New York State Electronic Syndromic Surveillance System (ESSS)

Statistical Unit
Division of Epidemiology

ESSSS Data Components

- Emergency Departments (EDs) data feeds
- Urgent Care Centers (UCCs) data feeds
  - Recruitment stage
- Medicaid over-the-counter (OTC) and prescription medications data feeds
  - Aggregated data
  - 2 weeks submission delay
Emergency Departments (EDs) Syndromic Surveillance

- ED syndromic surveillance objectives
- Syndrome definition and categories
- ED syndromic surveillance regions and coverage
- How does it work

ED Syndromic Surveillance Objectives

- The fundamental objective of syndromic surveillance (SS) is to identify illness clusters early, before diagnoses are confirmed and reported to public health agencies, and to mobilize a rapid response, thereby reducing morbidity and mortality.
- A nearly real-time method of categorizing visits from EDs into disease or illness syndromes, based on patient chief complaint (CC) upon admission to ED.
NYS ED Syndromic Surveillance

- Data from the previous day are submitted daily via Electronic Clinical Laboratory Reporting System (ECLRS), which is then categorized into 13 syndromes.
- By searching the CC text upon admission to ED and/or discharge diagnosis for specific terms indicative of drug/opioid/heroin overdose, SS can be used as an early detection method for overdose outbreaks.
- SS staff review the data daily to capture overdose spikes and investigate, if needed.
- Summary, case level counts, graphs and signals are available by syndrome, hospital, county and region.

Syndrome Definition and Categories

- Syndrome Definition
  - A set of signs and symptoms that appear together and characterize a disease or medical condition.

- NYS ED Syndrome Categories:
  - Asthma
  - Carbon Monoxide
  - Drug overdose
  - Fever
  - GI
  - Heat
  - Heroin overdose
  - Hypothermia
  - Neurologic
  - Opioid overdose
  - Rash
  - Respiratory
  - Synthetic drugs
ED Surveillance Regions and Coverage

Definitions of Regions by County
NYSDOH, ESSS

136 Upstate NY EDs (95%)
Output/Reports

• CuSum reports
• Special reports

To access Electronic Syndromic Surveillance System (ESSS) application:

User Guide:
Log on to HCS > My Applications – Elec Syndromic Surveillance > FAQ
ESSS CuSum Analysis

- CuSum statistics are used to identify daily counts higher than the 28-day baseline mean plus a measure of normal variation.

- Two types of signals generated:
  - C1: counts higher than average for past 1-28 days plus normal variations (Less Sensitive, Abrupt Changes)
  - C2: counts higher than average for past 3-30 days plus normal variations (More Sensitive, Gradual Changes)

- 3 types of reports generated daily for both ED data, and Medicaid OTC & Prescription Drug data for every hospital, county and region by syndrome:
  - Counts for past 10 days
  - Short-term trend graph
  - Long-term trend graph
Example: Counts for Past 10 days

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>COUNT TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>3 3 3 4 4 4 6 7 6 6</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>0 0 0 1 2 0 0 0 0 0</td>
</tr>
<tr>
<td>Drug Overdose</td>
<td>7 6 5 5 1 2 1 1 1 0</td>
</tr>
<tr>
<td>Fever</td>
<td>2 3 4 5 6 7 8 9 3 2</td>
</tr>
<tr>
<td>Ig</td>
<td>3 3 3 3 3 3 3 3 3 3</td>
</tr>
<tr>
<td>Hiv</td>
<td>7 6 5 4 3 2 1 0 0 0</td>
</tr>
<tr>
<td>Dengue 1D</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>Nervousness</td>
<td>4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Dengue 2D</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Rash</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>Septicnearly</td>
<td>10 11 12 13 14 15 16 17 18 19</td>
</tr>
<tr>
<td>Synthetic Drugs</td>
<td>0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

C1 = Mild Sensitivity  C2 = Moderate Sensitivity  N = Data Missing, Result May Not Valid

Note: Only records with Non-Missing values for Hospital, Event, and Date are analyzed

Produced on: [Division of Epidemiology, NYSDOH]

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Short-Term Trend Graph

![Short-Term Trend Graph](image-url)

C1 = Mild Sensitivity  C2 = Moderate Sensitivity  N = Data Missing, Result May Not Valid
Long-Term Trend Graph

Special Reports

- Run weekly, shared internally
  - Number of Drug, Opioid and Heroin overdose ED visits
    - By region
    - By age groups
    - By gender
  - Cluster reports
    - Cluster is a geographic area with a high density of drug overdoses during a period of time.
    - Counts are measured by zip code, so the cluster areas can include several parts of different counties.
    - Uses specialized software and a more complex statistical algorithm (SatScan Analysis).
**Weekly Report - by Region**

<table>
<thead>
<tr>
<th>MMWR Week</th>
<th>Ending Date</th>
<th>Capital_Northeast</th>
<th>Buffalo_Rochester</th>
<th>Central</th>
<th>Hudson_Valley</th>
<th>Long_Island</th>
<th>NYC</th>
<th>Upstate Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td>11</td>
<td>6</td>
<td>33</td>
<td>15</td>
<td>14</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
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<td>12</td>
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<tr>
<td>38</td>
<td></td>
<td>11</td>
<td>0</td>
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<td>20</td>
<td>20</td>
<td>12</td>
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<tr>
<td>37</td>
<td></td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Number of Heroin Overdose Related ED Visits in New York State since 1/1/2016**

**Weekly Report - by Age and Gender**

**Number of Opioid Overdose Related ED Visits in New York State by Age and Gender since 1/1/2016**

- **Gender**: Male, Female
- **Age Group**: 0-10, 11-19, 20-29, 30-39, 40-49, 50+, Unknown
- **Counts**: Various counts for each age and gender group.
Cluster (SatScan) Analysis

Map of Opioid OD Clusters by Patient's ZIP Code, ending

What’s Next?
• Current issues
• Action items
Current Issues

- Non-specific chief complaint

<table>
<thead>
<tr>
<th>Chief Complaint Text Received</th>
<th>Corresponding Diagnosis Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Overdose</td>
<td>F1190,S62339A</td>
</tr>
<tr>
<td>Needs to be seen</td>
<td>T40.1X1A</td>
</tr>
<tr>
<td>OVERDOSE</td>
<td>F11.10</td>
</tr>
<tr>
<td>OD</td>
<td>T50902A,T401X1A</td>
</tr>
</tbody>
</table>

- Completeness of data; e.g., for Feb 2019 we received:
  - Diagnosis Code 63.5%
  - Triage Notes 36.1%
  - Clinical Impressions 14.2%

Action Items

- Improve the completeness of data
  - Chief complaint
  - Diagnosis
  - Triage notes
  - Clinical impressions
- Improve the quality of data
  - Use free-text chief complaint
  - Be more specific about the type/name of the drug used
- Maintain timeliness of data submission
Need To Reach Us?

- **NYSDOH Syndromic Surveillance:**
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  - Shivani Arora
  - Sarah Kimball
  - Charlene Weng
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- **Special thanks to:**
  - Kitty Gelberg
  - Nicole D'Anna

Email (for Opioid specific questions):
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