 Population, by Age Group (Years) and Health Region, 2013/14 to 2017/18 Influenza Seasons Combined

Age Group (Years)	Health Unit Region	Ontario
0 to 4 years	354.1	177.9
5 to 19 years	83.6	44.8
20 to 64 years	51.2	26.4
65 years or older	231.5	113.7

Influenza-Related Hospitalizations and Deaths

Of those lab-confirmed influenza cases in the Health Unit region with known hospitalization status (81%), over half of the cases (55%) were hospitalized. Eleven deaths occurred among the 297 confirmed cases reported in the Health Unit region during the 2017/18 influenza season, with influenza being an antecedent (i.e., preceding) cause for all eleven cases (78%).

Respiratory Infection and Influenza Outbreaks

During the 2017/18 influenza season, 41 confirmed respiratory outbreaks were reported, with an unspecified respiratory infection as the most common cause of outbreaks followed by influenza A (Table 4). In the 2016/17 season, the most common cause of outbreaks was influenza A. Most of the 2017/18 outbreaks (93%) occurred within long-term care homes, and two (5%) occurred in hospitals. The median duration for influenza A outbreaks during the 2017/18 season was 18 days (range: 9 to 33 days). In Ontario, one of every three outbreaks had influenza A reported in the outbreak (34%), followed by human metapneumovirus, adenovirus, or coronavirus (13%) (Public Health Ontario, 2018).

Table 4. Number (Percentage) of Respiratory Outbreaks by Agent, Health Unit Region, 2016/17 & 2017/18 Influenza Seasons

Respiratory Agent	Number of Outbreaks (%) in 2016/17 (n=31)	Number of Outbreaks (%) in 2017/18 (n=41)
Respiratory infection, unspecified	1 (3%)	18 (44%)
Influenza A	13 (42%)	11 (27%)
Influenza B	0 (0%)	6 (15%)
Parainfluenza	3 (10%)	2 (5%)
Respiratory syncytial virus	1 (3%)	2 (5%)
Bordetella pertussis	1 (3%)	1 (2%)
Enterovirus	0 (0%)	1 (2%)

Influenza Immunization

In Canada, about four of every ten adults aged 18 years or older reported receiving the 2017/18 influenza vaccine (Public Health Agency of Canada, 2019).

In 2015/16, about three of every ten individuals aged 12 years or older in the Health Unit region received a seasonal influenza immunization within the previous year, about the same as the population in Northeastern Ontario and Ontario as a whole (Table 5). More seniors aged 65 years or older received a seasonal influenza immunization within the previous year compared to individuals aged 12 to 64 years in all three regions.

Table 5. Percentage (95%) of Individuals Receiving the Seasonal Influenza Immunization within the Previous Year, by Health Region, 2015/16

Population	Health Unit region	Northeastern Ontario	Ontario
Individuals aged 12 years or older	34.8 (30.5, 39.4)	34.5 (32.1, 36.9)	34.6 (33.6, 35.5)
Individuals aged 12 years to 64 years	26.8 (22.0, 32.4)	27.2 (24.6, 30.1)	28.4 (27.4, 29.5)
Individuals aged 65 years or older	74.8 (67.2, 81.1)	70.7 (66.6, 74.5)	65.6 (63.6, 67.5)

Influenza Immunization Administered by the Health Unit

In Canada, the most commonly reported places of vaccination among adults during the 2017/18 season were pharmacies (34%) and doctor's offices (30%), followed by temporary vaccine clinics (11%) (Public Health Agency of Canada, 2019). During the 2017/18 influenza season, the Health Unit administered 1,370 seasonal influenza vaccines. The Health Unit administered most vaccines through in-house clinics (89% or 1,223 seasonal influenza vaccines) and the rest (11% or 147 seasonal vaccines) through community clinics.

Most vaccinations were administered to high priority individuals (74%). About four of every ten individuals who were administered a seasonal influenza vaccine by the Health Unit were adults aged 19 to 64 years old, followed by seniors aged 65 years, and children aged 5 to 18 years (Figure 6; Table 6). The number of seasonal influenza vaccines administered by the Health Unit to individuals of either the general population or high risk population were the lowest in the past eight influenza seasons since 2010/11 (see Figure 7; Tables 7).

