### British Columbia Influenza Surveillance Bulletin

Influenza Season 2014-15, Number 14, Week 2 January 11 to January 17, 2015

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# Peak of A(H3N2) Epidemic Likely Passed but Activity Still Elevated in BC

In week 2 (January 11 to 17, 2015), most surveillance indicators suggest that BC has passed the epidemic peak of influenza A(H3N2) activity. However, influenza activity remains elevated across most regions of the province, still predominantly due to A(H3N2) viruses that are mismatched to the 2014-15 influenza vaccine component.

The proportion of patients testing positive for influenza at the BC provincial laboratory has remained stable at ≥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 in the past few weeks.

Since our last bulletin one week ago, 22 new confirmed influenza outbreaks have been reported from LTCFs. The cumulative tally of facility outbreaks since week 39 (n=126) now exceeds by more than a third the total tally across the entire 2012-13 season, also associated with dominant, mismatched A(H3N2) activity (n=91) and the prior historic record for number of LTCF outbreaks in a single season.

### Prepared by BCCDC Influenza & Emerging Respiratory Pathogens Team

Contributors: Helen Guiyun Li, Catharine Chambers, Lisan Kwindt, Danuta Skowronski

Report Disseminated: January 22, 2015

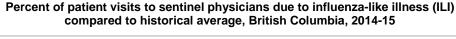


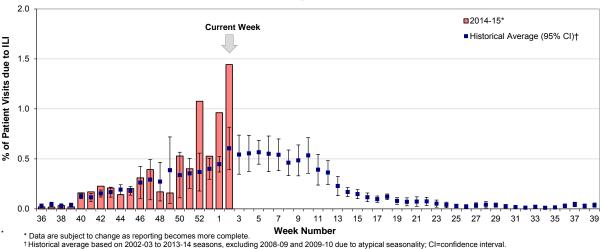


### **British Columbia**

### **Sentinel Physicians**

In week 2, the proportion of patients with influenza-like illness (ILI) among those presenting to sentinel physicians remained significantly above historical averages for this time of year for the fourth consecutive week and were ≥1% for three of the past four weeks. So far in week 2, 56% of sentinel sites have reported data.

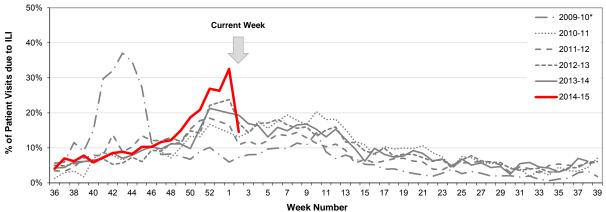




#### BC Children's Hospital Emergency Room

The proportion of visits to BC Children's Hospital Emergency Room (ER) attributed to ILI declined sharply from above 30% in week 1 to 15% in week 2, returning to expected levels observed in previous seasons for this time of year. As outlined on page 6, this was concurrent with a substantial drop in respiratory syncytial virus (RSV) activity reported by the BC Children's and Women's Health Centre Laboratory.

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



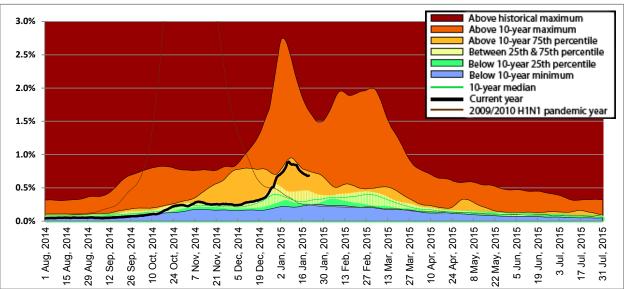
Source: BCCH Admitting, discharge, transfer database, ADT

<sup>\*</sup> 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 2, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, remained elevated but began to show signs of declining activity following an earlier seasonal increase for the province overall and in most regional Health Authorities. In IHA, FHA, and VCHA, rates were above 10-year 75<sup>th</sup> percentiles; in VIHA, rates were above 10-year maximums; and in NHA, rates were between 25<sup>th</sup> and 75<sup>th</sup> percentiles.

