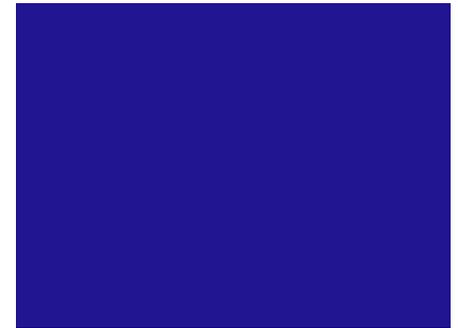




**DATA SCIENCE  
SOLUTIONS TO  
COMBATTING  
OPIOID AND CRIME  
PROBLEMS**



**American Society of Criminology Meeting  
November 15, 2019  
San Francisco, CA**

# + Big Problems & Big Data

- ❑ Researchers across disciplines are developing innovative ways to understand and address the current opioid epidemic using “Big Data”
- ❑ Today’s panel highlights two such projects:
  - ❑ The Delaware Opioid Metric Intelligence project (DOMIP – funded by the National Institute of Justice) and
  - ❑ The Florida Drug-Related Outcomes and Tracking System (FROST- funded by the Bureau of Justice Assistance)

# + Presentation Format

- Two presentations & Open Dialogue
  1. Delaware DOMIP
  2. Florida FROST
  3. Question set posed to each project group by moderator
  4. Open discussion with audience
  5. