New Brunswick Influenza Summary Report: 2018-2019 season
(Data from August 26, 2018 to July 13, 2019)

Highlights of the 2018-2019 Influenza season:

A- Influenza Activity Surveillance

- **This season, we observed an earlier start of influenza activity compared to previous seasons with the influenza A(H1N1) pdm09 being the predominant strain**, which typically affects children, young and middle-aged adults. Typical activity for New Brunswick starts in the last 2 weeks of December, however this season the activity started to increase in the last 2 weeks of November.
- Influenza activity this season reached a peak at week 1 (first week of January) which is early for New Brunswick since activity usually peaks around mid-February. Nationally, the peak of activity, mainly driven by the Western Provinces, was observed at week 52 (last week of December).
- **Despite the early peak, influenza activity in the province was sustained with a second smaller peak in week 13 (last week of March).** This was a result of persistent lower-level Influenza A (unsubtyped likely H1N1 and typed H1N1) activity and increased influenza B activity.
- The predominant strain this season is influenza A (H1N1) pdm09: Among the subtyped influenza A specimens, 82% were influenza A (H1N1) pdm09.
- Up to July 13, 2019, **3008** laboratory confirmed influenza cases were reported: 2647 were influenza A (88% of all positive), 357 were influenza B (11.9% of all positive) and 4 were a co-infection of A & B (0.1% of all positive). In seasons where A (H1N1) pdm09 was predominant, an average of 1340 influenza lab confirmations were reported up to July 13 (season 2013/2014 and 2015/2016).
- **The relatively high number of confirmed cases reported during the 2018-2019 season was the result of increased testing:**
    o The number of specimens submitted this current season was double the average number of tests submitted in the last 5 years: over 13 000 specimens were submitted for testing this season while the average number of specimens submitted for the past 5 years was 6600 tests.
    o The overall positivity rate was 23%, lower than previous seasons when A(H1N1) pdm09 was the predominant strain (25% in 2015/2016 and 28% in 2013/2014).
- **Adults aged 20-64 accounted for 43% of the lab confirmed influenza cases** this season and those aged 65 and above accounted for 18% of lab confirmed influenza cases. **Children less than 10 years of age accounted for 30% of all lab confirmed influenza cases.**
- **The median age for influenza A and influenza B cases was 38 years and 9 years old respectively.** 54% of the influenza B cases were less than 10 years of age.
- There have been **619** hospitalizations reported, including **106** ICU admissions and **36** deaths.
- **Among all hospitalized this season, 51% were individuals 65 years and older** (compared to 34% in 2015/2016 and 30% in 2013/2014) and 14% were children less than 10 years of age (compared to 22% in 2015/2016 and 11% in 2013/2014).
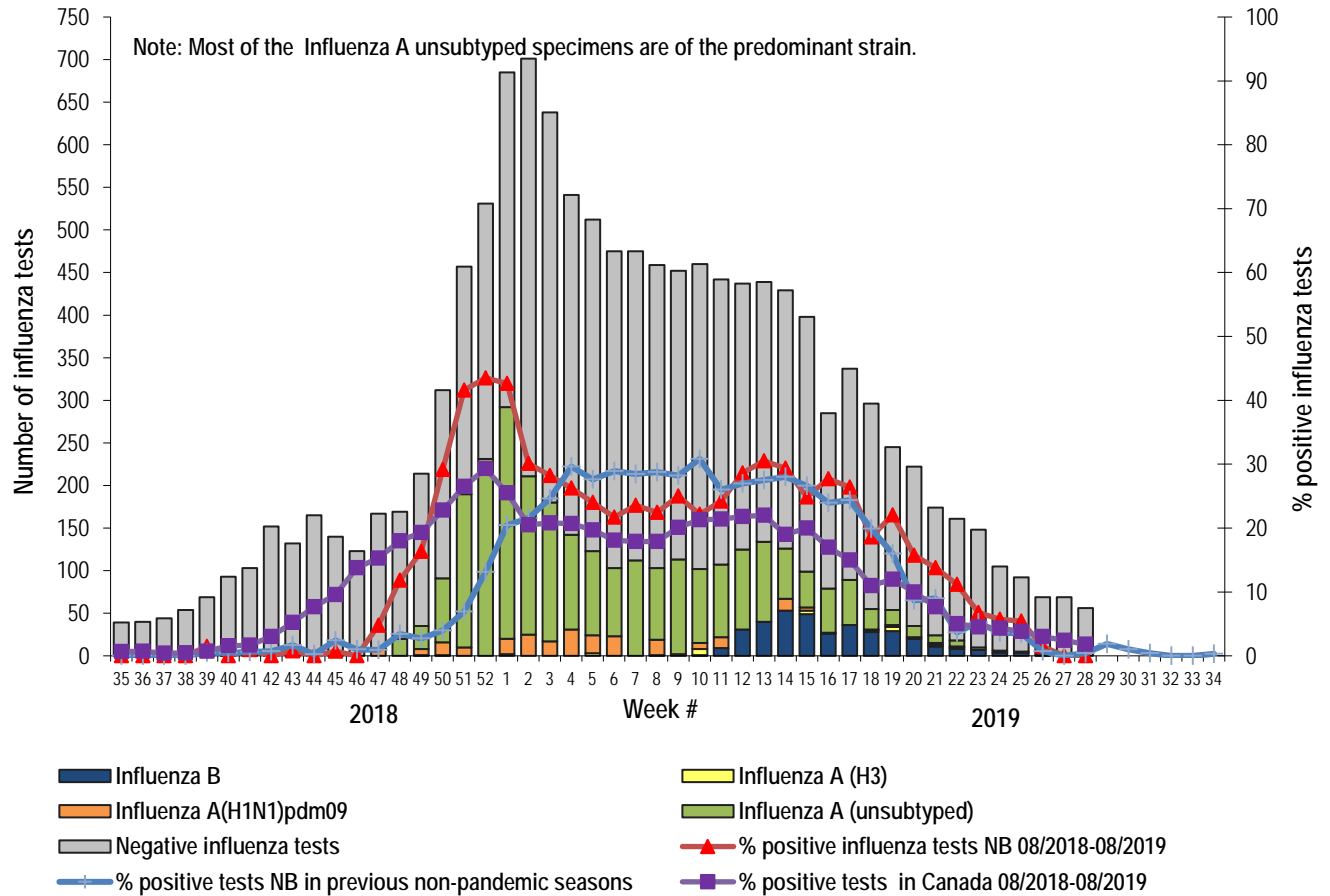- Fourteen nursing homes reported outbreaks.

