The Opioid Epidemic and Enhanced Opioid Surveillance in Missouri

Evan Mobley and Whitney Coffey
Bureau of Health Care Analysis and Data Dissemination
Age-Adjusted Rates of Drug Overdose Deaths by State, US 2015

Resident Opioid Overdose Deaths by Type
Missouri, 2011-2016

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Resident Heroin Deaths as a Percent of All Opioid Deaths
Missouri, 2011-2016

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Opioid Grant Overview

• This 3-year grant supports states with a high burden of drug overdoses to quickly improve the timeliness of fatal and nonfatal opioid overdose surveillance, including overdoses related to opioid pain relievers and heroin. (CDC, 2016)
  • Strategy 1- Increase the timeliness of aggregate nonfatal opioid overdose reporting.
  • Strategy 2- Increase the timeliness of fatal opioid overdose and associated risk factor reporting.
  • Strategy 3- Disseminate surveillance findings to key stakeholders working to prevent or respond to opioid overdoses.
States Awarded CDC Enhanced Opioid Surveillance Grant

Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services
Strategy 1- Nonfatal Opioid Overdose Reporting

• Increase the timeliness of aggregate nonfatal opioid overdose reporting.
• Target area is the entire state of Missouri.
• Focus will be on emergency department records.
Strategy 1- Nonfatal Opioid Overdose Reporting

- **Two Data Sources**
  - ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics)
  - Missouri Patient Abstract System (PAS) quarterly Emergency Room discharge files

- **Three types of data collected**
  - Any Drug Overdose
  - Any Opioid Overdose
  - Any Heroin Overdose
## Reporting Timetable

<table>
<thead>
<tr>
<th>Date Quarterly Report Completed</th>
<th>Dates of Overdoses Included in the Report to Meet Minimum Reporting Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 15, 2017</td>
<td>October 2016 to December 2016</td>
</tr>
<tr>
<td>July 15, 2017</td>
<td>January 2017 to March 2017</td>
</tr>
<tr>
<td>October 15, 2017</td>
<td>April 2017 to June 2017</td>
</tr>
<tr>
<td>January 15, 2018</td>
<td>July 2017 to September 2017</td>
</tr>
<tr>
<td>April 15, 2018</td>
<td>October 2017 to December 2017</td>
</tr>
<tr>
<td>July 15, 2018</td>
<td>January 2018 to March 2018</td>
</tr>
<tr>
<td>October 15, 2018</td>
<td>April 2018 to June 2018</td>
</tr>
<tr>
<td>January 15, 2019</td>
<td>July 2018 to September 2018</td>
</tr>
<tr>
<td>April 15, 2019</td>
<td>October 2018 to December 2018</td>
</tr>
<tr>
<td>August 31, 2019</td>
<td>April to May, 2019*</td>
</tr>
</tbody>
</table>
What is ESSENCE?

- Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE)
- Web-based automated surveillance tool
- Emergency Department chief complaints
- Installed in 2006
- Data loaded hourly; available 24/7/365
- 9,000 ED visits per day
How is ESSENCE used in opioid surveillance?

- Daily ED visits due to opioid abuse in ESSENCE
Patient Abstract System (PAS)

- DHSS receives inpatient, emergency room, and outpatient data from approximately 132 Missouri hospitals.
- This data includes a variety of demographic information, as well as variables about the visit itself.
- Each healthcare record has 23 diagnoses fields (containing ICD codes, not literals), though rarely are all of these used.
  - DX1= Chief Complaint
PAS- continued

- Data is received quarterly and converted into an annual file.
- Missouri has entered into an agreement with Hospital Industry Data Institute (HIDI) to download data monthly in the early period of the grant in order to establish methodology.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Months</th>
<th>HIDI File Due to DHSS</th>
<th>DHSS File/Report Due to CDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan - Mar</td>
<td>June 1</td>
<td>July 15</td>
</tr>
<tr>
<td>2</td>
<td>Apr - June</td>
<td>September 1</td>
<td>October 15</td>
</tr>
<tr>
<td>3</td>
<td>July - Sept</td>
<td>December 1</td>
<td>January 15 (following year)</td>
</tr>
<tr>
<td>4</td>
<td>Oct - Dec</td>
<td>March 1 (following year)</td>
<td>April 15 (following year)</td>
</tr>
</tbody>
</table>
PAS- continued

• Strategy 1 uses emergency room (and possibly some inpatient) data for all Missouri residents, statewide.
• While case definitions are currently evolving, DHSS provides data on three categories of diagnoses:
  ▫ All Drug Overdoses
  ▫ All Opioid Overdoses
  ▫ All Heroin Overdoses
PAS- continued

