BC Centre for Disease Control
An agency of the Provincial Health Services Authority

British Columbia Influenza Surveillance Bulletin

Influenza Season 2016-17, Number 13, Week 5
January 29 to February 4, 2017

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Influenza Activity Decreasing in BC but Still Above Seasonal Norms

During week 5 (January 29 to February 4, 2017), influenza surveillance indicators continued to decline, although activity levels remained above expected seasonal norms in BC.

At the BCCDC Public Health Laboratory, influenza positivity remained stable around 35% compared to the prior week but decreased from a peak of about 50% in weeks 52-2. Influenza A(H3N2) remains the dominant type/subtype so far this season, but an increasing number of influenza B viruses has been detected in recent weeks, including those associated with long-term care facility (LTCF) outbreaks.

Since our last bulletin one week ago, eight new influenza outbreaks were reported from LTCFs, including six with influenza A and two with influenza B detected. Cumulatively, 153 influenza outbreaks have been reported to date this season.

Medical Services Plan (MSP) claims for influenza illness continued to decline across the province this week but remained elevated. Sentinel ILI rates were significantly above the 10-year historical average for this time of year for the second consecutive week.

On February 9, Canadian researchers published the first mid-season estimate of 2016-17 vaccine effectiveness, reporting that the vaccine this year has reduced the risk of medically-attended A(H3N2) illness by about 40%. See: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=22714.

Prepared by BCCDC Influenza & Emerging Respiratory Pathogens Team

Report Disseminated: February 9, 2017

Provincial Health Services Authority
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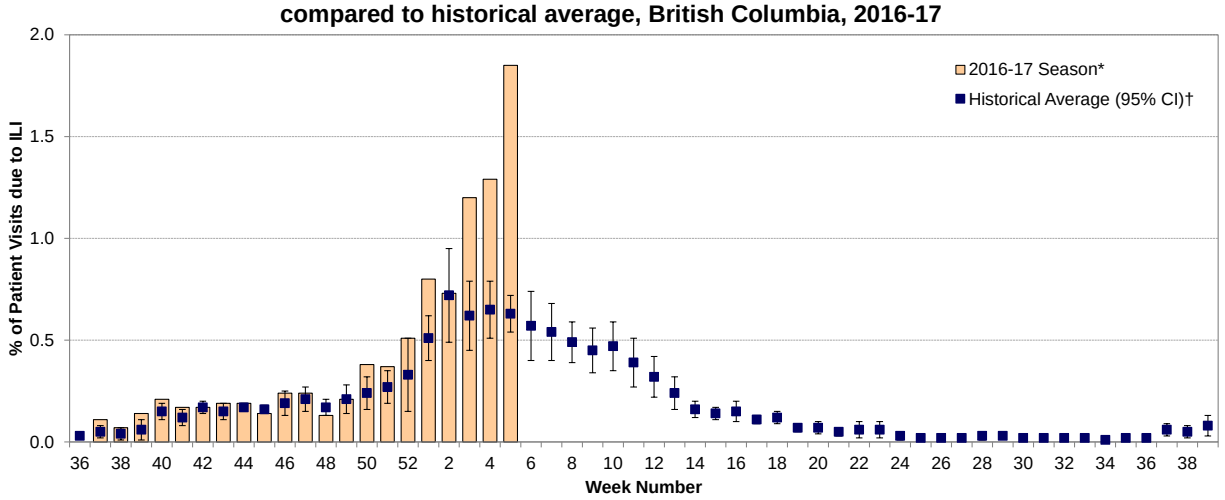
British Columbia

Sentinel Physicians

In week 5, the proportion of patients with influenza-like illness (ILI) among those presenting to sentinel sites was 1.85%, more than double the 10-year historical average for this time of year. Rates remained above the historical average for the third consecutive week. The most recent week's rates require cautious interpretation given inconsistency with other surveillance indicators. So far, 45% of sites have reported data for this week and rates are subject to change as reporting becomes more complete.

