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

British Columbia Influenza Surveillance Bulletin

Influenza Season 2014-15, Number 22, Weeks 18-36
May 3 to September 12, 2015

Table of Contents:

Back-to-School Update: Sporadic Influenza Activity throughout Summer in BC

In weeks 18-36 (May 3 to September 12, 2015), community-based surveillance indicators for influenza remained at inter-seasonal levels throughout the province.

However, sporadic cases of influenza A(H3N2) and influenza B continued to be detected, driven in part by cases among out-of-province residents associated with cruise ship travel.

Also, in week 32, VCHA reported a lab-confirmed outbreak of influenza A(H3N2) in a long-term care facility (LTCF). Summer reporting of LTCF influenza outbreaks is atypical. Since 2009 this has occurred only during the A(H3N2)-dominant 2014-15 season during which an outbreak was reported in week 33, followed by additional LTCF outbreak reports in weeks 39-43. Monitoring for possible early season activity is thus warranted for the 2015-16 season.

At the BC provincial laboratory, overall influenza positivity was 8%, fluctuating between 0% and 18% during this period. Entero/rhinoviruses were the most commonly detected respiratory viruses; however, unlike last year, no EV-D68 has been detected thus far in BC despite enhanced surveillance by the provincial laboratory since August 1, 2015.

Prepared by BCCDC Influenza & Emerging Respiratory Pathogens Team
Contributors: Helen Guiyun Li, Catharine Chambers, Lisan Kwindt, Danuta Skowronski

Report Disseminated: September 17, 2015

Provincial Health Services Authority
Province-wide solutions. Better health.

ACCREDITED • AGRÉÉ • CCHSA • CCASS

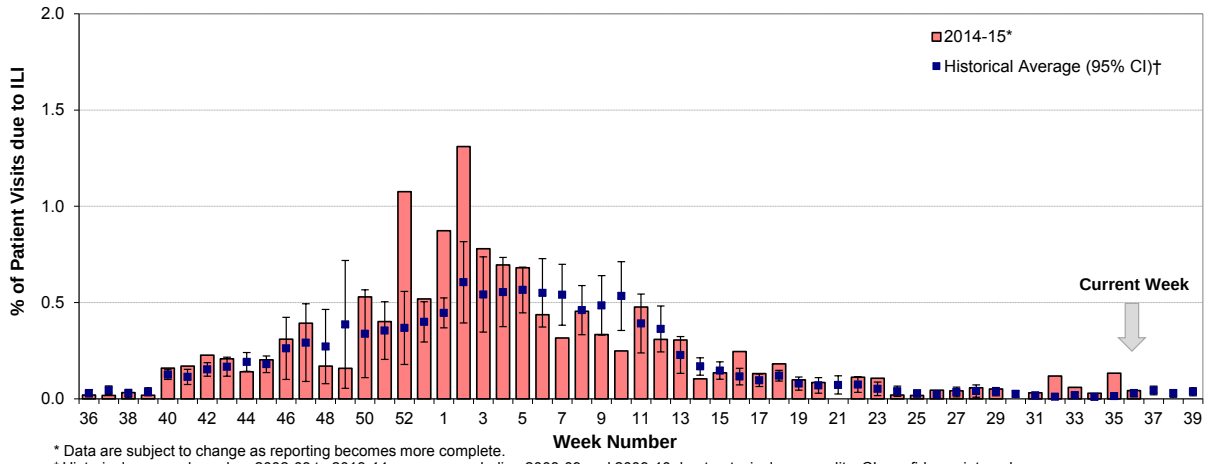
A research and teaching centre affiliated with UBC

British Columbia

Sentinel Physicians

In weeks 18-36, the proportion of patients with influenza-like illness (ILI) among those presenting to sentinel sites remained at inter-seasonal levels, with the exception of weeks 32 and 35 where proportions increased above historical averages due in part to a cluster of ILI reported at a single sentinel site. On average, 58% (range: 37-74%) of sentinel sites reported data each week during this period.