B- National Estimates for Vaccine Effectiveness
- Early season estimates of the 2018/2019 vaccine effectiveness showed a vaccine effectiveness (VE) of 72% (95% confidence interval (CI): 60 to 81) against the dominant influenza A(H1N1)pdm09. This substantial vaccine protection was observed across all age groups, notably young children, who appear to have been disproportionately affected by this year's A(H1N1)pdm09-dominant strain.

Influenza Surveillance

1) **Influenza Laboratory Data**[1] (Data source: Lab results from the Georges L. Dumont University Hospital Center)

Graph 1. Number and percent of positive influenza specimens in New Brunswick by week, up to July 13 2019

Note: Most of the Influenza A unsubtyped specimens are of the predominant strain.

Legend:
- Influenza B
- Influenza A(H1N1)pdm09
- Negative influenza tests
- % positive tests NB in previous non-pandemic seasons
- Influenza A (H3)
- Influenza A (unsubtyped)
- % positive influenza tests NB 08/2018-08/2019
- % positive tests in Canada 08/2018-08/2019

Table 1. Demographics of positive influenza tests in New Brunswick, cumulative, up to July 13 2019 (data source: G. Dumont lab results)

Number of Laboratory Confirmed Influenza Cases Stratified by Type, Gender, and Age Groups						
Cumulative (August 26, 2018-July 13, 2019)						
	A(H3)	A(H1N1) pdm09	A (unsubtyped/ Other)	A Total	B Total	A & B co-infection
Gender						
Male	25	144	1053	**1222**	**154**	1
Female	37	146	1242	**1425**	**203**	3
Age Groups						
<5	11	69	355	**435**	65	0
5-9	8	29	245	**282**	128	2
10-19	10	10	183	**203**	67	0
20-44	4	50	511	**565**	69	0
45-64	7	69	561	**637**	13	0
65+	22	63	440	**525**	15	2

