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
VIROLOGIC SURVEILLANCE

Influenza Positive Tests Reported to CDC by U.S. Clinical Laboratories, National Summary, 2015-2016 Season
Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2015-2016 Season

Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, Age Groups by Type and Subtype, 2015-2016 Season
Virus Characterization Influenza A Viruses
October 1, 2015 – April 23, 2016

• Influenza A Virus [1,189]
  • All 744 characterized A (H1N1)pdm09 viruses matched the H1N1 component of the 2015-16 Northern Hemisphere vaccine
  • All 445 H3N2 viruses were genetically sequenced and belonged to genetic groups for which a majority of viruses antigenically characterized were similar to the H3N2 reference virus representing the 2015-2016 Northern Hemisphere vaccine component.
    o Of 193 H3N2 viruses also antigenically characterized, 185(95.9%) matched the H3N2 component of the 2015-16 Northern Hemisphere vaccine

Virus Characterization Influenza B Viruses
October 1, 2015 – April 23, 2016

• Influenza B Virus [588]
  • All 359 influenza B/Yamagata-lineage viruses matched the influenza B/Yamagata-lineage component of the 2015-2016 Northern Hemisphere trivalent and quadrivalent influenza vaccines.
  • Of the 229 influenza B/Victoria-lineage viruses, 97.4% matched the influenza B/Victoria-lineage component of the 2015-2016 Northern Hemisphere quadrivalent influenza vaccines.
# Antiviral Resistance

**October 1, 2015 – April 23, 2016**

## Antiviral Resistance

<table>
<thead>
<tr>
<th>Virus Type</th>
<th>Oseltamivir</th>
<th>Zanamivir</th>
<th>Peramivir</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Virus Samples tested (n)</td>
<td>Resistant Viruses, Number (%)</td>
<td>Virus Samples tested (n)</td>
</tr>
<tr>
<td>Influenza A (H1N1)pdm09</td>
<td>1,699</td>
<td>13 (0.8)</td>
<td>830</td>
</tr>
<tr>
<td>Influenza A (H3N2)</td>
<td>577</td>
<td>0 (0.0)</td>
<td>577</td>
</tr>
<tr>
<td>Influenza B</td>
<td>850</td>
<td>0 (0.0)</td>
<td>850</td>
</tr>
</tbody>
</table>

* Citations, references, and credits

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## 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, 2015-2016 and Selected Previous Seasons

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 43 ending Oct 31, 2015

ILI Activity Level
- High
- Moderate
- Low
- Minimal
- Insufficient Data
Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 4 ending Jan 30, 2016

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 10 ending Mar 12, 2016
Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2015-16 Influenza Season Week 16 ending Apr 23, 2016

HOSPITALIZATION SURVEILLANCE
Laboratory-Confirmed Influenza Hospitalizations
Cumulative rates by Season as of April 23, 2015

2015-16 Week 16:
63.8 per 100,000

2014-15 Week 16:
29.8 per 100,000

Laboratory-Confirmed Influenza Hospitalizations
Preliminary Cumulative rates by Age as of April 23, 2015

50-64 years:
43.1 per 100,000

0-4 years:
40.5 per 100,000

>65 years:
79.6 per 100,000
MORTALITY SURVEILLANCE

Pneumonia and Influenza Mortality from the National Center for Health Statistics Mortality Surveillance System
Data through the week ending April 9, 2016, as of April 28, 2016
Influenza Activity Summary 2015-16

- The 2015-16 season has been moderate
  - Activity peaked in early March
    - Increase in the percent of patient visits for ILI in late December may have been influenced in part by a reduction in healthcare visits during the holidays, as seen in previous seasons
    - Influenza A (H1N1) viruses predominated
    - According to the influenza-associated hospitalization rates, adults 65+ were the most adversely affected, followed by adults of 50-64 years and children of <5
EXTRA SLIDES

U.S. INFLUENZA VIROLOGIC SURVEILLANCE

- Comprised of WHO and NREVSS collaborating labs including both public health and clinical labs
  - WHO collaborating labs
    - Primarily state public health labs, DOD labs
  - NREVSS labs
    - Hospital/clinical labs
- Weekly reports – separated by clinical and public health labs
  - Number of specimens tested
  - Number of positive for influenza by type
    - Public Health labs provide subtype and age group distribution when available
- Subset of influenza viruses are sent to CDC for further characterization
OUTPATIENT INFLUENZA-LIKE ILLNESS SURVEILLANCE NETWORK (ILINET)

• ~2,000 providers reported for the 2015-16 season
  – Includes physicians/Facilities from all 50 states, DC, NYC, Chicago, U.S. Virgin Islands, and Puerto Rico

• Weekly Reports
  – Total number of patient visits
  – Number of visits for influenza-like illness (ILI) by age group
    • ILI = fever ≥ 100°F (37.8°C) and cough and/or sore throat, in absence of a known cause other than influenza
    • Age groups include 0-4 years, 5-24 years, 25-49 years, 50-64 years, and ≥ 65 years

• Respiratory specimens are submitted to state lab for testing

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
VACCINATION STATUS AMONG INFLUENZA ASSOCIATED PEDIATRIC DEATHS

- A total of 60 influenza-related pediatric deaths were reported to CDC during the 2015-16 season thus far
  - Of these 60 deaths, 54 had known vaccination history
    - Three were ineligible due to age
    - Six were fully vaccinated*
    - 45 were unvaccinated

* Fully Vaccinated: received one or two doses (depending on age and prior vaccination history) of influenza vaccine in the current season at least two weeks prior to illness onset
2016-17 influenza Season
U.S. Influenza Vaccine Composition

- **H1N1**
  - A/California/7/2009 (H1N1)pdm09-like virus
- **H3N2**
  - A/Hong Kong/4801/2014 (H3N2)-like virus
- **Influenza B**
  - Victoria (trivalent and quadrivalent): B/Brisbane/60/2008-like (B/Victoria lineage) virus
  - Yamagata (quadrivalent): B/Phuket/3073/2013-like (B/Yamagata lineage) virus
- **This represents a change in the influenza A (H3) component and a change in the B lineage included in the trivalent vaccine compared with the 2015-16 influenza vaccine**

Vaccination Effectiveness

- **In late February, CDC reported flu vaccine effectiveness of nearly 60% this season**
- **There were sufficient data to calculate some specific VE estimates:**
  - 51% VE against the H1N1 viruses responsible for most flu illness this season
  - 76% VE against all influenza B viruses
  - 79% VE against the B/Yamagata lineage of B viruses
SUMMARY OF GEOGRAPHIC SPREAD OF INFLUENZA

Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists*
Week ending October 10, 2015 - Week 40

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

Week ending April 23, 2016 - Week 16

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