Influenza Activity Update

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Surveillance Systems Overview

- Virologic Surveillance
- Outpatient Illness Surveillance
- Hospitalization Surveillance
- Mortality Surveillance
- Summary of the Geographic Spread of Influenza

http://www.cdc.gov/flu/weekly
Virologic Surveillance

Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2014-15

- A (Subtyping not performed)
- 2009 H1N1
- A(H3)
- H3N2v
- B
- Percent Positive

Week

Number of Positive Specimens

Percent Positive

0

2014-15
Characterization & Antiviral Resistance
October 1, 2014 – May 2, 2015

- **Antigenic and Genetic Characterization**
  - 20% of characterized A(H3N2) viruses matched the H3N2 component of 2014-15 Northern Hemisphere vaccine (A/Texas/50/2012-like)
  - All characterized A(H1N1)pmd09 viruses matched the H1N1 component of the 2014-15 Northern Hemisphere vaccine (A/California/7/2009-like)
  - 97% of characterized influenza B Yamagata lineage viruses matched the influenza B component of the Northern Hemisphere trivalent and quadrivalent vaccines (B/Massachusetts/2/2012-like)
  - 96% of characterized influenza B Victoria lineage viruses matched the influenza B component of the Northern Hemisphere quadrivalent vaccine (B/Brisbane/60/2008-like)

- **Antiviral Resistance**
  - 1 (1.8%) of 55 A(H1N1)pdm09 resistant to oseltamivir and peramivir
  - All 3,084 A(H3N2) sensitive to oseltamivir, zanamivir, and peramivir
  - All 684 influenza B sensitive to oseltamivir, zanamivir, and peramivir
OUTPATIENT ILLNESS SURVEILLANCE

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2014-15 and Selected Previous Seasons
HOSPITALIZATION SURVEILLANCE

Laboratory-Confirmed Influenza Hospitalizations
Preliminary rates as of May 02, 2015

Select a Surveillance Area: FluView.NET
Group By: ☐ Flu Season ☐ Age Group

Click on button to view and compare multiple Age Groups. Up to 6 Age Groups can be selected at a time.

Age Group: Overall, Week 17
Rates per 100,000 by Age Group
- 2014-15: 64.8
- 2013-14: 35.1
- 2012-13: 43.8
- 2011-12: 8.7
- 2010-11: 21.7

2014-15: 64.8 per 100,000
2012-13: 43.9 per 100,000
MORTALITY SURVEILLANCE
Number of Influenza-Associated Pediatric Deaths by Week of Death and Flu Type: 2011-12 season to present

Influenza Activity Summary 2014-15

- The 2014–15 season has been moderately severe
  - Activity began about 4 weeks earlier than average
  - Activity peaked in late December/early January
  - Influenza A (H3N2) viruses predominated
  - Season characterized by a drifted H3N2 virus strain
  - Wave of influenza B late in season
- Adults 65+ years most adversely affected
  - The 2014-15 rate of influenza-associated hospitalizations among persons 65+ years of age is the highest reported since surveillance began in 2005-06
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Thank you

www.cdc.gov/flu

The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the Centers for Disease Control and Prevention
U.S. Influenza Virologic Surveillance

- Comprised of ~300 participating labs
  - WHO collaborating labs
    - Primarily state public health labs, DOD labs
  - NREVSS labs
    - Hospital/clinical labs
- Weekly reports
  - Number of specimens tested
  - Number positive for influenza by type
    - Subtype, age information provided when available
- Subset of influenza viruses are sent to CDC for further characterization
Outpatient Influenza-like Illness Surveillance Network (ILINet)

- ~1,800 providers reported for the 2014-15 season
  - Physicians/Facilities from all 50 states, DC, NYC, Chicago, U.S. Virgin Islands, and Puerto Rico are enrolled

- Weekly reports
  - Total # of patient visits
  - # visits for influenza-like illness (ILI) by age group
    - ILI = fever ≥ 100 °F (37.8 °C) and cough or sore throat, in absence of a known cause other than influenza
    - 0-4 years, 5-24 years, 25-49 years, 50-64 years, and ≥ 65 years.

