Summer and Start of Autumn Update: Sporadic Influenza Activity in BC

During the summer period (weeks 20-37, May 15 to September 17, 2016), influenza-like illness (ILI) activity remained at inter-seasonal levels in BC.

At the BCCDC Public Health Laboratory, sporadic influenza cases were detected throughout the summer period, mostly due to influenza A viruses with a mix of A(H3N2) and A(H1N1)pdm09 subtypes. Influenza positivity remained <5% during weeks 20-35, increasing slightly to 5-10% in weeks 36 and 37. Enteroviruses were the mostly commonly detected respiratory virus during this period.

More recently, FHA reported an influenza A(H3N2) outbreak in a long-term care facility (LTCF) with onset in week 37. This is the first lab-confirmed influenza outbreak to be reported in BC since week 18. Reporting of LTCF outbreaks during summer/early fall is atypical, although sporadic outbreaks did occur as early as week 32 during the 2014-15 and 2015-16 seasons.

Since August 2016, the BCCDC Public Health Laboratory has detected 9 cases of enterovirus D68 (EV-D68) in children <10 years old. Two-thirds of cases have occurred in infants/toddlers <2 years old and at least half have been hospitalized. These are the first EV-D68 cases to be detected in BC since the 2014 autumn outbreak.
Sentinel Physicians

During weeks 20-37, the proportion of patients with influenza-like illness (ILI) among those presenting to sentinel sites ranged from 0% to 0.2%. Rates were generally at or below inter-seasonal levels, but spiked to significantly above the 10-year historical average in weeks 21, 26, 29, 32 and 37. Between 53% and 85% of sentinel sites reported data each week during this period.

BC Children's Hospital Emergency Room

During weeks 20-37, the proportion of visits to BC Children’s Hospital Emergency Room (ER) attributed to ILI remained at inter-seasonal levels, ranging from 2.5% to 6.6%.

Source: BCCH Admitting, Discharge, Transfer database (ADT). Data includes records with a triage chief complaint of “flu” or “influenza” or “fever/cough.”

* 5-year historical average for 2015-16 season based on 2010-11 to 2014-15 seasons; CI=confidence interval.
Medical Services Plan

BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, remained below 10-year 25th percentile levels for the province overall throughout the summer period. MSP reports were not generated in August for annual maintenance purposes.

Service claims submitted to MSP for influenza illness (II)* as a proportion of all submitted general practitioner service claims, British Columbia, 2015-16

* 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 week beginning August 1, 2016 corresponds to sentinel ILI week 31; data are current to September 19, 2016.

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

BCCDC Public Health Laboratory

In weeks 20-37, 1,558 patients were tested for respiratory viruses at the BCCDC Public Health Laboratory (PHL). Of these, 51 (3%) tested positive for influenza, including 41 (80%) with influenza A [13 A(H1N1)pdm09, 27 A(H3N2), and 1 subtype pending] and 10 (20%) with influenza B. Influenza positivity remained <5% during weeks 20-35, increasing slightly to 5-10% in weeks 36 and 37. Entero/rhinoviruses were the mostly commonly detected respiratory virus during this period.

Cumulatively since week 40 (starting October 4, 2015), 2,311 (23%) patients tested positive for influenza at the BCCDC PHL, including 1,313 (57%) with influenza A [979 A(H1N1)pdm09, 323 A(H3N2), and 11 subtype pending], 992 (43%) with influenza B, and 6 patients with influenza A and B co-infections.

During the 2015-16 season, just over one-half (53%) of influenza detections were in non-elderly, working-aged adults 20-64 years, with a smaller proportion of detections in children <20 years (24%) and elderly adults ≥65 years (23%). However, this age distribution differs by influenza type/subtype: adults 20-64 years, and to a lesser extent children <20 years, comprised a larger proportion of A(H1N1)pdm09 and influenza B cases, while elderly adults ≥65 years comprised a larger proportion of A(H3N2) cases.

Data are current to September 21, 2016.
Data are current to September 21, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-37.

Age distribution of influenza detections (cumulative since week 40) by type/subtype, BCCDC Public Health Laboratory, 2015-16

Data are current to September 21, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-37.
BC Children's and Women's Health Centre Laboratory

During weeks 20-37, the BC Children's and Women's Health Centre Laboratory conducted 605 tests for influenza A and B. Of these, 2 (0.3%) were positive for influenza A and 1 (0.2%) was positive for influenza B. Enteroviruses and parainfluenza viruses were the most commonly detected non-influenza respiratory viruses during the summer period.

Influenza and other virus detections among respiratory specimens submitted to BC Children's and Women's Health Centre Laboratory, 2015-16

* 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

During weeks 20-37, one new lab-confirmed influenza A(H3N2) outbreak was reported from a long-term care facility (LTCF) in FHA with onset in week 37. This is the first lab-confirmed LTCF outbreak to be reported in BC since week 18. In week 37, one school ILI outbreak in IHA was additionally reported.