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

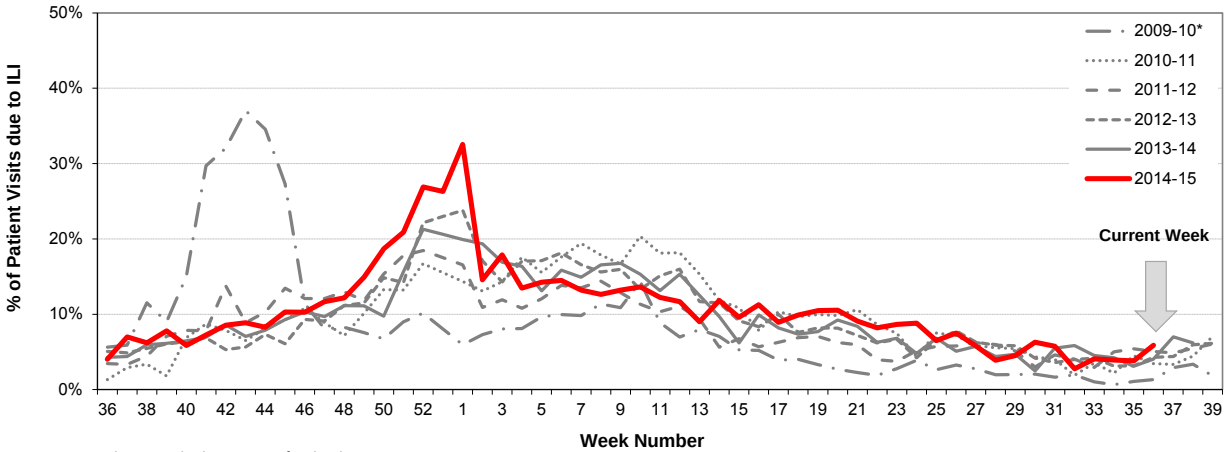


* Data are subject to change as reporting becomes more complete.
† Historical average based on 2002-03 to 2013-14 seasons, excluding 2008-09 and 2009-10 due to atypical seasonality; CI=confidence interval.

BC Children's Hospital Emergency Room

In weeks 18-36, the proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI ranged from 3% to 11%, consistent with previous seasons for this inter-seasonal period.

