Overdose Deaths Involving Opioids, United States, 2000-2015

- Any Opioid
- Commonly Prescribed Opioids (Natural & Semi-Synthetic Opioids and Methadone)
- Heroin
- Other Synthetic Opioids (e.g., fentanyl, tramadol)

Natural & Semi-Synthetic Opioid Overdose Death Rates

Age-adjusted deaths per 100,000 population for natural and semisynthetic opioids from 2014 to 2015, by census region of residence

- **South***
  - 4.2
  - 4.4
  - 5,374 Deaths in 2015

- **West**
  - 3.8
  - 3.9
  - 2,956 Deaths in 2015

- **Northeast***
  - 3.3
  - 3.6
  - 2,095 Deaths in 2015

- **Midwest**
  - 3.3
  - 3.4
  - 2,302 Deaths in 2015

- **United States***
  - 3.8
  - 3.9
  - 12,727 Deaths in 2015
Heroin Use Has INCREASED Among Most Demographic Groups

<table>
<thead>
<tr>
<th></th>
<th>2002-2004*</th>
<th>2011-2013*</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEX</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.4</td>
<td>3.6</td>
<td>50%</td>
</tr>
<tr>
<td>Female</td>
<td>0.8</td>
<td>1.6</td>
<td>100%</td>
</tr>
<tr>
<td><strong>AGE, YEARS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-17</td>
<td>1.8</td>
<td>1.6</td>
<td>--</td>
</tr>
<tr>
<td>18-25</td>
<td>3.5</td>
<td>7.3</td>
<td>109%</td>
</tr>
<tr>
<td>26 or older</td>
<td>1.2</td>
<td>1.9</td>
<td>58%</td>
</tr>
<tr>
<td><strong>RACE/ETHNICITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>1.4</td>
<td>3</td>
<td>114%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.7</td>
<td>--</td>
</tr>
<tr>
<td><strong>ANNUAL HOUSEHOLD INCOME</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>3.4</td>
<td>5.5</td>
<td>62%</td>
</tr>
<tr>
<td>$20,000-$49,999</td>
<td>1.3</td>
<td>2.3</td>
<td>77%</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>1</td>
<td>1.6</td>
<td>60%</td>
</tr>
<tr>
<td><strong>HEALTH INSURANCE COVERAGE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>4.2</td>
<td>6.7</td>
<td>60%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>4.3</td>
<td>4.7</td>
<td>--</td>
</tr>
<tr>
<td>Private or other</td>
<td>0.8</td>
<td>1.3</td>
<td>63%</td>
</tr>
</tbody>
</table>
Death Rate 1990 - 2013

INCREASING CAUSES OF DEATHS
Per 100,000 white Americans, 45–54

- Suicide
- Alcohol and drug poisoning
- Chronic liver diseases and cirrhosis

2000 2005 2010 '13
A sharp increase in opioid prescriptions is associated with an increase in deaths. The graph shows the trend from 1999 to 2013, with Opioid Sales (kg per 10k) and Rx Opioid Deaths (per 100k) on the y-axis and years on the x-axis. The data is from the National Vital Statistics System, DEA's Automation of Reports and Consolidated Orders System.
Some states have more opioid prescriptions per person than others.

Number of opioid prescriptions per 100 people:
- Yellow: 52-71
- Orange: 72-82.1
- Purple: 82.2-95
- Lavender: 96-143
How did we get here?

The Promotion and Marketing of OxyContin: Commercial Triumph, Public Health Tragedy

In Guilty Plea, OxyContin Maker to Pay $600 Million

By BARRY MEIER  MAY 10, 2007

OxyContin Promotional Video
"I got my life back." Purdue Pharma L.P. 1998
The Mississippi Drug Abuse Project

A collaborative effort between the Public Health Pharmacy, Office of Epidemiology, and Office of Preventive Health at the MSDH, the project started in the fall of 2014.

The project’s mission is to evaluate the scope of the opioid epidemic in Mississippi and build statewide surveillance systems utilizing different data sources.