- Respiratory specimens submitted to state lab for testing

ILI NET COVERAGE
Influenza Virus Characterization
October 1, 2014 – April 18, 2015

- **Influenza A**
  - A(H1N1)pmd09
    - All characterized viruses matched the H1N1 component of the 2013-14 Northern Hemisphere vaccine (A/California/7/2009-like)
  - A(H3N2)
    - 21% of characterized viruses matched the H3N2 component of 2013-14 Northern Hemisphere vaccine (A/Texas/50/2012-like)
    - 79% showed reduced titers, but the vast majority were antigenically similar to A/Switzerland/9715293/2013 the H3N2 component of the 2015 Southern Hemisphere (and the recommended components of the 2015-2016 Northern Hemisphere vaccine)

- **Influenza B**
  - Yamagata lineage
    - 97% of characterized viruses matched the influenza B component of the Northern Hemisphere trivalent and quadrivalent vaccines (B/Massachusetts/2/2012-like)
  - Victoria lineage
    - 96% of characterized viruses matched the influenza B component of the Northern Hemisphere quadrivalent vaccine (B/Brisbane/60/2008-like)

2015-16 Influenza Season
U.S. Influenza Vaccine Composition

- **H1N1**
  - A/California/7/2009 (H1N1)pdm09-like virus

- **H3N2**
  - A/Switzerland/9715293/2013 (H3N2)-like virus

- **Influenza B**
  - Yamagata (trivalent): B/Phuket/3073/2013-like (B/Yamagata lineage)
  - Victoria (quadrivalent): B/Brisbane/60/2008-like (B/Victoria lineage) virus

- This represents a change in the influenza A (H3) and influenza B (Yamagata lineage) components compared with the composition of the 2014-2015 influenza vaccine.

- Recommendations were based on several factors, including global influenza virologic and epidemiologic surveillance, genetic characterization, antigenic characterization, antiviral resistance, and the candidate vaccine viruses that are available for production.
Antiviral Resistance
October 1, 2014 – April 18, 2015

Neuraminidase Inhibitor Resistance Testing Results Samples Collected Since October 1, 2014

<table>
<thead>
<tr>
<th></th>
<th>Oseltamivir</th>
<th>Zanamivir</th>
<th>Peramivir</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virus Samples tested (n)</td>
<td>47</td>
<td>42</td>
<td>47</td>
</tr>
<tr>
<td>Resistant Viruses, Number (%)</td>
<td>1 (2.1)</td>
<td>0 (0.0)</td>
<td>1 (2.1)</td>
</tr>
<tr>
<td>Virus Samples tested (n)</td>
<td>2,810</td>
<td>2,810</td>
<td>1,556</td>
</tr>
<tr>
<td>Resistant Viruses, Number (%)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Virus Samples tested (n)</td>
<td>578</td>
<td>578</td>
<td>578</td>
</tr>
<tr>
<td>Resistant Viruses, Number (%)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

- High levels of resistance to the adamantanes (amantadine and rimantadine) persist among pH1N1 and influenza A (H3N2) viruses currently circulating globally.

Influenza Hospitalization Surveillance Network (FluSurv-NET)

- Population-based, laboratory-confirmed influenza related hospitalizations in children younger than 18 years (since 2003-04 season) and adults (since 2005-06 season)
- Network covers over 70 counties in the 10 Emerging Infections Program (EIP) states (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) and three additional states (MI, OH, and UT)
- Data gathered are used to estimate cumulative age-specific hospitalization rates on a weekly basis, and describe characteristics of persons hospitalized with severe influenza illness
SUMMARY OF THE GEOGRAPHIC SPREAD OF INFLUENZA
Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*
Week ending October 11, 2014 - Week 41

Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*
Week ending November 8, 2014 - Week 45

* This map indicates geographic spread & does not measure the severity of influenza activity
Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*

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Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*

* This map indicates geographic spread & does not measure the severity of influenza activity