PHO Media Briefing: Respiratory Viruses
December 16, 2014

Dr. David Mowat, Interim Chief Medical Officer of Health
Dr. Bryna Warshawsky, Public Health Physician
Dr. Jonathan Gubbay, Medical Microbiologist
Welcome

- **Format**
  - 3:30 – 4:00 Presentations
  - 4:00 – 4:30 Questions

- **Questions**
  - Please submit using webinar chat function

- The slides are posted on the PHO website newsroom at [www.publichealthonotario.ca/flubriefing](http://www.publichealthonotario.ca/flubriefing)

- An audio recording will be posted after the briefing.
Introduction and overview

Dr. David Mowat, Interim Chief Medical Officer of Health
Symptoms of influenza

- Widespread circulation every year sometime between November and April
- Can infect approximately 10% of the population
- Sudden onset of:
  - Fever
  - Cough
  - Runny nose
  - Muscle aches
  - Fatigue
  - Sore throat
- Diarrhea and vomiting symptoms not classic; can occur in children
- Generally lasts 2 – 7 days
Spread of influenza

• Spreads by:
  • Droplet route within 2 meters (6 feet) of infected person
  • Contact - virus may persist for hours on surfaces

• Time from exposure to symptoms (incubation period) is short:
  • 1 to 3 days

• Time when able to spread (period of communicability):
  • 24 hours before onset
  • 5 days from onset in adults, 7 days in children
Complications of Influenza

• Can result in complications such as:
  • Pneumonia
  • Worsening of chronic lung or heart disease or other underlying medical conditions

• In Canada, each year approximately
  • 12,200 hospitalizations
  • 3,500 deaths

Most at risk for complications

- People with chronic underlying medical conditions and morbid obesity
- Elderly
- Infants and young children
- Pregnant Women
Overview – historical trends, current season and prevention strategies

Dr. Bryna Warshawsky, Public Health Physician
Seasonal influenza

- Two types of seasonal influenza (A and B)
  - A has 2 predominant subtypes (H1N1 and H3N2)
  - B has 2 lineages (Yamagata and Victoria)
- Each subtype and lineage is then broken down into strains
- Seasonal influenza vaccine contains one strain from each influenza A subtype, and strains from one or both B lineages (depending on whether vaccine is trivalent or quadrivalent)

<table>
<thead>
<tr>
<th>Vaccine type</th>
<th>Influenza A strains</th>
<th>Influenza B strains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H1N1</td>
<td>H3N2</td>
</tr>
<tr>
<td>Trivalent</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Quadrivalent</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Confirmed cases
Ontario 2003 - 2014

*2013-2014 season only includes cases reported up to the end of Week 28 (July 12, 2014).
Note: Counts from 2009-2010 are underreported and should be interpreted with caution due to modified reporting during the pandemic.
Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/07/15].
PublicHealthOntario.ca
Institutional outbreaks
Ontario 2006 - 2014

*Note: 2013-2014 season only includes outbreaks reported up to the end of Week 28 (July 12, 2014). Outbreaks with a missing date of onset were excluded.

# Hospitalizations and deaths

## Ontario 2013 - 2014

<table>
<thead>
<tr>
<th>Age Group</th>
<th>HOSPITALIZATIONS</th>
<th>DEATHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Rate per 100,000</td>
</tr>
<tr>
<td>&lt;1</td>
<td>223</td>
<td>157.2</td>
</tr>
<tr>
<td>1 – 4</td>
<td>340</td>
<td>59.2</td>
</tr>
<tr>
<td>5 – 14</td>
<td>198</td>
<td>13.4</td>
</tr>
<tr>
<td>15 – 24</td>
<td>80</td>
<td>4.4</td>
</tr>
<tr>
<td>25 – 44</td>
<td>369</td>
<td>10.2</td>
</tr>
<tr>
<td>45 – 64</td>
<td>908</td>
<td>23.8</td>
</tr>
<tr>
<td>65+</td>
<td>1,616</td>
<td>78.5</td>
</tr>
<tr>
<td>Total</td>
<td>3,734</td>
<td>27.6</td>
</tr>
</tbody>
</table>

**Case data:** Ontario Ministry of Health and Long-Term Care (MOHLTC), integrated Public Health Information System (iPHIS) database, extracted by Public Health Ontario [2014/10/06].

