British Columbia Influenza Surveillance Bulletin
Influenza Season 2017-18, Number 10, Week 3
January 14 to 20, 2018

Influenza Activity Remains Elevated in BC

During week 3 (January 14 to 20, 2018), most influenza surveillance indicators remained stable, while others suggested declining activity. However, influenza activity levels remain elevated in BC with regional variation across the province.

Influenza positivity at the BCCDC PHL continued to decline, falling to below 40% in week 3 from a peak of more than 50% in week 52. Influenza B has predominated among influenza detections (>60%) this week. A(H3N2) remains the dominant subtype among influenza A detections.

Since our last bulletin, 10 new lab-confirmed outbreaks were reported; all from long-term care facilities (LTCFs). Of the 10 outbreaks, 6 had influenza B detected, and 4 had influenza A detected; the 1 influenza A outbreak that had subtype information available was an A(H3N2) outbreak. Additionally, three school ILI outbreaks, with unknown etiology, were reported during week 3.

Medical Services Plan (MSP) claims for influenza illness were elevated but stable for the province overall; however, variable trends were seen across the regions. Sentinel ILI rates were significantly above 10-year historical averages for the past 3 weeks.
**British Columbia**

**Sentinel Physicians**
The proportion of patients with influenza-like illness (ILI), among those presenting to sentinel sites, was significantly above the 10-year historical average for the third consecutive week. Rates are subject to change as reporting becomes more complete. To date, 70% of sentinel sites have reported data for week 3, whereas 89% have reported for week 2.

**Percent of patient visits to sentinel physicians due to influenza-like illness (ILI) compared to historical average, British Columbia, 2017-18**

* Data are subject to change as reporting becomes more complete.
† 10-year historical average for 2017-18 season based on 2005-06 to 2016-2017 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality; CI=confidence interval.

**BC Children's Hospital Emergency Room**
In week 3, the proportion of visits to BC Children’s Hospital Emergency Room (ER) attributed to ILI remained elevated and was higher than the historical average for the past 5 seasons.

**Percent of patients presenting to BC Children’s Hospital ER attributed to influenza-like illness (ILI), British Columbia, 2017-18**

* Data include records with a triage chief complaint of "flu" or "influenza" or "fever/cough."*
* 5-year historical average for 2017-18 season based on 2012-13 to 2016-17 seasons; CI=confidence interval.
Medical Services Plan

In week 3, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims remained stable but at elevated levels for the province overall following a sharp increase in previous weeks. Trends in MSP rates varied across regions with some regions (IHA and VCHA) suggesting declining activity, while in others (NHA) rates continued to increase. In week 3, rates for the province overall and in NHA were above the 10-year maximum, while rates in IHA, FHA, VCHA and VIHA were above the 10-year 75th percentile.

Service claims submitted to MSP for influenza illness (II)* as a proportion of all submitted general practitioner service claims, British Columbia, 2017-18

* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).

Data for the period August 1, 2009 to July 31, 2010 have been excluded from the 10-year median calculation due to atypical seasonality during the 2009/2010 H1N1 pandemic year. MSP data beginning August 1, 2017 corresponds to sentinel ILI week 31; data are current to January 23, 2018.

Data provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services.
Laboratory Reports

BCCDC Public Health Laboratory

In week 3, 784 patients were tested for respiratory viruses at the BCCDC Public Health Laboratory (PHL). Of these, 305 (39%) tested positive for influenza; 111 (36%) had influenza A detected [69 A(H3N2), 15 A(H1N1)pdm09 and 27 subtype pending], 193 (63%) had influenza B detected and 1 (<1%) had both influenza A(H3N2) and B detected. Influenza positivity at the BCCDC PHL declined to 39% in week 3 from a peak of more than 50% in week 52. Among influenza A detections, A(H3N2) remained the dominant subtype during this period. Influenza B positivity remained greater than in previous years for this period, comprising more than half of all influenza detections in week 3. Based on national surveillance reports, B(Yamagata) is the predominant influenza B lineage circulating in BC and elsewhere in Canada this season.

Cumulatively during the 2017-18 season (since week 40, starting October 1, 2017), 1908 (31%) patients tested positive for influenza at the BCCDC PHL, including 1009 (53%) with influenza A [774 A(H3N2), 182 A(H1N1)pdm09, 53 subtype pending], 895 (47%) with influenza B and four patients with both influenza A [three with A(H3N2), and one with A(H1N1)pdm09] and B detected.

