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

British Columbia Influenza Surveillance Bulletin

Influenza Season 2014-15, Number 13, Week 1
January 4 to January 10, 2015

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Widespread A(H3N2) Activity in BC

In week 1 (January 4 to 10, 2015), widespread influenza activity, predominantly A(H3N2), has been observed across most regions of the province. Most indicators remain elevated and it is not yet clear whether the epidemic peak has been reached.

The proportion of patients testing positive for influenza at the BC provincial laboratory has remained above 40% since week 52. Most influenza detections continue to be in elderly adults aged ≥65 years driven in part by a record number of influenza outbreaks reported from long-term care facilities (LTCFs), notably within the past week. Cumulatively since week 39, 105 facility outbreaks have been reported, more than double the number reported during the same year-to-date period for the 2012-13 season also of dominant, mismatched H3N2 activity (n=40), and now surpassing the number across the entire 2012-13 season (n=91).

Today, the US CDC released early, mid-season estimates of influenza vaccine effectiveness. Protection against the dominant circulating A(H3N2) virus for medically attended acute respiratory illness was 22% overall, lower among adults aged 18-49 and ≥50 years. Interim Canadian estimates are anticipated in the coming weeks. See: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6401a4.htm?s_cid=mm6401a4_w.

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Report Disseminated: January 15, 2015

Provincial Health Services Authority
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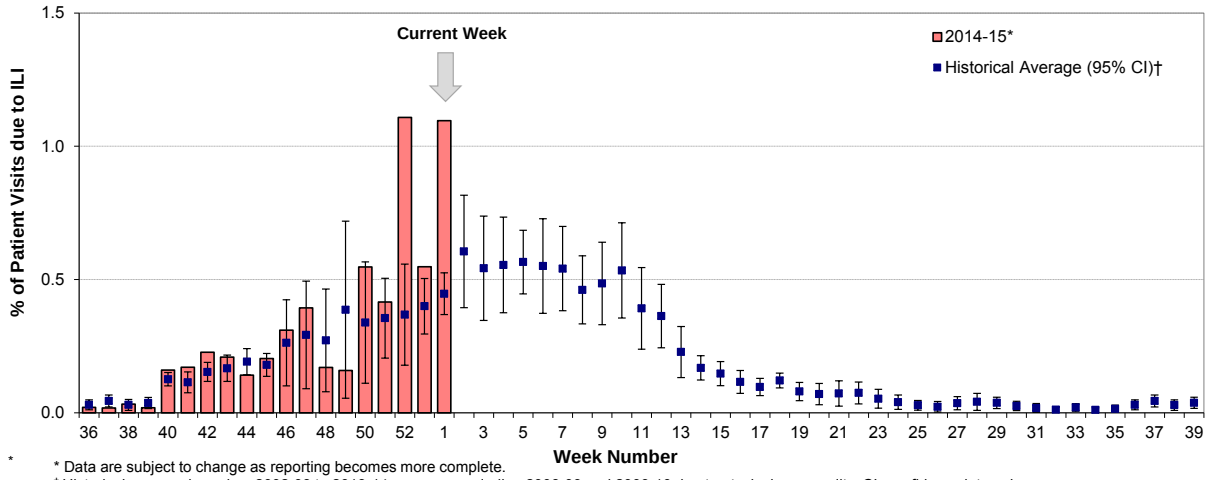
British Columbia

Sentinel Physicians

The proportion of patients with influenza-like illness (ILI) among those presenting to sentinel physicians increased sharply from 0.6% in week 53 to 1.1% in week 1, significantly above the historical average for this time of year and comparable to week 52 when rates also spiked above 1%. So far in week 1, 53% of sentinel sites have reported data.

Percent of patient visits to sentinel physicians due to influenza-like illness (ILI) compared to historical average, British Columbia, 2014-15

