

British Columbia Influenza Surveillance Bulletin

Influenza Season 2016-17, Number 04, Weeks 45-46

November 6 to 19, 2016

Table of Contents:

British Columbia:

Sentinel Physicians	Page 2
Children's Hospital ER	Page 2
Medical Services Plan	Page 3
Laboratory Surveillance	Page 5
ILI Outbreaks	Page 8

Emerging Respiratory Viruses:

Enterovirus D68	Page 9
-----------------	------------------------

Canada:

FluWatch Activity levels	Page 10
NML Strain Characterization	Page 10
NML Antiviral Resistance	Page 10

International:

USA (CDC) Surveillance	Page 11
WHO	Page 11

Influenza Vaccine Components (WHO Recommendations)

2016-17 Northern Hemisphere	Page 12
2017 Southern Hemisphere	Page 12

Additional Information:

Explanatory note	Page 13
List of Acronyms	Page 13
Web Sites	Page 13
Outbreak Report Form	Page 14

Low but Above Expected Influenza Activity Levels in BC, with Recent RSV Increase

During weeks 45-46 (November 6 to 19, 2016), surveillance indicators continue to suggest overall low-level influenza activity in BC.

At the BCCDC Public Health Laboratory, influenza positivity decreased slightly from 15% in week 44 to 12% in week 45 and 9% in week 46 but remained elevated. An increased number of influenza B viruses were detected during this period, concurrent with an influenza B outbreak report in a long-term care facility, although A(H3N2) remains the dominant circulating influenza type/subtype so far this season.

Enterovirus/rhinoviruses continue to be the most commonly detected other respiratory virus during this period, although an increasing number of respiratory syncytial viruses (RSV) were detected, notably at BC Children's and Women's Health Centre Laboratory in week 46.

A total of 13 influenza outbreaks have been reported since week 37, including 3 new influenza outbreaks reported since our last bulletin. All outbreaks with available subtype information have been A(H3N2), with the exception of one influenza B outbreak.

Since our last bulletin, 13 new cases of enterovirus D68 (EV-D68) were detected, bringing the total number of cases detected in BC since August 2016 to 60 cases.