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

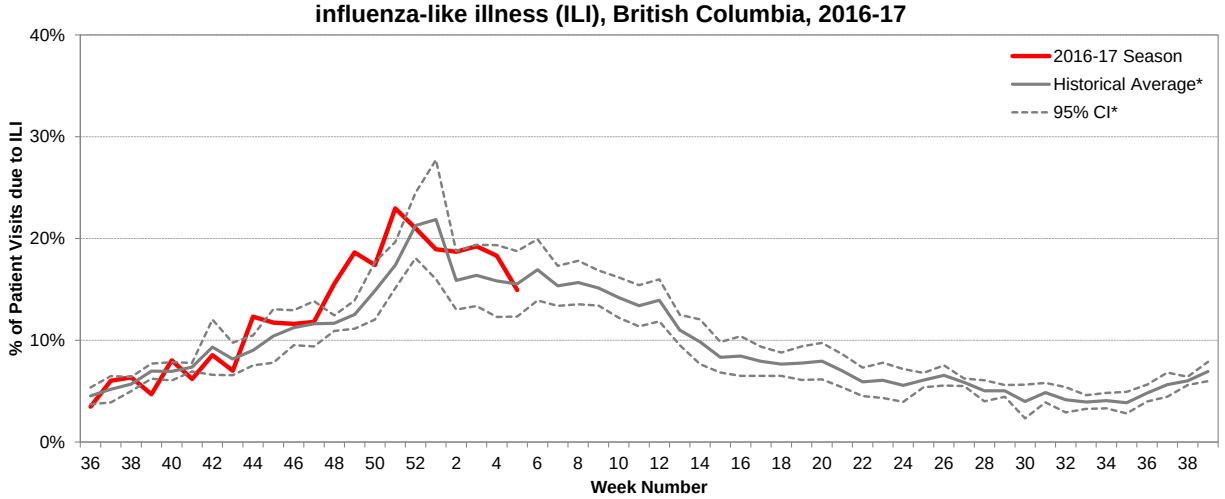


* Data are subject to change as reporting becomes more complete. One hospital ER site that reported ILI rates ≥5% was excluded from the graph.
† 10-year historical average for 2016-17 season based on 2004-05 to 2015-2016 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality; CI=confidence interval.

BC Children's Hospital Emergency Room

In week 5, the proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI decreased from 18% in week 4 to 15% in week 5, dipping below the 5-year historical average but remaining within expected values 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

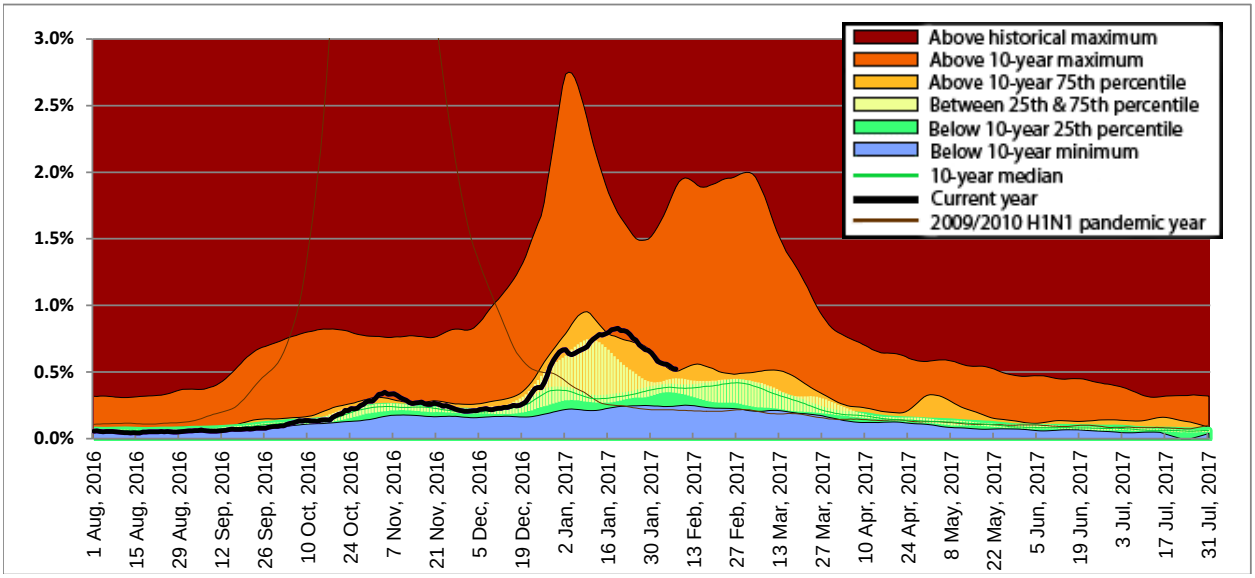


Source: BCCH Admitting, Discharge, Transfer database (ADT). Data includes records with a triage chief complaint of "flu" or "influenza" or "fever/cough."
* 5-year historical average for 2016-17 season based on 2011-12 to 2015-16 seasons; CI=confidence interval.

