Influenza Surveillance Systems in Texas 101

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Objectives

- The participant will be able to list the three main components of influenza surveillance.
- The participant will be able to differentiate between national, state and local levels of influenza surveillance.
Continuing Education Disclosures

Requirements for Successful Completion:

- Complete registration form.
- Sign in.
- Attend entire educational activity.
- Complete evaluation.
Continuing Education Disclosures

- Commercial Support
  - This educational activity received no commercial support.

- Disclosure of Conflict of Interest
  - The speakers and planning committee members have disclosed no conflict of interest.

- Non-Endorsement Statement
  - Accredited status does not imply endorsement by the Department of State Health Services, Continuing Education Services, Texas Medical Association, or American Nurses Credentialing Center of any commercial products displayed in conjunction with an activity.

- Off Label Use
  - If applicable, speakers will clearly delineate any off label use of FDA drugs or devices.
Outline

- Overview of Influenza Surveillance
- Levels of Influenza Surveillance
- Components of Influenza Surveillance
- Supporting Influenza Surveillance
Key Terms

- **Influenza Like Illness (ILI)**
  - Fever $\geq 100^\circ$F, plus:
    - Cough and/or
    - Sore throat
  - In the absence of another known cause

- **Influenza A**
  - May include both seasonal and novel strains

- **Influenza B**

- **Pandemic H1N1**
  - Also referred to as Swine flu, Pandemic flu and 2009 H1N1
The Influenza Surveillance System is a multi-component surveillance network with local, regional, state and national activities.

- Data collection is based on a reporting week that starts on Sunday and ends on Saturday of each week.
  - Designated as Week 32 or week ending 9/05
  - aka CDC MMWR week

- Reporting is voluntary except where noted
Goals of Influenza Surveillance

- Find out when and where influenza activity is occurring,
- Determine what type of influenza viruses are circulating,
- Detect changes in the influenza viruses,
- Track influenza-related illness and
- Measure the impact influenza is having on deaths in the United States.
Levels of Influenza Surveillance

- National
- State
- Regional
- Local
Influenza Surveillance Components

Influenza Surveillance

Mortality
- Pediatric influenza Associated
- 122 Cities

Morbidity
- Flu
  - Novel Influenza
  - Emerging Infections Program
  - New Vaccine Surveillance Network
- ILI
  - ILINet
  - ILI Activity
- Other
  - Schools
  - Outbreaks
  - Syndromic

Viral
- NREVSS / WHO
- Laboratory

Level
- National
- State
- Local
Mortality

Pediatric Influenza Associated

122 Cities
Influenza Pediatric Mortality

- **Activity:** Pediatric Influenza Associated Mortality
- **Level:** National (2004); state, regional and local (2007)
- **Who:** As required by law in Texas
- **What:** Individual reports on influenza associated deaths in anyone <18 years old
- **How:** Individual report form faxed to health department within 1 work day

Year Round Reporting
## Influenza-Associated Pediatric Deaths Case Report Form

**STATE USE ONLY -- DO NOT SEND INFORMATION IN THIS SECTION TO CDC**

<table>
<thead>
<tr>
<th>Last Name:</th>
<th>First Name:</th>
<th>County:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address:</th>
<th>City:</th>
<th>State, Zip:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Patient Demographics

1. State:  
2. County:  
3. State ID:  
4. CDC ID:  

5. Age:  
   - 0 Days
   - 0 Months
   - 0 Years

6. Date of birth: MM/DD/YYYY  
7. Sex:  
   - Male
   - Female
   - Unknown

8. Ethnicity:  
   - Hispanic or Latino
   - Not Hispanic or Latino
   - Unknown

9. Race:  
   - □ White
   - □ Black
   - □ Asian
   - □ Native Hawaiian or Other Pacific Islander
   - □ American Indian or Alaska Native
   - Unknown

### Death Information

10. Date of illness onset: MM/DD/YYYY  
11. Date of death: MM/DD/YYYY  
12. Was an autopsy performed?  
   - O Yes  
   - O No  
   - O Unknown

