Outline

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

- **Influenza Like Illness (ILI)**
  - Fever ≥100°F, plus:
    - Cough and/or
    - Sore throat
  - In the absence of another known cause

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

- **Influenza B**

- **2009 H1N1**
  - Also referred to as swine flu, pandemic flu and pandemic H1N1
Influenza Surveillance

- 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

- **Mortality**
  - National
  - State
  - Local
- **Flu**
  - National
  - State
  - Local
- **ILI**
  - National
  - State
  - Local
  - ILI Activity
  - BRFSS
  - IISP
- **Other**
  - NREVSS / WHO
- **Viral**
  - National
  - State
  - Local
  - Laboratory
  - Ad Hoc

**Influenza Surveillance**

- **Mortality**
- **Flu**
- **ILI**
- **Other**
- **Viral**

**Levels**

- National
- State
- Local

**Components**

- FluSurv Net
- ILINet
- Outbreaks
- Absenteeism
- Syndromic
- Ad Hoc

**Variation**

Ad Hoc varies by situation.

122 Cities

Influenza-Associated Pediatric

Novel Influenza

Syndromic
Influenza Pediatric Mortality

- **Activity**: Influenza-Associated Pediatric 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

Handbook section IVf
Influenza-Associated Pediatric Mortality

Pediatric Flu Data

- Expect 10 – 12 deaths a year
- Vaccine status:
  - 53% unvaccinated
  - 25% unknown
  - 11 % not eligible
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

FluSurv Net
Novel (Variant) 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

Handbook section IVg
2009 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

Discontinued at the end of May 2010
ILINet

- **Activity:** US Outpatient Influenza-Like Illness 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

Year Round Reporting
**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>Age 0-4</th>
<th>Age 5-24</th>
<th>Age 25-64</th>
<th>Age &gt;64</th>
<th>Total ILI</th>
<th>Total 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>
<td>1.01</td>
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<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>
<td>1.36</td>
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<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>
<td>1.44</td>
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<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>
<td>1.56</td>
</tr>
</tbody>
</table>

**Percentage of Visits Due to Influenza-Like Illness**

Reported by Texas Participants in ILINet, 2006-2010 Seasons
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
**Sample ILI Surveillance Forms**

**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

**Due each Monday by 3 PM!**

**SAMPLE ILI SURVEILLANCE FORMS**

<table>
<thead>
<tr>
<th>County (Residence of patient)</th>
<th># of patients seen w/ positive Flu A test</th>
<th># of patients seen w/ positive Flu B test</th>
<th># of patients seen w/ positive Flu test that is ND*</th>
<th># of patients seen with ILI (not tested)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Definitions:**
- 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 over 100°F and cough and/or sore throat in the absence of another diagnosis.

Please complete the table listing the number of flu and ILI cases seen in your facility.

Please email report to HSR7.Epi@dshs.state.tx.us. The report may also be faxed to 254-899-0405.

You may call 254-778-6744 with questions or comments. 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

[Bar chart showing influenza activity over weeks 20 to 35]
**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.
IISP

- **Activity**: Influenza Incidence Surveillance Project
- **Level**: National with a state level coordinator
- **Who**: 12 awardees in the US including Texas; 5-6 providers in Texas
- **What**: Aggregate count by age group of all patients seen and of patients with ILI; specimens submitted on first 10 patients seen each week
- **How**: Reported weekly via fax or email to DSHS

Year Round Reporting
Morbidity - Other

Morbidity

Other

Schools

Outbreaks

Syndromic
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
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
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.
Texas NREVSS Data 2008-2009 Season

Number of Positive Flu Tests

Percentage of Tests Positive for Flu

- October
- November
- December
- January
- February
- March
- April
- May
- June
- July
- August
- September

Pct positive

MMWR Reporting Week

- Pandemic A(H1N1)
- A(H1N1) seasonal
- A(H3N2)
- A (Unknown)
- B

Texas NREVSS Data 2008-2009 Season
Laboratory Surveillance

- **Activity**: Influenza Laboratory Surveillance (PCR)
- **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

Handbook sections IVd and VI
Reporting

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

- Flu reports
  - DSHS flu reports and information:
    - www.TexasFlu.org
    - http://www.dshs.state.tx.us/idcu/disease/influenza/
  - CDC FluView: www.cdc.gov/flu/weekly/