

British Columbia Influenza Surveillance Bulletin

Influenza Season 2016-17, Number 06, Weeks 48-49

November 27 to December 10, 2016

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Seasonal Influenza Circulation, with Increasing RSV Activity in BC

During weeks 48-49 (November 27 to December 10, 2016), seasonal influenza activity was observed in BC. Respiratory syncytial virus (RSV) activity continued to increase during this period, notably at the BC Children's and Women's Health Centre Laboratory where over one-third of tests were RSV positive in weeks 48-49.

At the BCCDC Public Health Laboratory, influenza positivity increased from 7% in week 48 to 15% in week 49, while RSV positivity increased from 8% in week 48 to 13% in week 49, concurrent with a decline in entero/rhinovirus detections.

Two new influenza A outbreaks were reported from long-term care facilities in FHA: one with onset in week 49 and one in week 50. A total of 15 influenza outbreaks have been reported so far this season (since week 37), 14 with influenza A detected (all H3N2 where subtype information is available) and one with influenza B detected.

Medical Services Plan (MSP) claims for influenza illness were at expected median levels for this time of year, while sentinel ILI rates remained above 10-year historical averages for the fourth consecutive week.

Nine new cases of enterovirus D68 (EV-D68) were detected, bringing the total number of cases detected in BC since August 2016 to 71 cases, including two children <2 years old with associated neurological features.

Prepared by BCCDC Influenza & Emerging Respiratory Pathogens Team

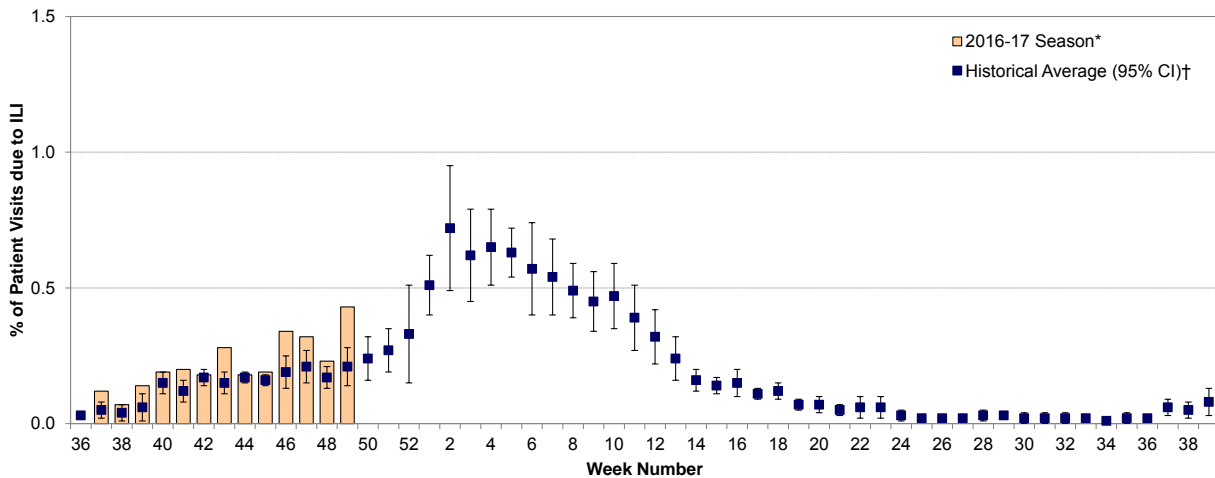
Report Disseminated: December 15, 2016

British Columbia

Sentinel Physicians

The proportion of patients with influenza-like illness (ILI) among those presenting to sentinel sites was 0.23% in week 48 and 0.43% in week 49. Rates remained significantly higher than the 10-year historical average for this time of year for the fourth consecutive week. So far, 63% and 43% of sentinel sites have reported data for weeks 48 and 49, respectively.

Percent of patient visits to sentinel physicians due to influenza-like illness (ILI) compared to historical average, British Columbia, 2016-17