**Population data:** Population Estimates, 2005-2013, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, extracted by Public Health Ontario [2014/07/03].
Current influenza season
Tests performed and % positive
Dec 8, 2013 - Dec 6, 2014

Current influenza season: Ontario Sep 1 - Dec 6 2014

- **342** laboratory confirmed cases
  - **93.9%** A (of those subtyped, 99% are A/H3N2)
  - **5.8%** B
  - **0.3%** A and B
- **37** outbreaks: 36 A and 1 B
- **120** hospitalizations
- **12** deaths

Source: Ontario Ministry of Health and Long-Term Care - integrated Public Health Information System (iPHIS)
Influenza vaccine
Influenza vaccine
2014 - 2015 season

Same strains as last season’s vaccine

• A/Texas/50/2012 (H3N2)-like virus
• A/California/7/2009 (H1N1)pdm09-like virus
• B/Massachusetts/2/2012-like virus (Yamagata)
Strain typing to Dec 6, 2014

US - 236 strains

A/H1N1

A/H3N2/ Texas

Reduced titre to A/H3N2/ Texas

197 H3N2
• 32.5% matched
• 67.5% reduced titre

Canada - 26 strains

A/H3N2/ Texas

Reduced titre to A/H3N2/ Texas

11 H3N2
• 18% matched
• 82% reduced titre
Vaccination is very important

- Vaccination provides
  - Protection against matched A/H3N2 (about 60% effective based on past seasons)
  - Partial protection against mismatched A/H3N2 (about 40% effective based on past seasons)
  - Protection against other strains (e.g. influenza B)
- If not already vaccinated, time to do so is now
Use of Antiviral Medications
Antiviral recommendations

• Oseltamivir or zanamivir
• Medication to prevent replication of the influenza virus
• Faster recovery; fewer complications
• Best if given within 48 hours of illness onset

http://www.pulsus.com/journals/JnlSupToc.jsp?CurrPg=journal&jnlKy=3&supKy=520&fromfold=Supplements&fold=Supplement
Antiviral recommendations

• People with severe influenza illness (hospitalized)
• People with influenza symptoms who are at risk for complications, including
  • Children under 5 years
  • Adults 65 years or older
  • Chronic medical conditions
  • Pregnant
  • Aboriginal peoples
  • Under 18 years of age receiving long-term aspirin therapy
  • Morbidly obese
Other prevention strategies
Protection against influenza

• Influenza vaccine
• Frequent hand hygiene
• Avoid touching your face
• Stay at least 2 meters (6 feet) from ill people
• Frequently clean commonly touched objects
• Cough into your sleeve and not your hands
• Stay home if you are ill
Laboratory testing and research – respiratory viruses

Dr. Jonathan Gubbay, Medical Microbiologist
PHO laboratory testing, surveillance and research

• Routine testing
• Molecular surveillance: early clues to vaccine mismatch
• Resistance testing/surveillance
• Gene sequencing and culture-based resistance testing
• Respiratory viral research
• Testing for emerging respiratory viruses
  • Enterovirus D-68
  • Avian influenza A (H7N9) and other avian influenzas (e.g. H5N1)
  • Influenza A variant (swine origin) viruses e.g. H3N2v
  • Middle Eastern Respiratory Syndrome Coronavirus (MERS Co-V)
# Respiratory virus testing