Objectives:

• Implementing cutting-edge, national trends in opioid-related research, data analyses, and public health reporting.
• Translating data and research into action: our group is actively involved in the process of information dissemination and various state-level collaborative initiatives targeting the MS opioid epidemic.

Our research has been presented at four national conferences and multiple state venues. Our work includes two reports posted on the MSDH website.
“The ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation and evaluation of public health practice, closely integrated with the dissemination of these data to those who need to know and linked to prevention and control.”
The Mississippi Opioid Epidemic: Surveillance Data

The Opioid Pyramid

- Mortality Vital Records
- Morbidity Hospital Discharge Data
- Use, Misuse Prescription Monitoring Program Data

- What data sources do we have to track the MS opioid epidemic?
- What can we measure with these data sources?
Objectives

• Define the scope of the opioid epidemic in Mississippi utilizing evidence-based research methods and population-level data sources

• Identify at-risk populations for opioid abuse and describing their demographics and comorbidity profiles

• Demonstrate the use of these data sources for building community-level reports
Description
Prescription Monitoring Program (PMP) Data: a statewide electronic database designed to collect information about the prescribing and dispensing of controlled substances.

- **Patient:** identifier, gender, age and location
- **Controlled substance:** drug name, dose, prescribed amount and treatment duration
- **Prescriber:** identifier and location
- **Dispensing pharmacy:** identifier and location

Benefits of Use
- Identify and prevent illegitimate use of controlled substances ("doctor shopping")
- Reduce the potential of drug abuse and dependence due to legitimate overprescribing
- Inform the public and medical professionals about current trends of drug use and abuse
- Identify geographic areas with high rates of opioid misuse and prescription “hot spots”
- Allow community-oriented interventions
All opioid substances within the PMP database were identified. Opioid substances were categorized into three major groups: opioid agonists, opioid partial agonists, and antitussive preparations containing hydrocodone and codeine. Opioid agonist analgesics were selected as the focus of our analyses. Data analyses included only Mississippi residents.

Our Approach

- Opioid agonists accounted for 88%. The rest of this presentation displays data for this group only.
- Buprenorphine (e.g., Suboxone), an addiction treatment medication, accounted for 95% of all prescriptions for partial opioid agonists. Buprenorphine prescription increased by 50% between 2011 and 2014.
During 2014 in Mississippi, there were 7,287,299 prescriptions for controlled substances, of which 3,348,009 (46%) were for opioid analgesics.

On average for every resident in the state of Mississippi in 2014, there were 2.4 prescriptions for controlled substances and 1.1 prescriptions for opioids.

During 2012, many southern states had very high prescriptions rates (AL, TN, WV – in particular). Mississippi was included in the highest ranking range.
Hydrocodone was the leading prescribed opioid, accounting for 60.4% of all prescribed opioids, followed by tramadol (15.6%) and oxycodone (13.4%).

### Top Prescribed Opioid Analgesics

### Oral Morphine Milligram Equivalent Conversion Factors

<table>
<thead>
<tr>
<th>Opioid</th>
<th>MME Conversion Factor (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocodone</td>
<td>1.0</td>
</tr>
<tr>
<td>Tramadol</td>
<td>0.1</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>1.5</td>
</tr>
<tr>
<td>Codeine</td>
<td>0.15</td>
</tr>
<tr>
<td>Morphine</td>
<td>1.0</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>7.2 (0.13-7.2)</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Source: CDCs
**Top 3 Medications:** Compared to 2011 in 2014, the number of prescriptions for hydrocodone declined by 2.9%, while the number of prescriptions for tramadol and oxycodone, a strong opioid, climbed by 8.3% and 33.6%, respectively.

**Future Approach:** The evaluation of statewide opioid usage should follow a holistic approach incorporating metrics assessing the number of opioid prescriptions and pills as well as the strength and duration of opioid treatment.
Almost 2/3 (64%) of all opioid prescriptions were dispensed to patients 50 years of age and older.