Medical Services Plan

In week 5, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, continued to decline across the province but remained elevated. Rates were above the 10-year historical maximum for this time of year in VCHA, VIHA and for the province overall and above the 10-year 75th percentile in FHA. In IHA and NHA, rates were at median levels.

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

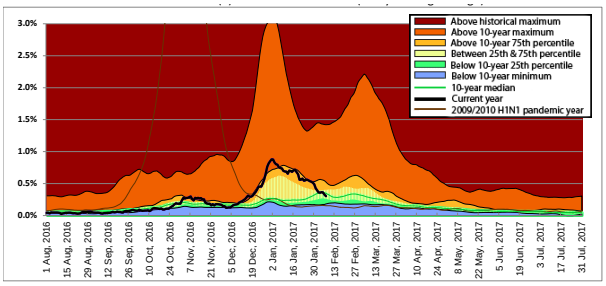


* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).

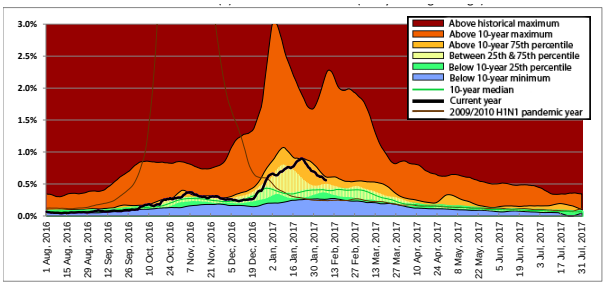
Data for the period August 1, 2009 to July 31, 2010 have been excluded from the 10-year median calculation due to atypical seasonality during the 2009/2010 H1N1 pandemic year. MSP week beginning August 1, 2016 corresponds to sentinel ILI week 31; data are current to February 7, 2017.

