## Table of Contents:

**British Columbia:**
- Sentinel Physicians  
- Children’s Hospital ER  
- Medical Services Plan  
- Laboratory Surveillance  
- ILI Outbreaks  

**Canada:**
- FluWatch Activity levels  
- NML Strain Characterization  
- NML Antiviral Resistance  

**International:**
- USA (CDC)  
- WHO  

**Emerging Respiratory Viruses**
- Enterovirus D68  
- Mers-CoV  
- Avian influenza A(H7N9)  
- Avian influenza A(H5N1)  
- Avian influenza A(H5N8)  

**Influenza Vaccine Components**
- (WHO Recommendations)  
  - 2014-15 Northern Hemisphere  
  - 2015 Southern Hemisphere  

**Additional Information:**
- List of Acronyms  
- Web Sites  
- Outbreak Report Form  

---

### Ongoing Influenza-like Illness Activity

In weeks 45-46 (November 2-15, 2014), surveillance indicators suggest ongoing and slightly elevated influenza-like illness (ILI) activity in BC compared to previous years, following an earlier than usual start to the season.

At the BC provincial laboratory, influenza A detections increased from 1% in week 45 to 5% in week 46. Influenza A(H3N2) continues to be the predominant influenza subtype, with co-circulation of entero/rhinoviruses and respiratory syncytial virus (RSV).

One new laboratory-confirmed influenza A outbreak was reported from a long-term care facility (LTCF) in week 47 in VIHA. So far this season, since week 39, 8 laboratory-confirmed influenza LTCF outbreaks have been reported.

As of November 19, BCCDC is aware of 132 laboratory-confirmed hospitalized cases of enterovirus D68 (EV-D68) in BC. About two-thirds were children <10 years old. Among hospitalized cases with recorded illness onset date, a decline in recent weeks is suggested but ongoing monitoring is warranted. Although enteroviruses typically show epidemic activity in late summer/autumn, community circulation may continue through the early winter and a small proportion may experience severe outcomes.
British Columbia

Sentinel Physicians
The proportion of patients with influenza-like illness (ILI) among those presenting to sentinel physicians increased from 0.25% in week 45 to 0.41% in week 46, slightly higher than historical averages for this time of year. So far, 64% and 53% of sentinel sites have reported data in weeks 45 and 46, respectively.

BC Children’s Hospital Emergency Room
In weeks 45-46, the proportion of visits to BC Children’s Hospital Emergency Room (ER) attributed to ILI continued a gradual increasing trend since week 40 but remained consistent with rates observed in previous seasons for this time of year at 10%.
Medical Services Plan
In weeks 45-46, BC Medical Services Plan (MSP) general practitioner claims for influenza illness (II), as a proportion of all submitted MSP claims, remained elevated but within or slightly above expected seasonal levels in most regions following a sharp increase earlier in October. For the province overall and in IHA and VIHA, rates were above the 10-year 75th percentiles for this time of year. In FHA and VCHA, rates were between 25th and 75th percentiles, and, in NHA, rates were below 10-year minimums.

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 November 18, 2014.
Laboratory Reports

BC Public Health Microbiology & Reference Laboratory (PHMRL)

In weeks 45-46, the BC Public Health Microbiology & Reference Laboratory (PHMRL) tested 358 patients for respiratory viruses. Of these, 10 (3%) were positive for influenza A(H3N2), including 1 in week 45 and 9 in week 46. The influenza percent positivity increased from 1% in week 45 to 5% in week 46 and followed a period of early activity in weeks 40-44. Enterorhinoviruses continued to be the most commonly detected respiratory virus during this period; however, an increasing proportion of patients were positive for respiratory syncytial virus (RSV) in weeks 45-46.

Cumulatively, during the 2014-15 influenza season (since week 40, starting September 28, 2014), 71 (6%) patients have tested positive for influenza at the BC PHMRL, including 65 (92%) influenza A [56 A(H3N2) and 9 subtype pending] and 6 (8%) influenza B. So far this season, A(H3N2) has been the dominant subtype. The majority of influenza detections continue to be in elderly adults (≥65 years of age).

Note: Data current to November 20, 2014.
BC Children’s and Women’s Health Centre Laboratory
In weeks 45-46, the BC Children’s and Women’s Health Centre Laboratory conducted 161 tests for influenza A and 160 tests for influenza B. Of these, 1 (1%) was positive for influenza A in week 46 and none were positive for influenza B. RSV and entero/rhinoviruses were the most commonly detected respiratory viruses during 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 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

In weeks 45-46, 4 new ILI outbreaks in long-term care facilities (LTCFs) with symptom onset ranging from weeks 44 to 46 were reported from IHA (3) and VIHA (1). None were laboratory confirmed as influenza at the time of writing. In week 47, 2 new ILI outbreaks in LTCFs were reported with symptom onset in weeks 46 and 47 from VCHA (1) and VIHA (1), respectively; one was laboratory-confirmed as influenza A and for the other laboratory results are pending.