More than half (60%) of A(H3N2) cases have been detected among elderly adults ≥65 years old, with 8% <20 years old, 18% 20-49 years old, and 14% 50-64 years old. Conversely, 43% of influenza B cases have been detected among elderly adults ≥65 years old, with 15% <20 years old, 22% 20-49 years old, and 21% 50-64 years old. Among A(H1N1)pdm09 cases, only 16% have been detected among elderly adults ≥65 years old, with 26% <20 years old, 40% 20-49 years old, and 17% 50-64 years old.

RSV was the most commonly detected non-influenza respiratory virus during this period. RSV detections have been less frequent than in the 2016-17 season; 6% of patients tested positive for RSV in week 3 this season compared to 14% in the 2016-17 season during the same period.

Influenza and other virus detections among respiratory specimens submitted to BCCDC Public Health Laboratory, 2017-18

Source: BCCDC Public Health Laboratory (PHDRW); Data are current to January 24, 2018.
Cumulative number (since week 40) of influenza detections by type subtype and age group,
BCCDC Public Health Laboratory, 2017-18

Age distribution of influenza detections (cumulative since week 40),
BCCDC Public Health Laboratory, 2017-18

Source: BCCDC Public Health Laboratory (PHDRW); Data are current to January 24, 2018; figure includes cumulative influenza detections for specimens collected from weeks 40-3.
BC Children’s and Women’s Health Centre Laboratory

In week 3, 95 tests for influenza viruses were conducted at the BC Children’s and Women’s Health Centre (CWHC) laboratory. Of these, 11 (12%) were positive for influenza A and 8 (8%) were positive for influenza B. Additionally, 19 (20%) tests were positive for respiratory syncytial virus (RSV). RSV was the most commonly detected respiratory viruses during this period. RSV positivity is identical for week 3 when compared to the 2016/17 season.

* Positive rates were calculated using aggregate data. The denominators for each rate represent the total number of tests; multiple tests may be performed for a single specimen and/or patient.
Influenza-like Illness (ILI) Outbreaks
Since our last bulletin, 10 new lab-confirmed outbreaks were reported; all from long-term care facilities (LTCFs). Of the 10 newly reported outbreaks, 1 had onset in week 2 in IHA, 7 had onset in week 3 (3 in FHA, 3 in IHA, 1 in VIHA), and 2 had onset in week 4 in FHA. Of the 10 outbreaks, 6 had influenza B detected, and 4 had influenza A detected; the 1 influenza A outbreak that had subtype information available was an A(H3N2) outbreak.

Additionally, three school ILI outbreaks, with unknown etiology, were reported during week 3. All of these outbreaks occurred in IHA, currently the only health authority routinely reporting school ILI outbreaks to BCCDC.

Cumulatively during the 2017-18 season (since week 37, starting September 10, 2017), 97 lab-confirmed influenza outbreaks have been reported, including 37 with influenza A detected [18 A(H3N2) and 19 subtype unknown], 55 with influenza B, 1 with influenza A (H3N2) and influenza B, and 4 with influenza A (unspecified subtype) and influenza B; of these, 90 were reported in LTCFs and 7 were reported from an acute care facility. No influenza A outbreaks have been subtyped as A(H1N1)pdm09 so far this season. Additionally, 18 school ILI outbreaks have occurred without etiologic agent identified.

So far during this season of mixed A(H3N2) and influenza B co-circulation, the number of long term care facility outbreaks reported since week 40 (n=88) is lower than the tally for the same period during recent A(H3N2) dominant epidemics in 2014-15 (n=128) and 2016-17 (n=120) but higher than during recent A(H1N1)pdm09 dominant epidemics in 2013-14 (n=5) and 2015-16 (n=11), bearing in mind variation in the timing of seasonal epidemics that may influence final end-of-season comparisons.

Number of influenza-like illness (ILI) outbreaks reported, British Columbia 2017-18

Updated Antiviral Guidelines
The Association of Medical Microbiology and Infectious Disease Canada (AMMI Canada) have released updated guidance on the use of antiviral drugs given potential low vaccine effectiveness for the 2017-18 influenza season. These guidelines are available at: https://www.ammi.ca/Update/79.ENG.pdf.
FluWatch (week 2, January 7 to 13, 2018)
Overall, influenza activity in Canada remains high. Most indicators have slowed their increase, remained similar, or declined compared to the previous week, suggesting that we may be nearing the peak of the season at the national level. Most indicators remain in the higher range of expected levels for this time of year. The majority of influenza detections continue to be A(H3N2), although 37% of detections were influenza B in week 2. Influenza B is circulating much earlier than usual this season. The number of influenza B detections remains substantially greater this season compared to previous years. To date this season, the majority of lab confirmations, hospitalizations and deaths have been among adults 65 years of age and older. Details are available at: www.canada.ca/en/public-health/services/diseases/flu-influenza/influenza-surveillance/weekly-influenza-reports.html.