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

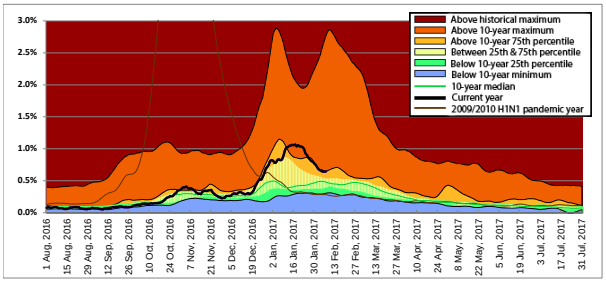
Interior



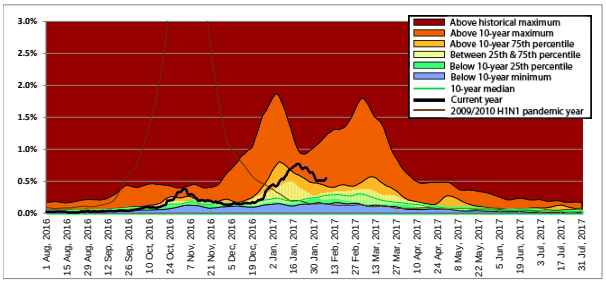
Fraser



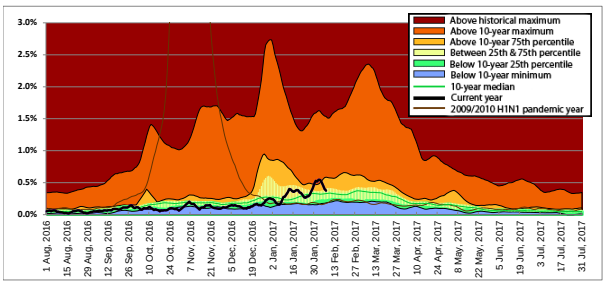
Vancouver Coastal



Vancouver Island



Northern



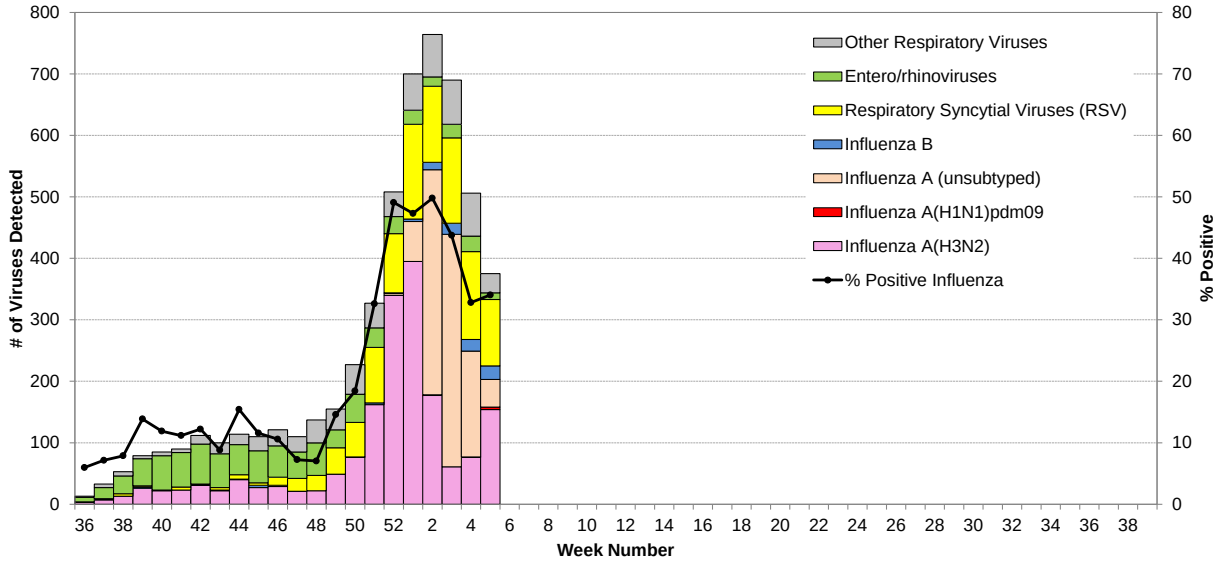
Laboratory Reports

BCCDC Public Health Laboratory

In week 5, 661 patients were tested for respiratory viruses at the BCCDC Public Health Laboratory (PHL). Of these, 224 (34%) tested positive for influenza, including 202 (90%) with influenza A [154 A(H3N2), 4 A(H1N1)pdm09 and 44 with subtype pending] and 22 (10%) with influenza B. Overall influenza positivity remained relatively stable around 35% compared to the prior week but has decreased from a peak of about 50% in weeks 52-2. Influenza A(H3N2) remains the most frequently detected type/subtype (≥90% of influenza specimens); however, an increasing number of influenza B, and to a lesser extent A(H1N1)pdm09, viruses have been sporadically detected in recent weeks.

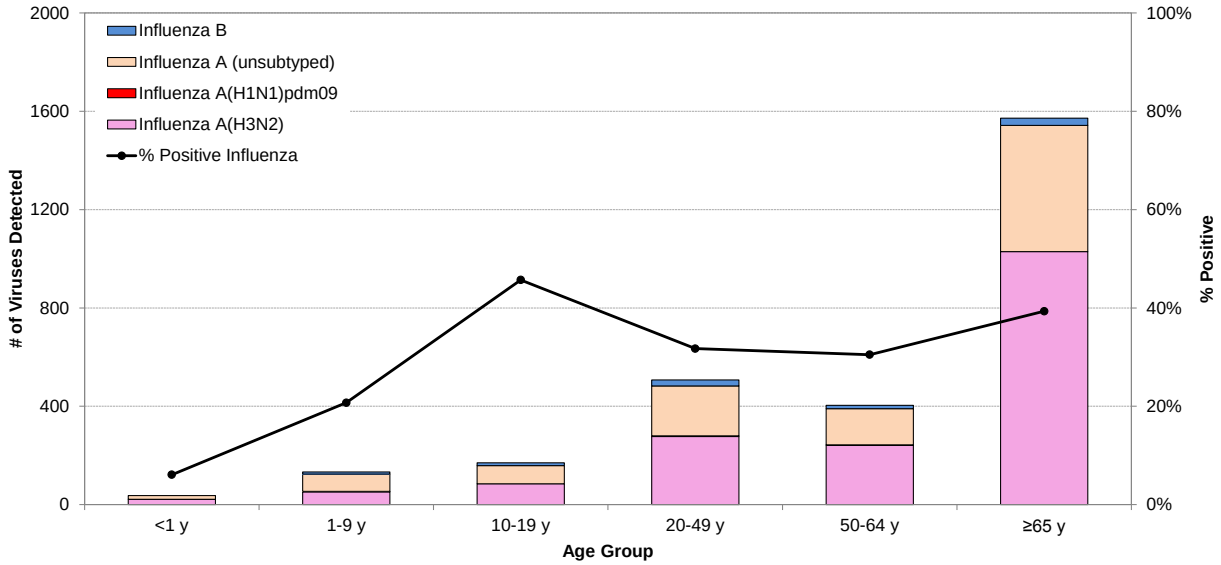
Cumulatively since week 40 (starting October 2, 2016), 2812 (33%) patients tested positive for influenza at the BCCDC PHL, including 2724 (97%) with influenza A [1707 A(H3N2), 6 A(H1N1)pdm09 and 1011 subtype pending] and 88 (3%) with influenza B. So far during the 2016-17 season, influenza A(H3N2) has been the dominant subtype among influenza detections. Elderly adults ≥65 years old are disproportionately represented among influenza detections, although younger age groups are also affected.