2) **Nursing Homes Influenza Outbreak[2] Data** (Data source: Influenza Outbreak Investigation Final Report submitted by Regional Public Health, hard copy)

- In NB, there are 68 licensed nursing homes, out of which 14 reported influenza outbreaks during this season.
- This is lower than the average number of outbreaks reported in the previous 5 seasons (average of 17 outbreaks), likely due to the influenza A (H1N1) pdm09 being the predominant strain.
- Regional distribution of the nursing home outbreaks is presented in table 2.

Table 2. Influenza outbreak reports, by Region, for season 2018-2019.

Region	Total# of nursing homes	Total # of reported outbreaks
Region 1	15	4
Region 2	16	4
Region 3	16	3
Region 4	5	0
Region 5	2	0
Region 6	9	1
Region 7	5	2

- All were influenza A outbreaks. The first influenza outbreak was reported on December 11, 2018 and the last outbreak was reported on April 5, 2019.
- The median percentage immunized for residents was 93% (range 87%-100 %) and the median percentage immunized for staff was 37% (range 13.4%-98%).
- The median ILI attack rate for residents was 14.5% (range 2.3% - 40 %) and the median ILI attack rate for staff was 6.0% (range 0% - 18.3 %).

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[2] An influenza outbreak in a nursing home is defined as two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case.

- The median duration of the outbreaks[3] was 11.5 days (range 5-41 days).
- The median duration between first ILI case and laboratory confirmation was 5 days (range 0-14 days).
- 93% (13/14) of the nursing home outbreaks occurred throughout the entire facility versus 7% (1/14) that was considered a localized outbreak.
- Antivirals prophylaxis was recommended and administered in 93% (13/14) of the nursing homes outbreaks.
- 50% (7/14) of the nursing home reported hospitalizations related to the outbreaks.
- 13 related deaths[4] were reported from 6 nursing homes (out of the 14) experiencing influenza outbreaks.

3) **Influenza associated Hospitalization Data** (Data source: New Brunswick Influenza Hospitalization and Death Surveillance Database, submitted by Regional Public Health, electronic copy)

   A. Hospitalizations, ICU admissions and outcome (cumulative up to July 13 2019)[5]
   Graph 2 and 3, Table 3.
   - There have been **619 hospitalizations** reported, of which **106 were admitted to the ICU**.
     o This season, the overall number of hospitalizations was higher than that in 2015/2016 season (last season with predominant H1N1) when 250 hospitalizations were reported for the same time period. However, the proportion of ICU admissions was lower this season (17% of all hospitalized) compared to the 2015/2016 season (22% of all hospitalized).
   - 51% of all hospitalizations occurred among individuals 65 years old or above in this current season compared to 34% in the 2015/2016 season, and 30% in the 2013/2014 season for the same time period.
   - **36 influenza related deaths have been reported:** 14 were males and 22 were females. The median age was 72.5 years (range 39-95 years). Deaths occurred in the period between December 4 2018 and May 10 2019. 92% (33/36) had at least one risk factor[6], 12 were vaccinated, 13 were not vaccinated and the vaccination status was unknown for 11.
   - Hospitalizations occurred between the period of September 24, 2018 and June 15, 2019. However some cases were hospitalized several months before influenza laboratory confirmation.
   - 6% (35/619) of the hospitalizations were related to nosocomial outbreaks.
   - The median length of stay was 5 days (range 1-370 days).
   - The median age for hospitalization was 66 years (range 1 week-97 years).
   - Most of the hospitalized cases were from Region 1 (32 %), followed by Region 3 (25 %), 2 (17 %) and Region 7 (12%).
   - 71% (438/619) of the hospitalized cases were treated with antivirals.