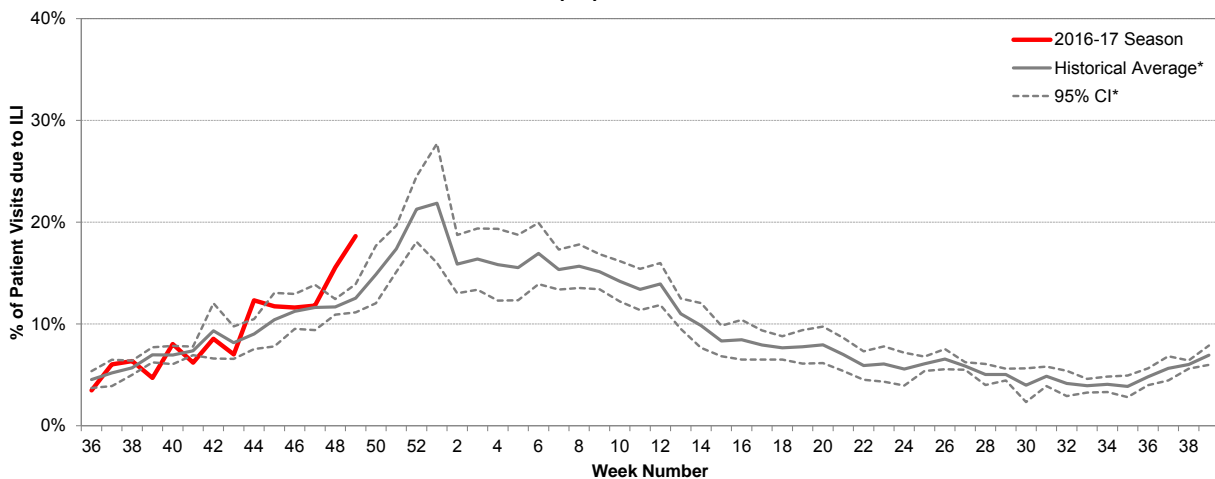
* Data are subject to change as reporting becomes more complete.

† 10-year historical average for 2016-17 season based on 2004-05 to 2015-2016 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality; CI=confidence interval.

BC Children's Hospital Emergency Room

The proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI increased from 12% in week 47 to 16% in week 48 and 19% in week 49 and was significantly above the 5-year historical average during this period.

Percent of patients presenting to BC Children's Hospital ER attributed to influenza-like illness (ILI), British Columbia, 2016-17



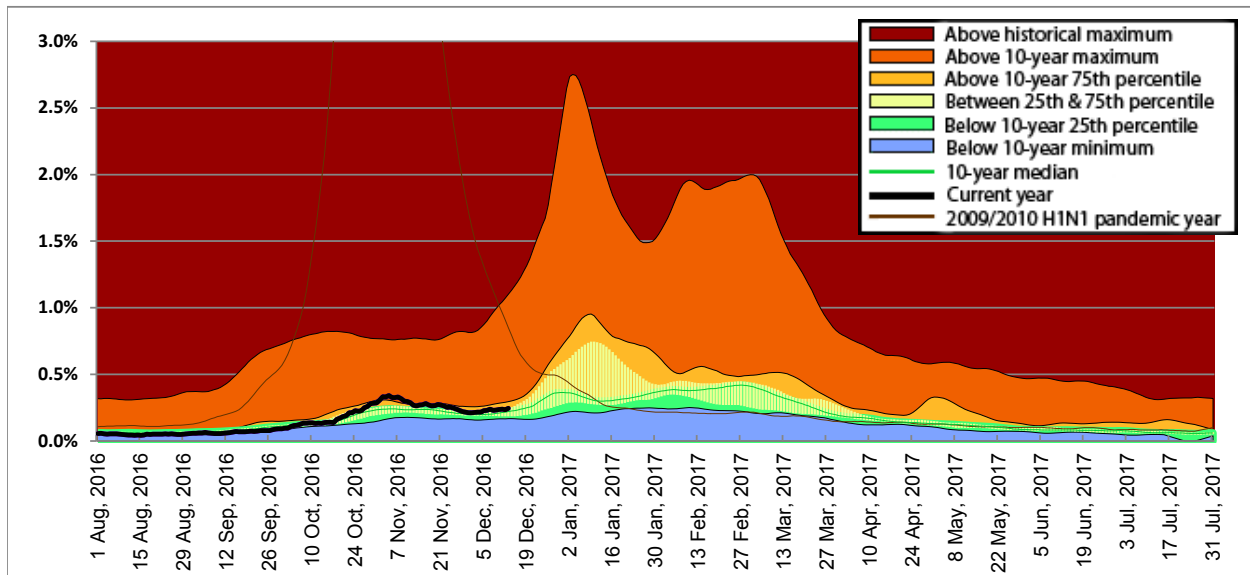
Source: BCCCH Admitting, Discharge, Transfer database (ADT). Data includes records with a triage chief complaint of "flu" or "influenza" or "fever/cough."

* 5-year historical average for 2016-17 season based on 2011-12 to 2015-16 seasons; CI=confidence interval.

Medical Services Plan

In weeks 48-49, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, remained relatively stable across the province. In week 49, rates were at median levels for the province overall and in FHA, above 10-year 75th percentiles in VCHA and VIHA, and above 10-year maximums in IHA, but remained below 10-year minimums in NHA.

