Fusing Administrative Data to Combat the Opioid Crisis

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Fusing Administrative Data to Combat the Opioid Crisis

Abstract
Opioid-related overdose deaths remain the leading cause of unintentional injury fatalities in the United States. State lawmakers have responded to this crisis by establishing a regulatory environment that extends various legal protections to persons who may help save the life of someone experiencing an opioid-related overdose. Most states now protect specific parties (e.g., doctors, pharmacists, first responders, laypersons) from civil or criminal liability who prescribe, dispense, possess or administer an opioid antagonist in accordance with the provisions of the state’s law. In addition to standing orders that facilitate access to opioid antagonists, many states offer legal protection to “Good Samaritans” seeking medical and emergency assistance for a person experiencing an overdose. Some states additionally mandate that addiction-treatment services be offered in conjunction with the dispensing of an opioid antagonist, whereas others designate revenue to purchase opiate antagonists or to fund treatment programs.

Little is known about the potential impact of such regulatory actions on the opioid crisis. RTI’s Data Fusion Center seeks to meet this need by combining administrative data across sources and systems to inform research and policy. The current paper describes the Data Fusion Center and presents preliminary results from a study that predicts opioid-related overdose deaths based on the existence and strength of opioid-related state laws among 50 states from 2006 to 2016. Policy data were webscraped from state agencies, systematically coded, and associated with target outcomes sourced from CDC. Study findings may help inform lawmakers and stakeholders in prioritizing data-driven policy responses to the opioid crisis.

Comments
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MEASURING STATE-LEVEL POLICIES TO REDUCE OPIOID-RELATED OVERDOSE DEATHS: AN EXPLORATORY STUDY
Opioid Overdose Deaths by State, 2016

### Top 10 States with Opioid-Related Overdose Deaths, 2016

<table>
<thead>
<tr>
<th>RANK</th>
<th>STATE</th>
<th>RATE / 100,000</th>
<th>Number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WV</td>
<td>52.0</td>
<td>884</td>
</tr>
<tr>
<td>2</td>
<td>OH</td>
<td>39.1</td>
<td>4,329</td>
</tr>
<tr>
<td>3</td>
<td>NH</td>
<td>39.0</td>
<td>481</td>
</tr>
<tr>
<td>4</td>
<td>PA</td>
<td>37.9</td>
<td>4,627</td>
</tr>
<tr>
<td>5</td>
<td>KY</td>
<td>33.5</td>
<td>1,419</td>
</tr>
<tr>
<td>6</td>
<td>MD</td>
<td>33.2</td>
<td>2,044</td>
</tr>
<tr>
<td>7</td>
<td>MA</td>
<td>33.0</td>
<td>2,227</td>
</tr>
<tr>
<td>8</td>
<td>DE</td>
<td>30.8</td>
<td>282</td>
</tr>
<tr>
<td>9</td>
<td>RI</td>
<td>30.8</td>
<td>326</td>
</tr>
<tr>
<td>10</td>
<td>ME</td>
<td>28.7</td>
<td>353</td>
</tr>
</tbody>
</table>

Do state laws reduce opioid-related overdose deaths?

Exploratory study aims:

1. Identify and quantify opioid-related laws in the United States
2. Fuse policy data with state-level overdose data
3. Inform a comprehensive study with testable hypotheses
Data Fusion Center: Integrating Opioid Data Data

- Regulations Data
- Community Risk Data
- PDMP Data
- Pharma Data
- Coroner Data
- Claims Data
- Internet Data (e.g. chat)
- Sensor Data
- Treatment Data
- Services Data
- Survey Data
- Police Data
- Emergency Room Data
- EMS Data
- Drug Seizure Data
- Naloxone Data
Methods and Approach

• Compile policy categories in effect, from 2000-18, in 50 states + D.C.
• Use Boolean terms & connectors searches to identify relevant state laws in LexisNexis
• Identify laws in 3 categories that may be correlated with a reduction in opioid-related mortality
  • Naloxone Immunity
  • Good Samaritan
  • Earmarked funding
• Coding Scheme: “zero” = if no law; “1” if law exists
• Variables: number of laws per category, state, year, and state ranking for overdose mortality
Naloxone Immunity Laws: Overview

Civil, criminal, or disciplinary legal protection

1. Physicians prescribing naloxone (including 3rd party Rx)
2. Pharmacists dispensing naloxone
3. First Responders administering naloxone
4. School Staff administering naloxone
5. Laypersons possessing naloxone
6. Laypersons administering naloxone

Standing Orders
Number of Naloxone Immunity Laws, National (per-state) Average by Year

![Graph showing the number of Naloxone Immunity Laws per year from 2008 to 2018. The x-axis represents the years, and the y-axis represents the number of provisions. The graph shows a steady increase in provisions from 2010 onwards, with a significant rise after 2015. The national average is represented by a solid line, and structural break(s) are indicated by dashed lines at specific years.]
Common Types of Naloxone Immunity Laws in the United States (2017)