Prepared by BCCDC Influenza & Emerging Respiratory Pathogens Team

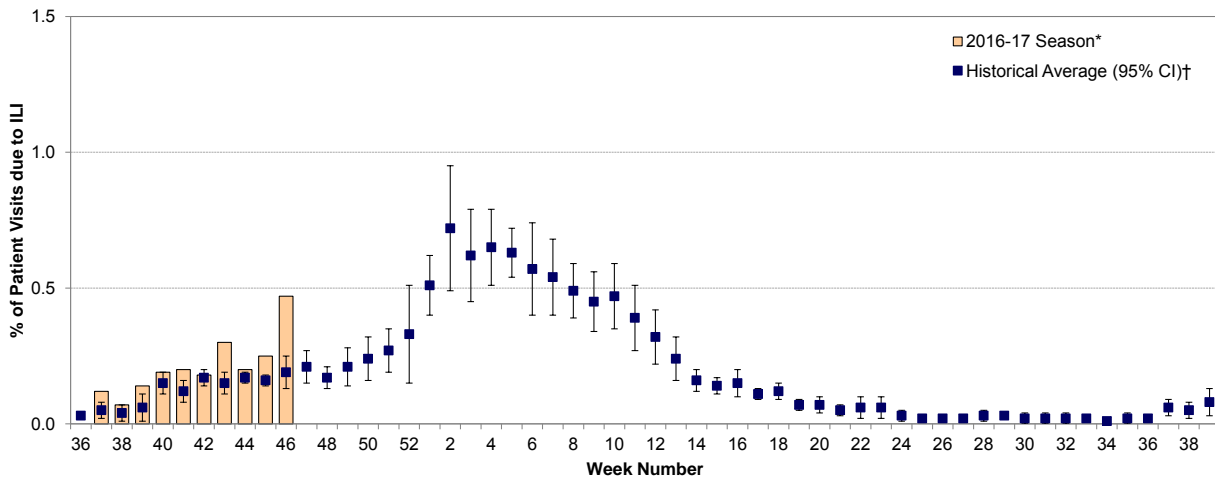
Report Disseminated: November 24, 2016

British Columbia

Sentinel Physicians

In weeks 45-46, the proportion of patients with influenza-like illness (ILI) among those presenting to sentinel sites was significantly higher than the 10-year historical average for the fourth consecutive week. Rates were 0.25% and 0.47% in weeks 45 and 46, respectively. So far, 77% and 57% of sentinel sites have reported data for weeks 45 and 46, respectively.

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



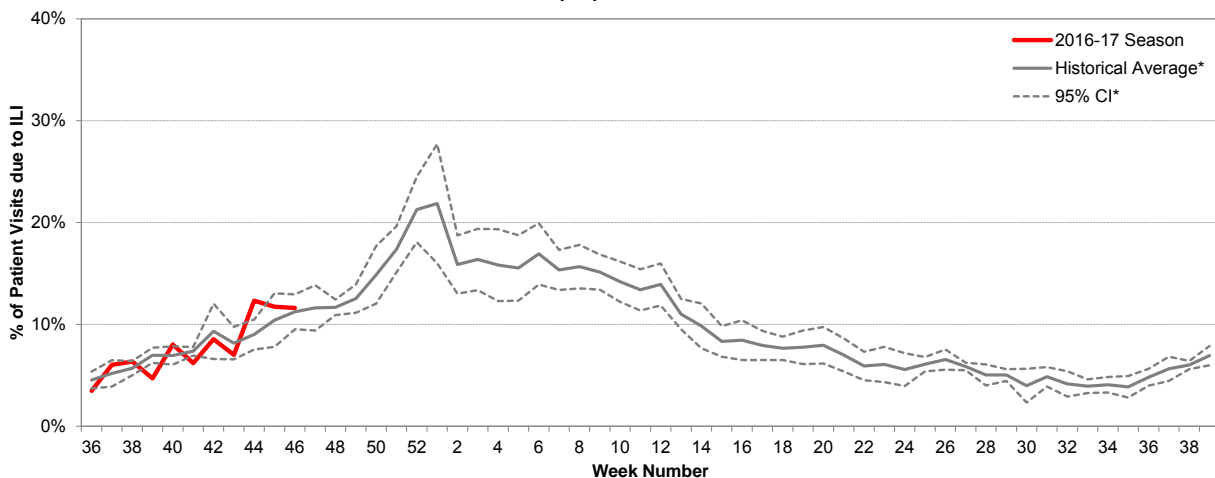
* Data are subject to change as reporting becomes more complete.

† 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

In weeks 45-46, the proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI remained constant at 12%, consistent with the 5-year historical average for this time of year.