Service claims submitted to MSP for influenza illness (II)* as a proportion of all submitted general practitioner service claims, British Columbia, 2016-17

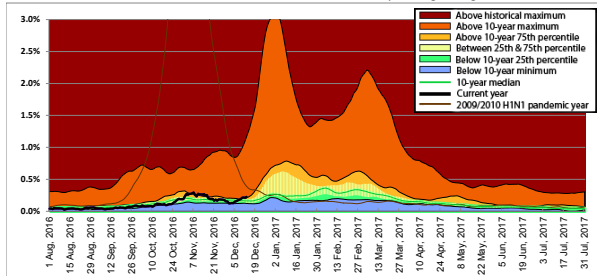


* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).

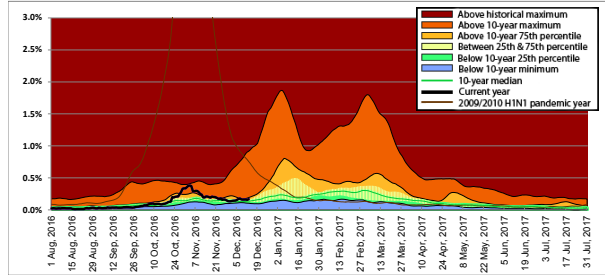
Data for the period August 1, 2009 to July 31, 2010 have been excluded from the 10-year median calculation due to atypical seasonality during the 2009/2010 H1N1 pandemic year. MSP week beginning August 1, 2016 corresponds to sentinel ILI week 31; data are current to December 13, 2016.