In 2017/18, the Health Unit distributed 40,696 seasonal influenza vaccines to physicians, pharmacies, and other local health care practitioners.

Figure 6. Number of Individuals Who Were Administered the Seasonal Influenza Vaccine by the Health Unit, by Priority Group, 2010/11 to 2017/18 Influenza Seasons

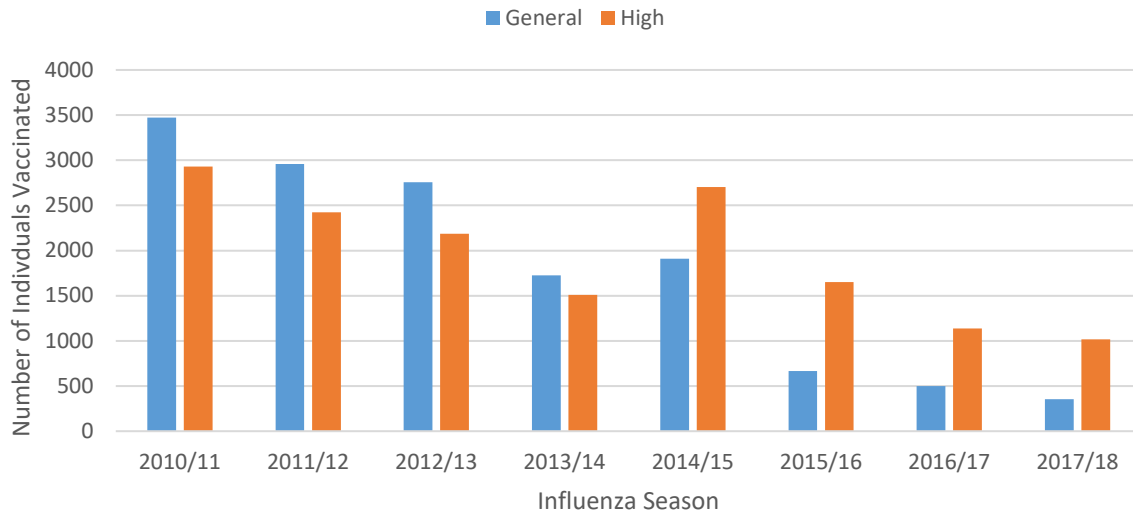


Table 6. Number (Percentage) of Individuals Who Were Administered the Seasonal Influenza Vaccine by the Health Unit, by Priority Group, 2010/11 to 2017/18 Influenza Seasons

Influenza Season	High priority group	General population	Total
2010/11	3,474 (54.3%)	2,929 (45.7%)	6,403
2011/12	2,960 (55.0%)	2,423 (45.0%)	5,383
2012/13	2,757 (55.8%)	2,186 (44.2%)	4,943
2013/14	1,724 (53.3%)	1,508 (46.7%)	3,232
2014/15	1,909 (41.4%)	2,704 (58.6%)	4,613
2015/16	665 (28.7%)	1,652 (71.3%)	2,317
2016/17	501 (30.5%)	1,139 (69.5%)	1,640
2017/18	354 (25.8%)	1,016 (74.2%)	1,370

Figure 7. Number of Individuals Who Were Administered the Seasonal Influenza Vaccine by the Health Unit, by Age Group, 2010/14 to 2017/18 Influenza Seasons