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



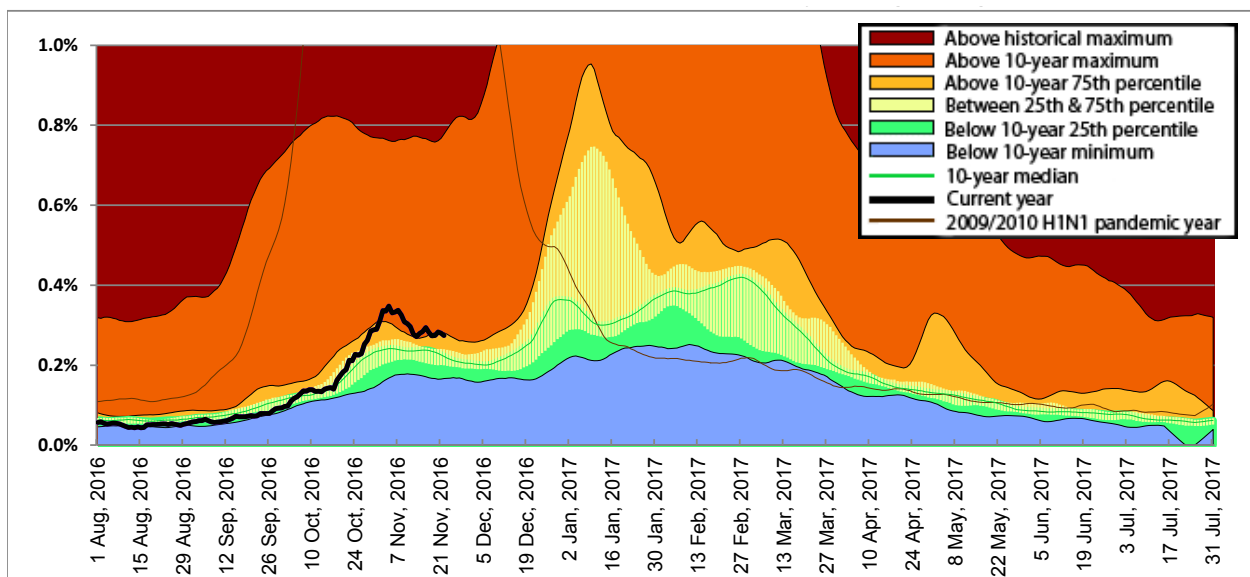
Source: BCCCH Admitting, Discharge, Transfer database (ADT). Data includes records with a triage chief complaint of "flu" or "influenza" or "fever/cough."

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

Medical Services Plan

In weeks 45-46, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, decreased slightly following a spike in recent weeks, but remained above 10-year 75th percentiles for the province overall. In week 46, rates were above 10-year maximums in FHA and VIHA, above 10-year 75th percentiles in IHA and VCHA, but 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

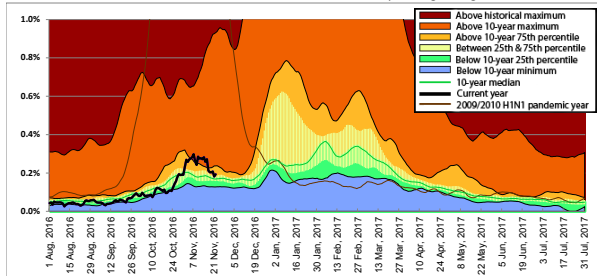


* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).

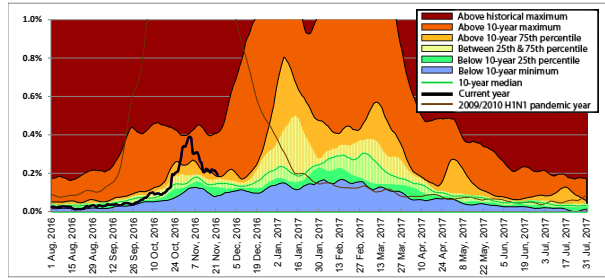
Data for the period August 1, 2009 to July 31, 2010 have been excluded from the 10-year median calculation due to atypical seasonality during the 2009/2010 H1N1 pandemic year. MSP week beginning August 1, 2016 corresponds to sentinel ILI week 31; data are current to November 22, 2016.