National Microbiology Laboratory (NML): Strain Characterization
From September 1, 2017 to January 25, 2018, the National Microbiology Laboratory (NML) received 583 influenza viruses from Canadian laboratories for antigenic characterization.

Influenza A(H3N2): Of the 318 influenza A(H3N2) viruses, only 83 (26%) had sufficient haemagglutination titre for antigenic characterization by haemagglutination inhibition (HI) assay. Of the 84 viruses characterized by HI assay, 83 (99%) were considered antigenically similar to a cell culture-propagated A/Hong Kong/4801/2014-like virus, the WHO-recommended A(H3N2) component for the 2017-18 northern hemisphere influenza vaccine, while one virus (belonging to genetic clade 3C.3a) showed reduced titre with ferret antisera raised against cell culture-propagated A/Hong Kong/4801/2014. Of the 72 out of 84 viruses that were antigenically characterized with available sequencing information, 60 belonged to genetic clade 3C.2a, 11 belonged to subclade 3C.2a1 and 1 belonged to clade 3C.3a; sequencing is pending for the remaining 12 isolates. Of the 294 viruses genetically characterized, 191 were reported to belong to genetic clade 3C.2a, which includes the A/Hong Kong/4801/2014 vaccine strain, while 42 belonged to subclade 3C.2a1 and 1 belonged to clade 3C.3a.

Influenza A(H1N1)pdm09: All of the 42 A(H1N1)pdm09 viruses characterized were antigenically similar to an A/Michigan/45/2015-like virus, the WHO-recommended influenza A(H1N1) component for the 2017-18 northern hemisphere influenza vaccine.

Influenza B: Of the 223 influenza B viruses characterized, 11 (5%) belonged to the B(Victoria) lineage and 212 (95%) belonged to the B(Yamagata) lineage. Among the 11 B(Victoria) viruses, 5 (45%) were characterized as antigenically similar to a B/Brisbane/60/2008(Victoria)-like virus, the WHO-recommended influenza B component for the 2017-18 northern hemisphere trivalent influenza vaccine, while 6 (55%) viruses showed reduced titre with ferret antisera produced against cell-propagated B/Brisbane/60/2008. Sequence analysis showed that the six viruses had a two-amino acid deletion in the hemagglutinin (HA) gene. Among the 212 B(Yamagata) viruses, all were antigenically similar to a B/Phuket/3073/2013(Yamagata lineage)-like virus, the WHO-recommended influenza B component for the 2017-18 northern hemisphere quadrivalent influenza vaccine containing two influenza B strains.

National Microbiology Laboratory (NML): Antiviral Resistance
From September 1, 2017 to January 25, 2018, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing.

Amantadine: Of the 471 influenza A viruses [428 A(H3N2) and 43 A(H1N1)pdm09] tested against amantadine, all were resistant.
Oseltamivir: Of the 521 influenza viruses [299 A(H3N2), 39 A(H1N1)pdm09, and 183 B] tested against oseltamivir, all were sensitive.
Zanamivir: Of the 516 influenza viruses [295 A(H3N2), 39 A(H1N1)pdm09, and 182 B] tested against zanamivir, all were sensitive.
International

USA (week 2, January 7 to 13, 2018)
During week 2, overall influenza activity increased in the United States. The most frequently identified influenza virus subtype reported by public health laboratories during week 2 was influenza A(H3N2). The percentage of respiratory specimens testing positive for influenza in clinical laboratories increased. The proportion of deaths attributed to pneumonia and influenza (P&I) was above the system-specific epidemic threshold in the National Center for Health Statistics (NCHS) Mortality Surveillance System. Ten influenza-associated pediatric deaths were reported. A cumulative rate of 31.5 laboratory-confirmed influenza-associated hospitalizations per 100,000 population was reported. The proportion of outpatient visits for influenza-like illness (ILI) was 6.3%, which is above the national baseline of 2.2%. The geographic spread of influenza in Puerto Rico and 49 states was reported as widespread; Guam reported regional activity; the District of Columbia and one state reported local activity; and the U.S. Virgin Islands reported sporadic activity. Details are available at: www.cdc.gov/flu/weekly/.