13. a. Did cardiac/respiratory arrest occur outside the hospital?  
   - O Yes  
   - O No  
   - O Unknown

13. b. Location of death:  
   - O Outside the Hospital (e.g., home or in transit to hospital)
   - O Emergency Dept (ED)
   - O Inpatient ward
   - O ICU
   - O Other (specify):  

13. c. If the death occurred in the hospital, what was the date of admission? MM/DD/YYYY  

### CDC Laboratory Specimen

14. a. Were pathology specimens sent to CDC's Infectious Diseases Pathology Branch?  
   - O Yes  
   - O No  
   - O Unknown

   Please provide the lab ID No. if known.

14. b. Were influenza isolates or confirmatory clinical material sent to CDC's Influenza Division?  
   - O Yes  
   - O No  
   - O Unknown

   Please provide the lab ID No. if known.

14. c. Were Staph aureus isolates sent to CDC's Division of Healthcare Quality Promotion?  
   - O Yes  
   - O No  
   - O Unknown

   Please provide the lab ID No. if known.
### Pediatric Flu Data

<table>
<thead>
<tr>
<th>Season</th>
<th>Year</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>06_07</td>
<td>2006</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>12</td>
</tr>
<tr>
<td>07_08</td>
<td>2007</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td>10</td>
</tr>
<tr>
<td>08_09</td>
<td>2008</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>27</td>
</tr>
<tr>
<td>09_10</td>
<td>2009</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>6</td>
</tr>
</tbody>
</table>

#### Age Group: 2007-2010

- **<1**: 23%
- **1-4**: 45%
- **5-9**: 16%
- **10-17**: 16%
122 Cities

- **Activity**: 122 Cities Mortality Reporting System
- **Level**: National
- **Who**: Vital Statistics offices in 122 US cities (7 cities in Texas)
- **What**: total number of death certificates received by age group and the number citing influenza and/or pneumonia
- **How**: Weekly to CDC

Year Round Reporting
Other Potential Mechanisms

- Vital Statistics reports directly to health departments / state
- Reports of all influenza associated deaths
- Reports of select influenza associated deaths (pregnancy / post partum)
Morbidity - Influenza

- Morbidity
- Flu
- Novel Influenza
- Emerging Infections Program
- New Vaccine Surveillance Network
Novel Influenza

- **Activity**: Exotic disease reporting
- **Level**: State, regional and local
- **Who**: As required by law in Texas; typically laboratories
- **What**: Individual reports of any outbreak, exotic disease, or unusual group expression (Includes novel strains of influenza)
- **How**: Call to local health department

Year Round Reporting

Special Reporting
Pandemic H1N1

- **Activity**: Enhanced influenza surveillance
- **Level**: State, regional and local
- **Who**: Hospitals and/or healthcare providers
- **What**:
  - Aggregate Reporting of Confirmed Cases
  - Hospitalized by age group and county
  - Individual Reports of Confirmed Cases
    - ICU
    - Deaths
- **How**: Faxed or emailed weekly to health department
EIP

- **Activity**: Emerging Infections Program
- **Level**: National
- **Who**: Select hospitals in 12 metropolitan areas in 10 states; no participating sites in Texas
- **What**: Lab confirmed influenza in hospitalized people <18 years old
- **How**: Directly to CDC
Activity: New Vaccine Surveillance Network

Level: National

Who: Hospitals in 1 county each in 3 states (OH, TN, NY)

What: Lab confirmed influenza hospitalization rates for kids <5

How: Directly to CDC
Morbidity - ILI

ILI

ILI Net
ILI Activity
BRFSS
ILINet

- **Activity**: US Outpatient Influenza-Like Illness Surveillance Network (formerly Sentinel Provider Surveillance Network)

- **Level**: National with a state level coordinator

- **Who**: ~ 2,500 providers were enrolled in this network during the 2007-08 influenza season nationwide; 130 were in Texas