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



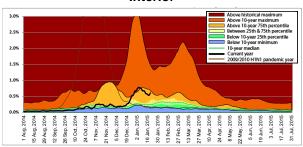
<sup>\*</sup> Influenza illness is tracked as the percentage of all submitted MSP general practitioner claims with ICD-9 code 487 (influenza). Data provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services.

Note:MSP week beginning 3 August 2014 corresponds to sentinel ILI week 32; data current to January 20, 2015.

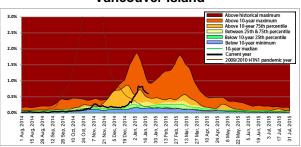
### **BC Centre for Disease Control**

An agency of the Provincial Health Services Authority

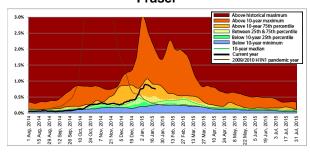
### Interior



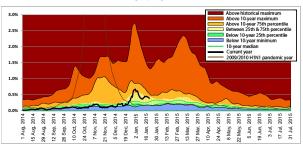
### Vancouver Island



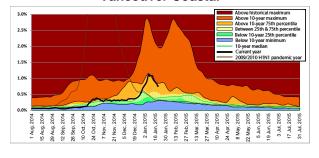
#### Fraser



### Northern



### **Vancouver Coastal**



### **Laboratory Reports**

### BC Public Health Microbiology & Reference Laboratory (PHMRL)

In week 2, the BC Public Health Microbiology & Reference Laboratory (PHMRL) tested 865 patients for respiratory viruses. Of these, 345 (40%) tested positive for influenza, including 337 (98%) influenza A [281 A(H3N2), 1 A(H1N1)pdm09, and 55 with subtype pending] and 8 (2%) influenza B.

Influenza percent positivity has remained stable at ≥40% since week 52, concurrent with an overall increase in test volumes since week 53. Respiratory syncytial virus (RSV) activity also remained stable 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), 1701 (31%) patients have tested positive for influenza at the BC PHMRL, including 1660 (98%) with influenza A and 41 (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 minimal 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).

800 100 Other respiratory virus **Current Week** Rhino/Enterovirus 700 Respiratory syncytial virus (RSV) 80 600 ■Influenza B # of Viruses Detected Influenza A (unsubtyped) ■Influenza A(H3N2) Influenza A(H1N1)pdm09 400 % positive influenza 300 200 20 100

Week Number

21 23 25 27

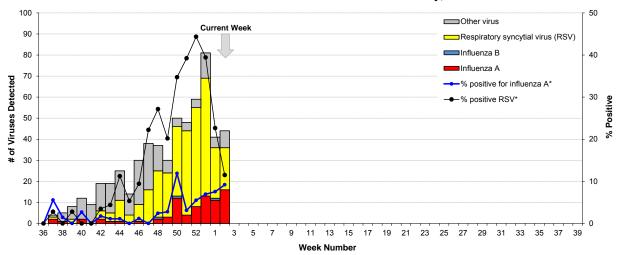
Influenza and other virus detections among respiratory specimens submitted to BC Public Health Microbiology & Reference Laboratory, PHSA, 2014-15

Note: Data current to January 21, 2015.

### BC Children's and Women's Health Centre Laboratory

In week 2, the BC Children's and Women's Health Centre Laboratory conducted 120 tests for influenza A and influenza B. Of these, 16 (9%) were positive for influenza A and none were positive for influenza B. The percent positive for influenza A continued a gradual increase since week 51, while the percent positive for RSV continued to decline from a peak of 44% in week 52 to 12% in week 2. Nevertheless, RSV remained the most commonly detected respiratory virus during this period.

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



<sup>\*</sup> 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.

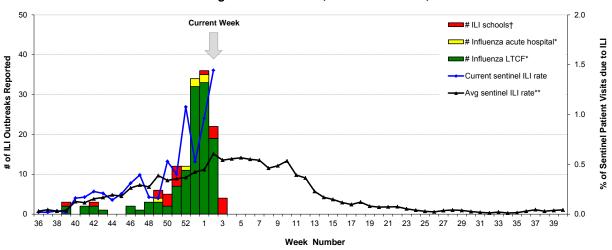
### Influenza-like Illness (ILI) Outbreaks

Since our last bulletin, 22 new laboratory-confirmed influenza outbreaks in LTCFs have been reported, including 12 A(H3N2) and 10 influenza A with subtype pending. Of the new facility influenza outbreaks, one had symptom onset in week 52 (IHA), one in week 53 (VCHA), 9 in week 1 (3 FHA, 4 IHA, 2 VCHA), and 11 in week 2 (3 FHA, 1 IHA, 2 VCHA, 5 VIHA).

