Public Health Impact of Influenza

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Outline

- General information about influenza (flu)
- Overview of flu surveillance and flu activity levels
- 2014-15 flu season summary
- Ohio Department of Health Laboratory testing
- 2015-16 influenza vaccine
- Influenza vaccination recommendations
- H5Nx avian influenza
Influenza

- Contagious respiratory illness caused by flu viruses
- Mild to severe illness with symptoms including fever, cough, sore throat, myalgia, headache, fatigue
- Transmission:
  - Through infectious droplets
  - From 1 day before symptoms develop and up to 5-7 days after the onset of symptoms
Influenza (cont.)

- Complications: pneumonia, ear infections, sinus infections, dehydration, worsening of chronic medical conditions
- The best way to prevent the flu is by getting a flu vaccination each year.
- “Universal” flu vaccination recommendation
Overview of Public Health Flu Surveillance

• Determine when, where, and which influenza viruses are circulating
• Determine the intensity and impact of influenza activity
• Detect the emergence of novel influenza viruses *(flu viruses that do not commonly circulate)* and unusual or severe influenza outbreaks
• Aid in guidance for treatment recommendations and vaccine selection
CDC/CSTE Influenza Activity Levels

- Flu activity level decided weekly based on analysis of influenza data sources
  - No Activity
  - Sporadic Activity
  - Local Activity
  - Regional Activity
  - Widespread Activity

**Note:** Influenza activity level indicates **geographic spread** of influenza across the state and not severity of disease.
FluView
A Weekly Influenza Surveillance Report Prepared by the Influenza Division
Weekly Influenza Activity Estimates Reported by State and Territorial Epidemiologists*

Week Ending May 23, 2015 - Week 20

*This map indicates geographic spread and does not measure the severity of influenza activity.
The Flu Surveillance Pyramid

- Emergency department visits (EpiCenter)
- Sentinel Providers (ILINet)
- ODH Lab / NREVSS
- AthenaHealth (medical claims data)

Hospitalizations
- OTC drug and thermometer sales (National Retail Data Monitor)
- Google Flu Trends

Symptomatic—medical attention
- 122 Cities Mortality Reporting System (Vital Statistics)
- Influenza Pediatric Mortality (ODRS)
- NCHS – Adult Flu Deaths, coming soon???

Symptomatic—no medical attention
- Influenza-associated hospitalizations (ODRS)

Asymptomatic

Note: pyramid represents all exposed persons at a moment in time
U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)

- 2014-2015 season: >2,900 providers nationwide
- Ohio has 72 providers – 1 per 160,000 population
- Collect outpatient influenza-like illness (ILI) data
- **ILI**: fever $>100^\circ F$ **AND** cough **and/or** sore throat (in absence of a known cause) – report weekly through ILINet webpage
U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)

Ohio ILINet Providers –

Report weekly percent ILI into CDC web portal
  • Percent ILI=Number of outpatient visits with ILI/#Total outpatient visits
  • Percent ILI is considered when assigning Ohio’s weekly Influenza Activity level

Submit weekly viral surveillance specimens to ODH Laboratory
  • Specimens are subtyped to determine which strains are circulating
  • Aids CDC in vaccine strain selection
  • Free materials and shipping for ILINet Providers
2014-2015 Influenza Season Overview
We had a rough season...

Ohio Confirmed Influenza-associated Hospitalizations by MMWR Week, Influenza Seasons 2010-Present (2014-15 n=9419);

Source: Ohio Disease Reporting System
Medical Claims Data

Outpatient Claims Attributable to Influenza-like Illness, AthenaHealth Providers, Ohio, Influenza Seasons 2011 - Present

Source: AthenaHealth
Influenza-associated Hospitalizations, Influenza Related Internet Search Queries (Google Flu Trends), AthenaHealth ILI Diagnoses, ILINet Percent
ILI, Ohio, 2014-2015 Influenza Season

MMWR Week

Percent

Flu Hospitalization
ILI Net
AthenaHealth
Google
Syndromic Influenza Surveillance

Ohio Thermometer Sales by MMWR Week with 5 Year Baseline Average; 2014-2015 Influenza Season

Source: National Retail Data Monitor
Emergency Department Syndromic Surveillance

Ohio Fever/ILI Specified and Constitutional Emergency Department visits with 5 Year Baseline Average, Ohio, 2014-2015 Influenza Season