   B. Hospitalizations and ICU admissions by influenza type
   - 96% (594/619) of the hospitalized cases were due to influenza A and 4% (25/619) were due to influenza B.
   - The median age for influenza A hospitalized cases was 66 years (1 week -97 years) and 19 years (5 months- 86 years) for the influenza B hospitalized cases.
   - 17% of all (101/594) of the influenza A hospitalized cases were admitted to ICU (median age of 62 years) and 20% (5/25) of the influenza B hospitalized cases were admitted to ICU as well (median age of 54 years).

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[3] Duration of outbreak is indicated as the time period in days from the date of first positive laboratory confirmation to the date when outbreak was declared over.
[4] These deaths occurred among ILI cases whether they had lab-confirmed influenza or not.
[5] Disclaimer: Hospitalizations (including ICU admissions) are influenza associated; they may or may not be due to influenza. Deaths are influenza associated; influenza may not be the direct cause of death.
[6] Risk factors include: chronic pulmonary disease, asthma, chronic heart disease, diabetes, kidney disease, immunosuppressed, cancer, chronic liver disease, anemia/hemoglobinopathy, chronic neurological disease, pregnant, First nations, obesity, current smoker, resident of a nursing home and children who have been treated with ASA for long period of time, and other chronic diseases.

- 5% (4/87) of hospitalized children less than 10 years of age were admitted to ICU compared to 13% (7/56) in season 2015/2016.

C. Hospitalizations and vaccination status
- Influenza vaccine is not recommended in infants less than 6 months.
- Eight hospitalized children were under 6 months of age and not able to receive the vaccine, therefore were excluded from the analysis of the vaccination status.
- Out of 611 hospitalized cases who could receive the vaccine, 262 were not vaccinated (43%) while 30% (183/611) received the vaccine; vaccination status was unknown for 27% of hospitalized individuals (166/611).
    o Of those with known vaccination status (Yes+No=445), 41% (183/445) were vaccinated. NOTE: This proportion cannot be generalized to the whole hospitalized population, as 27% of cases report unknown vaccination status. These individuals may include vaccinated or unvaccinated individuals.
- 51% (54/106) of cases admitted to the ICU didn't receive the current seasonal vaccination. 22% (23/106) received the vaccine, and the vaccination status is unknown for 27% (29/106).
- Among those hospitalized who could receive the vaccine, 95% (578/611) were considered meeting the high-risk eligibility criteria for publicly funded vaccine[7].
- Among those hospitalized and not vaccinated (n=262), 241 individuals (92%) would have been eligible to receive publicly funded seasonal influenza vaccine.
- Among those with ICU admissions and able to receive the vaccine, 90% (95/106) were considered meeting the high-risk eligibility criteria for publicly funded vaccine.
- Of the hospitalized children under 10 years of age who could take the vaccine, 14% (11/79) received the vaccine, 48% (38/79) did not receive the vaccine and vaccination status was unknown for 38% (30/79). (See graph 5)

D. Risk factors for hospitalization: Graph 4
- 59% of the hospitalized cases had at least 2 risk factors and 78% had at least 1 risk factor.
- In addition to age (being 65 years of age and older), the main prevalent risk factors in the hospitalized cases were chronic pulmonary disease, diabetes, chronic heart disease, being a smoker, asthma and cancer.

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[7] Meeting the high risk eligibility criteria for publicly funded vaccine includes: children between 6 months and 18 years old, people 65 years and older, persons having any co-morbid condition, being pregnant, being a First Nation or residing in a nursing home. It does not include people capable of transmitting influenza to those at high risk. Link to eligibility criteria can be found in SEASONAL INFLUENZA VACCINE ("Flu shot") FACTSHEET