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

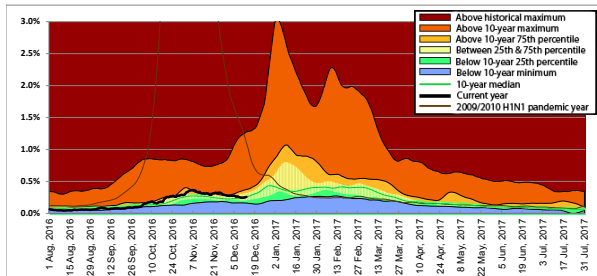
Interior



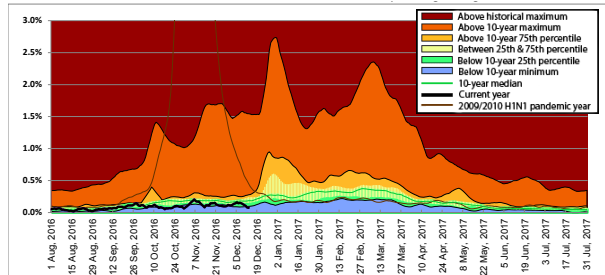
Vancouver Island



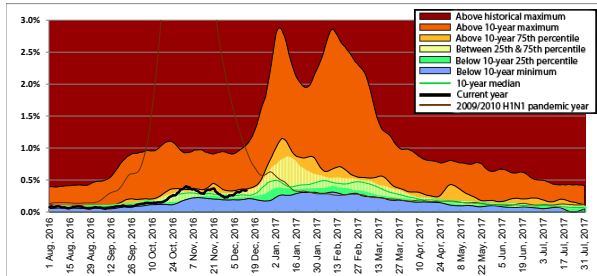
Fraser



Northern



Vancouver Coastal



Laboratory Reports

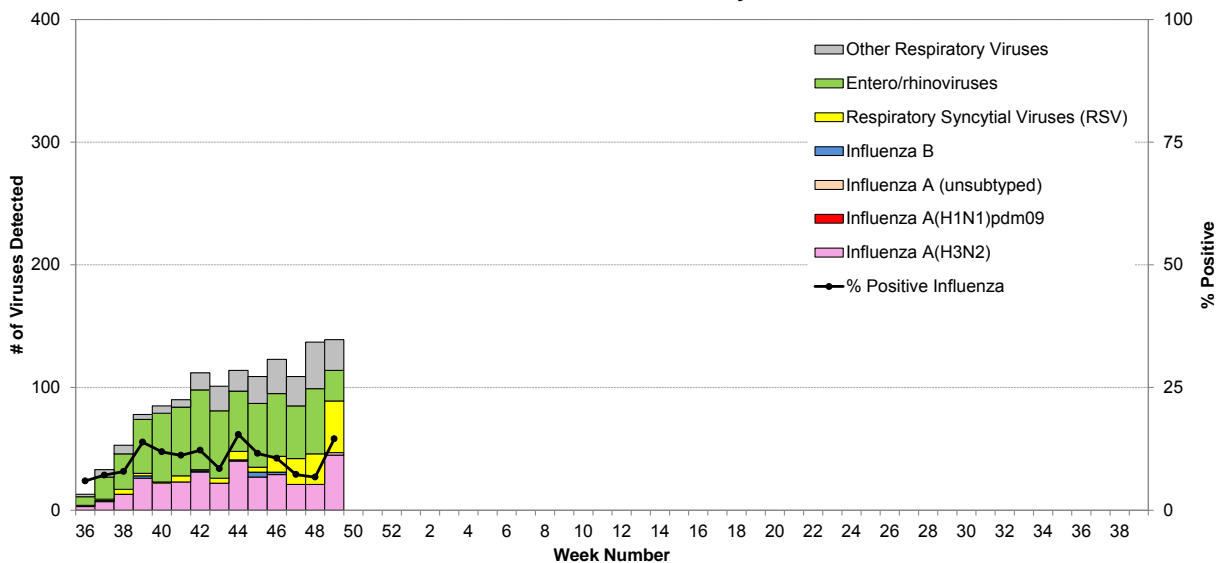
BCCDC Public Health Laboratory

During weeks 48-49, 632 patients were tested for respiratory viruses at the BCCDC Public Health Laboratory (PHL). Of these, 68 (11%) tested positive for influenza A [66 A(H3N2) and 2 with subtype pending]; none tested positive for influenza B. Overall influenza positivity increased from 7% in week 48 to 15% in week 49. The number of respiratory syncytial virus (RSV) positive specimens almost doubled during this period, increasing from 8% positivity in week 48 to 13% in week 49, concurrent with a decrease in the number of entero/rhinovirus-positive detections.

Cumulatively since week 40 (starting October 2, 2016), 289 (11%) patients tested positive for influenza at the BCCDC PHL, including 281 (97%) with influenza A [279 A(H3N2) and 2 subtype pending] and 8 (3%) with influenza B. No patients have tested positive for influenza A(H1N1)pdm09 so far this season.

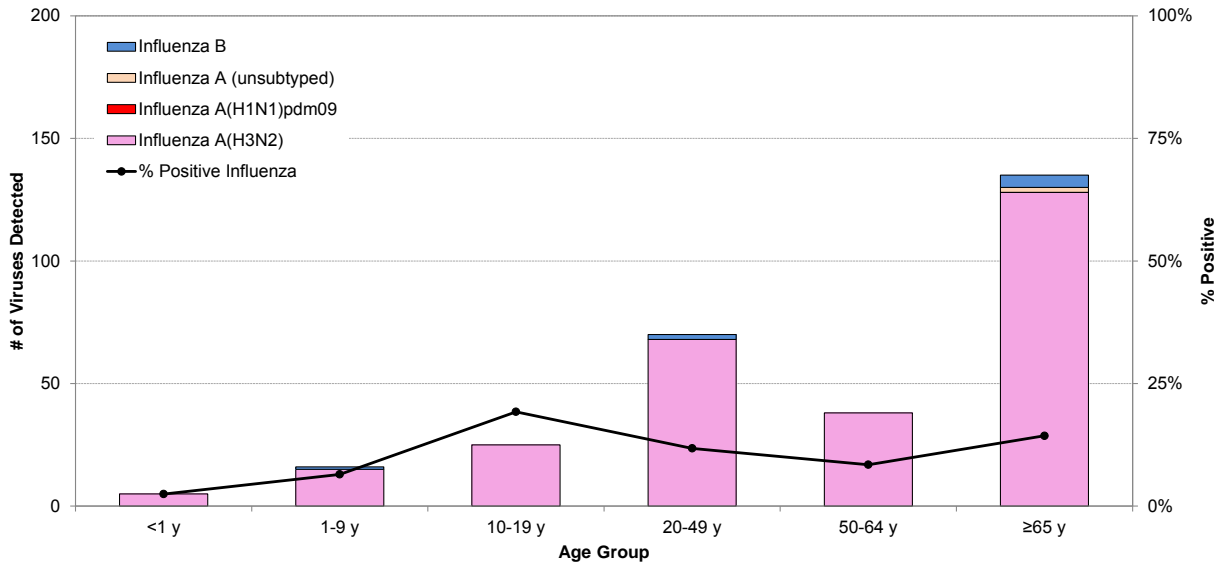
So far during the 2016-17 season, influenza A(H3N2) has been the dominant subtype among influenza detections. Elderly adults ≥ 65 years old are disproportionately represented among influenza detections, consistent with dominant circulation of A(H3N2) subtype viruses so far this season, although younger age groups are also affected.