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

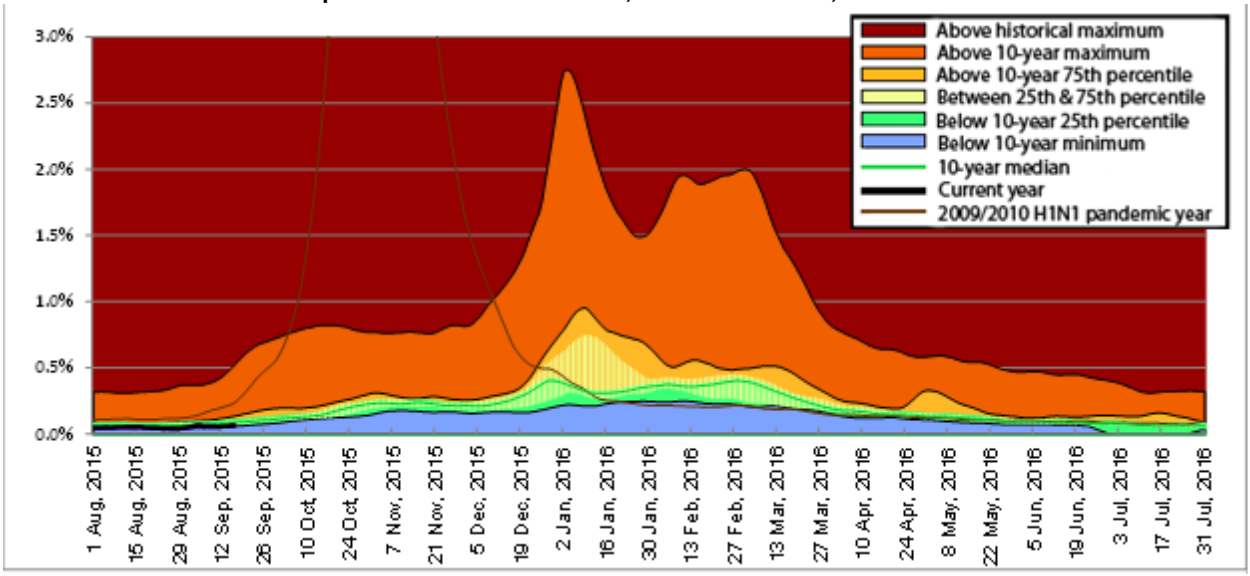


Source: BCCH Admitting, discharge, transfer database, ADT
* Data from 2010-11 to 2014-15 are based on new variable (Triage Chief Complaint) for capturing ILI symptoms and are not directly comparable to data for 2009-10. In week 9 of the 2011-12 season, the BCCH ER implemented a new data collection system,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

Medical Services Plan

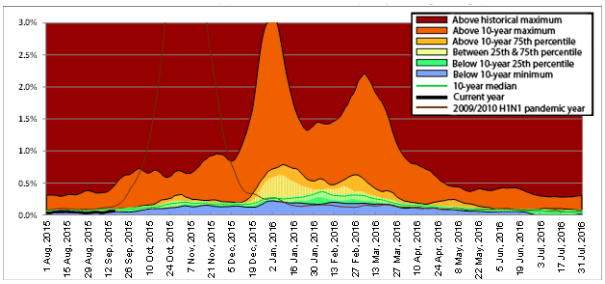
BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, have remained at or below 10-year median levels throughout the province since week 20. MSP reports were not generated during weeks 26-30 for annual maintenance purposes.

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

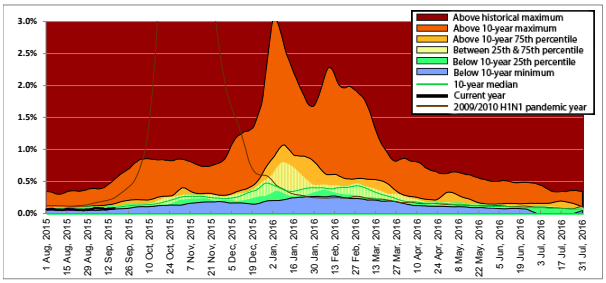


* Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza).
Data provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services
Note: MSP week beginning 1 August 2015 corresponds to sentinel ILI week 30; data current to 16 September 2015.