<table>
<thead>
<tr>
<th>Year</th>
<th>Geography</th>
<th>Discharges</th>
<th>Population</th>
<th>Rate (per 1,000)</th>
<th>95% Lower Confidence Interval</th>
<th>95% Upper Confidence Interval</th>
<th>Significantly Different*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Missouri</td>
<td>7,402</td>
<td>6,010,544</td>
<td>1.23</td>
<td>1.20</td>
<td>1.26</td>
<td>L</td>
</tr>
<tr>
<td>2015</td>
<td>Missouri</td>
<td>9,172</td>
<td>6,083,672</td>
<td>1.51</td>
<td>1.48</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>Camden County</td>
<td>39</td>
<td>44,237</td>
<td>0.88</td>
<td>0.64</td>
<td>1.21</td>
<td>L</td>
</tr>
<tr>
<td>2015</td>
<td>Jackson County</td>
<td>580</td>
<td>687,623</td>
<td>0.84</td>
<td>0.78</td>
<td>0.92</td>
<td>L</td>
</tr>
</tbody>
</table>

*Comparison value for the significance column is the 2015 Missouri rate.

L= significantly lower, N/S= no significant difference, H= significantly higher
PAS - continued

Resident Opioid Abuse Emergency Room Discharges
Missouri, 2006-2015

Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services
Strategy 2- Fatal Opioid Overdose Reporting

- Increase the timeliness of fatal opioid overdose and associated risk factor reporting.
- Target area is a subset of Missouri counties.
- DHSS partners with medical examiner and coroner offices across the state to integrate Missouri Death Certificates with Medical Examiner/Coroner (ME/C) reports in cases of suspected opioid overdoses.
  - Time Period: July 1, 2016 through December 31, 2018
## Reporting Timetable

<table>
<thead>
<tr>
<th>Date of Opioid-Involved Overdose Death</th>
<th>Data Entry on All Opioid-Involved Overdose Deaths Initiated</th>
<th>Data Entry on All Opioid-Involved Overdose Deaths Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1, 2016 to December 31, 2016</td>
<td>June 30, 2017</td>
<td>August 31, 2017</td>
</tr>
<tr>
<td>January 1, 2017 to June 30, 2017</td>
<td>December 31, 2017</td>
<td>February 28, 2018</td>
</tr>
<tr>
<td>July 1, 2017 to December 31, 2017</td>
<td>June 30, 2018</td>
<td>August 31, 2018</td>
</tr>
</tbody>
</table>
Participating Counties

• Per grant requirements, DHSS reached out to ME/C offices with high frequencies of overdose deaths.

• The counties shown in green represent just over 80% of opioid-involved overdose deaths in first reporting period (Jul-Dec 2016).

Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services
Strategy 2 - continued

- Data abstracted by analysts at DHSS and entered into the overdose module of the web-based National Violent Death Registry System (NVDRS).
- ME/Cs provide complete reports (including toxicology results) to DHSS.
- ME/C offices compensated $30 for every complete report provided to DHSS.
Opioid Overdose Case Definition

- Drug poisoning deaths where the ME/C report indicates that an opioid contributed to death.

  - ICD-10 underlying cause-of-death codes on the death certificate are X40–44 (unintentional) or Y10–Y14 (undetermined intent) AND any of the ICD-10 codes T40.0, T40.1, T40.2, T40.3, T40.4, or T40.6 are indicated in the multiple cause-of-death codes.
ME/C Participation

- DHSS has received commitments from more than 20 county and city ME/C offices.
- DHSS coordinated with NVDRS grant project managers to create a single contract for both grants.
- All local ME/C offices are encouraged to participate and reach out to DHSS with any questions or concerns.
Data Analysis

• Once data has been abstracted, DHSS staff will run a variety of statistical analyses, including:
  • Time-space trend analyses
  • Risk factor analyses

Initial list of Demographic/Risk Factors to analyze

• Sex
• Age
• Race
• Ethnicity
• Educational attainment

• Occupational industry
• History of opiate/other drug abuse
• History of mental illness

Percent change values compare the 2005-2006 rates to the 2015-2016 rates.