WHO (January 22, 2018)
Influenza activity continued to increase in the temperate zone of the northern hemisphere while in the temperate zone of the southern hemisphere activity was at inter-seasonal levels. Worldwide, influenza A accounted still for the majority of influenza detections (62%) but influenza B (mostly from the Yamagata lineage) has increased proportionally. Up to now, the majority of countries which started the season, reported influenza like illness reaching moderate levels in comparison with previous years, with few reaching already high levels. Some countries have reported levels of hospitalization and ICU admissions at levels reaching or exceeding peak levels of previous influenza seasons.

From December 25, 2017 to January 7, 2018, the WHO GISRS laboratories tested more than 225,174 specimens, of which 70,504 were positive for influenza viruses: 43,898 (62%) were typed as influenza A and 26,606 (38%) as influenza B. Of the subtyped influenza A viruses, 6,160 (41%) were influenza A(H1N1)pdm09 and 8,825 (59%) were influenza A(H3N2). Of the characterized B viruses, 6,960 (89%) belonged to the B(Yamagata) lineage and 845 (11%) to the B(Victoria) lineage.

- In North America, overall influenza activity remained high, with detections of predominantly influenza A(H3N2) viruses.
- In Europe, influenza activity increased above baseline levels in most countries in Northern, Western and Southwestern Europe with sharp increases in some countries. Activity remained low in countries in Eastern Europe. Influenza B remained the virus most frequently detected and the subtype of the influenza A viruses detected varied depending on the country and the surveillance system (outpatient or inpatient systems).
- In Western Asia, increasing influenza activity was reported in some countries, with influenza A(H1N1)pdm09 and B viruses present in the region.
- In Central Asia, influenza activity remained low.
- In East Asia, high levels of illness indicators and influenza activity were reported in most of the countries. Influenza B-Yamagata lineage virus was predominantly detected followed by influenza A(H3N2) viruses.
- In South East Asia, low levels of influenza activity were reported.
- In Southern Asia, increased influenza activity continued to increase in Iran, with detection of all seasonal subtypes.
- In Northern Africa, detections of influenza A(H1N1)pdm09 virus sharply increased in Algeria and Tunisia. Detections of influenza B virus remained high in Egypt (together with influenza A(H1N1)pdm09) and Morocco.
- In Western Africa, influenza activity continued to decrease across the region. In Middle Africa, there were no updates available for this reporting period. In Eastern Africa, influenza activity remained low across the region.
- In the Caribbean and Central American countries, respiratory illness indicators and influenza activity remained low in general.
- In the tropical countries of South America, low to no influenza activity was reported.
- In the temperate zone of the Southern Hemisphere, influenza activity remained overall at inter-seasonal levels.

Details are available at: www.who.int/influenza/surveillance_monitoring/updates/en/.
WHO Recommendations for Influenza Vaccines

WHO Recommendations for the 2017-18 Northern Hemisphere Influenza Vaccine
On March 2, 2017, the WHO announced the recommended strain components for the 2017-18 northern hemisphere trivalent influenza vaccine (TIV):*

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;†
- an A/Hong Kong/4801/2014 (H3N2)-like virus;
- a B/Brisbane/60/2008 (Victoria-lineage)-like virus.

It is recommended that quadrivalent influenza vaccines (QIV) containing two influenza B viruses contain the above three viruses and a B/Phuket/3073/2013 (Yamagata-lineage)-like virus.

* These recommended strains are the same as those recommended for the 2017 southern hemisphere TIV and represent a change for one of the three components used for the 2016-17 northern hemisphere TIV and 2016 southern hemisphere TIV.
† Recommended strain represents a change from an A/California/7/2009-like virus, which had been retained as the A(H1N1)pdm09 component since the 2009 pandemic, to an A/Michigan/45/2015-like virus belonging to the emerging phylogenetic subclade 6B.1.

For further details: www.who.int/influenza/vaccines/virus/recommendations/2017_18_north/en/.

WHO Recommendations for the 2018 Southern Hemisphere Influenza Vaccine
On September 28, 2017, the WHO announced recommended strain components for the 2018 southern hemisphere trivalent influenza vaccine (TIV):*

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;†
- an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus;‡
- a B/Phuket/3073/2013-like (Yamagata-lineage) virus.§

It is recommended that quadrivalent influenza vaccines (QIV) containing two influenza B viruses contain the above three viruses and a B/Brisbane/60/2008 (Victoria-lineage)-like virus.