Graph 2. Number of Laboratory Confirmed Influenza Cases and Level of Care* by Report Week, New Brunswick (September 24, 2018 to July 13, 2019)
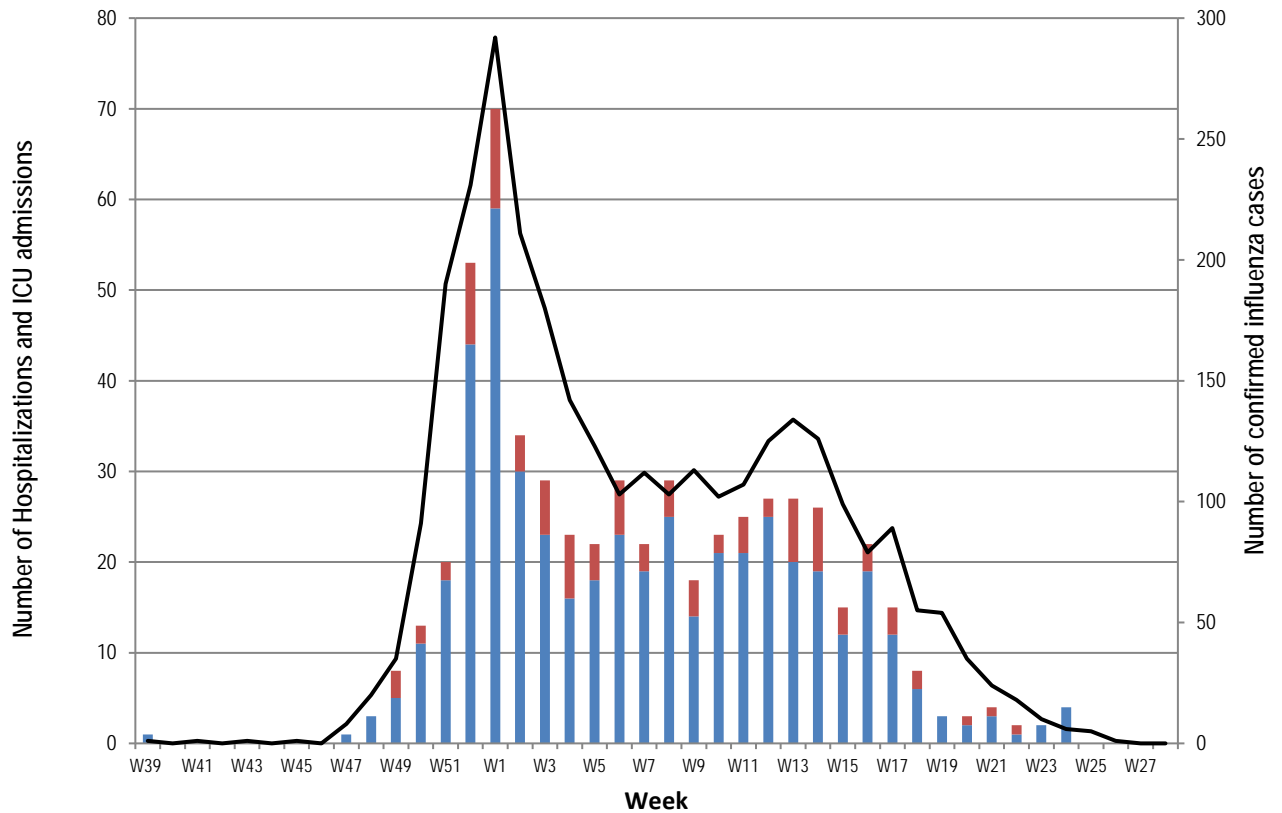
* Date of hospital admission was used as a proxy for ICU patients because Date of ICU admission is not available for all patients
Note: Those who had been hospitalized 15 days or more prior to laboratory confirmation date were excluded from the graph.