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Resident Non-Heroin Overdose Death Rates
Missouri, 2007 and 2016

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Non-Heroin Opiate Death Rates (per 100,000), 2012-2016

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Heroin Death Rates (per 100,000), 2012-2016
Missouri and St. Louis Area Zip Codes

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services
Strategy 3- Data Dissemination

- Disseminate opioid surveillance findings to key stakeholders working to prevent or respond to opioid overdoses
- Data dissemination unit housed within BHCADD will continually revise dissemination strategies based on stakeholder feedback.
- Activities include:
  - New opioid-overdose website
  - Annual report
  - Development of Fact Sheets for areas with high rates/increases
  - Presentations to local stakeholders
  - Respond to data requests
Focus Articles

Community Data Profiles and MICAS

![Image of data profiles and MICAS interface]

### Missouri Resident Emergency Room Profile

**Choose Your Profile Data**

- Geography: COUNTY
- County: Camden
- Demographic: All

**Emergency Room Visits Indicators**

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Data Years</th>
<th>Count</th>
<th>Rate</th>
<th>State Rate</th>
<th>Significantly Different</th>
<th>Ranking Quartile</th>
<th>Download Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Diseases/Conditions</td>
<td>2013</td>
<td>15,727</td>
<td>414.06</td>
<td>378.52</td>
<td>H</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Infections</td>
<td>2013</td>
<td>325</td>
<td>9.78</td>
<td>9.97</td>
<td>NS</td>
<td>5</td>
<td>Graphics</td>
</tr>
<tr>
<td>Viral Infections</td>
<td>2013</td>
<td>233</td>
<td>6.09</td>
<td>5.30</td>
<td>H</td>
<td>5</td>
<td>Graphics</td>
</tr>
<tr>
<td>Neoplasms (Cancer and Other Growth)</td>
<td>2013</td>
<td>18</td>
<td>0.36</td>
<td>0.43</td>
<td>NS</td>
<td>5</td>
<td>Graphics</td>
</tr>
<tr>
<td>Nutritional/Metabolic/Immunity</td>
<td>2013</td>
<td>200</td>
<td>4.17</td>
<td>4.75</td>
<td>H</td>
<td>5</td>
<td>Graphics</td>
</tr>
<tr>
<td>Fluid and Electrolyte Disorders (Dehydration)</td>
<td>2013</td>
<td>74</td>
<td>1.48</td>
<td>1.67</td>
<td>NS</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>2013</td>
<td>76</td>
<td>1.56</td>
<td>1.94</td>
<td>NS</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Blood and Blood-Forming</td>
<td>2013</td>
<td>24</td>
<td>0.46</td>
<td>0.65</td>
<td>L</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Anemia</td>
<td>2013</td>
<td>12</td>
<td>0.19</td>
<td>0.71</td>
<td>L</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td>2013</td>
<td>508</td>
<td>14.56</td>
<td>13.69</td>
<td>NS</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Alcohol and Substance-Related Disorders</td>
<td>2013</td>
<td>131</td>
<td>3.80</td>
<td>4.17</td>
<td>NS</td>
<td>4</td>
<td>Graphics</td>
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<tr>
<td>Anxiety-Related Disorders</td>
<td>2013</td>
<td>182</td>
<td>5.28</td>
<td>3.83</td>
<td>H</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Brain/Spinal Cord/Eye/Ear</td>
<td>2013</td>
<td>1,391</td>
<td>33.59</td>
<td>34.67</td>
<td>H</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Headache/Migraine</td>
<td>2013</td>
<td>351</td>
<td>10.52</td>
<td>10.38</td>
<td>NS</td>
<td>3</td>
<td>Graphics</td>
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<tr>
<td>Eye Infections</td>
<td>2013</td>
<td>73</td>
<td>2.22</td>
<td>2.60</td>
<td>L</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Ocular Media and Related Conditions</td>
<td>2013</td>
<td>297</td>
<td>9.73</td>
<td>7.03</td>
<td>H</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Heart and Circulation</td>
<td>2013</td>
<td>863</td>
<td>17.46</td>
<td>20.44</td>
<td>L</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2013</td>
<td>119</td>
<td>1.51</td>
<td>2.68</td>
<td>L</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>2013</td>
<td>587</td>
<td>12.54</td>
<td>15.03</td>
<td>L</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Stroke/Other Cerebrovascular Disease</td>
<td>2013</td>
<td>35</td>
<td>0.81</td>
<td>0.75</td>
<td>NS</td>
<td>2</td>
<td>Graphics</td>
</tr>
<tr>
<td>Respiratory (Throat and Lung)</td>
<td>2013</td>
<td>1,069</td>
<td>52.84</td>
<td>52.45</td>
<td>NS</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Respiratory Infections</td>
<td>2013</td>
<td>1,033</td>
<td>30.76</td>
<td>31.26</td>
<td>NS</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease (COPD)</td>
<td>2013</td>
<td>379</td>
<td>7.57</td>
<td>5.29</td>
<td>H</td>
<td>4</td>
<td>Graphics</td>
</tr>
<tr>
<td>Asthma</td>
<td>2013</td>
<td>114</td>
<td>3.14</td>
<td>5.23</td>
<td>L</td>
<td>3</td>
<td>Graphics</td>
</tr>
<tr>
<td>Pneumonia and Influenza</td>
<td>2013</td>
<td>190</td>
<td>4.94</td>
<td>5.51</td>
<td>NS</td>
<td>2</td>
<td>Graphics</td>
</tr>
</tbody>
</table>
MICA Newsletters

