Getting to the Bigger Picture: Opioid-Related Public Health Surveillance in Missouri

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Public Health Surveillance Process

- Many pieces of the “Opioid Puzzle”
- General surveillance theme:
  - Receive Initial Data
  - Recognize Limitations
  - Address limitations when possible
  - Receive higher quality data in future
MoDHSS Surveillance Systems

- State Unintentional Drug Overdose Reporting System (SUDORS)
- Enhanced State Opioid Overdose Surveillance (ESOOS)
- Early Notification of Community-based Epidemics (ESSENCE)
- Newborn Screening
- Neonatal Abstinence Syndrome (NAS) Medical Record Abstraction
- Pregnancy Risk Assessment Monitoring System (PRAMS)
- Opioid Dashboard
SUDORS

- Fatal Opioid Data

**Identify Case**
- Scan death certs for ICD-10 codes
- Underlying cause of death:
  - X40-X44.9 (Accidental)
  - Y10-Y14 (Undetermined)
- Multiple Cause codes
  - T40.1 (Heroin)
  - T40.0, T40.2, T40.3, T40.4, T40.6 (Opioids)
  - T50.9 (Multi-drug)
- Literals

**Retrieve Death Certificate Information**

**Get Toxicology Report and Scene Narrative**
- Identifies drugs not specified in death cert
- Identifies other drugs that were not lethal
Sample Toxicology Report

<table>
<thead>
<tr>
<th>Sample Toxicology Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood: Heart (cont')</strong></td>
</tr>
<tr>
<td>Cannabinoid Quantitation: (cont')</td>
</tr>
<tr>
<td>11-NOR-DELTA-9-THC-COOH: 24.0 NANOGRAMS/ML</td>
</tr>
<tr>
<td>Methadone Quantitation:</td>
</tr>
<tr>
<td>METHADONE: 0.65 MICROGRAMS/ML</td>
</tr>
<tr>
<td>METHADONE METABOLITE (EDDP): LESS THAN 0.10 MICROGRAMS/ML</td>
</tr>
<tr>
<td>Opiate Quantitation:</td>
</tr>
<tr>
<td>Codeine: Negative</td>
</tr>
<tr>
<td>MORPHINE (TOTAL): 0.13 MICROGRAMS/ML</td>
</tr>
<tr>
<td>6-Monoacetylmorphine: Negative</td>
</tr>
<tr>
<td>Hydrocodone: Negative</td>
</tr>
<tr>
<td>Hydromorphone: Negative</td>
</tr>
<tr>
<td>Oxycodone: Negative</td>
</tr>
<tr>
<td>Dihydrocodeine (Hydrocodol): Negative</td>
</tr>
<tr>
<td>Oxymorphone: Negative</td>
</tr>
<tr>
<td>Morphine (Free): Negative</td>
</tr>
<tr>
<td><strong>Urine:</strong></td>
</tr>
<tr>
<td>Amphetamine Confirmation:</td>
</tr>
<tr>
<td>AMPHETAMINE: POSITIVE</td>
</tr>
<tr>
<td>METHAMPHETAMINE: POSITIVE</td>
</tr>
<tr>
<td>MDA: Negative</td>
</tr>
<tr>
<td>MDMA: Negative</td>
</tr>
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</tr>
<tr>
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<tr>
<td>METHADONE METABOLITE (EDDP): POSITIVE</td>
</tr>
<tr>
<td>Urine Individual Drug Confirmation:</td>
</tr>
<tr>
<td>PENTANYL: POSITIVE</td>
</tr>
<tr>
<td>Urine Opiate Confirmation:</td>
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<tr>
<td>CODEINE: POSITIVE</td>
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<td>6-MONOACETYLMORPHINE: POSITIVE</td>
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</table>
Reporting of nonfatal cases from hospital billing data
More timely than mortality data
Less detailed than mortality data
- No clinical text in data
- Specific substances are usually unknown
Toxicology testing not as extensive as mortality
ESSENCE

- Syndromic data surveillance system
- Uses first impressions from the Emergency Department
- Near real time, updated daily
- Only initial impressions and does not necessarily line up with final discharge diagnosis
- Toxicology testing generally not complete by this point
Newborn Screening

- All infants born in Missouri are screened for a variety of metabolic and genetic conditions at birth
- Heel prick blood test
- Test goes to SPHL in Jefferson City
- Included checkbox for NAS symptoms
NAS Medical Record Abstraction

- Uses laboratory results located in medical records for case ascertainment.
  - Symptoms of drug withdrawal of infant (and NASS score if applicable).
  - Treatments.
  - Contextual data regarding fetal exposure.
  - Laboratory data of infant, usually meconium or urine.
PRAMS

- Does not incorporate laboratory data
- Survey that mothers complete 3 to 6 months after a live birth
- Opioid supplemental questionnaire and 9-month call-back survey funded by CDC
Opioid Dashboard

Data Dissemination

1 out of every 65 deaths in 2017 were due to Opioid Overdose

Missouri Opioids Dashboard

The data presented here are relevant to the opioid misuse epidemic in Missouri. These data tell a troubling story: the opioid epidemic affects all genders, all races, and many age groups in both rural and urban Missouri geographies. The impact is multi-dimensional and multi-generational. Trends indicate that the scourge of misuse in our state, and nationwide, continues to affect people across all demographics.

Clicking the images below will lead to detailed graphics and analysis that feature data from Missouri death certificates and Missouri hospital and emergency room records, among other sources.

The Death Toll

An Epidemic Affecting Everyone

The Impact on the Future

The Costs of Opioid Misuse
Opioid Dashboard

Deaths Due to Opioid Overdoses 2013-2017

ER Visits Due to Opioid Misuse Rate 2012-2016

Crude Rate per 100,000 population
*Denominator is less than 20

Crude Rate per 1,000 population
*Denominator less than 20
Opioid Dashboard

- Currently, the only opioid breakouts done is heroin vs. non-heroin opioids
Addressing Limitations

- Increase speed and accuracy of laboratory testing
- Capacity building at SPHL and commercial labs
- Collaborate with county coroners/medical examiners to fund more extensive tests
- With more extensive lab testing, further data breakouts of additional substances can be done
- Expanding surveillance to include additional substances, such as stimulants
Conclusions

Missouri Health Care Providers

Scientists/Researchers

Missouri State Public Health Lab

ESOOS/PAS

ESSENCE

PRAMS

APHL

Missouri Hospital Association

Newborn Screening

And so many more....

Department of Mental Health

SUDORS
Thank you!

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Resources

- **Missouri Information**
  - Missouri Health and Senior Services website: [www.health.mo.gov](http://www.health.mo.gov)
  - Missouri Newborn Screening website: [www.health.mo.gov/living/families/genetics/newbornscreening/](http://www.health.mo.gov/living/families/genetics/newbornscreening/)
  - Missouri Opioid Dashboard website: [www.health.mo.gov/data/opioids/](http://www.health.mo.gov/data/opioids/)

- **National Information:**
  - CDC website: [www.cdc.gov](http://www.cdc.gov)
  - CDC ESOOS website: [www.cdc.gov/drugoverdose/index.html](http://www.cdc.gov/drugoverdose/index.html)
  - CDC PRAMS website: [www.cdc.gov/prams/index/php](http://www.cdc.gov/prams/index/php)