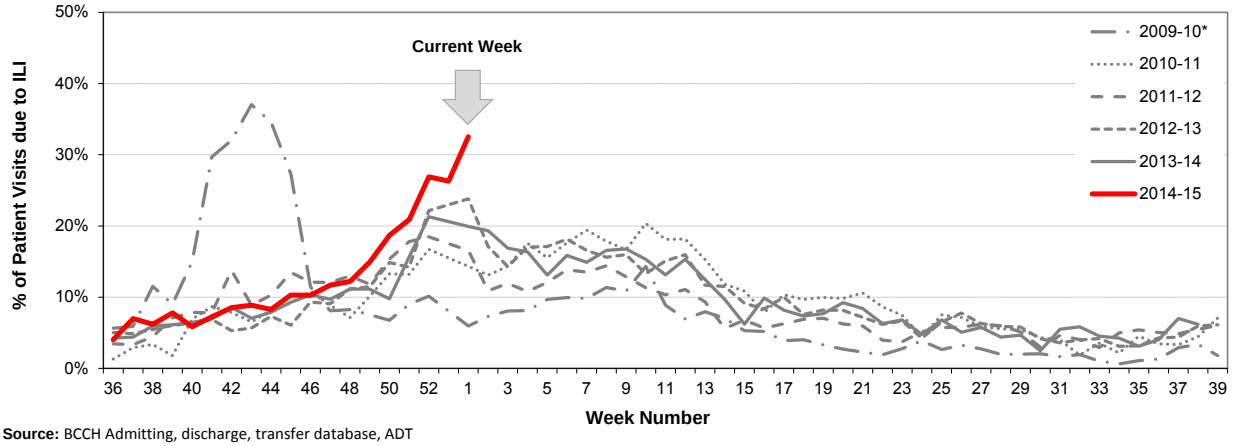


* Data are subject to change as reporting becomes more complete.
† Historical average based on 2002-03 to 2013-14 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality; CI=confidence interval.

BC Children's Hospital Emergency Room

The proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI continued to increase sharply from 26% in week 53 to 33% in week 1 and has remained above rates observed in previous seasons since week 49.

Percent of patients presenting to BC Children's Hospital ER with triage chief complaint of "flu," "influenza" or "fever/cough," British Columbia, 2014-15

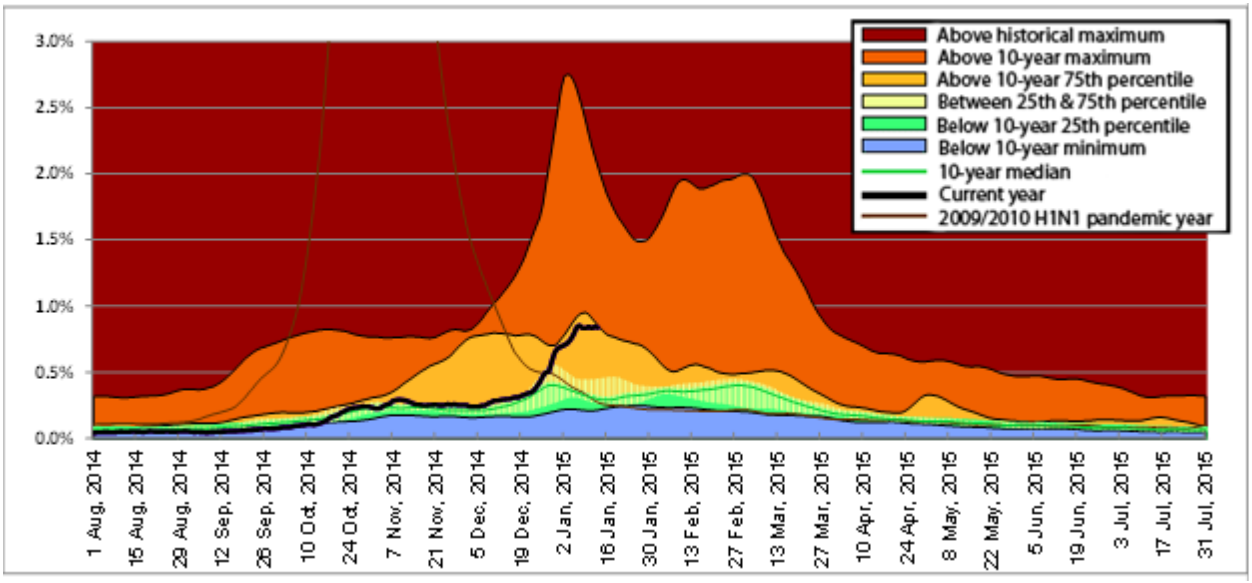


Source: BCCH Admitting, discharge, transfer database, ADT
* Data from 2010-11 to 2014-15 are based on new variable (Triage Chief Complaint) for capturing ILI symptoms and are not directly comparable to data for 2009-10. In week 9 of the 2011-12 season, the BCCH ER implemented a new data collection system, the National Ambulatory Care Reporting System (NACRS); data are not directly comparable to data collected using old system.