Reporting of LTCF outbreaks during summer/early fall is atypical. However, during the 2014-15 and 2015-16 seasons, sporadic LTCF outbreaks were reported as early as week 32.

Cumulatively since week 32 (starting August 9, 2015), 39 influenza outbreaks were reported from facilities, including 36 from LTCFs, 1 from an acute care facility, and 2 from rehabilitation facilities:

- 18 with influenza A(H3N2) detected (including 2 non-LTCF outbreaks);
- 3 with influenza A(H1N1)pdm09 detected;
- 1 with influenza A detected (subtype could not be determined due to insufficient sample);
- 2 with both influenza A(H3N2) and A(H1N1)pdm09 detected;
- 2 with both influenza A(H3N2) and B detected;
- 1 with both influenza A(H1N1)pdm09 and B detected; and
- 12 with influenza B detected (including 1 non-LTCF outbreak).

In addition, 40 school ILI outbreaks have been reported during the 2015-16 season.

Number of influenza-like illness (ILI) outbreaks reported, compared to current sentinel ILI rate and historical average sentinel ILI rate, British Columbia 2015-16

* Facility-based influenza outbreaks defined as 2 or more ILI cases within 7-day period, with at least one laboratory-confirmed case of influenza.
† School-based ILI outbreak defined as >10% absenteeism on any day, most likely due to ILI.
Emerging Respiratory Viruses

Enterovirus D68 (EV-D68), British Columbia

Since August 2016, the BCCDC Public Health Laboratory has detected 9 cases of enterovirus D68 (EV-D68) in BC. All cases were detected in children <10 years old, with two-thirds of cases in infants/toddlers ≤2 years old. At least half of the cases have been hospitalized and one infant/toddler case presented with neurologic illness characterized by arm paralysis and some truncal weakness. Cases have been detected in all regions of the province and are not epidemiologically linked. EV-D68 cases have also been reported in other parts of Canada, the US, and Europe in recent months, including one case in a young child ≤2 years old in Alberta with acute flaccid paralysis.

In 2014, BC along with other Canadian provinces and US states, experienced a nationwide outbreak of EV-D68, with several cases associated with severe respiratory illness notably in children with asthma. During the 2014 outbreak in BC, cases were initially detected in August, with subsequent increase through September and peak in October. The majority of cases were detected in young children <5 years old; however, in contrast to the current 2016 age profile, only about 20% of cases were detected in infants/toddlers ≤2 years old in 2014. A summary of the 2014 outbreak was published in Euro Surveillance, available from: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21283.

Of note, despite systematic testing of over 700 respiratory specimens at the BCCDC Public Health Laboratory for EV-D68 during August and September 2015, no EV-D68 cases were detected in BC last fall, consistent with an expected 2-3 year periodicity.

Generally most EV-D68 cases present with mild respiratory illness; however, EV-D68 infection has been associated with neurologic illness characterized by acute flaccid paralysis in a small subset of cases. People with asthma and other lung conditions may be at higher risk of more serious respiratory complications.
National

FluWatch (weeks 35-36, August 28 to September 10, 2016)

Influenza activity is at inter-seasonal levels with all regions of Canada reporting low to no influenza activity. In week 36, sporadic influenza activity was reported in 11 regions across five provinces and territories (YK, BC, AB, ON, and QC). In week 35-36, the percentage of tests positive for influenza remained at inter-seasonal levels, ranging from 0.2% in week 35 to 0.7% in week 36. A total of 13 positive influenza detections were reported in weeks 35 and 36 and the detections of influenza A and B were approximately equal. In week 36, 0.98% of visits to sentinel healthcare professionals were due to ILI. No outbreaks were reported in weeks 35 and 36. Low numbers of hospitalizations were reported in weeks 35 and 36. Details are available at: [healthycanadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/flu-grippe/surveillance/fluwatch-reports-rapports-surveillance-influenza-eng.php](http://healthycanadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/flu-grippe/surveillance/fluwatch-reports-rapports-surveillance-influenza-eng.php).

National Microbiology Laboratory (NML): Strain Characterization

From September 1, 2015 to August 31, 2016, the National Microbiology Laboratory (NML) received 3,040 influenza viruses [288 A(H3N2), 1,491 A(H1N1)pdm09 and 1,261 B] from Canadian laboratories for antigenic characterization.