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

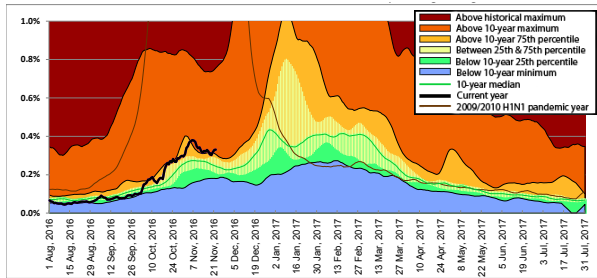
Interior



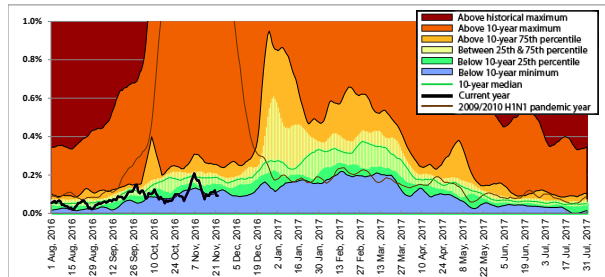
Vancouver Island



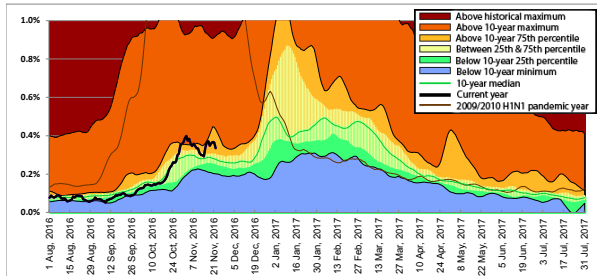
Fraser



Northern



Vancouver Coastal



Laboratory Reports

BCCDC Public Health Laboratory

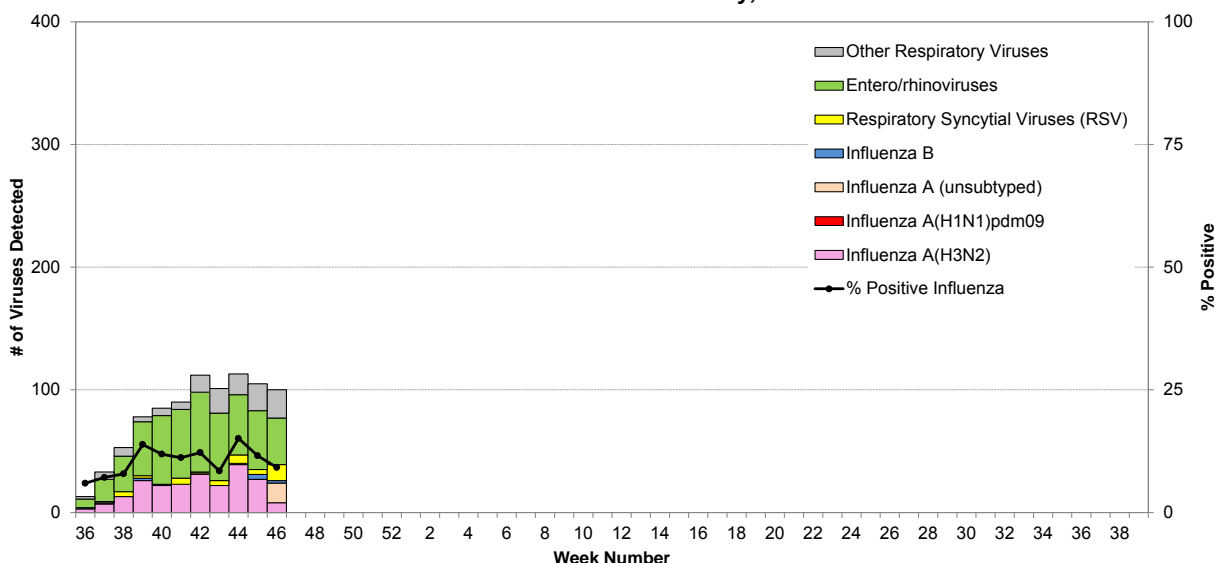
During weeks 45-46, 545 patients were tested for respiratory viruses at the BCCDC Public Health Laboratory (PHL). Of these, 57 (10%) tested positive for influenza, including 51 (86%) influenza A [35 A(H3N2) and 16 with subtype pending] and 6 (11%) influenza B. Although the majority of influenza detections remained A(H3N2) during this period, a slight increase in the number of influenza B detections was observed, concurrent with the first report this season of an influenza B outbreak in a long-term care facility (LTCF). Overall influenza positivity decreased slightly from 15% in week 44 to 12% in week 45 and 9% in week 46 but remained elevated.

Enteroviruses remained the most commonly detected respiratory virus during this period; however, the number of respiratory syncytial virus (RSV) positive specimens increased slightly in week 46.