Influenza and other virus detections among respiratory specimens submitted to BCCDC Public Health Laboratory, 2016-17



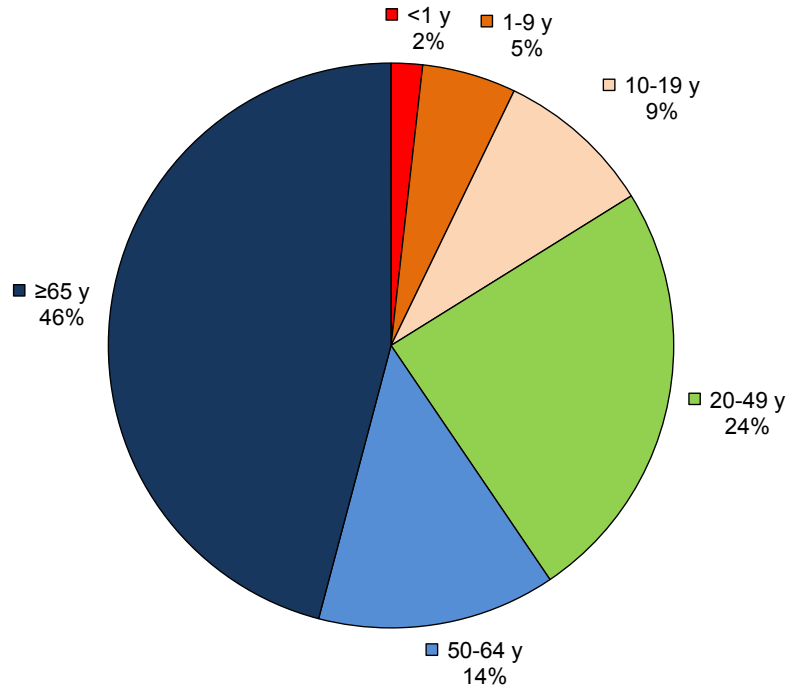
Data are current to December 14, 2016.

Cumulative number (since week 40) of influenza detections by type/subtype and age group, BCCDC Public Health Laboratory, 2016-17



Data are current to December 14, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-49.

Age distribution of influenza A(H3N2) detections (cumulative since week 40), BCCDC Public Health Laboratory, 2016-17

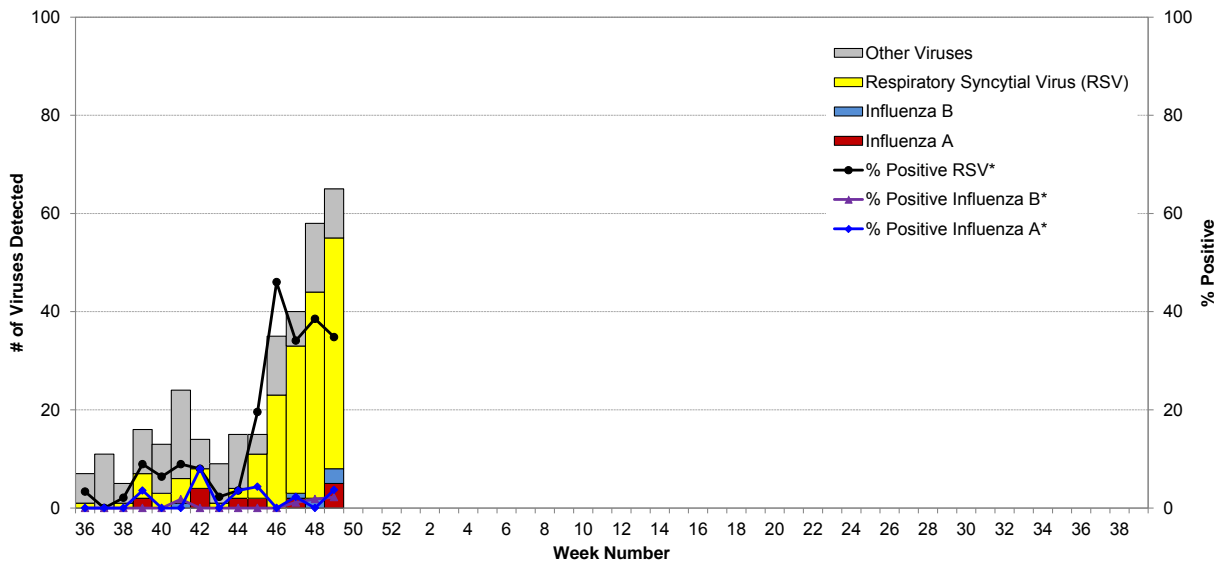


Data are current to December 14, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-49.

BC Children’s and Women’s Health Centre Laboratory

RSV activity remained elevated at the BC Children’s and Women’s Health Centre Laboratory in weeks 48 and 49. Of the 244 tests conducted, 89 (36%) were positive for RSV during this period. Five (2%) tests were positive for influenza A (all in week 49) and five (2%) were positive for influenza B (2 in week 48 and 3 in week 49).