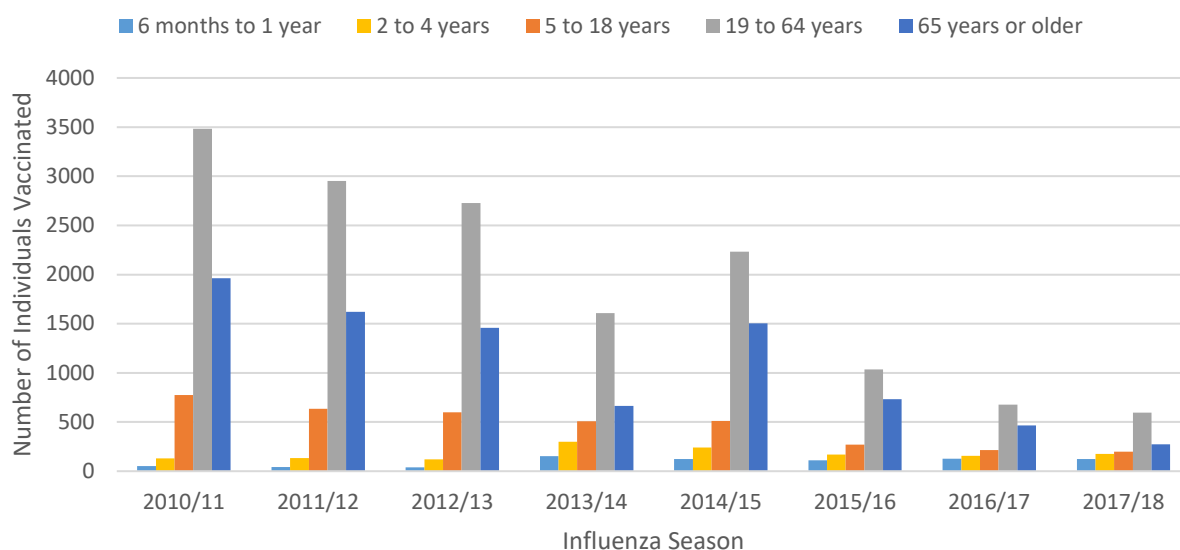


Table 7. Number (Percentage) of Individuals Who Were Administered the Seasonal Influenza Vaccine by the Health Unit, by Age Group, 2010/11 to 2017/18 Influenza Seasons

Influenza Season	6 months to 1 year old	2 to 4 year olds	5 to 18 year olds	19 to 64 year olds	65 years old or older
2010/11	52 (0.8%)	129 (2%)	776 (12.1%)	3482 (54.4%)	1964 (30.7%)
2011/12	42 (0.8%)	135 (2.5%)	634 (11.8%)	2951 (54.8%)	1621 (30.1%)
2012/13	39 (0.8%)	121 (2.4%)	598 (12.1%)	2728 (55.2%)	1457 (29.5%)
2013/14	153 (4.7%)	300 (9.3%)	507 (15.7%)	1608 (49.8%)	664 (20.5%)
2014/15	125 (2.7%)	240 (5.2%)	510 (11.1%)	2233 (48.4%)	1505 (32.6%)
2015/16	110 (4.7%)	168 (7.3%)	271 (11.7%)	1034 (44.6%)	734 (31.7%)
2016/17	127 (7.7%)	157 (9.6%)	215 (13.1%)	676 (41.2%)	465 (28.4%)
2017/18	125 (9.1%)	175 (12.8%)	199 (14.5%)	597 (43.6%)	274 (20.0%)

Influenza Immunization among Staff at Hospitals and Long-Term Care Homes

During the 2017/18 influenza season, a median of 76% of staff at long-term care homes (LTCHs) in the Health Unit region received the seasonal influenza immunization, comparable to a median of 73% of Ontario LTCH staff (Figure 8; Table 8). In the Health Unit region, a median of 64% of hospital staff were immunized in the 2017/18 season, higher compared to a median of 54% of staff in Ontario.

Within the Health Unit region, the median percentage of staff immunized at either facility type increased sharply since the 2009/10 influenza season, and has since levelled off (Figure 8; Table 8). In

2009/10, the pH1N1 vaccine was offered as a separate vaccine from the seasonal influenza vaccine, and consequently uptake for the seasonal influenza vaccine was low.

Figure 8. Median Percentage of Staff Immunized with the Seasonal Influenza Vaccine, by Facility Type, Health Unit Region, 2006/07 to 2017/18 Influenza Seasons