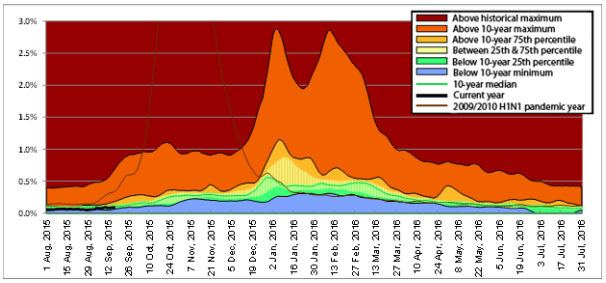
Interior



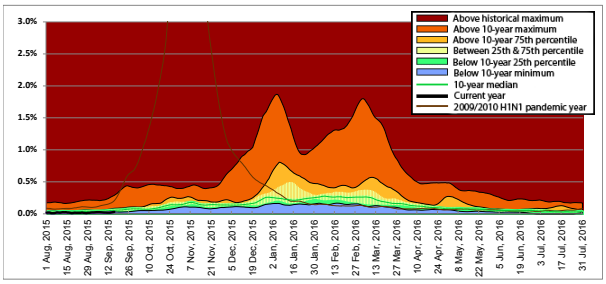
Fraser



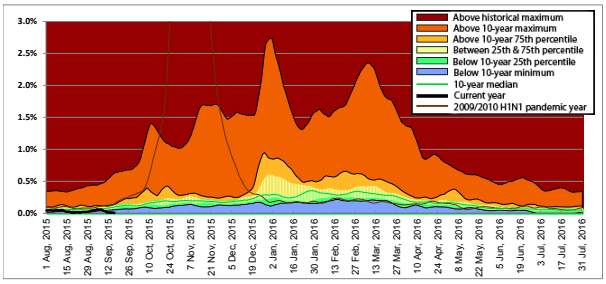
Vancouver Coastal



Vancouver Island



Northern



Laboratory Reports

BC Public Health Microbiology & Reference Laboratory (PHMRL)

In weeks 18-36, 1,552 patients were tested for respiratory viruses at the BC Public Health Microbiology & Reference Laboratory (PHMRL), PHSA. Of these, 127 (8%) tested positive for influenza, fluctuating between 18% in week 18 to <5% in week 23. During this period, there were 39 (31%) patients who were positive for influenza A [33 A(H3N2), 1 A(H1N1)pdm09 and 5 with subtype pending], 87 (69%) for influenza B, and one patient with influenza A(H3N2) and influenza B detected in different weeks.

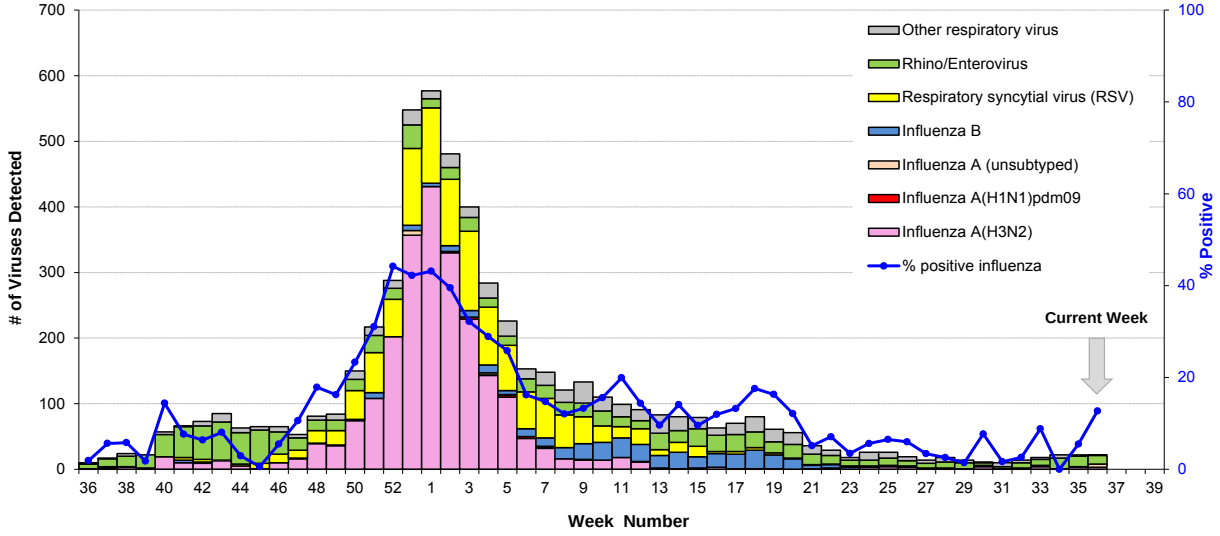
Although influenza B predominated as late season activity during May, influenza A(H3N2) comprised a greater proportion of overall influenza detections since the first week of June. Of 1,035 patients tested during that period (weeks 22-36), 55 (5%) were influenza positive, including 37 (67%) influenza A [31 A(H3N2), 1 A(H1N1)pdm09 and 5 with subtype pending] and 18 (33%) influenza B. Of the influenza A(H3N2) viruses that were collected during this period (week 22-36) and were able to be sequenced, all belonged to phylogenetic clade 3C.2a. This represents a different genetic clade than the A/Switzerland/9715293/2013-like strain recommended for the 2015 southern hemisphere and 2015-16 northern hemisphere vaccines, which belong to clade 3C.3a.