Cumulatively, since week 39 (starting September 21, 2014), 8 laboratory-confirmed influenza outbreaks have been reported from LTCFs, including 7 due to influenza A [6 A(H3N2) and 1 subtype pending] and 1 due to influenza B, suggesting unusually early seasonality. In no other season since the 2009 pandemic have LTCF influenza outbreaks been reported prior to week 45. To date, all but one of the reported laboratory-confirmed influenza outbreaks have occurred in FHA or VCHA, with one reported from VIHA.

BC Sentinel Hospital Influenza Surveillance (IMPACT)

In week 44, one new laboratory-confirmed influenza A(H3N2)-associated paediatric hospitalization was reported in a 2-4-year-old child by the BC Children’s Hospital to the Immunization Monitoring Program Active (IMPACT) network. Cumulatively, since week 38 (starting September 14, 2014), 2 laboratory-confirmed influenza-associated paediatric hospitalizations, both due to influenza A(H3N2), have been reported to IMPACT.
National

FluWatch (week45)
As expected, overall influenza activity in week 45 increased from the previous week. The majority of regions in Canada reported no activity; however, sporadic or localized activity was reported in several regions in 5 provinces/territories (BC, AB, ON, QC, and YT). Yukon reported activity for the first time this season but only at sporadic levels. The number of positive influenza tests increased from 2% in week 44 to 4% in week 45. In week 45, 106 (4%) influenza viruses were detected, including 97 (92%) influenza A [68 A(H3N2) and 29 unsubtyped] and 9 (9%) influenza B. Influenza A(H3N2) continues to be the most common type of influenza affecting Canadians. To date, 40-55% of influenza laboratory detections and hospitalizations have been in seniors ≥65 years of age. In week 45, 2 new LTCF outbreaks of influenza A(H3N2) were reported. 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 November 20, 2014, the National Microbiology Laboratory (NML) has antigenically characterized 20 influenza viruses [10 A(H3N2) and 10 influenza B] that were received from Canadian laboratories. Of the viruses characterized, 8 (80%) A(H3N2) viruses and 3 (30%) influenza B/Yamagata-lineage viruses showed reduced titres with antiserum raised against vaccine reference virus, signalling possible antigenic drift in circulating virus.

Influenza viruses were characterized as antigenically similar to:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A/Texas/50/2012(H3N2)-like</td>
</tr>
<tr>
<td>8</td>
<td>Reduced titre with antiserum raised against A/Texas/50/2012(H3N2)</td>
</tr>
<tr>
<td>0</td>
<td>A/California/07/2009(H1N1)pdm09-like†</td>
</tr>
<tr>
<td>7</td>
<td>B/Massachusetts/02/2012-like (Yamagata lineage)‡</td>
</tr>
<tr>
<td>3</td>
<td>Reduced titre with antiserum raised against B/Massachusetts/02/2012</td>
</tr>
<tr>
<td>0</td>
<td>B/Brisbane/60/2008-like (Victoria lineage)§</td>
</tr>
</tbody>
</table>

† WHO-recommended influenza A(H1N1) component for the 2014-15 Northern Hemisphere influenza vaccine.
‡ WHO-recommended influenza B component for the 2014-15 Northern Hemisphere influenza vaccine.
§ WHO-recommended influenza B component for the 2011-2012 Northern Hemisphere influenza vaccine; for quadrivalent vaccine, a B/Brisbane/60/2008-like virus is recommended as the second influenza B component.

National Microbiology Laboratory (NML): Antiviral Resistance
From September 1, 2014, to November 20, 2014, the NML received influenza viruses from Canadian laboratories for drug susceptibility testing:

Amantadine
- 21 influenza A(H3N2) viruses were tested;
- All tested viruses were resistant.

Oseltamivir
- 21 influenza viruses [12 A(H3N2) and 9 influenza B] were tested;
- All tested viruses were susceptible.

Zanamivir
- 21 influenza viruses [12 A(H3N2) and 9 influenza B] were tested;
- All tested viruses were susceptible.
International

USA (week 45)
During week 45, influenza activity was low in the United States. Of 9,138 specimens tested, 678 (7%) were positive for influenza, including 567 (84%) influenza A [192 A(H3N2), 2 A(H1N1)pdm09 and 373 with subtyping not performed] and 111 (16%) influenza B. Of the 13 A(H3N2) influenza viruses collected since October 1, 2014, and characterized by haemagglutination inhibition (HI) assay, 7 (54%) were characterized as A/Texas/50/2012-like, the A(H3N2) component of the 2014-15 Northern Hemisphere influenza vaccine, and 6(46%) showed reduced titres with antiserum raised against A/Texas/50/2012 but were antigenically similar to A/Switzerland/9715293/2013, the A(H3N2) component of the 2015 Southern Hemisphere influenza vaccine. The proportion of outpatient visits for ILI remained below the national baseline and the proportion of deaths attributed to pneumonia and influenza remained below the epidemic threshold. No new influenza-associated paediatric deaths were reported. Details are available at: www.cdc.gov/flu/weekly/.