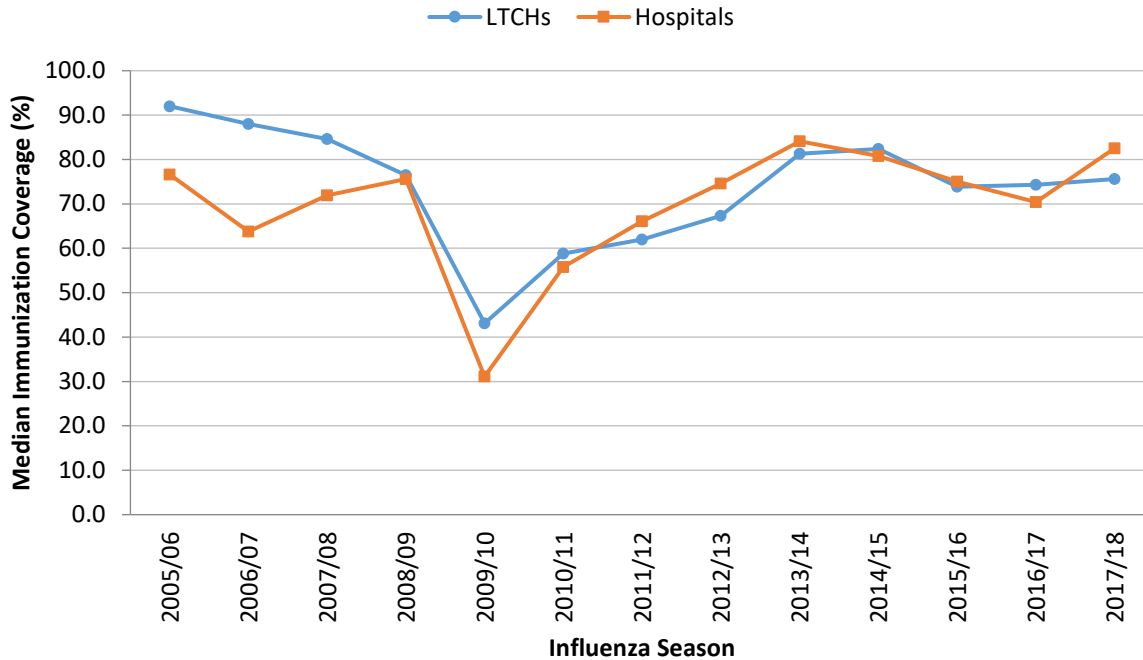


Table 8. Median Percentage of Staff Immunized with the Seasonal Influenza Vaccine, by Facility Type, Health Unit Region, 2007/08 to 2017/18 Influenza Seasons

Influenza Season	Median Percentage of Staff Immunized at Long-Term Care Homes	Median Percentage of Staff Immunized at Hospitals
2007/08	84.6	71.9
2008/09	76.5	75.6
2009/10	43.1	31.1
2010/11	58.8	55.8
2011/12	62.0	66.1
2012/13	67.3	74.6
2013/14	81.3	84.1
2014/15	82.4	80.8
2015/16	73.9	75.0
2016/17	74.3	70.4
2016/17	75.6	82.5

Adverse Events Following Immunization

Three adverse events following immunization (AEFI) with the seasonal influenza vaccine were reported to the Health Unit during the 2017/18 season. An annual median of four AEFIs with the seasonal influenza vaccine have been reported between the 2012/13 and 2016/17 influenza seasons.

References

Public Health Agency of Canada. (2019). Seasonal influenza vaccine coverage in Canada, 2017-18. Retrieved February 25, 2019 from http://publications.gc.ca/collections/collection_2019/aspc-phac/HP40-198-2018-eng.pdf

Public Health Ontario. (2018). Ontario Respiratory Pathogen Bulletin: Surveillance Season (September 1, 2017 – August 31, 2018). Retrieved February 25, 2019 from <https://www.publichealthontario.ca/-/media/documents/surveillance-reports/orpb-season-summary-2017-18.pdf?la=en&hash=7CFD7EE71EAB656162EFB094C82670141B322C75>

Definitions and data sources

Definition

Accurate episode year:

Accurate episode year is defined by the symptom onset date. If the symptom onset date is missing, laboratory test date determines accurate episode year. If the laboratory test date is missing, the date the case was reported is used to define the accurate episode date.