* Recommended strains represent a change for two of the three components used for the 2017 southern hemisphere vaccines.
† Recommended strain is the same as recommended for the 2017 southern hemisphere and 2017-18 northern hemisphere vaccines. The A/Michigan/45/2015-like virus belongs to the emerging phylogenetic subclade 6B.1; it replaces the A/California/7/2009-like virus that had been retained as the previous A(H1N1) component since the 2009 pandemic.
‡ Recommended strain for the A(H3N2) component represents a phylogenetic clade-level change from a clade 3C.2a virus to a clade 3C.2a1 virus containing the amino acid substitution N121K in the HA which is found in the majority of recent A(H3N2) viruses.
§ Recommended strain for the influenza B component represents a lineage-level change from a B(Victoria)-lineage virus to a B(Yamagata)-lineage virus.


Additional Information

Explanatory Note:
The surveillance period for the 2017-18 influenza season is defined starting in week 40. Weeks 36-39 of the 2016-17 season are shown on graphs for comparison purposes.

List of Acronyms:

ACF: Acute Care Facility
AI: Avian influenza
FHA: Fraser Health Authority
HBoV: Human bocavirus
HMPV: Human metapneumovirus
HSDA: Health Service Delivery Area
IHA: Interior Health Authority
ILI: Influenza-Like Illness
LTCF: Long-Term Care Facility
MSP: BC Medical Services Plan
NHA: Northern Health Authority
NML: National Microbiological Laboratory
A(H1N1)pdm09: Pandemic H1N1 influenza (2009)
RSV: Respiratory syncytial virus
VCHA: Vancouver Coastal Health Authority
VIHA: Vancouver Island Health Authority
WHO: World Health Organization


Web Sites:

BC CDC Emerging Respiratory Pathogen Updates: www.bccdc.ca/health-professionals/data-reports/emerging-respiratory-virus-updates

Influenza Web Sites
USA Weekly Surveillance Reports: www.cdc.gov/flu/weekly/
Joint ECDC – WHO/Europe weekly influenza update (Flu News Europe): flunewseurope.org
WHO – Weekly Epidemiological Record: www.who.int/wer/en/
WHO Collaborating Centre for Reference and Research on Influenza (Australia): www.influenzacentre.org/

Avian Influenza Web Sites
World Organization for Animal Health: www.oie.int/eng/en_index.htm

Contact Us:
Tel: (604) 707-2510
Fax: (604) 707-2516
Email: InfluenzaFieldEpi@bccdc.ca

Communicable Disease Prevention and Control Services (CDPACS)
BC Centre for Disease Control
655 West 12th Ave, Vancouver BC V5Z 4R4

Online: www.bccdc.ca/health-professionals/data-reports/influenza-surveillance-reports
Influenza-Like Illness (ILI) Outbreak Summary Report Form

Please complete and email to ilioutbreak@bccdc.ca

Note: This form is for provincial surveillance purposes.
Please notify your local health unit per local guidelines/requirements.

**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 *could* be due to influenza virus. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

**Schools and work site outbreak**: greater than 10% absenteeism on any day, most likely due to ILI.

**Residential institutions (facilities) outbreak**: two or more cases of ILI within a seven-day period.

### Reporting Information

**Health unit/medical health officer notified?** □ Yes □ No

| Person Reporting: | ____________________________ | Title: | ____________________________ |
| Contact Phone: | ____________________________ | Email: | ____________________________ |
| Health Authority: | ____________________________ | HSDA: | ____________________________ |
| Full Facility Name: | ____________________________ |

Is this report:

□ First Notification *(complete section B below; Section D if available)*
□ Update *(complete section C below; Section D if available)*
□ Outbreak Over *(complete section C below; Section D if available)*

### First Notification

**Type of facility:**

□ LTCF  □ Acute Care Hospital  □ Senior’s Residence

*(if ward or wing, please specify name/number: __________________)*

□ Workplace  □ School (grades: )  □ Other (_________)

**Date of onset of first case of ILI (dd/mm/yyyy):** DD / MMM / YYYY

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### Update AND Outbreak Declared Over

**Date of onset for most recent case of ILI (dd/mm/yyyy):** DD / MMM / YYYY

If over, date outbreak declared over (dd/mm/yyyy): DD / MMM / YYYY

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### Laboratory Information

**Specimen(s) submitted?** □ Yes (location: ________________) □ No □ Don’t know

**If yes, organism identified?** □ Yes (specify: ________________) □ No □ Don’t know