**Influenza A(H3N2):** Of the 288 influenza A(H3N2) viruses, only 91 (32%) had sufficient haemagglutination titre for antigenic characterization by haemagglutination inhibition (HI) assay. Of the 91 viruses characterized by HI assay, all were considered antigenically similar to cell-passaged A/Switzerland/9715293/2013, the WHO-recommended A(H3N2) component for the 2015-16 northern hemisphere influenza vaccine. Genetic characterization was performed to infer antigenic properties on the remaining 197 viruses that did not grow to sufficient haemagglutination titre for HI assay. Of the 197 A(H3N2) viruses genetically characterized, all were reported to belong to a genetic group in which most viruses were antigenically related to A/Switzerland/9715293/2013.

**Influenza A(H1N1)pdm09:** The 1,491 A(H1N1)pdm09 viruses characterized were antigenically similar to A/California/7/2009, the WHO-recommended A(H1N1) component for the 2015-16 northern hemisphere influenza vaccine.

**Influenza B:** Of the 1,261 influenza B viruses characterized, 267 (21%) were antigenically similar to B/Phuket/3073/2013 (Yamagata lineage), the recommended influenza B component for the 2015-16 northern hemisphere influenza vaccine, while 994 (79%) were characterized as B/Brisbane/60/2008 (Victoria lineage), the recommended influenza B component for the 2015-16 northern hemisphere quadrivalent influenza vaccine containing two influenza B components.

National Microbiology Laboratory (NML): Antiviral Resistance

From September 1, 2015 to August 31, 2016, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing. Of the 1,805 influenza A viruses [293 A(H3N2) and 1,512 A(H1N1)pdm09] tested against amantadine, all were resistant with the exception of one A(H3N2) virus and one A(H1N1)pdm09 virus which were sensitive to amantadine. Of the 2,256 influenza viruses [218 A(H3N2), 1,167 A(H1N1)pdm09 and 871 B] tested against oseltamivir, all A(H3N2) and B viruses and 1,157/1,167 (99%) A(H1N1)pdm09 viruses were sensitive; 10 A(H1N1)pdm09 viruses with a H275Y mutation were resistant to oseltamivir. Of the 2,257 influenza viruses [219 A(H3N2), 1,167 A(H1N1)pdm09 and 871 B] tested against zanamivir, all were sensitive.
International

USA (week 36, ending September 10, 2016)
During week 36, the most frequently identified influenza virus type reported by public health laboratories was influenza A(H3N2). The percentage of respiratory specimens testing positive for influenza in clinical laboratories increased slightly, with a mix of influenza A and B detected. The proportion of deaths attributed to pneumonia and influenza (P&I) was below system-specific epidemic thresholds. No influenza-associated pediatric deaths were reported to CDC during week 36. The proportion of outpatient visits for ILI was 1.0%, which is below the national baseline of 2.1%. Details are available at: www.cdc.gov/flu/weekly/.

WHO (September 19, 2016)
Influenza activity varied in countries of temperate South America, is ongoing in South Africa and increased steadily in the last few weeks in Oceania. Influenza activity in the temperate zone of the northern hemisphere was at inter-seasonal levels.

- In temperate South America, influenza and respiratory syncytial virus (RSV) activity decreased throughout most of the sub-region. In Chile, ILI and laboratory confirmed influenza and RSV virus detections remained elevated; influenza A(H1N1)pdm09 was predominant with co-circulation of A(H3N2) viruses and influenza B viruses. Influenza activity was low in Argentina and Paraguay, while no influenza activity was reported in Uruguay. In Argentina however, ILI and severe acute respiratory infection (SARI) cases remained elevated. RSV activity remained elevated in the region.

- In the temperate countries of Southern Africa, influenza activity is ongoing, with co-circulation of influenza A(H1N1)pdm09, A(H3N2) and B viruses.

- In Oceania, influenza virus activity increased slightly in recent weeks, but seems to have reached its peak. Influenza A(H3N2) remained the dominant circulating influenza virus. In contrast, in New Zealand ILI consultation rates remained below the seasonal baseline level, although 43% of ILI samples tested positive for influenza, with influenza A(H3N2) predominating.

- In the Caribbean countries, influenza and other respiratory virus activity remained low throughout most of the sub-region. The exception was Suriname where the number of SARI cases and hospitalizations continued to increase with parainfluenza virus predominating in the recent weeks. In Central America, influenza virus activity remained low but in most of the countries, detections of non-influenza respiratory viruses stayed elevated with RSV predominating.

- In tropical South America, influenza A(H1N1)pdm09 and RSV virus detections generally decreased in recent weeks or remained low in most of the countries. Influenza A(H1N1)pdm09 detections continued to decrease in Brazil and Ecuador. In Peru, influenza activity continue to decrease, with influenza A(H1N1)pdm09 and influenza B viruses co-circulating.

- In tropical countries of South Asia, influenza activity was generally low with seasonal influenza A and B viruses co-circulating in the region.

- In South East Asia, there was a decreasing trend in influenza detection in recent weeks, with co-circulation of seasonal influenza A and B viruses.