EpiCenter

- Emergency Department Visits
  - Constitutional (“not feeling well”)
  - Fever/ILI Specified

- Chief complaint data
  - Analyzed on regional level for >1 standard deviations above mean
  - ARIMA analysis

Source: EpiCenter
122 Cities Mortality Reporting System

• Vital Statistics offices in 122 cities throughout the U.S. report number of death certificates received
  – Also report number with pneumonia and/or influenza (P&I) listed as underlying or contributing cause of death
• The number of P&I deaths compared to a seasonal baseline and epidemic threshold value is calculated nationally each week by CDC.
• *National Center for Health Statistics (NCHS) – Electronic Death Reporting System (EDRS) mortality data coming soon – less reporting lag*
122 Cities Mortality Reporting System – P&I related deaths 2010-2014

Pneumonia and Influenza Mortality for 122 U.S. Cities
Week Ending July 18, 2015

Source: FluView (CDC)
Ohio Influenza-associated Pediatric Mortality by Influenza Season, Ohio, 2008-2015

- 2010-2011: 1 death
- 2011-2012: 8 deaths
- 2012-2013: 6 deaths
- 2013-2014: 0 deaths
- 2014-2015: 6 deaths

Legend:
- Flu A Unspecified
- Flu A pdH1N1
- Flu A H3
- Flu B
Ohio Department of Health Laboratory Viral Surveillance by Influenza Subtype and Submitter Type, Ohio, 2014-2015 Influenza Season (n=1,124)

- IHSP Submitter
- ILINet Provider
- NREVSS Submitter
- Other Submitter

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<tr>
<th>Submitter Type</th>
<th>Number of Tests</th>
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<tbody>
<tr>
<td>H1N1v</td>
<td>1</td>
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<tr>
<td>2009pdmH1N1</td>
<td>2</td>
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<tr>
<td>FluB</td>
<td>61</td>
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<tr>
<td>Neg</td>
<td>130</td>
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<tr>
<td>H3N2</td>
<td>919</td>
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Viral Surveillance Testing at ODH Lab

- ILINet Providers – Submit specimens from outpatients with ILI
- Influenza Hospitalization Surveillance Program (IHSP) – Specimens from hospitalized flu patients from central Ohio project catchment area
- National Respiratory and Enteric Virus Surveillance System (NREVSS) – Specimens from hospital labs throughout Ohio *started 2014-2015 season*
- Outbreak confirmation – Confirm Flu for outbreaks in nursing homes, assisted living facilities, etc. *started 2014-2015 season*
- Summer novel flu A surveillance – ODH requested that all positive flu A specimen be sent to ODH for subtyping June-September 2015. *started 2014-2015 season*
2015-2016 Influenza Vaccine

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
  - Drifted strain which circulated in 2014-2015
- B/Phuket/3073/2013-like virus.
  - B/Yamagata lineage virus
- B/Brisbane/60/2008-like virus
  - Quadrivalent vaccine only
2015-2016 ACIP Recommendations

- All persons aged ≥6 months without contraindications should receive influenza vaccine annually.
- Either LAIV or IIV is appropriate for healthy children aged 2 years through 8 years.
Healthcare Worker (HCW) Flu Vaccination

• 2013-2014 flu season: 75.2% overall
• Coverage was highest in settings with flu vaccination requirements: 98.8%
• Coverage is highest in physicians (92.2%) and lowest in assistants/aides (57.7%)
• Coverage is highest among healthcare providers working in hospitals (89.6%), a 6.5% increase from the 2013-2013 season, and lowest
Unsubtypable Influenza Specimens
• Sent to ODH Laboratory for rule out of novel Flu
• If still unable to subtype – sent to CDC for further analysis.

Testing for patients with medically attended influenza-like illness and...
• Recent exposure to swine or sick/dead birds
• Travel to H5Nx or H7N9 endemic nations
Highly Pathogenic Avian Influenza (HPAI) in the United States

- December 2014 – H5Nx (H5N8, H5N2, H5N1) detected in 21 U.S. States (through July 2015).
  - Backyard and commercial poultry flocks
  - Captive wild birds
  - Wild birds (6 of 21 states have ONLY detected H5Nx in wild birds)
- December 2014-June 2015 ~50 Million commercial birds depopulated
- **H5Nx NOT YET DETECTED IN OHIO**
QUESTIONS?