Adverse events following immunizations:

Includes confirmed cases as defined by the Ministry of Health & Long-Term Care (Infectious Disease Protocol: Influenza; Appendix B, 2015). Available from http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/aefi_cd.pdf

Confirmed influenza case:

Includes confirmed cases as defined by the Ministry of Health & Long-Term Care (Infectious Disease Protocol: Influenza; Appendix B, 2014). Available from http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/influenza_cd.pdf

High priority group for seasonal influenza immunization:

The Public Health Agency of Canada defines populations at great risk of influenza-related complications as high priority groups, defined annually. In 2017/18, high priority groups include adults and children with underlying health conditions, residents of nursing homes and other chronic care facilities, people aged 65 years or older, children under 60 months of age, pregnant women, and Indigenous peoples. Available from: <https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/healthy-living/canadian-immunization-guide-statement-seasonal-influenza-vaccine/naci-stmt-2017-2018-eng.pdf>

Respiratory infection outbreaks in institutions & public hospitals:

Includes confirmed outbreaks as defined by the Ministry of Health & Long-Term Care (Infectious Disease

Protocol: Respiratory Infection Outbreaks in Institutions and Public Hospitals; Appendix B, 2018).

Available from

http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/influenza_cd.pdf

Surveillance week:

Surveillance week number presents influenza case numbers and rates throughout the influenza season. Week numbers correspond with the calendar year, whereby week 1 is the first week in January, and week 52 is the last week in December. This method allows comparison of data across multiple years. Where week numbers have been referenced in the text, the week start date has been included in brackets as an added time reference.

Data sources:

Adverse events following immunization (AEFI):

North Bay Parry Sound District Health Unit, 2013/14 – 2017/18 influenza seasons: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, Date extracted: 10/26/2018.

Influenza & respiratory outbreaks:

North Bay Parry Sound District Health Unit, 2016/17 – 2017/18 influenza seasons: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, Date extracted: 10/26/2018.

Laboratory-confirmed Influenza cases by influenza season:

North Bay Parry Sound District Health Unit, Northeastern health units & Ontario 2009/10 – 2017/18 season confirmed influenza counts: Public Health Ontario. Query: Ontario & Northeastern health units: Counts by Age and Gender. Toronto, ON: Ontario Agency for Health Protection and Promotion 2018 Oct 10 [cited 2018 Oct 29] Available from: <http://www.publichealthontario.ca/en/DataAndAnalytics/Query/Pages/default.aspx>

Laboratory-confirmed Influenza cases by type:

North Bay Parry Sound District Health Unit, Communicable Disease Control Program internal data. 2017/18 Influenza Season.

Laboratory-confirmed Influenza cases by type & surveillance week:

North Bay Parry Sound District Health Unit, 2017/18 season confirmed influenza counts: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, Date extracted: 11/02/2018.

Population estimates:

North Bay Parry Sound District Health Unit, Northeastern health units & Ontario 2009– 2015: Statistics Canada 2009-2015, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, Extracted Date: 11/03/2017

Seasonal influenza vaccines administered by the Health Unit:

North Bay Parry Sound District Health Unit, Vaccine Preventable Diseases internal data. 2010/11 to

2017/18 Influenza Seasons.

Note: Scheduled vaccination data was not available prior to the 2013/14 influenza season

Seasonal influenza vaccines received by staff at institutional facilities (LTCHs; Hospitals):

North Bay Parry Sound District Health Unit Internal Access Database, Communicable Disease Program internal data. 2007/08 to 2017/18 Influenza Seasons.

Specimens submitted for influenza testing:

North Bay Parry Sound District Health Unit & Ontario 2010/11 – 2017/18 season: Public Health Ontario. Specimens tested and positive for influenza viruses at Public Health Ontario Laboratory from North Bay Parry Sound Health Unit and Ontario by Season, 2010-2018.

Analysis:

Crude rates were age-standardized using the Direct Method and standard 2011 Canadian population. Confidence intervals (95%) were calculated for age-standardized rates based on the gamma distribution (Fay and Feuer, 1997; Tiwari et al., 2006) in STATA IC/14.2 (2014) for the North Bay Parry Sound District Health Unit (NBPSDHU) region, Northeastern public health units, and Ontario.

Confidence intervals:

Confidence intervals (CI) and variances were estimated using the poisson distribution in STATA IC/14.2 (2014) for all regions.

Interpretation of a significant difference:

A statistic interpreted as 'significantly different' from another is an estimate found to be statistically meaningful; the difference is unlikely due to chance. Error ranges noted in tables within this report illustrate 95% confidence intervals. If there is no overlap in range between confidence intervals, the difference can be described as statistically significant.