## Sep 2013 - Aug 2014

### Available at:


<table>
<thead>
<tr>
<th>Detected viruses</th>
<th>Number and percent positive specimens</th>
<th>Total number of specimens tested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current n (%)</td>
<td>Cumulative n (%)</td>
</tr>
<tr>
<td>Influenza A (all)</td>
<td>0 (0.0)</td>
<td>3,985 (9.9)</td>
</tr>
<tr>
<td>Influenza B</td>
<td>0 (0.0)</td>
<td>2,280 (5.7)</td>
</tr>
<tr>
<td>Parainfluenza virus</td>
<td>16 (4.6)</td>
<td>1,147 (3.1)</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>2 (0.6)</td>
<td>359 (1.0)</td>
</tr>
<tr>
<td>Respiratory syncytial virus</td>
<td>2 (0.6)</td>
<td>2,149 (5.7)</td>
</tr>
<tr>
<td>Entero/rhinovirus</td>
<td>17 (14.5)</td>
<td>898 (9.0)</td>
</tr>
<tr>
<td>Human metapneumovirus</td>
<td>0 (0.0)</td>
<td>753 (2.1)</td>
</tr>
<tr>
<td>Coronavirus</td>
<td>0 (0.0)</td>
<td>372 (5.4)</td>
</tr>
</tbody>
</table>

Source: PHO Laboratory-based Respiratory Pathogen Report
Multiplex molecular testing
Sep 2013 - Aug 2014

Enhanced knowledge of the impact of newer and less well studied respiratory viruses

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<td>-------------------</td>
</tr>
<tr>
<td>Influenza A (all)</td>
<td>84 (13.6)</td>
<td>234 (2.5)</td>
</tr>
<tr>
<td>Influenza B</td>
<td>1 (0.2)</td>
<td>15 (0.2)</td>
</tr>
<tr>
<td>Parainfluenza virus</td>
<td>14 (2.8)</td>
<td>264 (2.9)</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>6 (1.2)</td>
<td>137 (1.5)</td>
</tr>
<tr>
<td>Respiratory syncytial virus</td>
<td>45 (9.1)</td>
<td>337 (3.7)</td>
</tr>
<tr>
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<td><strong>5 (6.5)</strong></td>
<td><strong>492 (17.7)</strong></td>
</tr>
<tr>
<td>Human metapneumovirus</td>
<td>1 (0.2)</td>
<td>16 (0.2)</td>
</tr>
<tr>
<td>Coronavirus</td>
<td>1 (1.4)</td>
<td>16 (0.9)</td>
</tr>
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Current season to date
Sep 1 to Dec 6 2014
Strain typing by hemagglutination inhibition (HAI) assay

A fixed amount of virus and RBC is mixed with a serial dilution of antibody.

Strain typing is done at WHO accredited-laboratories - in Canada the National Microbiology Laboratory (NML), Winnipeg.
Phylogenetic comparison of influenza A(H3N2) HA gene circulating in Ontario, December 2014

Sequencing done at Public Health Ontario Laboratories
Flu prevention and preparedness

Dr. David Mowat, Interim Chief Medical Officer of Health
Prevention strategies

Three-pronged approach to fighting influenza:

1. Influenza Vaccine
2. Everyday preventative measures
3. Antiviral medication
   - Oseltamivir
   - Zanamivir
Get a flu shot
Find out where to get a free flu shot in Ontario – protect yourself, your family and your community from the virus.

Children 6 months to 5 years old must get their flu shot at a health care provider’s office or a local public health unit, not a pharmacy.

Where to get a flu shot

https://www.ontario.ca/health-and-wellness/get-flu-shot/
Data Reports

Surveillance Reports

Routine

Monthly Infectious Disease Surveillance Reports

Ontario Respiratory Virus Bulletins (as of November 2, 2012)

Features:

- A summary of seasonal respiratory virus activity in Ontario.

PHO Laboratories Respiratory Pathogen Surveillance Reports

http://www.publichealthontario.ca/en/DataAndAnalytics/Pages/DataReports.aspx
Summary

- There are indications of a vaccine mismatch (A/H3N2 component) which may reduce vaccine effectiveness.
- When the vaccine is well-matched, it can prevent 60% to 80% of influenza in healthy adults and children and about 50% in the elderly.
- A less than ideal match may result in reduced vaccine effectiveness, but the vaccine can still provide some protection against circulating viruses.
- We strongly recommend the vaccine for everyone 6 months and older. By getting immunized, you greatly decrease your chances of becoming ill with the flu. If you do get sick, symptoms will be milder.
• Please use the webinar chat function of the webinar
• Audio recording and slides will be posted at www.publichealthontario.ca/flubriefing
• Any issues? Email media@oahpp.ca