- **What**: Aggregate count all patients seen and of ILI patients by age group

- **How**: Reported weekly through the CDC website
ILINet

Percentage of Visits for Influenza-like Illness reported by the US Outpatient Influenza-like Illness Surveillance Network (ILINet) in the Texas State (9/18/2009 11:11:36 AM)

<table>
<thead>
<tr>
<th>Week</th>
<th># of Reporters</th>
<th>0-4</th>
<th>5-24</th>
<th>25-64</th>
<th>&gt;64</th>
<th>Total ILI Patients</th>
<th>Total ILI %</th>
</tr>
</thead>
<tbody>
<tr>
<td>200930</td>
<td>54</td>
<td>25</td>
<td>41</td>
<td>23</td>
<td>11</td>
<td>100</td>
<td>9861</td>
</tr>
<tr>
<td>200931</td>
<td>57</td>
<td>55</td>
<td>91</td>
<td>83</td>
<td>9</td>
<td>238</td>
<td>17480</td>
</tr>
<tr>
<td>200932</td>
<td>53</td>
<td>54</td>
<td>108</td>
<td>76</td>
<td>9</td>
<td>247</td>
<td>17183</td>
</tr>
<tr>
<td>200933</td>
<td>50</td>
<td>46</td>
<td>107</td>
<td>124</td>
<td>13</td>
<td>290</td>
<td>18628</td>
</tr>
</tbody>
</table>
ILI Activity

- **Activity**: Health Department Seasonal Influenza Surveillance
- **Level**: Regional and local
- **Who**: private providers, clinics, hospitals and others
- **What**: Aggregate count of ILI and Flu (rapid tests: Flu A, Flu B and Undifferentiated Flu) by county
- **How**: Faxed or emailed weekly to health department
FACSIMILE TRANSMITTAL SHEET

To: Sandi Henley RN, CIC
FAX NUMBER: 254-899-0405

COMPANY: Texas Department of State Health Services
TOTAL NO. OF PAGES INCLUDING COVER: 1

PHONE NUMBER: 254-778-6744
INFLUENZA REPORTING

2009-2010
SCHOOL WEEKLY FLU REPORT

WEEK ENDING:

Flu activity is defined as:
• Lab confirmed case: Flu case confirmed by rapid test, culture, antigen detection, or PCR (Flu A, Flu B, Not Differentiated Flu). and/or,
• Influenza-like illness activity (ILI): ILI is defined as fever (temperature ≥ 100°F [37.8°C]) and cough and/or sore throat in the absence of another diagnosis.

Please complete the table listing the number of flu absences seen in your school/s.

<table>
<thead>
<tr>
<th>County (Residence of Students)</th>
<th>Absences due to ILI</th>
<th>Absences due to parental report of influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

If you have had a school closure please complete table below:

<table>
<thead>
<tr>
<th>School Closures</th>
<th>Date Closed</th>
<th># Absences due to ILI necessitating closure</th>
<th>Total number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tbody>
</table>

Please email report to hsr7.epi@dshs.state.tx.us by 3 p.m. on Mondays. If Monday is a holiday, send ASAP. The report may also be faxed to 254-899-0405 to Sandi’s attention. You may call 254-778-6744 with questions or comments. If sending additional information for a previously submitted report, please highlight the changes being made. Thank you!
ILI Surveillance
Surveillance of Influenza Activity
Texas Department of State Health Service Region 7

Notes:
Week #31 - change in reporting by a large clinic
Week #35 - School Reporting began
BRFSS

- **Activity**: Behavioral Risk Factor Surveillance System
- **Level**: National
- **Who**: General public
- **What**: Recent ILI
- **How**: ILI assessment questions added to the BRFSS survey. Survey conducted through random digit dialing.