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



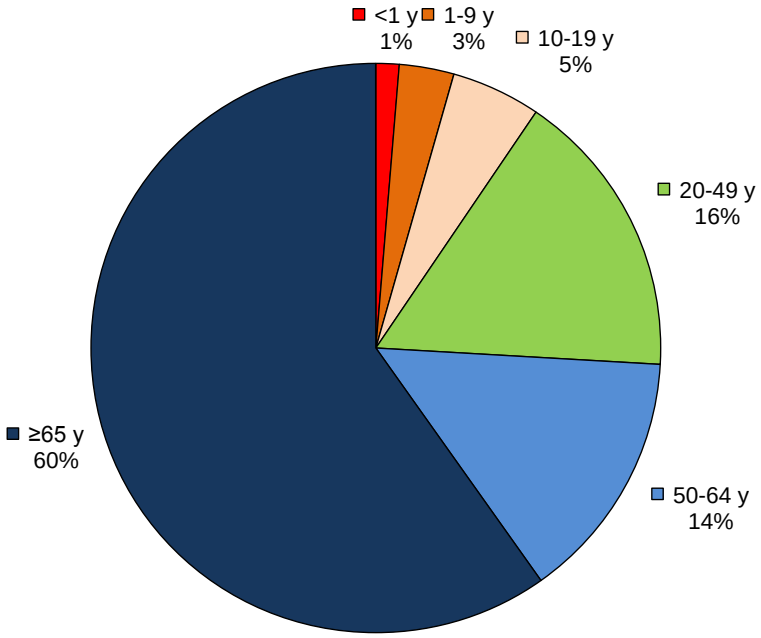
Data are current to February 8, 2017.

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



Data are current to February 8, 2017; figure includes cumulative influenza detections for specimens collected from weeks 40-5.