Medical Services Plan

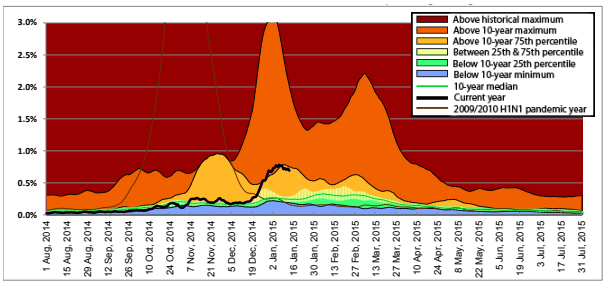
In week 1, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, remained above seasonal norms for this time of year. With the exception of VCHA and VIHA, where rates increased to above 10-year maximums, rates appear to have plateaued for the province overall and in all other regional Health Authorities.

Service claims submitted to MSP for influenza illness (II)* as a proportion of all submitted general practitioner service claims, British Columbia, 2014-15

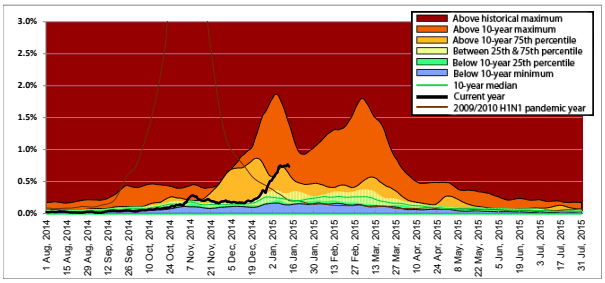


* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).
Data provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services.
Note:MSP week beginning 3 August 2014 corresponds to sentinel ILI week 32; data current to January 13, 2015.