Sporadic cases of influenza A(H3N2) and influenza B during the summer were driven in part by detections among out-of-province residents associated with cruise ship travel and a lab-confirmed outbreak of influenza A(H3N2) in VCHA with onset in week 32.

Entero/rhinoviruses were the most commonly detected respiratory viruses during this period, with other respiratory viruses sporadically detected. However, unlike this time last year, no EV-D68 detections have yet been identified in BC despite enhanced laboratory surveillance among specimens submitted to the BC PHMRL since August 1, 2015.

The 2014-15 influenza season in BC was characterized by early and intense influenza A(H3N2) activity, followed by low-level, late-season influenza B circulation. Since week 40 starting 28 September 2014, 2,750 patients were tested positive for influenza at the BC PHMRL, including 2,344 (85%) influenza A [2,313 (99%) A(H3N2), 17 (<1%) A(H1N1)pdm09, 2 A(H7N9) and 12 (<1%) influenza un-subtyped], 403 (15%) influenza B and 3 patients with both influenza A and influenza B infection in different times.

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

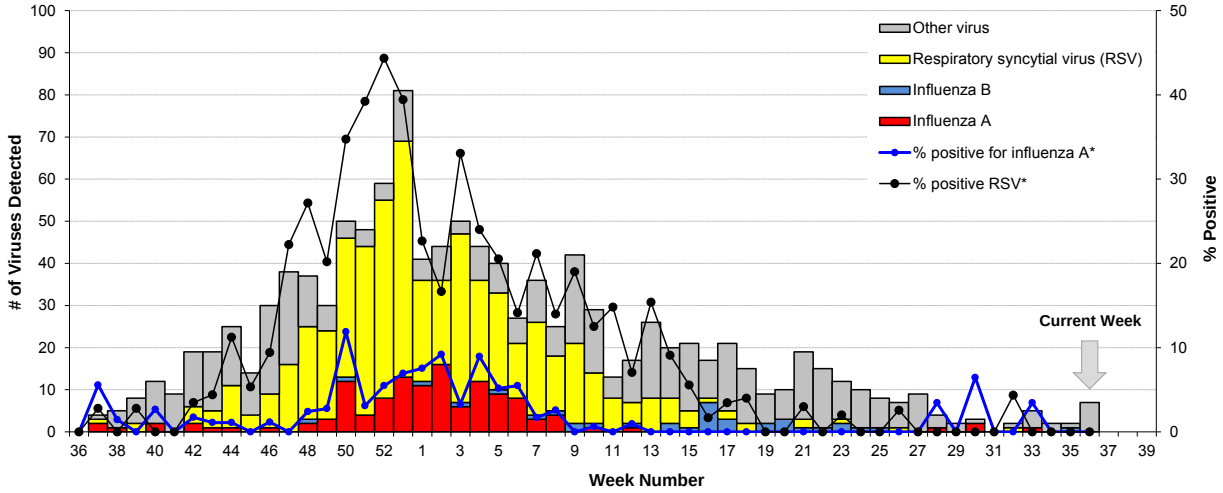


Note: PHMRL data current to September 16, 2015.

BC Children's and Women's Health Centre Laboratory

In weeks 18-36, 0.5% (4/775) of tests were positive for influenza A and 1.6% (12/775) were positive for influenza B at the BC Children's and Women's Health Centre Laboratory. Between weeks 22-36, 0.7% (4/571) of tests were positive for influenza A and 1.1% (6/571) were positive for influenza B. Parainfluenza viruses were the most commonly detected respiratory viruses over this period.