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

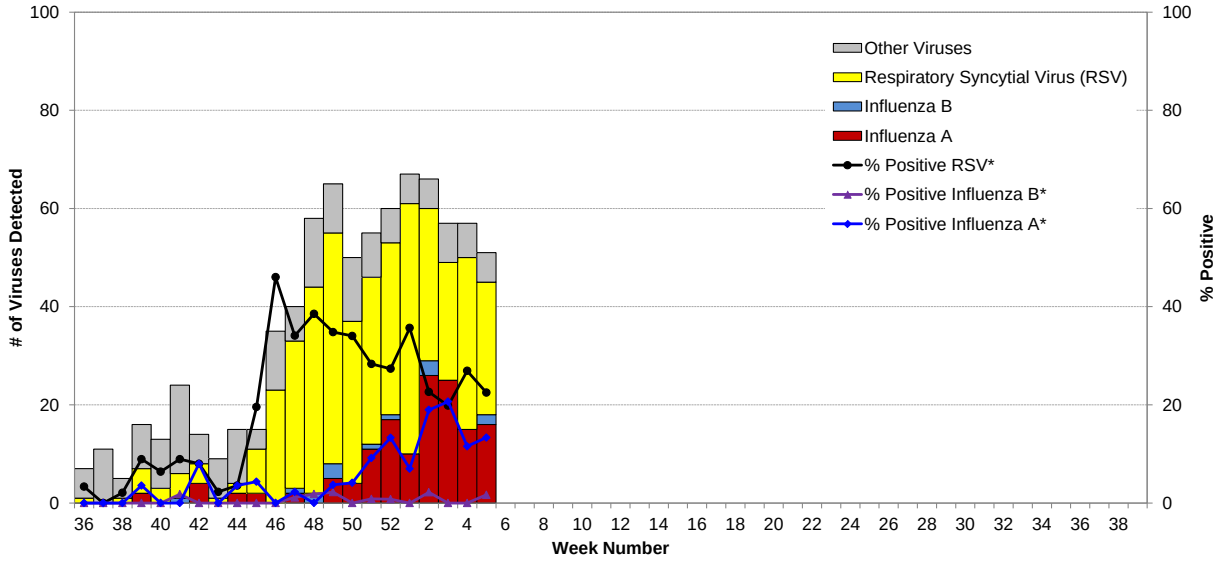


Data are current to February 8, 2017; figure includes cumulative influenza detections for specimens collected from weeks 40-5.

BC Children's and Women's Health Centre Laboratory

As in prior weeks, influenza A and respiratory syncytial virus (RSV) continue to be the most frequently detected respiratory viruses at the BC Children's and Women's Health Centre Laboratory. Of the 120 tests conducted in week 5, 16 (13%) were positive for influenza A and 27 (23%) were positive for RSV; two (2%) 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.

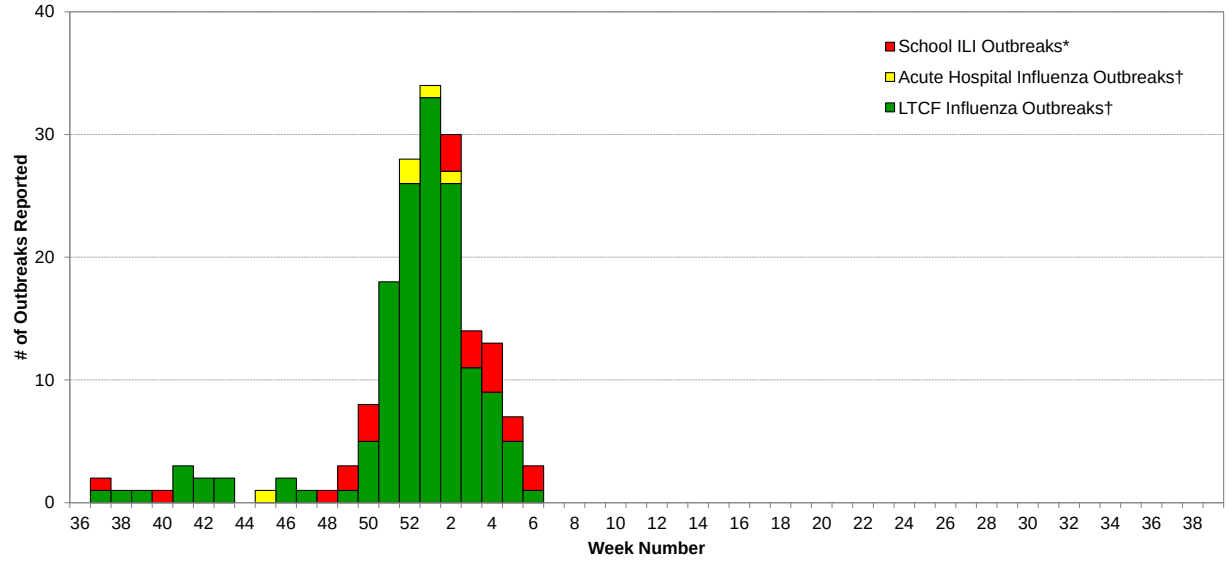
Influenza-like Illness (ILI) Outbreaks

Since our last bulletin one week ago, eight new influenza outbreaks were reported from long-term care facilities (LTCFs), including six with influenza A detected [three A(H3N2) and three subtype pending] and two with influenza B detected. Of the eight newly reported outbreaks, six were reported from FHA, one from VCHA and one from VIHA. Onset dates ranged from week 4-6. Two new school ILI outbreaks were reported from IHA in week 6.