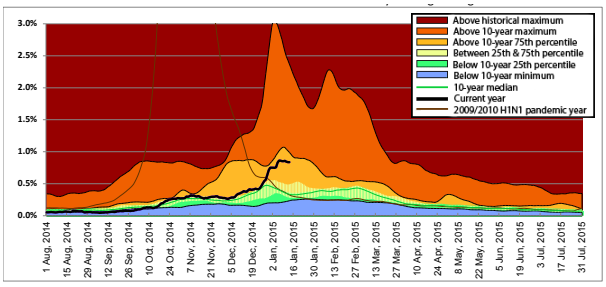
Interior



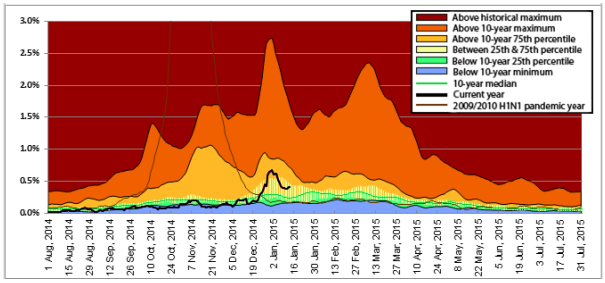
Vancouver Island



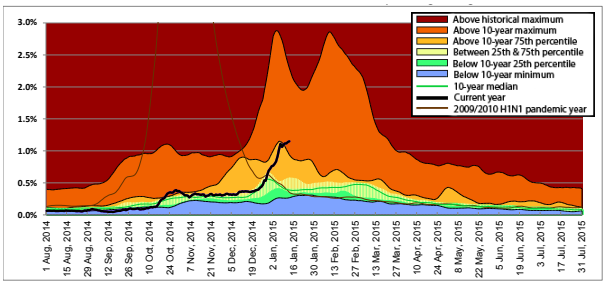
Fraser



Northern



Vancouver Coastal



Laboratory Reports

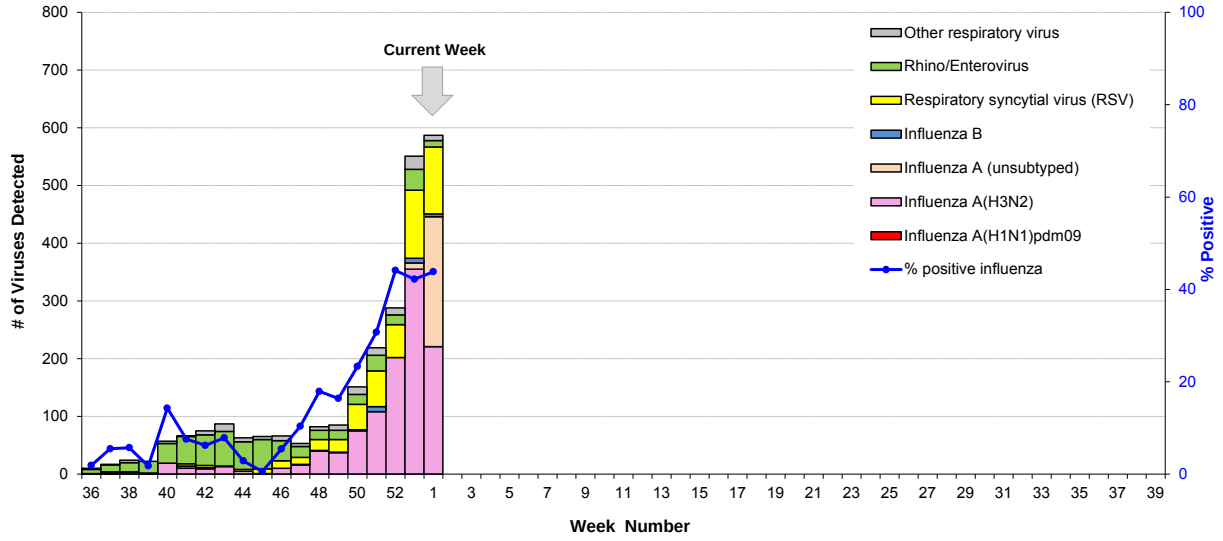
BC Public Health Microbiology & Reference Laboratory (PHMRL)

In week 1, the BC Public Health Microbiology & Reference Laboratory (PHMRL) tested 1029 patients for respiratory viruses. Of these, 449 (44%) had laboratory-confirmed influenza, including 444 (99%) influenza A [221 A(H3N2) and 223 with subtype pending] and 5 (1%) influenza B. Influenza percent positivity has remained above 40% since week 52, concurrent with an overall increase in test volumes in week 53 and week 1. Respiratory syncytial virus (RSV) activity also remained elevated during this period and, after influenza, was the most commonly detected other respiratory virus.

Cumulatively, during the 2014-15 influenza season (since week 40, starting September 28, 2014), 1378 (29%) patients have tested positive for influenza at the BC PHMRL, including 1345 (98%) with influenza A and 33 (2%) with influenza B. So far this season since week 40, A(H3N2) has been the dominant subtype in BC, with lesser co-circulation of influenza B and no detection of A(H1N1)pdm09.

The majority of influenza detections continue to be in elderly adults (≥65 years of age), driven in part by reports of influenza outbreaks in long-term care facilities (LTCFs).

Influenza and other virus detections among respiratory specimens submitted to BC Public Health Microbiology & Reference Laboratory, PHSA, 2014-15

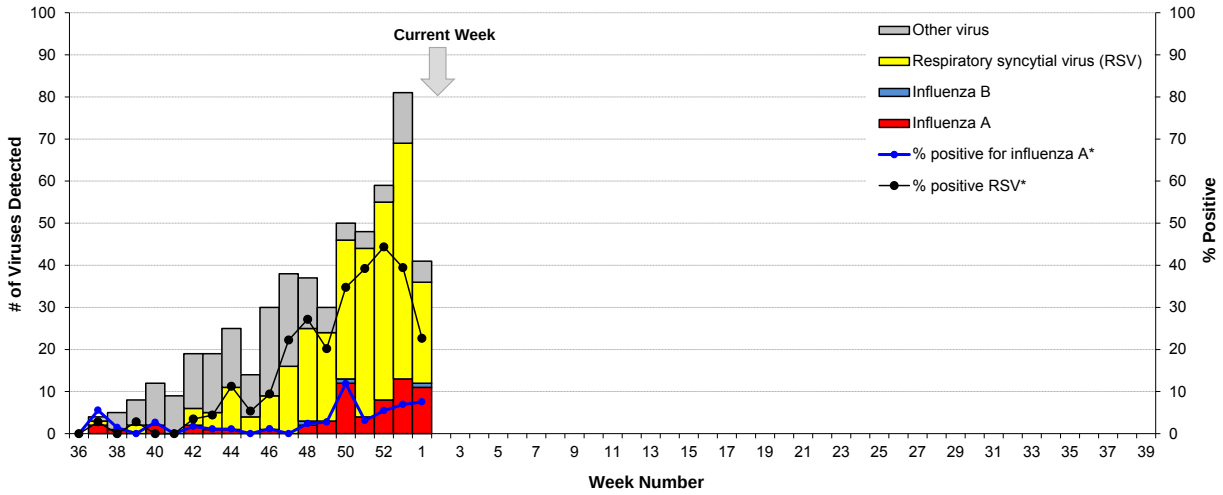


Note: Data current to January 14, 2015.