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



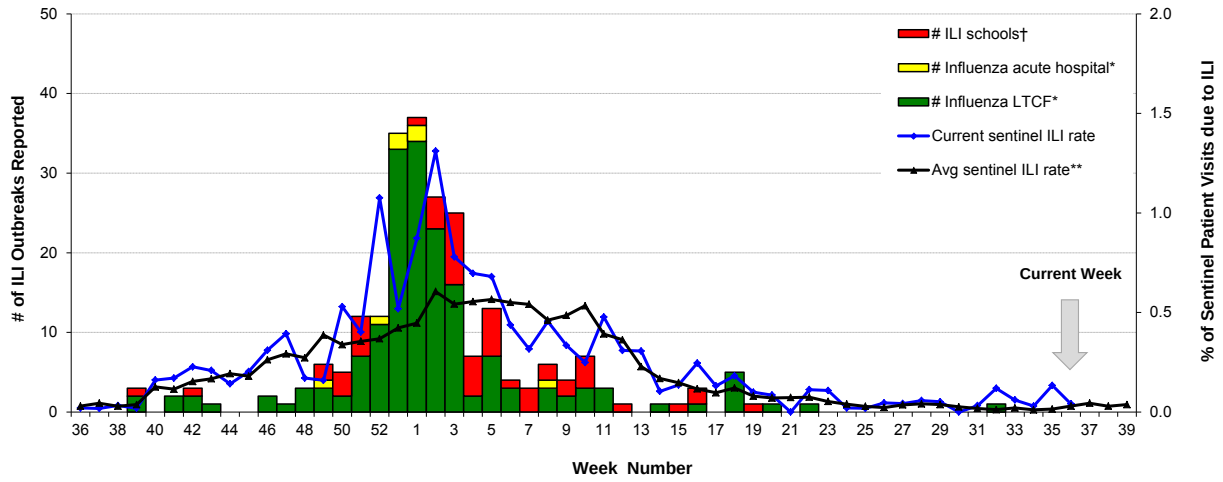
* Positive rates were caculated using aggregate data. The denominators for each rate represent the total number of tests; multiple tests may be performed for a single specimen and/or patient.

Influenza-like Illness (ILI) Outbreaks

Since our last bulletin covering weeks 13-17, 7 new lab-confirmed influenza outbreaks were reported from long-term care facilities (LTCF), including 6 where influenza B was detected (VCHA: 3, FHA: 1, VIHA: 1, IHA:1) with onset in weeks 18 (4), 20 (1) and 22 (1), and 1 where influenza A(H3N2) was detected from VCHA with onset in week 32. In no other season since the 2009 pandemic have influenza outbreaks in LTCFs been reported in late summer, with the exception of the A(H3N2)-dominant 2014-15 season where a LTCF outbreak was reported in week 33, followed by additional reports as early as weeks 39-43.

Ultimately during the 2014-15 season, 182 lab-confirmed influenza outbreaks in facilities were reported to BCCDC, including 175 from LTCFs and 7 from acute care. This tally is higher than in any prior season of the past decade. In all but 20 of these outbreaks influenza A was detected; influenza B was detected in 19 outbreaks, and one facility had both influenza A and B detected. Of the 116 out of 162 influenza A outbreaks where subtype information was available, all were due to influenza A(H3N2).

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.

National

FluWatch (weeks 33-34):

In weeks 33-34, little to no influenza activity was reported in Canada overall. However, in week 34, there were low levels of influenza activity reported in regions of Ontario, Quebec and Nova Scotia. In the summer months (weeks 27 to 34), 82 influenza detections were reported and the majority (65%) were influenza A(H3N2). For the 2014-15 season, adults ≥65 years of age have predominantly been affected by influenza A, accounting for 62% of influenza A detections. In week 34, no outbreaks of influenza were reported; however, outbreaks of influenza in LTCFs were reported in weeks 30 (Ontario) and 32 (BC). To date this season, 1,282 outbreaks in LTCFs have been reported and the majority of those with known subtypes were attributable to A(H3N2). There have been a higher number of reported influenza outbreaks to date this season compared to the same period in previous seasons. As of week 34, 8,021 hospitalizations and 606 deaths have been reported from participating regions, which is substantially more than were reported last year at this time (5,457 hospitalizations and 344 deaths). 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 August 27, 2015, the NML has antigenically characterized 1,171 influenza viruses [221 A(H3N2), 24 A(H1N1)pdm09, and 926 influenza B] and genetically characterized 1,224 influenza A(H3N2) viruses that were received from Canadian laboratories.