Influenza and other virus detections among respiratory specimens submitted to BC Children’s and Women’s Health Centre Laboratory, 2016-17



* 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.

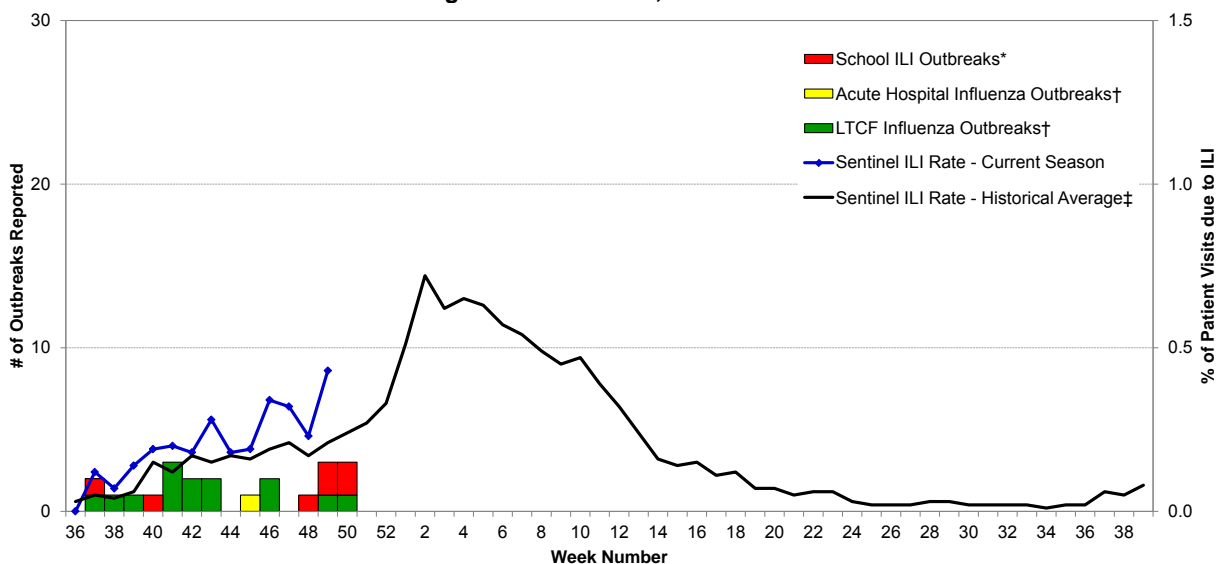
Influenza-like Illness (ILI) Outbreaks

Since our last bulletin two weeks ago, two new influenza outbreaks were reported from long-term care facilities (LTCFs) with influenza A (subtype pending) detected; both were in FHA (one with onset in week 49 and one in week 50). Four school ILI outbreaks in IHA were additionally reported during this period (two in week 49 and two in week 50).

Cumulatively during the 2016-17 season (since week 37, starting September 11, 2016), a total of 15 influenza outbreaks have been reported, including 14 in LTCFs and one in an acute care setting. All of the influenza A outbreaks with subtype information available had influenza A(H3N2) detected; one outbreak with influenza B detected was additionally reported.

A total of 7 school ILI outbreaks have also been reported so far during the 2016-17 season but without etiologic agent identified.

Number of influenza-like illness (ILI) outbreaks reported, compared to current sentinel ILI rate and historical average sentinel ILI rate, British Columbia 2016-17



* School-based ILI outbreak defined as >10% absenteeism on any day, most likely due to ILI.

† Facility-based influenza outbreaks defined as 2 or more ILI cases within 7-day period, with at least one laboratory-confirmed case of influenza.

‡ 10-year historical average for 2016-17 season based on 2004-05 to 2015-16 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality.

Emerging Respiratory Viruses

Enterovirus D68 (EV-D68), British Columbia

Since our last bulletin two weeks ago, 9 new cases of enterovirus D68 (EV-D68) were detected at the BCCDC Public Health Laboratory, bringing the total number of cases detected in BC since August 2016 to 71 cases.

Of the 71 laboratory-confirmed EV-D68 cases reported in BC to date since August 2016, 54 (76%) were detected in children <10 years old, and of those, about half (28/54, 52%) have been detected in infants/toddlers <2 years old. Over 60% of cases are male. Almost three-quarters of cases with known information have been hospitalized, including two hospitalized cases with EV-D68-associated neurologic illness, both <2 years old involving arm paralysis. Cases have been detected in all regions of the province. 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. A summary of the 2014 outbreak was published in *Euro Surveillance*, available from: 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 (week 48, November 27 to December 3, 2016)