Cumulatively since week 40 (starting October 2, 2016), 194 (12%) patients tested positive for influenza at the BCCDC PHL, including 186 (96%) with influenza A [170 A(H3N2) and 16 subtype pending] and 8 (4%) with influenza B. No patients have tested positive for influenza A(H1N1)pdm09 so far this season.

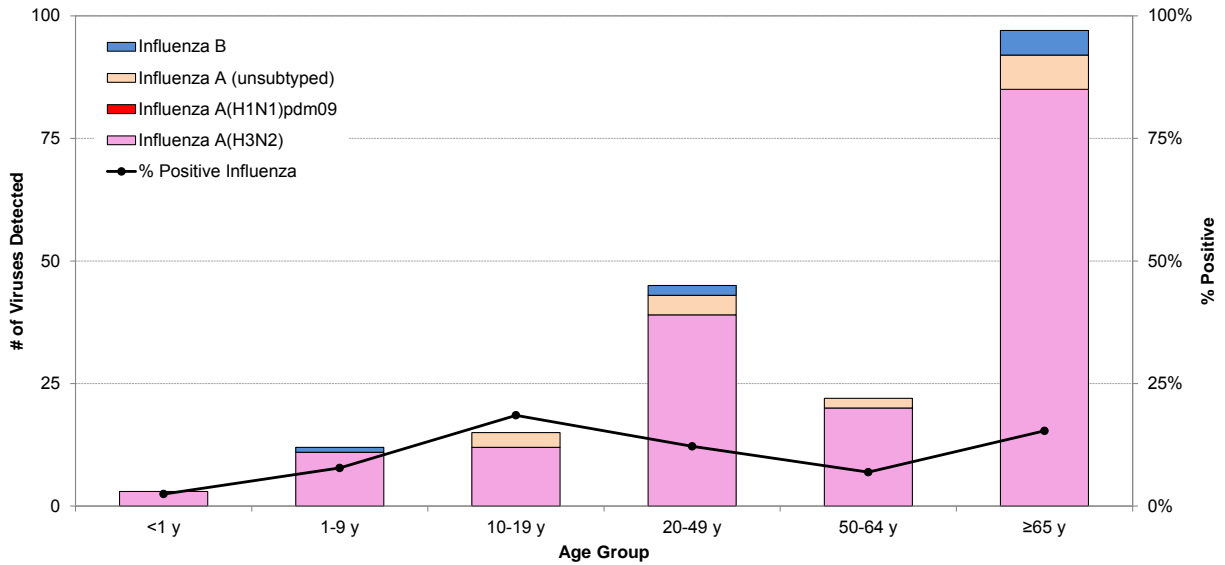
So far during the 2016-17 season, influenza A(H3N2) has been the dominant subtype among influenza detections. The majority of influenza detections have been in elderly adults ≥ 65 years old, consistent with early season outbreak reports from LTCFs and dominant circulation of A(H3N2) subtype viruses so far this season. However, a greater proportion of influenza A(H3N2) detections during the 2016-17 season are in non-elderly individuals < 64 years old compared to the same period of the last early dominant A(H3N2) season in 2014-15 (50% vs. 34%, respectively).

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



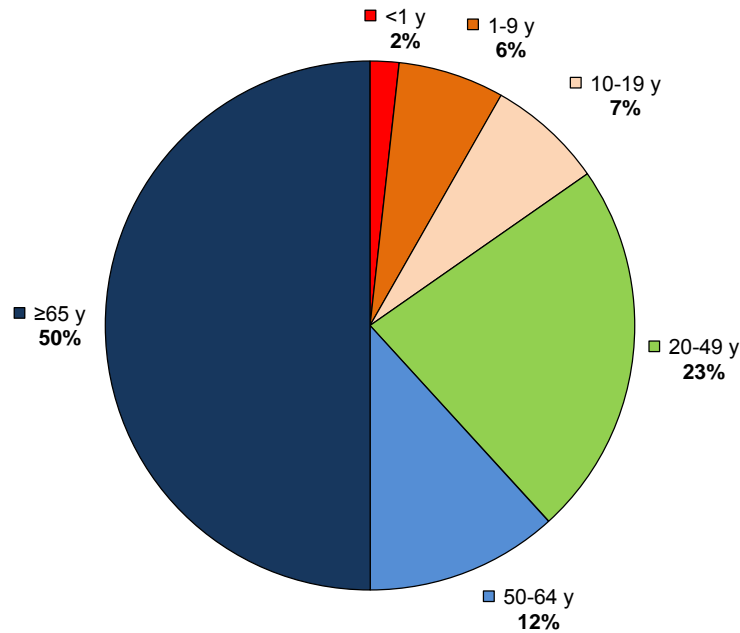
Data are current to November 23, 2016.

