Influenza Surveillance Systems in Texas 101

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Texas Department of State Health Services
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

- Local
- Regional
- State
- National
Influenza Surveillance Components

**Influenza Surveillance**

**Mortality**
- **NSL** Influenza-AssOCIated Pediatric
- **N** 122 Cities

**Morbidity**
- **Flu**
  - **NSL** Novel Influenza
  - **N** Emerging Infections Program
- **ILI**
  - **NSL** ILINet
  - **NSL** ILI Activity
- **Other**
  - **S** Outbreaks
  - **L** Absenteeism
  - **L** Syndromic

**Viral**
- **NSL** NREVSS / WHO
- **NSL** Laboratory

**Ad Hoc**
- Varies by situation

**Level**
- **N** National
- **S** State
- **L** Local
Mortality

- Influenza Associated Pediatric
- 122 Cities
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
Influenza-Associated Pediatric Mortality

## 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>
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<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: 45%
- 1-4: 16%
- 5-9: 16%
- 10-17: 23%
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
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

Discontinued at the end of May 2010
**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
NVSN

- **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

- Morbidity
- ILI
- ILINet
- ILI Activity
- BRFSS
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 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>
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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>
</tr>
</tbody>
</table>

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

Reported by Texas Participants in ILINet, 2006-2010 Seasons

![Percentage of visits due to ILI](chart.png)
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

**2009-2010**  
**CLINIC WEEKLY ILI/FLU REPORT**  
**SUBMIT BY 3:00 EACH MONDAY FOR THE WEEK PRIOR (SUNDAY – SATURDAY)**

ENTER TOTAL NUMBER OF PATIENTS SEEN FOR THE WEEK

<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>
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</table>

*ND = Not Differentiated Flu

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 of ≥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 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!

**SCHOOL WEEKLY FLU REPORT**

**2009-2010**  
**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 of ≥100°F (37.8°C) and a cough and/or sore throat in the absence of another known diagnosis.

Please complete the table listing the number of flu absences seen in your schools. Only count a student’s absence one time (i.e. if you put in the section “Absences due to parental report of influenza” don’t put in “absences due to ILI”)

<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>
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</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>
<th>Date Re-Opened</th>
</tr>
</thead>
<tbody>
<tr>
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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
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.
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

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 / patient list</td>
<td></td>
</tr>
<tr>
<td>10/29</td>
<td>Mon</td>
<td>6</td>
<td>9.9</td>
<td>609</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/28</td>
<td>Sun</td>
<td>9</td>
<td>15.9</td>
<td>533</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/27</td>
<td>Sat</td>
<td>6</td>
<td>11.1</td>
<td>540</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/26</td>
<td>Fri</td>
<td>13</td>
<td>23.5</td>
<td>553</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/25</td>
<td>Thur</td>
<td>14</td>
<td>20.1</td>
<td>698</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/24</td>
<td>Wed</td>
<td>22</td>
<td>30.3</td>
<td>726</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/23</td>
<td>Tues</td>
<td>25</td>
<td>40.0</td>
<td>625</td>
<td>map / patient list</td>
<td></td>
</tr>
<tr>
<td>10/22</td>
<td>Mon</td>
<td>7</td>
<td>36.9</td>
<td>780</td>
<td>map / patient list</td>
<td></td>
</tr>
</tbody>
</table>
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
NREVSS / WHO

- **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.
Laboratory Surveillance

- **Activity:** Influenza Laboratory Surveillance (Culture/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
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/