BC Children's and Women's Health Centre Laboratory

In week 1, the BC Children's and Women's Health Centre Laboratory conducted 146 tests for influenza A and 106 tests for influenza B. Of these, 11 (8%) were positive for influenza A and 1 (1%) was positive for influenza B. The percent of tests positive for influenza A has increased slightly in the past four weeks from 3% in week 51 to 8% in week 1. RSV continued to be the most commonly detected respiratory virus during this period; however, the percent of tests positive for RSV decreased from 39% in week 53 to 23% in week 1.

Influenza and other virus detections among respiratory specimens submitted to BC Children's and Women's Health Centre Laboratory, 2014-15



* Positive rates were caculated 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.

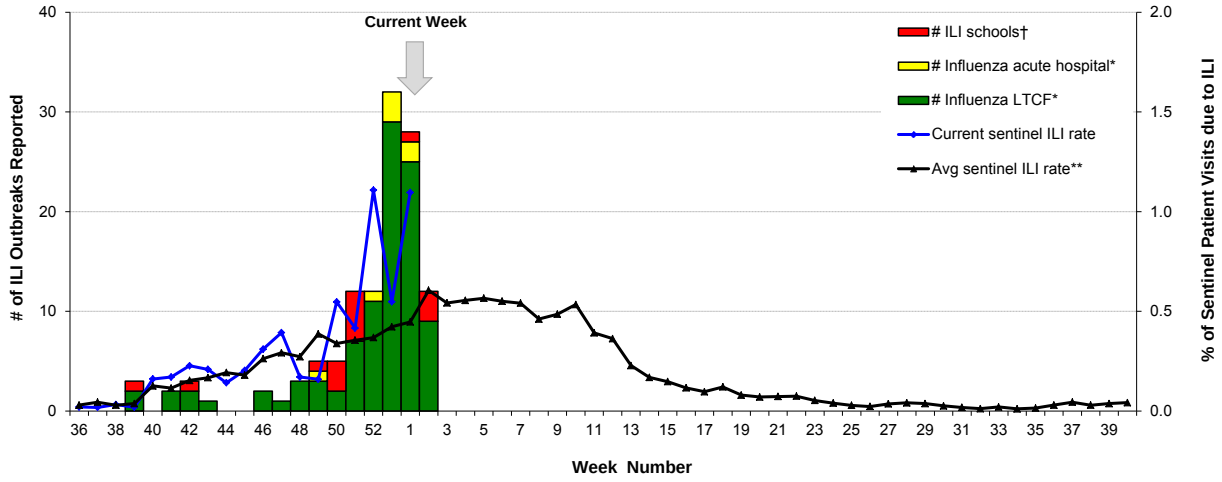
Influenza-like Illness (ILI) Outbreaks

Since our last bulletin, a large number of newly-declared facility outbreaks have been reported from all regional Health Authorities, with the exception of NHA, including 44 due to laboratory-confirmed influenza. Of the 44 laboratory-confirmed influenza outbreaks, 42 were in LTCFs and 2 in acute care. All were due to influenza A, including 17 A(H3N2) and 27 with subtype pending. Of the new facility outbreaks, two had symptom onset in week 51 (1 IHA and 1 VIHA), one in week 52 in IHA, 9 in week 53 (1 FHA, 2 IHA, 5 VCHA, and 1 VIHA), 23 in week 1 (11 FHA, 6 IHA, 3 VCHA, and 3 VIHA), and 9 in week 2 (4 FHA and 5 VIHA).

Cumulatively, since week 39 (starting September 21, 2014), 105 facility outbreaks due to laboratory-confirmed influenza have been reported, including 99 from LTCFs and 6 from acute care. All but three of these outbreaks were due to influenza A and, of those with subtype information available, all were A(H3N2); two outbreaks due to influenza B and one due to both influenza A and influenza B detected in separate units were reported.

The number of year-to-date facility outbreaks reported during the 2014-15 season are now more than double the same period (week 40 – week 1) during the last 2012-13 season of dominant, mismatched H3N2 activity (n=40), and have surpassed the total number across the entire 2012-13 season (week 40 – week 17) (n=91), which had previously been the year of record facility outbreak reports, now supplanted by the 2014-15 season.

Number of influenza-like illness (ILI) outbreaks reported, compared to current sentinel ILI rate and historical average sentinel ILI rate, British Columbia, 2014-15



* 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.
** Historical values exclude 2008-09 and 2009-10 seasons due to atypical seasonality.