Cumulatively, since week 39 (starting September 21, 2014), 126 facility outbreaks due to laboratory-confirmed influenza have been reported, including 120 from LTCFs and 6 from acute care. All but four 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 two due to both influenza A and B detected in separate units were reported.

The number of year-to-date facility outbreaks reported during the 2014-15 season is now more than double the same period (week 40 – week 2) during the last 2012-13 season of dominant, mismatched H3N2 activity (n=53), and has surpassed (by more than a third) the total number of facility influenza outbreaks reported 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



<sup>\*</sup> Facility-based influenza outbreaks defined as 2 or more ILI cases within 7-day period, with at least one laboratory-confirmed case of influenza.

### **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: <a href="www.ammi.ca/guidelines">www.ammi.ca/guidelines</a>.

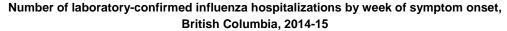
<sup>†</sup> School-based ILI outbreak defined as >10% absenteeism on any day, most likely due to ILI.

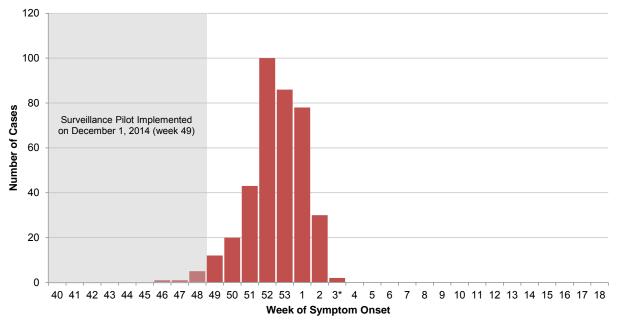
\*\* Historical values exclude 2008-09 and 2009-10 seasons due to atypical seasonality.

#### 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). About 75% of cases have been reported in elderly adults ≥65 years, with half reported in those ≥80 years. The majority (>80%) of cases have one or more pre-existing chronic comorbidities. Almost all cases have been due to influenza A, all A(H3N2) among those with subtype information available, with a minority due to influenza B.





<sup>\*</sup> 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 22, 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 (week 1)

In week 1, seven of the thirteen provinces and territories reported widespread activity within their jurisdictions, the highest levels reported to date. The percent positive for laboratory detections of influenza decreased from 34% in week 53 to 29% in week 1, suggesting that the influenza season in Canada may have peaked. In week 1, 4,579 (29%) influenza viruses were detected, including 4,320 (97%) influenza A [887 A(H3N2) and 3,433 unsubtyped] and 130 (3%) influenza B. Similar to the previous week, there were a large number of newly-reported laboratory-confirmed outbreaks of influenza: 195 outbreaks in 9 provinces, of which 152 were in LTCFs, a record number of LTCF outbreaks reported over the last five influenza seasons. Overall in week 1, many indicators such as laboratory detections, prescriptions for antiviral medications, paediatric hospitalizations, and ILI consultation rates have decreased. 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: <a href="https://www.phac-aspc.gc.ca/fluwatch/14-15/index-eng.php">www.phac-aspc.gc.ca/fluwatch/14-15/index-eng.php</a>.

### National Microbiology Laboratory (NML): Strain Characterization

From September 1, 2014 to January 22, 2015, the NML has antigenically characterized 106 influenza viruses [62 A(H3N2), 2 A(H1N1)pdm09, and 42 influenza B] and genetically characterized 395 influenza A(H3N2) viruses that were received from Canadian laboratories.