5 MOST COMMON:

- 90%
- 84%
- 82%
- 82%
- 75%

% of states with provision:
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

5 LEAST COMMON:

- 25%
- 20%
- 20%
- 12%
- 12%

% of states with provision:
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Number of Naloxone Immunity Laws in “Top 5” States, by Year

<table>
<thead>
<tr>
<th>State</th>
<th>OLS slope coefficient [95% confidence interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia</td>
<td>0.71** [0.33, 1.09]</td>
</tr>
<tr>
<td>Ohio</td>
<td>0.79*** [0.42, 1.16]</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>0.53** [0.24, 0.81]</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>0.80*** [0.48, 1.12]</td>
</tr>
<tr>
<td>Kentucky</td>
<td>0.59*** [0.36, 0.82]</td>
</tr>
<tr>
<td>National Average</td>
<td>0.51*** [0.28, 0.74]</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001
Naloxone Immunity Laws: Summary

1. Heterogeneity across states; no 2 states are the same

2. More states offer protection from civil than criminal lawsuits or disciplinary/professional sanction

3. Many states offer at least one form of legal protection, for many of the same parties

4. “Top 5” states tend to have more laws than the national average
Protection from arrest, criminal charges or prosecution for Good Samaritans who seek help:

1. Controlled substance (CS) possession
2. CS paraphernalia possession
3. Individuals on probation or parole
Proportion of States with Good Samaritan Laws, by Year

- CSP, Arrest
- CPS, Charge
- CSP, Prosecution
- Para, Arrest
- Para, Charge
- Para, Prosecution
- Other violation, Probation
Common Types of Good Samaritan Laws in the United States (2017)

MORE COMMON
(CONTROLLED SUBSTANCES)

LESS COMMON
(PARAPHERNALIA & PROBATION)

- Prosecution: 76%
- Charge: 53%
- Arrest: 43%
- Prosecution: 43%
- Probation: 37%
- Charge: 31%
- Arrest: 25%
Number of Good Samaritan Laws in “Top 5” States, by Year

<table>
<thead>
<tr>
<th>State</th>
<th>OLS slope coefficient</th>
<th>[95% confidence interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia</td>
<td>0.11**</td>
<td>[0.05, 0.16]</td>
</tr>
<tr>
<td>Ohio</td>
<td>0.17*</td>
<td>[0.04, 0.30]</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>0.16**</td>
<td>[0.07, 0.24]</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>0.31***</td>
<td>[0.18, 0.43]</td>
</tr>
<tr>
<td>Kentucky</td>
<td>0.21**</td>
<td>[0.10, 0.33]</td>
</tr>
<tr>
<td>National Average</td>
<td>0.17***</td>
<td>[0.11, 0.24]</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001
Good Samaritan Laws: Summary

1. Heterogeneity: no two states’ laws are the same
2. Greater protection for drug possession than for drug paraphernalia
3. For drug possession, greater protection from prosecution than arrest
4. Protection for Good Samaritans on probation or parole is uncommon
5. PA, KY, and OH have more laws than the national average
# Naloxone + Good Samaritan Laws (combined) by State (2017)

# corresponds to the state’s rank of opioid-related mortality in 2016 according to the CDC
Designated state-level revenue specifically earmarked for opioid-related interventions or responses:

1. Purchase and distribution of naloxone kits
2. Addiction treatment (general population)
3. Addiction treatment (pregnant/post-partum women)
4. Addiction treatment (inmates)
5. Pilot program to address opioid crisis
6. Other opioid program that implies funding
7. Specific dollar or revenue percentage amounts
Number of Opioid-Related Earmarks, National (per state) Average by Year

- **Number of Provisions**
  - National Average
  - Structural break(s)

- **Years**:
  - 2008
  - 2009
  - 2010
  - 2011
  - 2012
  - 2013
  - 2014
  - 2015
  - 2016
  - 2017
  - 2018

- **Graph**:
  - Axes: # of provisions on the y-axis, years on the x-axis.
  - Line graph showing the trend of national average and structural breaks from 2008 to 2018.
Common Types of Opioid-Related Earmarks in the United States (2017)
Number of Opioid-Related Earmarks in “Top 5” States, by Year

<table>
<thead>
<tr>
<th>State</th>
<th>OLS slope coefficient</th>
<th>[95% confidence interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Virginia</td>
<td>0.02</td>
<td>[-0.01, 0.05]</td>
</tr>
<tr>
<td>Ohio</td>
<td>0.04</td>
<td>[-0.01, 0.10]</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>0.05</td>
<td>[0.00, 0.10]</td>
</tr>
<tr>
<td>Kentucky</td>
<td>0.05*</td>
<td>[0.01, 0.10]</td>
</tr>
<tr>
<td>National Average</td>
<td>0.03***</td>
<td>[0.02, 0.04]</td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001
Opioid Earmarked Funding: Summary

1. Heterogeneity: type of funding varies across states

2. Designated opioid-related funding changes year to year

3. States appropriate funding most often to treat opioid use disorder