Graph 3. NB influenza-related Hospitalization, ICU admissions and Deaths by Age group, Influenza season 2018-2019 (Data up to July 13, 2019)
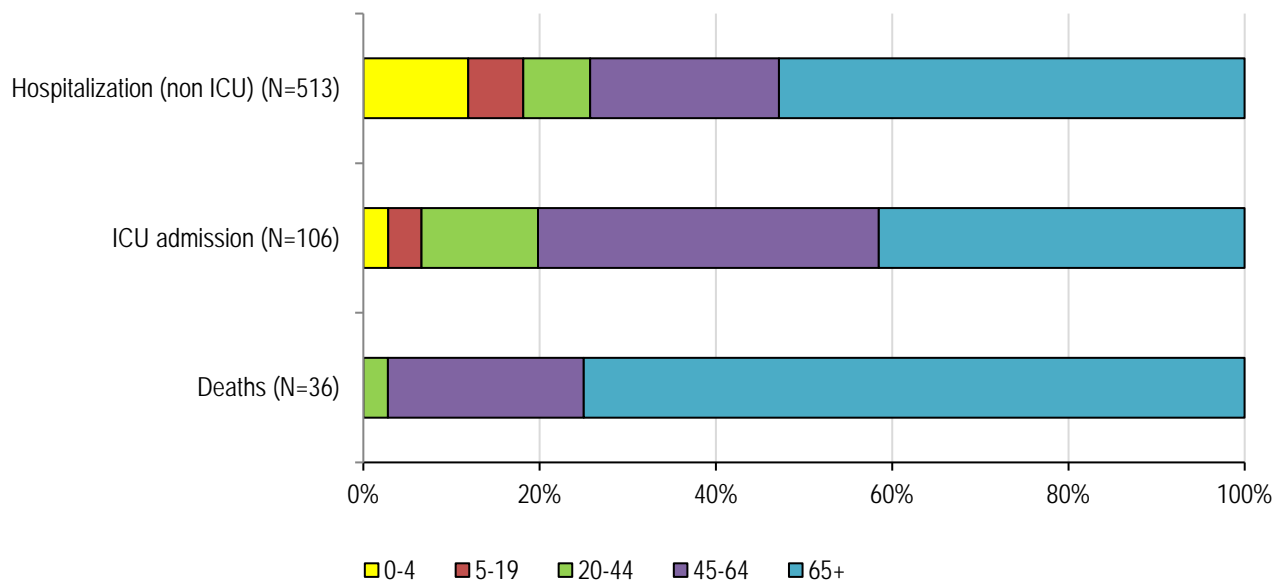
Table 3. NB influenza-related Hospitalization, ICU admissions and Deaths by Region, influenza season 2018-2019 (Data up to July 13 2019)

		R1	R2	R3	R4	R5	R6	R7
Level of care	Hospitalization (not ICU)	164	90	137	14	13	33	62
	ICU admission*	36	14	18	12	8	4	14
	Total Hospitalization**	**200**	**104**	**155**	**26**	**21**	**37**	**76**

Notes for Table 3:
- * = the number of individuals admitted to ICU
- ** = total hospitalizations (includes those admitted to ICU)

Graph 4. Predominant risk factors and co-morbid conditions in hospitalized cases, percentage of total hospitalized cases (Data up to July 13, 2019)
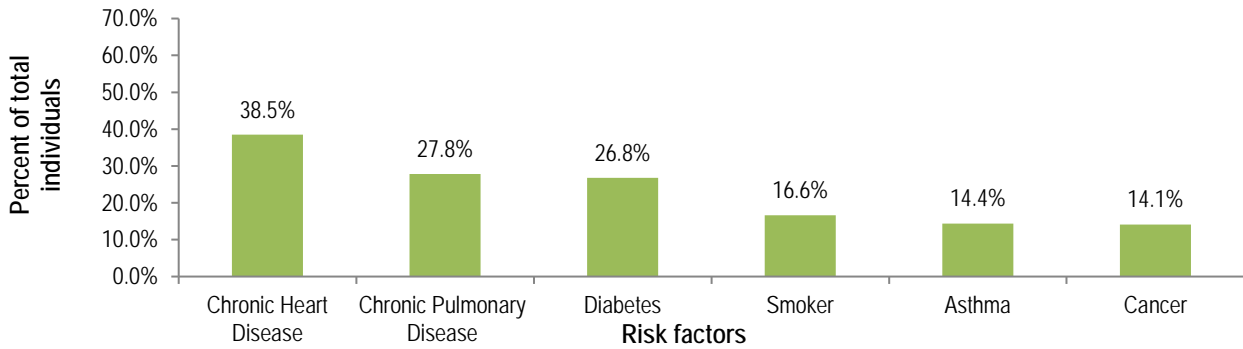
Note: Risk factors are not mutually exclusive; some individuals may have more than 1 risk factor or condition.

Graph 5. Number of Hospitalized children under 10 years of age, by age and vaccination status, in New Brunswick (N=87). (Data up to July 13, 2019)