MICA User Group Newsletter

September 2015 Issue #13

In 2013, cancer remained the second leading cause of Missouri resident deaths, behind only heart disease. Heart disease and cancer have long been the two leading causes of death, both in Missouri and nationally, by a wide margin. The Death MICA allows users to analyze cancer mortality statistics to obtain a good deal of information, including demographics of cancer decedents, trends in cancer mortality rates, and the leading causes of cancer deaths in Missouri. (Data related to cancer incidence are available through the Cancer Registry MICA, which will be covered in a later issue of this newsletter.)

Cancer is a general name used to describe a large and complex group of diseases that share some common characteristics. Cancer begins "when cells in a part of the body start to grow out of control... [They] continue to grow and form new, abnormal cells." Cancer cells are unique because they have the ability to expand into other tissue. Rapid growth of abnormal cells and the ability to expand to other parts of the body are two common traits found in all forms of cancer. Statewide, 12,902 residents died from cancer in 2013. In fact, just over 22.5 percent of all deaths in the state were attributed to this disease. The Death MICA can be used to compare cancer with other leading causes of death in Missouri.

Cancer and other leading causes of death can also be easily tracked over time using the Death MICA, which provides mortality statistics going back to 1990. Since 1990, the trend has been declining death rates. This is true for cancer and heart disease as well as all causes overall (the sum of all Missouri resident deaths, regardless of the specific cause). For instance, from 1990 to 2013 the heart disease mortality rate declined a massive 41 percent. While declines in cancer death rates have not been as dramatic, the 18.3 percent cancer mortality decline is larger than the all causes decrease of 14.9 percent. The trend line on the left shows that the cancer mortality rate decline has been steady. The 2013 rate is statistically significantly lower than the rates in all years from 1990 through 2009.

Her presentation, titled “Behind Missouri’s Health Data Trainings: The Making of Health Data Rock Stars” is available at https://cste.confex.com/cste/2015/webprogram/Sess ion2950.html.

Behind Missouri’s Health Data Trainings: The Making of Health Data Rock Stars

2015 CSTE Annual Conference
Monday, June 15, 2015
2:30 PM
Sheraton Hotel Back Bay A

Andy presented a poster on “Rural and Urban Health Disparities in Missouri.” The poster highlighted the key findings of the 2012-2013 Health in Rural Missouri Biennial Report but incorporated more recent data. The poster abstract is available at https://cste.confex.com/cste/2015/webprogram/Session 3222.html.
DHSS Opioid Dashboard

• The Division of Community and Public Health is in the process of developing a web-based dashboard to communicate data related to opioid abuse.

• Maps, charts, and other graphics will tell the story of the opioid epidemic in Missouri.

• COMING SOON!
DHSS Opioid Dashboard Preview

Source: Bureau of Vital Statistics, Missouri Department of Health and Senior Services

1 in 66 deaths in 2016 were due to OPIOID or HEROIN overdose.
Resident Opioid Abuse Emergency Room Discharges
Insurance Payers
Missouri, 2010-2014

- Governmental: $38,384,003
- Self Pay/No Charge: $36,291,099
- Commercial: $19,926,517
- Other: $713,518

Medicaid: $24,446,705
Medicare: $12,984,192
Other Gov: $953,106

Estimated Emergency Room Charge Total: $95,315,137

Governmental insurance payers include: Medicare, Medicaid, Workman's Compensation, CHAMPUS, Veteran's Administration, TriCare, and all other government insurance.

Source: Bureau of Health Care Analysis and Data Dissemination, Missouri Department of Health and Senior Services
Committed Partners for Surveillance and Dissemination

- **At least 20 local ME/C offices**
- DHSS, Bureau of Community Health and Wellness and the Injury Prevention Program
- DHSS, Bureaus of Reportable Disease Informatics and Communicable Disease Control and Prevention
- DHSS, Bureau of Vital Statistics
- DHSS, NVDRS Grant Principal Investigator
- DHSS, Office of Minority Health
- DHSS, Office of Primary Care and Rural Health
- DHSS, Office on Women’s Health
- Hospital Industry Data Institute (HIDI), The Data Company of the Missouri Hospital Association
- Midwest HIDTA
- Missouri Department of Mental Health, Division of Behavioral Health
- Missouri State Registrar
- National Council on Alcoholism and Drug Abuse- St. Louis Area
- Regional Heroin and Opiates Steering Committee
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