Influenza activity has reached seasonal levels with many regions in Canada reporting increasing influenza activity. In week 48, the percentage of tests positive for influenza increased with 7.2% of tests positive for influenza. The percentage of tests positive for influenza is at seasonal levels with percent positivity remaining above 5% for two consecutive weeks. Influenza A(H3N2) continues to be the most common subtype detected. In week 48, 1.1% of visits to sentinel healthcare professionals were due to influenza-like symptoms. Two laboratory-confirmed influenza outbreaks were reported in week 48 with all occurring in long-term care facilities. Twenty-eight hospitalizations were reported from participating provinces and territories in week 48; the majority due to influenza A(H3N2). Details are available at: 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 to December 14, 2016, the National Microbiology Laboratory (NML) received 144 influenza viruses [125 A(H3N2), 7 A(H1N1)pdm09 and 12 B] from Canadian laboratories for antigenic characterization.

Influenza A(H3N2): Of the 125 influenza A(H3N2) viruses, only 47 (38%) had sufficient haemagglutination titre for antigenic characterization by haemagglutination inhibition (HI) assay. Of the 47 viruses characterized by HI assay, all were considered antigenically similar to A/Hong Kong/4801/2014, the WHO-recommended A(H3N2) component for the 2016-17 northern hemisphere influenza vaccine. Of the 47 viruses antigenically characterized with available sequencing information, 41 (87%) belonged to genetic group 3C.2a and 6 (13%) belonged to genetic group 3C.3a. Genetic characterization was performed to infer antigenic properties on the remaining 78 viruses that did not grow to sufficient haemagglutination titre for HI assay. Of the 78 viruses genetically characterized, all were reported to belong to genetic group 3C.2a, which includes the A/Hong Kong/4801/2014 vaccine strain.

Influenza A(H1N1)pdm09: The 7 A(H1N1)pdm09 viruses characterized were antigenically similar to A/California/7/2009, the WHO-recommended A(H1N1) component for the 2016-17 northern hemisphere influenza vaccine.

Influenza B: Of the 12 influenza B viruses characterized, 8 (67%) were antigenically similar to a B/Brisbane/60/2008(Victoria lineage)-like virus, the WHO-recommended influenza B component for the 2016-17 northern hemisphere trivalent influenza vaccine. The remaining 4 (33%) viruses were characterized as a B/Phuket/3073/2013(Yamagata lineage)-like virus, the WHO-recommended influenza B component for the 2016-17 northern hemisphere quadrivalent influenza vaccine containing two influenza B components.

National Microbiology Laboratory (NML): Antiviral Resistance

From September 1 to December 14, 2016, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing.

Amantadine: Of the 51 influenza A viruses [45 A(H3N2) and 6 A(H1N1)pdm09] tested against amantadine, all were resistant.

Oseltamivir: Of the 134 influenza viruses [117 A(H3N2), 6 A(H1N1)pdm09 and 11 B] tested against oseltamivir, all were sensitive.

Zanamivir: Of the 134 influenza viruses [117 A(H3N2), 6 A(H1N1)pdm09 and 11 B] tested against zanamivir, all were sensitive.

International

USA (week 48, November 27 to December 3, 2016)

During week 48, influenza activity increased slightly, but remained low in the United States. The most frequently identified influenza virus subtype reported by public health laboratories during week 48 was influenza A(H3N2). The percentage of respiratory specimens testing positive for influenza in clinical laboratories remained low. Of the 101 A(H3N2) viruses genetically characterized by the US CDC during the 2016-17 season, 91% belonged to genetic group 3C.2a, including the newly emerging subgroup 3C.2a1, and 9% to group 3C.3a based on analysis of HA gene segments. No influenza-associated pediatric deaths were reported. The proportion of outpatient visits for ILI was 1.8%, which is below the national baseline of 2.2%. The geographic spread of influenza in Puerto Rico was reported as widespread; Guam and two states were reported as regional; 19 states reported local activity; the U.S. Virgin Islands and 28 states reported sporadic activity; one state reported no activity; and the District of Columbia did not report. Details are available at: www.cdc.gov/flu/weekly/.

WHO (December 12, 2016)

Influenza activity in the temperate zone of the northern hemisphere increased slightly.