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



Data are current to November 23, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-46.

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

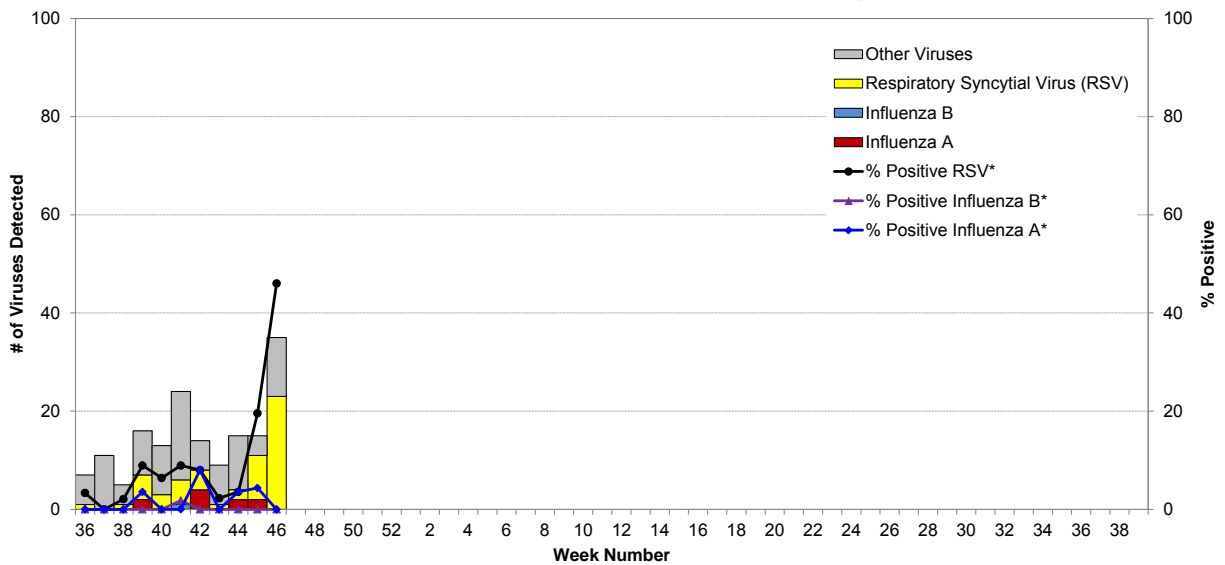


Data are current to November 23, 2016; figure includes cumulative influenza detections for specimens collected from weeks 40-46.

BC Children's and Women's Health Centre Laboratory

In weeks 45-46, the proportion of tests positive for RSV increased dramatically at the BC Children's and Women's Health Centre Laboratory. Of the 96 tests conducted, 32 (33%) were positive for RSV. Only 2 (2%) tests were positive for influenza A (both in week 45) and none were positive for influenza B.

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.