Influenza A(H3N2): Of the 1,445 A(H3N2) viruses characterized so far this season by the NML, 1,442 (>99%) showed antigenic or genetic evidence of antigenic drift (i.e. vaccine mismatch). Of the 221 A(H3N2) viruses antigenically characterized by haemagglutinin inhibition (HI) assay: 215 (97%) were similar to cell-passaged A/Switzerland/9715293/2013, the WHO-recommended A(H3N2) component for the 2015-16 Northern Hemisphere influenza vaccine; one (<1%) 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 (2%) 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 1,224 A(H3N2) viruses that did not grow to sufficient titres for antigenic characterization by HI assay. Of the 1,224 A(H3N2) viruses genetically characterized, 1,222 (~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 two (<1%) viruses belonged to a genetic group that does not show reduced titres to A/Texas/50/2012.

Influenza A(H1N1)pdm09: Of the 24 A(H1N1)pdm09 viruses characterized, all 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 926 influenza B viruses characterized, 815 (88%) 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; 3 (<1%) viruses showed reduced titres with antiserum produced against B/Massachusetts/2/2012, signalling antigenic drift from the vaccine strain; and 108 (12%) were antigenically similar to B/Brisbane/60/2008 (Victoria-lineage), the WHO-recommended influenza B/Victoria vaccine component for the quadrivalent 2014-15 Northern Hemisphere influenza vaccine.

National Microbiology Laboratory (NML): Antiviral Resistance

From September 1, 2014 to August 27, 2015, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing. Of the 1,503 influenza A viruses [1,477 A(H3N2) and 26 A(H1N1)pdm09] tested against amantadine, all but one were resistant; one A(H3N2) virus was sensitive to amantadine. Of the 1,937 influenza viruses [986 A(H3N2), 25 A(H1N1)pdm09, and 926 B] tested against oseltamivir, all but one was sensitive; one A(H3N2) virus was resistant to oseltamivir. Of the 1,935 influenza viruses [984 A(H3N2), 25 A(H1N1)pdm09, and 926 B] tested against zanamivir, all were sensitive.

Interim Estimates of 2014-15 Influenza Vaccine Effectiveness, Canada

Canadian Sentinel Physician Surveillance Network (SPSN), Community-based

On January 29, the Canadian Sentinel Physician Surveillance Network (SPSN) published interim estimates of vaccine effectiveness (VE) against medically attended, laboratory-confirmed influenza infection for the 2014-15 influenza vaccine. Of the characterized viruses contributing to VE analysis, virtually all (99%) clustered with phylogenetic clades that are considered antigenically distinct from the vaccine strain. Consistent with this substantial vaccine mismatch in circulating viruses, little to no protection against the dominant circulating A(H3N2) viruses was found by the Canadian SPSN. VE against medically attended laboratory-confirmed A(H3N2) infection was estimated at -8%, with 95% confidence intervals (CIs) spanning -50% to 23%. When analyses were restricted to non-elderly adults 20-64 years old, VE was 2% (95% CI: -49 to 36%). Details are available at: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21022.

Canadian Immunization Research Network (CIRN), Hospital-based

On February 5, the Serious Outcomes Surveillance Network of the Canadian Immunization Research Network (CIRN) published interim estimates of VE against influenza-associated hospitalizations for laboratory-confirmed influenza for the 2014-15 influenza vaccine. Influenza A(H3N2) was the predominant influenza virus detected among hospitalized cases, accounting for 99% of influenza A viruses with known subtype. Unmatched VE estimates adjusted for age and comorbidity were -17% (95% CI: -56 to 13%) overall and -22% (95% CI: -77 to 16%) for influenza A(H3N2). Among elderly adults ≥65 years old, adjusted VE estimates were -25% (95% CI: -74 to 10%) and -33 (95% CI: -104 to 13%), respectively. Among non-elderly adults <65 years old, VE estimates were 11% (95% CI: -66 to 52%) and 8% (95% CI: -102 to 58%), respectively. Details are available at: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21024.