- In North America, influenza activity slightly increased with influenza A(H3N2) virus predominating. ILI levels remained below seasonal thresholds. In the United States, RSV activity continued to be reported.
- In Europe, influenza activity was low but has started to rise, particularly in Northern European countries. Influenza A viruses were predominating with the most frequent subtype being A(H3N2). The season has started earlier than usual with a positivity rate $\geq 10\%$ for influenza among sentinel surveillance samples.
- In East Asia, influenza activity increased slightly with influenza A(H3N2) remaining the dominant virus circulating. In Western Asia, influenza detections remained low.
- In Northern Africa, influenza detections increased in Morocco with influenza A(H3N2) viruses dominating.
- In the Caribbean countries, influenza and other respiratory virus activity remained low. In Central America, there was a slight decrease in influenza and other respiratory viruses activity. RSV continued to circulate in Costa Rica.
- In tropical South America, influenza and other respiratory viruses activity remained low with exception of Colombia where RSV activity continued to be reported.
- In Southern Asia, there was a slight increase in influenza detections in both Iran and Sri Lanka with influenza A(H3N2) as the most frequently detected virus in this region.
- In South East Asia, influenza activity continued to be reported at low levels, with influenza A(H3N2) virus predominant in the region. A slight increase in influenza A(H1N1)pdm09 detections was reported in Vietnam.
- In West Africa, influenza detections increased in Ghana with B viruses dominating. In Southern Africa, influenza activity continued at inter-seasonal levels.
- In temperate South America, influenza and RSV activity continued to decrease throughout the sub-region.
- In Oceania, influenza virus activity was reported at inter-seasonal levels.
- From November 14 to 27, 2016, the WHO GISRS laboratories tested more than 93,152 specimens, of which 6,209 were positive for influenza viruses: 5,630 (91%) were typed as influenza A and 579 (9%) as influenza B. Of the subtyped influenza A viruses, 112 (3%) were influenza A(H1N1)pdm09 and 3,787 (97%) were influenza A(H3N2). Of the characterized B viruses, 46 (36%) belonged to the B/Yamagata lineage and 81 (64%) 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 (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 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.

For further details: http://www.who.int/influenza/vaccines/virus/recommendations/2016_17_north/en/.

WHO Recommendations for 2017 Southern Hemisphere Influenza Vaccine

On September 29, 2016, the WHO announced the recommended strain components for the 2017 southern 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 represent a change for one of the three components used for the 2016 southern hemisphere TIV and 2016-17 northern 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_south/en/.

Additional Information

Explanatory Note:

The surveillance period for the 2016-17 influenza season is defined starting in week 40. Weeks 36-39 of the 2015-16 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/?ID=122&Language=ENG

Web Sites:

BCCDC Emerging Respiratory Pathogen Updates:

www.bccdc.ca/health-professionals/data-reports/emerging-respiratory-virus-updates

Influenza Web Sites

Canada – Influenza surveillance (FluWatch): healthycanadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/flu-grippe/surveillance/index-eng.php

Washington State Flu Updates: <http://www.doh.wa.gov/portals/1/documents/5100/420-100-fluupdate.pdf>

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/

Australian Influenza Report:

www.health.gov.au/internet/main/publishing.nsf/content/cda-surveil-ozflu-flucurr.htm

New Zealand Influenza Surveillance Reports: www.surv.esr.cri.nz/virology/influenza_weekly_update.php

Avian Influenza Web Sites

WHO – Influenza at the Human-Animal Interface: www.who.int/csr/disease/avian_influenza/en/

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.

A	<u>Reporting Information</u> Health unit/medical health officer notified? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Person Reporting: _____ Title: _____
	Contact Phone: _____ Email: _____
	Health Authority: _____ HSDA: _____
	Full Facility Name: _____
	Is this report: <input type="checkbox"/> First Notification (<i>complete section B below; Section D if available</i>) <input type="checkbox"/> Update (<i>complete section C below; Section D if available</i>) <input type="checkbox"/> Outbreak Over (<i>complete section C below; Section D if available</i>)

B	<u>First Notification</u>
	Type of facility: <input type="checkbox"/> LTCF <input type="checkbox"/> Acute Care Hospital <input type="checkbox"/> Senior's Residence <i>(if ward or wing, please specify name/number: _____)</i>
	<input type="checkbox"/> Workplace <input type="checkbox"/> School (grades: _____) <input type="checkbox"/> Other (_____)
	Date of onset of first case of ILI (dd/mm/yyyy): <u>DD / MMM / YYYY</u>

Numbers to date	Residents/Students	Staff
Total		
With ILI		
Hospitalized		
Died		

C	<u>Update AND Outbreak Declared Over</u>
	Date of onset for most recent case of ILI (dd/mm/yyyy): <u>DD / MMM / YYYY</u>
	If over, date outbreak declared over (dd/mm/yyyy): <u>DD / MMM / YYYY</u>

Numbers to date	Residents/Students	Staff
Total		
With ILI		
Hospitalized		
Died		

D	<u>Laboratory Information</u>
	Specimen(s) submitted? <input type="checkbox"/> Yes (location: _____) <input type="checkbox"/> No <input type="checkbox"/> Don't know If yes, organism identified? <input type="checkbox"/> Yes (specify: _____) <input type="checkbox"/> No <input type="checkbox"/> Don't know