Updated AMMI Guidelines: LTCF Outbreak Control

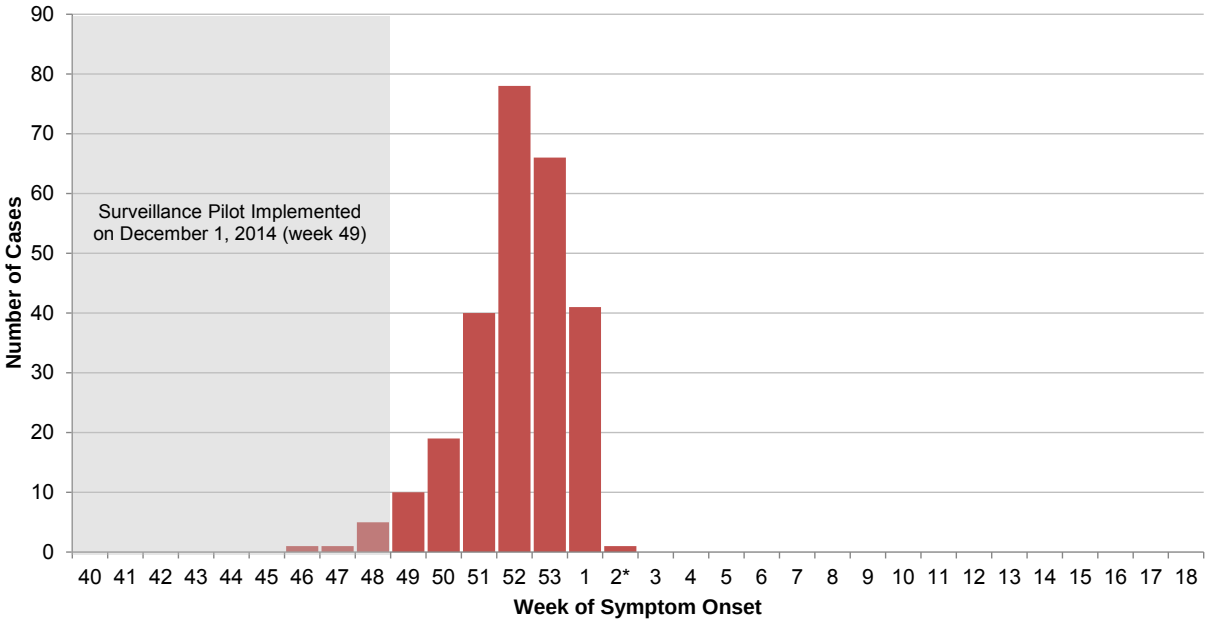
In the context of documented vaccine mismatch to circulating A(H3N2) viruses, all of which retain sensitivity to the neuraminidase inhibitor drugs, the Association of Medical Microbiology and Infectious Disease (AMMI) Canada has posted updated recommendations for antiviral use, notably in relation to LTCF outbreak control, available here: www.ammi.ca/guidelines.

Laboratory-confirmed Influenza Hospitalizations

On December 1, 2014, the BC Centre for Disease Control and the regional Health Authorities implemented an influenza severe outcome surveillance (SOS) pilot in BC for monitoring laboratory-confirmed influenza hospitalizations. An epidemic curve of hospitalized influenza cases by week of symptom onset is shown below, mirroring trends observed in other surveillance indicators. Of note, reporting delays should be taken into account in interpreting trends, particularly for the most recent weeks of the epidemic curve displayed.

The median age of cases is 79 years (range: <1 year to >100 years). More than 75% of cases have been reported in elderly adults ≥65 years, and about half have been reported in those ≥80 years. The majority (80%) of cases have one or more pre-existing chronic comorbidities. Almost all cases (≥98%) have been due to influenza A, all A(H3N2) among those with subtype information available, with a minority due to influenza B.

Number of laboratory-confirmed influenza hospitalizations by week of symptom onset, British Columbia, 2014-15



* Based on partial week; data are subject to change as reporting becomes more complete. Includes influenza SOS case report forms received as of 3:00 PM PST on January 15, 2015.

Symptom onset date was imputed as hospital admission date minus two days where symptom onset was unknown.

Only severe cases of laboratory-confirmed influenza admitted to an intensive care unit (ICU) are reported in FHA; in all other Health Authorities, both hospitalizations and ICU admissions are reported.