International

USA (week 35 ending September 5, 2015): Influenza activity in the United States remained at inter-seasonal levels, with co-circulation of influenza A, predominantly A(H3N2), and influenza B. Details are available at: www.cdc.gov/flu/weekly/.

WHO (as of 7 September 2015): Globally, there was continued influenza activity in the Southern hemisphere, with an increase in Oceania, a peaking of activity in temperate South America and a decrease in activity in South Africa. In the Northern Hemisphere countries, respiratory virus activity remained low in general, and influenza activity continued at low, inter-seasonal levels. Influenza type A predominated in sporadic detections. A number of countries have also scaled down surveillance activity during the inter-seasonal period. In Eastern Africa, in countries with reported influenza activity, influenza type A predominated. In Western Africa, influenza activity decreased overall, with influenza B predominating in Ghana and influenza A in Côte d'Ivoire. In tropical countries of the Americas, Central America and the Caribbean, influenza activity remained at low levels, with the exception of Cuba, where high levels of influenza-like illness (ILI) and severe acute respiratory infections (SARI) were reported, associated with influenza A(H1N1)pdm09 and RSV viruses detections. In tropical Asia, countries in Southern Asia and South East Asia reported an overall low influenza activity though India reported a minor increase in activity with predominantly A(H1N1)pdm09. Influenza activity was still high in southern China with influenza A(H3N2) predominating. In temperate South America, ILI and SARI activity remained low and continued to decrease in general, except in Chile, where respiratory virus activity remained elevated. Influenza type A viruses predominated in the region. In South Africa, influenza activity decreased, with influenza type B predominating in recent weeks. In Australia, influenza activity seemed to be still increasing with predominantly influenza B virus followed by influenza A(H3N2) detections. In New Zealand, influenza activity may have peaked in the second week of August with influenza A(H3N2) and B predominating. The WHO Global Influenza Surveillance and Response System (GISRS) laboratories tested more than 32,226 specimens during that time period. Of these, 4,246 were positive for influenza viruses: 3,219 (76%) were typed as influenza A and 1,027 (24%) as influenza B. Of the sub-typed influenza A viruses, 326 (12%) were influenza A(H1N1)pdm09 and 2,350 (88%) were influenza A(H3N2). Of the characterized B viruses, 126 (92%) belonged to the B-Yamagata lineage and 11 (8%) 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 2015-16 Northern Hemisphere Influenza Vaccine

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

- an A/California/7/2009(H1N1)pdm09-like virus;†
- an A/Switzerland/9715293/2013(H3N2)-like virus;‡
- a B/Phuket/3073/2013-like (Yamagata-lineage) virus.§

* These recommended strains are the same as those that will be used for the 2015 Southern Hemisphere vaccine.

† Recommended strain has been retained as the A(H1N1) component since the 2009 pandemic and has been included in the Northern Hemisphere vaccine since 2010-11.

‡ A/South Australia/55/2014, A/Norway/466/2014, and A/Stockholm/6/2014 are A/Switzerland/9715293/2013-like viruses. Recommended strain is considered antigenically distinct from the A/Texas/50/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine and clusters within the emerging phylogenetic clade 3C.3a.

§ Recommended strain is the same influenza B-Yamagata lineage as the B/Massachusetts/2/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine but represents a phylogenetic clade-level change from clade 2 to clade 3.

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

Additional Information

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 BC V5Z 4R4

Phone: (604) 707-2510
Fax: (604) 707-2516
ilioutbreak@bccdc.ca