The 18 years and younger and the age group 19-29 years experienced the greatest increase in number of prescriptions from 2011 through 2014.

### Prescription Opioid Analgesics: Age Groups

- **18 years or less**: +18%
- **19-29 years**: +24%
- **30-39 years**: +3%
- **40-49 years**: +2%
- **50-59 years**: +6%
- **60-69 years**: +5%
- **70 years and above**: -7%

### Opioid Prescriptions by Age Group: Number and Percentage

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number of Prescriptions</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 years or less</td>
<td>64,426</td>
<td>+18%</td>
</tr>
<tr>
<td>19-29 years</td>
<td>212,445</td>
<td>+24%</td>
</tr>
<tr>
<td>30-39 years</td>
<td>396,124</td>
<td>+3%</td>
</tr>
<tr>
<td>40-49 years</td>
<td>517,893</td>
<td>+2%</td>
</tr>
<tr>
<td>50-59 years</td>
<td>745,730</td>
<td>+6%</td>
</tr>
<tr>
<td>60-69 years</td>
<td>712,142</td>
<td>+5%</td>
</tr>
<tr>
<td>70 years and above</td>
<td>699,147</td>
<td>-7%</td>
</tr>
</tbody>
</table>
Prescriptions dispensed to women accounted for around 60% of all opioid prescriptions during each of the studied years.

Opioid Prescriptions by Gender: Number and Percentage

- **2011**
  - Female: 1,932,389
  - Male: 1,310,998

- **2012**
  - Female: 1,998,528
  - Male: 1,365,934

- **2013**
  - Female: 1,990,745
  - Male: 1,355,391

- **2014**
  - Female: 1,993,262
  - Male: 1,351,324
**Definition:** Multiple provider episodes ("doctor shopping") were defined as the use of six or more prescribers and six or more pharmacies within one year by a single patient.

**Case Study**

**Doctor Shopping, 2011**
- Female patient born in 1974
- Number of prescriptions for opioids: 146
- Number of different prescribers: 76
- Number of different pharmacies used: 30
- Number of different patient names: 10
- Number of cities of residence: 6
- Number of different payment types: 5

The number of MPEs showed a downward trend from 5,357 episodes in 2011 to 4,493 in 2014.
During 2014, the number of prescribers issuing opioid prescriptions in Laurel, MS was 157. These prescribers issued a total of 109,335 opioid prescriptions.

The majority (57%) of prescribers wrote less than 199 prescriptions for opioids during this same year.

In fact, the top 6 prescribers of opioids prescribed 58% (63,878) of all opioid prescriptions.

One prescriber wrote 31,654 or 29% of all prescriptions for opioid analgesics dispensed in Laurel during 2014. This prescriber issued a total 37,490 prescriptions for controlled substances.
### Number of Prescriptions: Top Zip Codes

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Location</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>39503</td>
<td>Gulfport</td>
<td>13,465</td>
<td>1.5</td>
</tr>
<tr>
<td>39401</td>
<td>Hattiesburg</td>
<td>13,137</td>
<td>1.5</td>
</tr>
<tr>
<td>38654</td>
<td>Olive branch</td>
<td>12,369</td>
<td>1.4</td>
</tr>
<tr>
<td>39402</td>
<td>Hattiesburg (Oak Grove)</td>
<td>11,504</td>
<td>1.3</td>
</tr>
<tr>
<td>39042</td>
<td>Brandon</td>
<td>11,290</td>
<td>1.3</td>
</tr>
<tr>
<td>39110</td>
<td>Madison</td>
<td>11,232</td>
<td>1.3</td>
</tr>
<tr>
<td>39047</td>
<td>Brandon</td>
<td>10,904</td>
<td>1.2</td>
</tr>
<tr>
<td>39564</td>
<td>Ocean Springs</td>
<td>10,617</td>
<td>1.2</td>
</tr>
<tr>
<td>38671</td>
<td>Southaven</td>
<td>10,168</td>
<td>1.2</td>
</tr>
<tr>
<td>38655</td>
<td>Oxford</td>
<td>10,033</td>
<td>1.1</td>
</tr>
</tbody>
</table>

The case of zip code 39402, Hattiesburg MS, 2014

- Population = 31,116
- Opioid prescriptions = 38,201
- There 597 patients with more than 12 prescriptions during 2014.
- These 597 patients had a total of 10,977 prescriptions for opioids, which accounted for 29% of all 38,201 prescription opioids.
Hospital discharge data are an important "big data" source with profound applications for public health research and health care planning.