National

FluWatch (weeks 52-53)

In weeks 52-53, the majority of laboratory detections continued to be reported in AB, ON and QC, but with increasing activity in BC and MB. Regions across BC, AB, MB, ON, QC, and NL reported widespread activity in week 52 and/or week 53. The percentage of respiratory specimens testing positive for influenza increased to 35% in week 52 but remained stable at 34% in week 53. In week 53, 5,550 (34%) influenza viruses were detected, including 4,930 (98%) influenza A [1,421 A(H3N2), 4 A(H1N1)pdm09, and 1,421 unsubtyped] and 102 (2%) influenza B. Influenza A(H3N2) continues to be the most common subtype of influenza affecting Canadians. Among laboratory detections, hospitalizations and deaths, the majority of cases have been senior citizens ≥65 years of age. There was a large number of newly-reported laboratory-confirmed outbreaks of influenza over the two-week period (n=309). In week 53, there were 166 influenza outbreaks in 8 provinces, of which 122 were in LTCFs. To date, the NML has found that the majority of A(H3N2) influenza specimens are not optimally matched to the vaccine strain, anticipated to reduce vaccine effectiveness. Canadian vaccine effectiveness estimates are anticipated in the coming weeks. Details are available at: www.phac-aspc.gc.ca/fluwatch/14-15/index-eng.php.

National Microbiology Laboratory (NML): Strain Characterization

From September 1, 2014 to January 15, 2015, the NML has antigenically characterized 89 influenza viruses [55 A(H3N2), 2 A(H1N1)pdm09, and 32 influenza B] and genetically characterized 250 influenza A(H3N2) viruses that were received from Canadian laboratories.

Influenza A(H3N2): Of the 305 A(H3N2) viruses characterized so far this season by the NML, 303 (99%) showed antigenic or genetic evidence of antigenic drift (i.e. vaccine mismatch). Of the 55 A(H3N2) viruses antigenically characterized by haemagglutinin inhibition (HI) assay: 49 (89%) were similar to A/Switzerland/9715293/2013, the WHO-recommended A(H3N2) component for the 2015 Southern Hemisphere influenza vaccine; one (2%) was similar to A/Texas/50/2012, the WHO-recommended A(H3N2) component for the 2014-15 Northern Hemisphere influenza vaccine used this season; and 5 (9%) showed reduced titres to A/Texas/50/2012 but could not be further characterized in relation to A/Switzerland/9715293/2013 due to insufficient titres. Genetic characterization was performed on 250 A(H3N2) viruses that did not grow to sufficient titres for antigenic characterization by HI assay. Of the 250 A(H3N2) viruses genetically characterized: 249 (~100%) belonged to a genetic group that typically shows reduced titres to A/Texas/50/2012 due to amino acid mutations at antigenic sites. The remaining one (<1%) virus belonged to a genetic group that does not show reduced titres to A/Texas/50/2012.

Influenza A(H1N1)pdm09: Of the 2 A(H1N1)pdm09 viruses characterized, both were antigenically similar to A/California/7/2009, the WHO-recommended A(H1N1)pdm09 component for the 2014-15 Northern Hemisphere influenza vaccine.

Influenza B: Of the 32 influenza B viruses characterized, 29 (91%) viruses were antigenically similar to B/Massachusetts/2/2012 (Yamagata-lineage), the WHO-recommended influenza B vaccine component for the 2014-15 Northern Hemisphere influenza vaccine, and 3 (9%) viruses showed reduced titres with antiserum produced against B/Massachusetts/2/2012, signalling antigenic drift from vaccine strain.

National Microbiology Laboratory (NML): Antiviral Resistance

From September 1, 2014 to January 15, 2015, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing. Of the 340 influenza A viruses [338 A(H3N2) and 2 A(H1N1)pdm09] tested against amantadine, 337 A(H3N2) viruses and both A(H1N1)pdm09 viruses were resistant; one A(H3N2) virus was sensitive to amantadine. Of the 235 influenza viruses [206 A(H3N2), 2 A(H1N1)pdm09, and 27 influenza B] tested against oseltamivir, all were sensitive. Of the 233 influenza viruses [204 A(H3N2), 2 A(H1N1)pdm09, and 27 influenza B] tested against zanamivir, all were sensitive.

International

USA (week 53)

During week 53, influenza activity continued at elevated levels the United States. Of the 30,469 specimens tested, 7,515 (25%) were positive for influenza, including 7,218 (96%) influenza A [2,486 A(H3N2), 8 A(H1N1)pdm09, and 4,724 with subtyping not performed] and 297 (4%) influenza B. Of the 268 A(H3N2) influenza viruses collected since October 1, 2014, and characterized by HI assay, 85 (32%) were characterized as A/Texas/50/2012-like, the A(H3N2) component of the 2014-15 Northern Hemisphere influenza vaccine, and 183 (68%) showed either reduced titres with antiserum produced against A/Texas/50/2012 or belonged to a genetic group that typically shows reduced titres to A/Texas/50/2012. Among viruses that showed reduced titres with antiserum raised against A/Texas/50/2012, most were antigenically similar to A/Switzerland/9715293/2013, the A(H3N2) virus selected for the 2015 Southern Hemisphere influenza vaccine. The proportion of outpatient visits for ILI was 5.6%, above the national baseline of 2.0%, and the proportion of deaths attributed to pneumonia and influenza was above the epidemic threshold. Five influenza-associated paediatric deaths were reported. Details are available at: www.cdc.gov/flu/weekly/.