Special Reporting
School Surveillance

- **Activity**: Varies
- **Level**: Regional and local
- **Who**: School nurses and/or attendance clerks
- **What**: Number of students sent home with ILI and/or who called in sick with ILI or in general
- **How**: Faxed or emailed weekly to health department; some electronic systems are available
Outbreaks

- **Activity**: Outbreak reporting
- **Level**: Local, regional, state
- **Who**: As required by law
- **What**: Report of suspected outbreak or cluster of illness
- **How**: Call to health department; Surveillance data analysis

Year Round Reporting
Syndromic Surveillance

- **Activity**: Syndromic programs: ESSENCE, RODS, BioSense etc
- **Level**: Regional and local
- **Who**: Hospitals with emergency rooms
- **What**: Emergency room visits categorized by syndrome, age, zip code, date (de-identified)
- **How**: Electronic data automatically sent from hospital to syndromic servers. Frequency of reports may occur hourly, daily or weekly.

Year Round Reporting
Time Series

Asthma Sub-Syndrome, Emergency, Chief Complaint Data.

Hospital Data, All Facilities, from 09/04/2007 to 10/30/2007.
Analysis: W2, 100 Days Recurrence Interval Threshold.
Number of Visits = 432

* Rate per 1000 visits

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Count</th>
<th>Rate per 1000 Visits</th>
<th>All Visits</th>
<th>Links</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/30</td>
<td>Tues</td>
<td>1</td>
<td>10.2</td>
<td>98</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/29</td>
<td>Mon</td>
<td>6</td>
<td>9.3</td>
<td>609</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/28</td>
<td>Sun</td>
<td>9</td>
<td>16.9</td>
<td>533</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/27</td>
<td>Sat</td>
<td>6</td>
<td>11.1</td>
<td>540</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/26</td>
<td>Fri</td>
<td>13</td>
<td>23.5</td>
<td>553</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/25</td>
<td>Thur</td>
<td>14</td>
<td>20.1</td>
<td>655</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/24</td>
<td>Wed</td>
<td>22</td>
<td>30.3</td>
<td>726</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/23</td>
<td>Tues</td>
<td>25</td>
<td>40.0</td>
<td>625</td>
<td>map</td>
<td>/ patient list</td>
</tr>
<tr>
<td>10/22</td>
<td>Mon</td>
<td>20</td>
<td>28.3</td>
<td>700</td>
<td>map</td>
<td>/ patient list</td>
</tr>
</tbody>
</table>

* Rate per 1000 visits

Statistically Significant Result
Data Change
Holiday
Monday
Other Possible Morbidity Mechanisms

- Absenteeism / ILI surveillance with large businesses
- Absenteeism / ILI surveillance with first responders
- Pharmacy based surveillance
- Nurse call center surveillance
- Poison Control cough/cold medication overdose calls
Viral Surveillance

Viral

NREVSS / WHO

Laboratory
Activity: National Respiratory and Enteric Virus Surveillance System and WHO Collaborating Labs

Level: National coordination

Who: Volunteer public health and hospital laboratories

What: Total number of respiratory specimens tested and number of positives

How: Reported weekly to CDC

Note: Tracks multiple respiratory pathogens. Not all labs report all pathogens.

Year Round Reporting
Laboratory Surveillance

- **Activity**: Influenza Laboratory Surveillance (Culture)
- **Level**: State, regional, and local coordination
- **Who**: Selected providers
  - Identified by health departments
  - May include ILINet providers
- **What**: Specimens from patients suspected of having influenza
- **How**: Specimens sent to the DSHS lab or LRNs
- **Note**: Subset of submitted specimens sent every two weeks to CDC for further testing

Year Round Reporting
Supporting Surveillance
DSHS Laboratory Testing

- Not for clinical testing – Send to a commercial lab
- To support public health surveillance and response
- Testing criteria (as of 02/08/10)
  - As designated by public health (culture surveillance; investigations)
  - ILI patients who died with no other known cause of death (must be collected ante mortem)
  - Hospitalized with ILI for at least 48 hours plus one or more of the following:
    - Severe illness such as lower respiratory tract infections or pneumonia
    - Unusual presentation in children, adults >64 or immunocompromised individuals
Reporting

- New email for DSHS flu team
  - flutexas@dshs.state.tx.us

- Flu reports
  - DSHS flu reports and information: www.TexasFlu.org
  - CDC FluView: www.cdc.gov/flu/weekly/