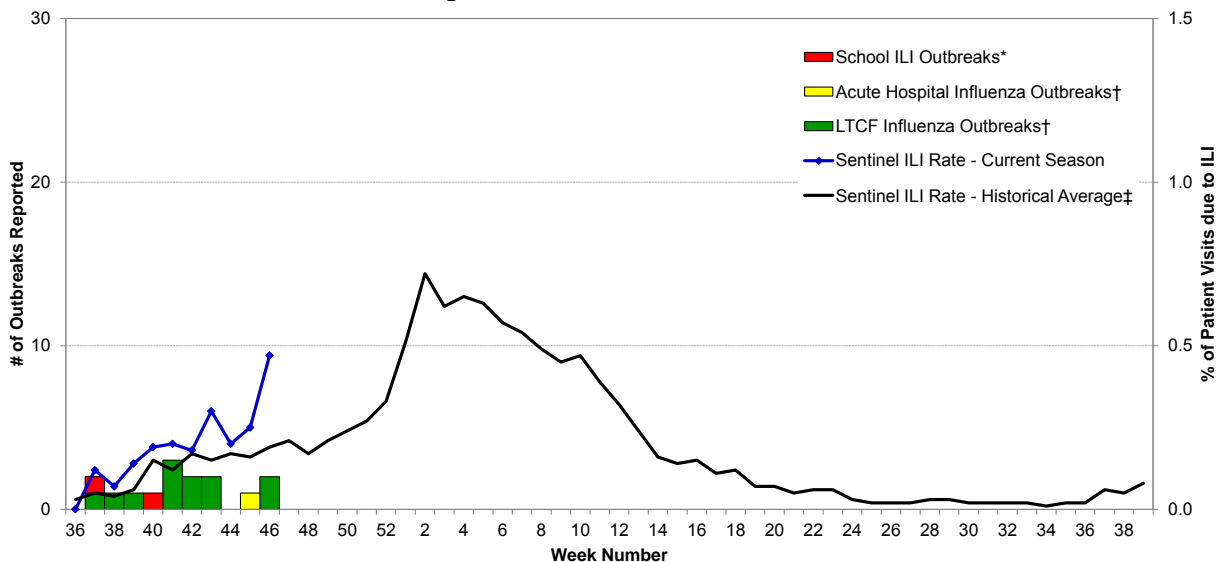
Influenza-like Illness (ILI) Outbreaks

Since our last bulletin two weeks ago, three new lab-confirmed influenza outbreaks were reported in LTCFs: one with influenza B detected in VCHA with onset in week 42 and two with influenza A (subtype pending) detected (one in FHA and one in VIHA) with onset in week 46. The LTCF outbreak in VCHA is the first with influenza B detected to be reported this season.

Cumulatively during the 2016-17 season (since week 37, starting September 11, 2016), a total of 13 influenza outbreaks have been reported, including 12 in LTCFs and one in an acute care setting. Of the 10 out of 12 influenza A outbreaks with available subtype information, all had A(H3N2) detected; one outbreak with influenza B detected was additionally reported.

Two school ILI outbreaks (one in week 37 and one in week 40) 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, 13 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 60 cases.

Of the 60 laboratory-confirmed EV-D68 cases reported in BC to date since August 2016, 45 (75%) were detected in children <10 years old, and of those, a substantial proportion (23/45, 51%) 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 and one infant/toddler presented with acute flaccid myelitis (AFM). 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 45, November 6 to 12, 2016)

Influenza activity is at inter-seasonal levels with the majority of regions in Canada reporting no activity. A total of 181 positive influenza detections were reported in week 45. The percentage of tests positive for influenza increased in week 45 but remained at inter-seasonal levels, with 4.4% of tests positive for influenza. Influenza A(H3N2) continues to be the most common subtype detected. In week 45, 1.6% of visits to sentinel healthcare professionals were due to influenza-like symptoms, a slight increase from week 44. Two laboratory-confirmed influenza outbreaks were reported in week 45, a decrease from the previous week. Sixteen hospitalizations were reported from participating Provinces and Territories in week 45; all due to influenza A. Less than five ICU admissions have been reported in week 45. To date, the majority of pediatric hospitalizations reported were 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 November 23, 2016, the National Microbiology Laboratory (NML) received 91 influenza viruses [77 A(H3N2), 5 A(H1N1)pdm09 and 9 B] from Canadian laboratories for antigenic characterization.