Nation-wide, 47 states currently compile hospital discharge data from the administrative claims filed by individual hospitals. States submit their data to H-CUP, a national hospital discharge data bank.

The Mississippi State Department of Health began collecting such data in 2009.

**STRUCTURE AND CONTENT**

Two types of data sets: inpatient discharges and outpatient visits (ER visits included)

- Demographics: sex, race, age, location
- Expected payers, length of stay and hospital charges
- Admission and discharge status
- Medical diagnoses and performed procedures
Opioid-related Hospitalizations: Types

- The state’s two-year average rate was 15 opioid-related hospitalizations per 10,000 residents.
- Nationwide range (between 7 and 40 per 10,000 persons)

**Opioid-related hospitalizations, 2010-2011**

9,781

- Dependence 6,337 (65%)
- Abuse 1,595 (16%)
- Overdose 1,273 (12%)
- Adverse effects 912 (9%)

Over one third (3,466 or 35%) of all discharges for opioid misuse had a coexisting diagnosis of another type of drug misuse.
Compared to patients hospitalized for all other causes, Caucasians (83% vs. 59%), males (46% vs. 40%), urban residents (49% vs. 44%), and the uninsured (17% vs. 7%) were more likely to be hospitalized with a diagnosis indicating opioid misuse.
Forty-three percent (4,208) of all opioid-related hospitalizations were among the age group of 25-44.
Females between the age of 25 and 44 years had the highest hospitalization rate: 28 hospital admissions per 10,000 persons.
We identified a cluster of high hospitalization rates in the Southeast region of the state where four counties, Forrest, Perry, Marion, and Lauderdale had over 30 discharges per 10,000 persons.
Comorbidities

- Compared to all other hospitalizations, patients hospitalized with a diagnosis of opioid misuse were more likely to have a co-existing diagnosis of mental health disorders (71% vs 24%), chronic non-cancer-related pain (19% versus 2%), lower back pain (12% versus 2%), and myalgia (3% versus 1%).
- Interestingly, patients hospitalized with an opioid-related diagnosis were less likely to have a coexisting cancer diagnosis (2% verses 6%).
Mental Health and Opioids

- Mood disorders were the most prevalent mental health issues
- There were a total of 362 (15%) discharges with a coexisting diagnosis of opioid drug misuse.

Coexisting Mental Health Conditions

- Mood disorders: 48%
- Alcohol misuse: 21%
- Anxiety: 15%
- Suicides and attempt: 4%

Opioids and Coexisting Suicide

- All other suicides and attempts: 85%
- Suicides/attempt and opioid diagnoses: 15%
Societal Cost

Health care cost
Criminal justice cost
Lost workforce
Disruption of family relations

Resource Utilization, 2010-2011

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay</td>
<td></td>
<td>Sum</td>
</tr>
<tr>
<td>Total charges</td>
<td></td>
<td>$199,918,316</td>
</tr>
</tbody>
</table>

The publically funded payers, Medicare and Medicaid, accounted for the payments of 54% of all charges for opioid-related hospitalizations.

Primary Expected Payer

- Medicaid: 23% (Opioid-related), 23% (All Other Discharges)
- Medicare: 31% (Opioid-related), 41% (All Other Discharges)
- Other: 9% (Opioid-related), 6% (All Other Discharges)
- Private: 21% (Opioid-related), 23% (All Other Discharges)
- Self-Pay: 17% (Opioid-related), 7% (All Other Discharges)
Deaths from Opioid Overdose: The Capstone of the Opioid Pyramid

- In 2015, 33,091 Americans died from an opioid-involved overdose.
- The same year, opioids claimed the lives of 146 Mississippi residents.
- Between 2011 and 2015, 543 Mississippi residents lost their lives to opioids.