WHO (November 17, 2014)
Globally, influenza activity remained low, with the exception of some Pacific Islands. In North America, influenza activity continued to increase slightly but remained low. In Europe, overall influenza activity remained at inter-seasonal levels. In tropical countries of the Americas, influenza detections remained low, with RSV causing most ILI and severe acute respiratory infections (SARI) activity. In Africa and western and eastern Asia, influenza activity was low. In tropical Asia, influenza activity was low with influenza B predominant in Viet Nam. In the southern hemisphere, influenza activity remained low except in several Pacific Islands where ILI activity remained high. During weeks 43-44 (October 19 to November 1, 2014), WHO Global Influenza Surveillance and Response System (GISRS) laboratories tested more than 44,937 specimens. Of these, 1,978 were positive for influenza viruses: 1,434 (73%) were typed as influenza A and 544 (28%) as influenza B. Of the sub-typed influenza A viruses, 60 (7%) were influenza A(H1N1)pdm09 and 813 (93%) were influenza A(H3N2). Of the characterized B viruses, 87 (97%) belonged to the B-Yamagata lineage and 3 (3%) to the B-Victoria lineage. Details are available at: www.who.int/influenza/surveillance_monitoring/updates/en/.
Emerging Respiratory Pathogens

**Enterovirus D68 (EV-D68), British Columbia**

Since September, the BCCDC has been collecting enhanced surveillance information on laboratory-confirmed cases of enterovirus D68 (EV-D68) in collaboration with the Public Health Agency of Canada.

As of November 19, there have been 202 EV-D68 detections in BC, of which 132 were associated with hospitalization including reports from all Health Authorities of BC. About two-thirds (63%) of these hospitalized cases are children <10 years of age, and males are over-represented (58%). Among hospitalized cases with recorded illness onset date, a decline in recent weeks is suggested but ongoing monitoring is warranted. In the United States reduced illness activity has also been observed in 47 states and the District of Columbia. Although enteroviruses typically show epidemic activity in late summer/autumn, community circulation may continue through the early winter and a small proportion may experience severe outcomes.

In early November, a second fatal case associated with EV-D68 infection in BC was identified in an elderly individual with multiple chronic comorbidities that likely contributed to this death. BCCDC has also been notified this week of an additional EV-D68 infection in an adult in association with neurologic findings primarily involving the head and neck, still under investigation.

In total since mid-August, four cases of neurologic illness (two paediatric, two adult) and two deaths (one young adult, one elderly) associated with EV-D68 infection have been reported in BC. However, it remains unclear to what extent EV-D68 infection caused or contributed to these severe manifestations. As with other respiratory viruses, including enteroviruses, a proportion of all EV-D68 cases may experience more severe sequelae although this risk for most individuals remains low.

The BCCDC will continue to monitor EV-D68 and other seasonal respiratory viruses (e.g. influenza and RSV) that are anticipated to be greater contributors to acute respiratory illness as we enter the winter period. For more information on EV-D68: [www.bccdc.ca/dis-cond/a-z/_e/EnterovirusD68/default.htm](http://www.bccdc.ca/dis-cond/a-z/_e/EnterovirusD68/default.htm).

**Middle East Respiratory Syndrome Coronavirus (MERS-CoV), Middle East**

Although MERS-CoV activity in the Middle East remains low compared to the dramatic surge observed in April 2014, sporadic cases continue to be reported this month. An increasing trend in case reports was observed in September and October, driven in part by a large health care-associated outbreak in Taif, located in the Mecca region of Saudi Arabia. The majority of cases have occurred in the Middle East, with more than 80% of cases to date reported by Saudi Arabia. All cases identified outside of the Middle East have reported recent travel to affected regions in the Middle East or were epidemiologically linked to persons with such travel history. As with the SARS epidemic in 2003, MERS-CoV shows a pattern of sporadic cases followed by secondary amplification in health care settings; however, there remains no evidence of sustained human-to-human spread in the community. As of November 6, the WHO has been informed of 909 laboratory-confirmed cases of MERS-CoV including at least 331 deaths (case fatality: 36%).