Cumulatively during the 2016-17 season (since week 37, starting September 11, 2016), a total of 153 influenza outbreaks have been reported as of February 9, 2017, including 146 in LTCFs, five in acute care settings, and two from other facility types. All of the influenza A outbreaks with subtype information available had influenza A(H3N2) detected; three outbreaks with influenza B detected and one outbreak with both influenza A and B detected were additionally reported.

A total of 22 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.

National

FluWatch (week 4, January 22 to 28, 2017)

Influenza activity continues to be reported across Canada and a few regions are reporting widespread influenza activity. All indicators (laboratory detections, influenza-like illness, outbreaks and hospitalizations) have either decreased or remained similar to the previous week. In week 4, the percentage of tests positive for influenza remained similar to the previous week at 23%. A(H3N2) continues to be the most common type/subtype of influenza affecting Canadians. In week 4, 51 outbreaks were reported, the majority in long-term care facilities and due to influenza A. The majority of laboratory detections, hospitalizations and deaths have been among adults aged ≥65 years. 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, 2016 to February 9, 2017, the National Microbiology Laboratory (NML) received 559 influenza viruses [515 A(H3N2), 10 A(H1N1)pdm09 and 34 B] from Canadian laboratories for antigenic characterization.

Influenza A(H3N2): Of the 515 influenza A(H3N2) viruses, only 167 (32%) had sufficient haemagglutination titre for antigenic characterization by haemagglutination inhibition (HI) assay. Of the 167 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 164 out of 167 viruses antigenically characterized with available sequencing information, 137 (84%) belonged to genetic group 3C.2a and 27 (16%) belonged to genetic group 3C.3a. Genetic characterization was performed to infer antigenic properties on the remaining 348 viruses that did not grow to sufficient haemagglutination titre for HI assay. Of the 348 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 10 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 34 influenza B viruses characterized, 15 (44%) 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 19 (56%) viruses were characterized as a B/Phuket/3073/2013(Yamagata lineage)-like virus, the other 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, 2016 to February 9, 2017, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing.

Amantadine: Of the 137 influenza A viruses [129 A(H3N2) and 8 A(H1N1)pdm09] tested against amantadine, all were resistant.

Oseltamivir: Of the 390 influenza viruses [348 A(H3N2), 10 A(H1N1)pdm09 and 32 B] tested against oseltamivir, all were sensitive.

Zanamivir: Of the 390 influenza viruses [348 A(H3N2), 9 A(H1N1)pdm09 and 33 B] tested against zanamivir, all were sensitive.

Mid-season Estimates of 2016-17 Influenza Vaccine Effectiveness

On February 9, 2017, researchers from the Canadian Sentinel Practitioner Surveillance Network (SPSN) published the first mid-season estimates of influenza vaccine effectiveness (VE) for the 2016-17 season. They found VE of 42% (95% confidence interval: 18-59%) against outpatient medically attended, laboratory-confirmed A(H3N2) illness, which has been the dominant subtype so far this season. This finding indicates that, compared to unvaccinated people, the risk of A(H3N2) illness in vaccinated people was reduced by about 40%. This VE estimate is consistent with vaccine protection typically expected for A(H3N2)-dominant seasons, but is considerably higher than in the 2014-15 season when no vaccine protection was found.

Dominant A(H3N2) viruses this season are generally considered well-matched to the 2016-17 vaccine strain, belonging to clade 3C.2a; however, sequence analysis revealed continuing genetic evolution in circulating viruses, with about 80% of viruses belonging to a newly emerging clade known as 3C.2a1. SPSN investigators also found differences in the mix of A(H3N2) genetic variants across provinces and over time. In Alberta, where influenza activity started earliest and where there was a single dominant A(H3N2) variant, the VE estimate was higher (about 60%). Conversely, in British Columbia (BC) and further east in Ontario and Quebec, where influenza activity was delayed and a greater mix of A(H3N2) genetic variants was detected, the VE estimate was lower (about 30%). The ecological correlation between greater genetic diversity and lower VE by geographic region requires further investigation and confirmation in other countries, as well as end-of-season analysis.