<table>
<thead>
<tr>
<th>OPIOID-RELATED DEATHS</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heroin</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>23</td>
<td>35</td>
</tr>
<tr>
<td>Non-heroin</td>
<td>75</td>
<td>103</td>
<td>90</td>
<td>92</td>
<td>111</td>
</tr>
<tr>
<td>Total opioid-related deaths</td>
<td>76</td>
<td>107</td>
<td>99</td>
<td>115</td>
<td>146</td>
</tr>
</tbody>
</table>

Opioid Overdose Deaths, 2015: Rate per 100,000 Population, US and MS

Percent Heroin-Related Deaths Among all Opioid Deaths

- 2011: 1.3%
- 2012: 3.9%
- 2013: 10.0%
- 2014: 25.0%
- 2015: 31.5%
The MS Opioid Epidemic - Summary

- Our state had alarmingly high numbers and rates of opioid prescriptions in 2014.

- While there was a slight recent decrease in the total number of opioids prescribed, this positive trend may be counteracted by a considerable increase in the prescription of stronger opioids such as oxycodone.

- Opioid prescribing is increasing among younger people.

- Females are especially at risk for both, opioid prescribing and hospitalizations with an opioid-related diagnosis.

- Caucasians are the predominant group hospitalized for opioid-related disorders.

- Non-chronic pain conditions and mental health conditions are highly prevalent among patients with an opioid use disorder.

- The opioid overdose deaths have doubled from 2011 through 2015 and heroin deaths are increasing at a higher pace.
Public Health Initiatives

Making a Difference: State Successes

**New York** 75% ↓

**2012 Action:**
New York required prescribers to check the state’s prescription drug monitoring program before prescribing painkillers.

**2013 Result:**
Saw a 75% drop in patients who were seeing multiple prescribers to obtain the same drugs, which would put them at higher risk of overdose.

**Florida** 50% ↓

**2010 Action:**
Florida regulated pain clinics and stopped health care providers from dispensing prescription painkillers from their offices.

**2012 Result:**
Saw more than 50% decrease in overdose deaths from oxycodone.

**Tennessee** 36% ↓

**2012 Action:**
Tennessee required prescribers to check the state’s prescription drug monitoring program before prescribing painkillers.

**2013 Result:**
Saw a 36% drop in patients who were seeing multiple prescribers to obtain the same drugs, which would put them at higher risk of overdose.
Most overdose deaths in Mississippi are accidental, caused by prescription drugs. Proper storage and disposal of medications can prevent injuries and deaths from drug abuse and drug overdoses.

**Prescription abuse** is taking any medication prescribed for someone else, or taking a higher dosage or in a manner than has not been prescribed.

Prescription drug abuse is a national epidemic – more than 78 Americans die each day from an opioid overdose. More people died from drug overdoses in 2014 than in any year on record. The rate of overdose deaths involving opioids has doubled since 2000, and southern states, including Mississippi, have the most prescriptions per person for opioid painkillers.
To Your Health

A doctor prescribed so many painkillers, she’s been charged with murdering her patients, authorities say

By Cleve R. Wootson Jr.  June 24
Summary of CDC Recommendations for the Use of Opioids for Chronic Pain:

• Use non-opioid treatments first. There is insufficient evidence to support efficacy of long term opioids.
• Start low and go slow.
• Start with 3 to 7 days of treatment and use the lowest possible dose.
• When required, use short acting opioids versus long acting or sustained release formulations.
• Check the state’s Prescription Drug Monitoring Program (PDMP) with every prescription or every 3 months.
• Avoid concurrent prescribing of opioids and benzodiazepines.
• Check a urine drug screen before initiating opioids and at least annually thereafter.
• Connect patients with opioid use disorders to appropriate treatment including medication assisted treatment and behavioral therapy.
We are where we are. Now what?
Thank you!