Given ongoing activity in affected regions and an incubation period of 14 days or more, clinicians are reminded to stay alert for possible importations among patients presenting with severe acute respiratory illness (SARI) and links to the Middle East.
Avian Influenza A(H7N9), Human Cases, China
On November 15, the WHO was informed of three additional laboratory-confirmed cases of human infection with avian influenza A(H7N9) in China, including two in Jiangsu Province and one fatal case in Xinjiang UAR. Since mid-July 2014, sporadic cases of H7N9 have been detected across a widespread geographic area in China (4 in Xinjiang UAR, 1 in Beijing, and 2 in Jiangsu), heightening concerns about seasonal re-emergence this winter. Ongoing close monitoring for a third epidemic wave is therefore warranted. As of November 18, a total of 458 laboratory-confirmed H7N9 cases have been reported to the WHO, including 177 deaths (case fatality: 39%). This total includes four cases reported from Taiwan CDC, ten cases reported from Hong Kong CHP, and one case reported from Malaysia MoH.

Avian Influenza A(H5N1), Human Cases, Egypt
This week, 3 cases, including one fatal, of human infection with avian influenza A(H5N1) were reported in Egypt. All 3 recent cases reported exposure to birds and are not considered epidemiologically linked. According to the latest WHO report as of October 2, a total of 19 cases and 8 deaths have been reported so far in 2014 from Cambodia (9), Egypt (4), China (2), Indonesia (2), and Viet Nam (2), historically among the most affected countries since the emergence of this virus in 2003. These latest official tallies do not include the 3 cases reported in Egypt this past week. It also does not include one additional case in Egypt reported and two fatal cases in Indonesia reported in October. Sporadic cases of H5N1 continue to be reported from certain countries in Africa (Egypt) and Asia, warranting ongoing monitoring of international activity.

Avian Influenza A(H5N8), Poultry Outbreaks, Europe
Since early November, health authorities in several European countries have reported outbreaks of a highly pathogenic avian influenza (HPAI) A(H5N8) in domestic poultry to the World Organization for Animal Health (OIE). Affected countries include Germany (turkeys), the Netherlands (layer and breeding hens), and the United Kingdom (domestic ducks). On November 20, Dutch authorities identified another H5 outbreak affecting a chicken farm within 25 km of their first HPAI H5N8 outbreak; the strain and pathogenicity are under investigation. Earlier this year, HPAI H5N8 was detected in wild birds, including a recent detection in a single tundra swan in Japan in November, and has caused several outbreaks in domestic poultry in China, Japan and South Korea. The European HPAI H5N8 viruses are considered genetically similar to each other and to strains detected earlier this year in Asia. The route of introduction into Europe remains unclear but transmission from migratory birds to domestic poultry flocks is suspected. HPAI refers to the viral pathogenicity in birds and does not reflect its ability to cause clinical disease in humans. To date, there have been no reported human cases of H5N8.

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.


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.

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/
USA Weekly Surveillance Reports: www.cdc.gov/flu/weekly/

European Influenza Surveillance
WHO – Weekly Epidemiological Record: www.who.int/wer/en/
WHO Collaborating Centre for Reference and Research on Influenza (Australia): www.influenzacentre.org/

Avian Influenza Web Sites
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
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.

<table>
<thead>
<tr>
<th>Reporting Information</th>
<th>Health unit/medical health officer notified? ☐ Yes ☐ No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person Reporting:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Title:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Contact Phone:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Email:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Health Authority:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>HSDA:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Full Facility Name:</td>
<td>____________________________________________________</td>
</tr>
<tr>
<td>Is this report:</td>
<td>☐ First Notification (complete section B below; Section D if available)</td>
</tr>
<tr>
<td></td>
<td>☐ Update (complete section C below; Section D if available)</td>
</tr>
<tr>
<td></td>
<td>☐ Outbreak Over (complete section C below; Section D if available)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of facility:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Date of onset of first case of ILI (dd/mm/yyyy): DD/MMM/YYYY</td>
</tr>
<tr>
<td>Numbers to date</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>With ILI</td>
</tr>
<tr>
<td>Hospitalized</td>
</tr>
<tr>
<td>Died</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Update AND Outbreak Declared Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of onset for most recent case of ILI (dd/mm/yyyy): DD/MMM/YYYY</td>
</tr>
<tr>
<td>If over, date outbreak declared over (dd/mm/yyyy): DD/MMM/YYYY</td>
</tr>
<tr>
<td>Numbers to date</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>With ILI</td>
</tr>
<tr>
<td>Hospitalized</td>
</tr>
<tr>
<td>Died</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laboratory Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen(s) submitted? ☐ Yes (location:__________) ☐ No ☐ Don’t know</td>
</tr>
<tr>
<td>If yes, organism identified? ☐ Yes (specify:__________) ☐ No ☐ Don’t know</td>
</tr>
</tbody>
</table>