Influenza A(H3N2): Of the 77 influenza A(H3N2) viruses, only 32 (42%) had sufficient haemagglutination titre for antigenic characterization by haemagglutination inhibition (HI) assay. Of the 32 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 32 viruses antigenically characterized with available sequencing information, 27 (84%) belonged to genetic group 3C.2a and 5 (16%) belonged to genetic group 3C.3a. Genetic characterization was performed to infer antigenic properties on the remaining 45 viruses that did not grow to sufficient haemagglutination titre for HI assay. Of the 45 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 5 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 9 influenza B viruses characterized, 7 (78%) 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 2 (22%) 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 November 23, 2016, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing.

Amantadine: Of the 39 influenza A viruses [36 A(H3N2) and 3 A(H1N1)pdm09] tested against amantadine, all were resistant.

Oseltamivir: Of the 81 influenza viruses [67 A(H3N2), 5 A(H1N1)pdm09 and 9 B] tested against oseltamivir, all were sensitive.

Zanamivir: Of the 81 influenza viruses [67 A(H3N2), 5 A(H1N1)pdm09 and 9 B] tested against zanamivir, all were sensitive.

International

USA (week 45, November 6 to 12, 2016)

During week 45, influenza activity remained low in the United States. The most frequently identified influenza virus subtype reported by public health laboratories during week 45 was influenza A(H3N2). Of the 211 A(H3N2) viruses genetically characterized by the US CDC since May 2016, 85% belonged to genetic group 3C.2a, including the newly emerging subgroup 3C.2a1, and 15% to group 3C.3a based on analysis of HA gene segments. The percentage of respiratory specimens testing positive for influenza in clinical laboratories was low. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the system-specific epidemic threshold. No influenza-associated pediatric deaths were reported. The proportion of outpatient visits for ILI was 1.6%, which is below the national baseline of 2.2%. The geographic spread of influenza in Guam was reported as widespread; Puerto Rico, the U.S. Virgin Islands and one state reported regional activity; five states reported local activity; the District of Columbia and 40 states reported sporadic activity; and four states reported no activity. Details are available at: www.cdc.gov/flu/weekly/.

WHO (November 14, 2016)

Influenza activity in the temperate zone of the northern hemisphere has not yet picked up and remained at inter-seasonal levels. Influenza activity in temperate southern hemisphere countries is back at inter-seasonal levels.

- In North America and Europe, influenza activity was low with few influenza virus detections and ILI levels below seasonal thresholds. In the United States, RSV activity continued to be reported.
- In temperate South America, influenza and RSV activity continue to decrease throughout the sub-region.
- In South Africa and Oceania, influenza virus activity is now at inter-seasonal levels.
- In African countries, few reported surveillance activity in this period. Senegal and Kenya reported influenza A virus detections, and Côte d'Ivoire reported influenza B virus detections.
- In the Caribbean countries, influenza and other respiratory virus activity remained low except in Cuba where influenza A(H3N2) and influenza B viruses continue to be detected.
- In Central America, influenza virus activity remained low but RSV continued to circulate in several countries as the predominant respiratory virus.
- In tropical South America, respiratory virus activities remained low with exception of French Guyana where influenza A(H3N2) viruses detections increased slightly.
- In tropical countries of South Asia, influenza activity was low.
- In South East Asia, a decreasing trend in influenza detection was observed, although influenza activity continued to be reported in Lao People's Democratic Republic (PDR), Thailand and Cambodia. Influenza activity also increased in southern China, with influenza A(H3N2) virus predominating.
- In Western Asia, influenza detections remained low.
- From October 17 to 30, 2016, the WHO GISRS laboratories tested more than 65,111 specimens during that time period, of which 2,215 were positive for influenza viruses: 1,866 (84%) were typed as influenza A and 349 (16%) as influenza B. Of the sub-typed influenza A viruses, 73 (5%) were influenza A(H1N1)pdm09 and 1306 (95%) were influenza A(H3N2). Of the characterized B viruses, 15 (30%) belonged to the B/Yamagata lineage and 35 (70%) 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-affectations/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