These findings are being submitted to the World Health Organization (WHO) to inform their selection of the vaccine components for the 2017-18 northern hemisphere influenza vaccine during their upcoming meeting in February 2017. VE estimates for other types of influenza during the 2016-17 season (such as possible late-season influenza B activity) will be explored in end-of-season analyses.

The full report is available at: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=22714.

International

USA (week 4, January 22 to 28, 2017)

During week 4, influenza activity increased in the United States. The most frequently identified influenza virus subtype reported by public health laboratories during week 4 was influenza A(H3N2). The percentage of respiratory specimens testing positive for influenza in clinical laboratories increased. Of the 494 A(H3N2) viruses genetically characterized by the US CDC during the 2016-17 season, 96% belonged to genetic group 3C.2a, including the newly emerging subgroup 3C.2a1, and 4% to group 3C.3a based on analysis of HA gene segments. Seven influenza-associated pediatric deaths were reported. A cumulative rate for the season of 20.3 laboratory-confirmed influenza-associated hospitalizations per 100,000 population was reported. The proportion of outpatient visits for ILI was 3.9%, which is above the national baseline of 2.2%. The geographic spread of influenza in Puerto Rico and 40 states was reported as widespread; Guam and nine states reported regional activity; the District of Columbia and one state reported local activity; and the U.S. Virgin Islands reported no activity. Details are available at: www.cdc.gov/flu/weekly/.

WHO (February 6, 2017)

Influenza activity in the temperate zone of the northern hemisphere continued to increase, with many countries especially in East Asia and Europe having passed their seasonal threshold early in comparison with previous years. Worldwide, influenza A(H3N2) virus was predominant. The majority of influenza viruses characterized so far were similar antigenically to the reference viruses contained in vaccines for use in the 2016-17 northern hemisphere influenza season. All tested viruses collected recently for antiviral sensitivity were susceptible to the neuraminidase inhibitor antiviral medications.

- In North America, influenza activity with A(H3N2) virus predominating continued to increase in the United States of America, whereas in Canada and Mexico, influenza activity decreased.
- In Europe, influenza activity remained high, and has peaked already in some countries, with influenza A(H3N2) virus being the most prominent subtype. Persons aged ≥65 years were most frequently associated with severe disease from influenza infection.
- In East Asia, high influenza activity continued to be reported with influenza A(H3N2) viruses predominant.
- In Western Asia, influenza and ILI activity appeared to be decreasing in Armenia, Georgia, Israel and Iraq. Influenza A(H3N2) was the most frequently detected virus, followed by influenza B virus.
- In Southern Asia, influenza activity remained low in most of the countries, with influenza A(H3N2) virus predominant, and low levels of influenza A(H1N1) and influenza B viruses present.
- In South East Asia, influenza activity remained low, with influenza A(H3N2) virus and influenza B predominating in the region.
- In Northern Africa, influenza activity was reported in Algeria and Morocco with influenza A(H3N2) and influenza B virus detections.
- In West Africa, influenza B continued to be detected in Ghana.
- In the Caribbean countries and Central America, influenza and other respiratory virus activity remained low in general. Puerto Rico and Costa Rica however reported an increase of ILI and influenza activity, respectively.
- In tropical South America, influenza and other respiratory viruses activity remained low.
- In temperate South America, influenza and RSV activity remained low in most of the countries. In Paraguay, ILI activity increased above expected levels but no influenza activity was reported.
- In the temperate zone of the Southern Hemisphere, influenza activity was at inter-seasonal levels.
- From January 9 to 22, 2017, the WHO GISRS laboratories tested more than 159,276 specimens, of which 40,570 were positive for influenza viruses: 38,581 (95%) were typed as influenza A and 1989 (5%) as influenza B. Of the subtyped influenza A viruses, 294 (2%) were influenza A(H1N1)pdm09 and 16,121 (98%) were influenza A(H3N2). Of the characterized B viruses, 186 (60%) belonged to the B/Yamagata lineage and 122 (40%) 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

version: 26 Oct 2011

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

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)*

B

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

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

C

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

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

D

Laboratory Information

Specimen(s) submitted? ☐ Yes (location: _____) ☐ No ☐ Don't know

If yes, organism identified? ☐ Yes (specify: _____) ☐ No ☐ Don't know

Communicable Disease Prevention & Control Services
655 W. 12th Ave.
Vancouver BC V5Z 4R4

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Fax: (604) 707-2516
ilioutbreak@bccdc.ca