- Sporadic cases of influenza A(H3N2) virus infection were reported from northern, middle and western Africa in recent weeks, among the few countries reporting data during this period. In East Africa, ongoing elevated influenza B detections were reported by Madagascar. Kenya reported decreasing influenza A(H1N1)pdm09 and A(H3N2) activity.

- In North America and Europe, influenza activity was low with few influenza virus detections. ILI levels were below seasonal thresholds.

- Influenza activity was low in temperate Asia.

- Between August 22 and September 4, 2016, the WHO GISRS laboratories tested more than 42,184 specimens. Of these, 2,911 were positive for influenza viruses: 2,271 (78%) were typed as influenza A and 640 (22%) as influenza B. Of the sub-typed influenza A viruses, 301 (19%) were influenza A/H1N1pdm09 and 1,313 (81%) were influenza A/H3N2. Of the characterized B viruses, 44 (25%) belonged to the B/Yamagata lineage and 133 (75%) to the B/Victoria lineage.

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

WHO Recommendations for 2016-17 Northern Hemisphere Influenza Vaccine
On February 25, 2016, the WHO announced recommended strain components for the 2016-17 Northern Hemisphere trivalent influenza vaccine (TIV):*

- an A/California/7/2009 (H1N1)pdm09-like virus;†
- an A/Hong Kong/4801/2014(H3N2)-like virus;‡
- a B/Brisbane/60/2008-like (Victoria-lineage) 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-like (Yamagata-lineage) virus.

These recommended components are the same as those recommended for the 2016 Southern Hemisphere vaccine.

* Recommended strains represent a change for two of the three components used for the 2015-16 Northern Hemisphere vaccines.
† Recommended strain has been retained as the A(H1N1) component since the 2009 pandemic and has been included in the Northern Hemisphere vaccine since 2010-11.
‡ Recommended strain for the A(H3N2) component represents a phylogenetic clade-level change from a clade 3C.3a virus to a clade 3C.2a virus.
§ Recommended strain for the influenza B component represents a lineage-level change from a B/Yamagata-lineage virus to a B/Victoria-lineage virus.


WHO Recommendations for 2015-16 Northern Hemisphere Influenza Vaccine
On February 26, 2015, the WHO announced the recommended strain components for the 2015-16 Northern Hemisphere trivalent influenza vaccine (TIV):*

- an A/California/7/2009(H1N1)pdm09-like virus;†
- an A/Switzerland/9715293/2013(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-like (Victoria-lineage) virus.

* These recommended strains are the same as those used for the 2015 Southern Hemisphere vaccine.
† Recommended strain has been retained as the A(H1N1) component since the 2009 pandemic and has been included in the Northern Hemisphere vaccine since 2010-11.
‡ A/South Australia/55/2014, A/Norway/466/2014, and A/Stockholm/6/2014 are A/Switzerland/9715293/2013-like viruses. Recommended strain is considered antigenically distinct from the A/Texas/50/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine and clusters within the emerging phylogenetic clade 3C.3a.
§ Recommended strain is the same influenza B-Yamagata lineage as the B/Massachusetts/2/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine but represents a phylogenetic clade-level change from clade 2 to clade 3.

For further details: www.who.int/influenza/vaccines/virus/recommendations/2015_16_north/en/.
Additional Information

Explanatory Note:
The surveillance period for the 2015-16 influenza season is defined starting in week 40. Weeks 36-39 of the 2014-15 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

Current AMMI Canada Guidelines on the Use of Antiviral Drugs for Influenza:
www.ammi.ca/guidelines

Web Sites:
BCCDC Emerging Respiratory Pathogen Updates:
www.bccdc.ca/health-professionals/data-reports/emerging-respiratory-virus-updates

Influenza Web Sites
Canada – Flu Watch: www.phac-aspc.gc.ca/fluwatch/
USA Weekly Surveillance Reports: www.cdc.gov/flu/weekly/
European Influenza Surveillance Scheme:
edc.europa.eu/EN/HEALTHTOPICS/SEASONAL_INFLUENZA/EPIDEMIOLOGICAL_DATA/Pages/Weekly_Influenza_Surveillance_Overview.aspx
WHO – Weekly Epidemiological Record: www.who.int/wer/en/
WHO Collaborating Centre for Reference and Research on Influenza (Australia):
www.influenzacentre.org/
Australian Influenza Report:

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.

### Reporting Information

Health unit медицинский здравоохранительный орган 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**

<table>
<thead>
<tr>
<th>Numbers to date</th>
<th>Residents/Students</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>With ILI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospitalized</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Died</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>Numbers to date</th>
<th>Residents/Students</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>With ILI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospitalized</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Died</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Laboratory Information

Specimen(s) submitted?
- Yes (location: ______________)  
- No  
- Don’t know

If yes, organism identified?
- Yes (specify: ____________)  
- No  
- Don’t know

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.