Influenza A(H3N2): Of the 457 A(H3N2) viruses characterized so far this season by the NML, 454 (99%) showed antigenic or genetic evidence of antigenic drift (i.e. vaccine mismatch). Of the 62 A(H3N2) viruses antigenically characterized by haemagglutinin inhibition (HI) assay: 56 (90%) 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 (8%) 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 395 A(H3N2) viruses that did not grow to sufficient titres for antigenic characterization by HI assay. Of the 395 A(H3N2) viruses genetically characterized: 393 (99%) 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 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 42 influenza B viruses characterized, 38 (90%) 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, three (7%) viruses showed reduced titres with antiserum produced against B/Massachusetts/2/2012, signalling antigenic drift from vaccine strain, and one was 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 January 22, 2015, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing. Of the 513 influenza A viruses [511 A(H3N2) and 2 A(H1N1)pdm09] tested against amantadine, 510 A(H3N2) viruses and both A(H1N1)pdm09 viruses were resistant; one A(H3N2) virus was sensitive to amantadine. Of the 280 influenza viruses [237 A(H3N2), 2 A(H1N1)pdm09, and 41 influenza B] tested against oseltamivir, all were sensitive. Of the 278 influenza viruses [235 A(H3N2), 2 A(H1N1)pdm09, and 41 influenza B] tested against zanamivir, all were sensitive.

### International

### USA (week 1)

During week 1, influenza activity remained elevated in the United States. Of the 26,204 specimens tested, 5,284 (20%) were positive for influenza, including 5,051 (96%) influenza A [1,868 A(H3N2), 7 A(H1N1)pdm09, and 3,176 with subtyping not performed] and 233 (4%) influenza B. Of the 349 A(H3N2) influenza viruses collected since October 1, 2014, and characterized by HI assay, 122 (35%) were characterized as A/Texas/50/2012-like, the A(H3N2) component of the 2014-15 Northern Hemisphere influenza vaccine, and 227 (65%) either showed 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 4.4%, above the national baseline of 2.0%, and the proportion of deaths attributed to pneumonia and influenza was above the epidemic threshold. Nineteen 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 predominantly 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: <a href="http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6401a4.htm?scid=mm6401a4">http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6401a4.htm?scid=mm6401a4</a> w.

#### **WHO**

There have been no updates to the WHO Influenza Surveillance Summary since our last bulletin. Previous updates are available at: <a href="https://www.who.int/influenza/surveillance">www.who.int/influenza/surveillance</a> 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.

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;<sup>†</sup>
- a B/Phuket/3073/2013-like (Yamagata-lineage) virus.<sup>‡</sup>

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

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

<sup>\*</sup>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.

<sup>&</sup>lt;sup>†</sup>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.

<sup>‡</sup> 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.

### **Additional Information**

**List of Acronyms:** 

ACF: Acute Care Facility

AI: Avian influenza

MSP: BC Medical Services Plan

NHA: Northern Health Authority

**FHA:** Fraser Health Authority **NML:** National Microbiological Laboratory

**HBoV**: Human bocavirus **A(H1N1)pdm09**: Pandemic H1N1 influenza (2009)

**HMPV**: Human metapneumovirus **RSV**: Respiratory syncytial virus

HSDA: Health Service Delivery Area

IHA: Interior Health Authority

ILI: Influenza-Like Illness

VCHA: Vancouver Coastal Health Authority

VIHA: Vancouver Island Health Authority

WHO: World Health Organization

LTCF: Long-Term Care Facility

### **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/Wee

kly 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: <a href="https://www.who.int/csr/disease/avian\_influenza/en/">www.who.int/csr/disease/avian\_influenza/en/</a>

World Organization for Animal Health: www.oie.int/eng/en\_index.htm

### **Contact Us:**

Tel: (604) 707-2510 Fax: (604) 707-2516

Email: <a href="mailto:lnfluenzaFieldEpi@bccdc.ca">lnfluenzaFieldEpi@bccdc.ca</a>

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.

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A	Reporting Inform Person Reporting: Contact Phone: Health Authority: Full Facility Name: Is this report:	☐First Notification (☐Update (complete	Ith unit/medical health office Title: Email: HSDA: Complete section B below; e section C below; Section complete section C below;	Section <b>D</b> if available) <b>D</b> if available)
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D	Laboratory Information			
	Specimen(s) submitted?			
	If yes, organism identified?			