Mid-Season Influenza Vaccine Effectiveness (VE) Estimates: US CDC

On January 16, 2015, the US Centers for Disease Control and Prevention (US CDC) published early estimates of 2014-15 influenza vaccine effectiveness (VE) in Morbidity and Mortality Weekly Report (MMWR). During the study period (November 10, 2014 to January 2, 2015), adjusted VE against the dominant circulating A(H3N2) virus for medically-attended acute respiratory illness was 22% (95% CI: 5-35%), driven predominately by children aged <18 years who comprised almost half of their study sample. Adjusted VE against A(H3N2) among adults aged 18-49 and ≥50 years was lower and non-significant at 12% (95% CI: -26-39) and 14% (95% CI: -31-43), respectively. In the context of low VE observed so far this season, adjunct protective measures such as antiviral medication should be considered. Details are available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6401a4.htm?s_cid=mm6401a4_w.

WHO (as of January 12, 2015)

Globally, influenza activity continued to increase in the Northern Hemisphere with influenza A(H3N2) viruses predominating so far this season. Most of the recent A(H3N2) viruses characterized to date were antigenically distinct from the A(H3N2) component of the Northern Hemisphere's 2014-15 vaccine. Influenza A(H3N2) viruses remain sensitive to neuraminidase inhibitors. In North America, the influenza season is ongoing with influenza activity still increasing in most areas. Influenza A(H3N2) remains the predominant virus. In Europe, influenza activity was still low, but the season appears to have started. In eastern Asia, influenza activity increased with influenza A(H3N2) also predominating. In northern and western Africa, influenza activity increased with influenza B virus predominant. In tropical countries of the Americas, influenza activity increased in some countries of the Caribbean, decreased in Central America and was low in the tropical countries of South America. In tropical Asia, influenza activity increased slightly but remained low with influenza B predominating. In the Southern Hemisphere, influenza activity remained at low levels, although ILI activity remained high in several Pacific Islands. The Global Influenza Surveillance and Response System (GISRS) laboratories tested more than 96,535 specimens. Of these, 23,421 were positive for influenza viruses: 22,129 (95%) were typed as influenza A and 1,292 (6%) as influenza B. Of the sub-typed influenza A viruses, 163 (2%) were influenza A(H1N1)pdm09 and 9,211 (98%) were influenza A(H3N2). Of the characterized B viruses, 423 (98%) belonged to the B-Yamagata lineage and 9 (2%) 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 2014-15 Northern Hemisphere Influenza Vaccine

On February 20, 2014, the WHO announced the recommended strain components for the 2014-15 Northern Hemisphere trivalent influenza vaccine (TIV):*

- an A/California/7/2009(H1N1)pdm09-like virus;
- an A/Texas/50/2012(H3N2)-like virus;
- a B/Massachusetts/2/2012-like (Yamagata-lineage) virus.

*These recommended strains are the same as those used for the 2013-14 Northern Hemisphere vaccine.

For further details: www.who.int/influenza/vaccines/virus/recommendations/2014_15_north/en/.

WHO Recommendations for 2015 Southern Hemisphere Influenza Vaccine

On September 25, 2014, the WHO announced the recommended strain components for the 2015 Southern 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.‡

*Recommended strain has been retained as the A(H1N1) component since the 2009 pandemic and has been included in the Southern Hemisphere vaccine since 2010 and 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_south/en/.

Additional Information

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/dis-cond/DiseaseStatsReports/EmergingRespiratoryVirusUpdates.htm

Influenza Web Sites

Canada – Flu Watch: www.phac-aspc.gc.ca/fluwatch/
Washington State Flu Updates: www.doh.wa.gov/Portals/1/Documents/5100/fluupdate.pdf
USA Weekly Surveillance Reports: www.cdc.gov/flu/weekly/
European Influenza Surveillance Scheme:
ecdc.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:
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/dis-cond/DiseaseStatsReports/influSurveillanceReports.htm

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 BCV5Z 4R4

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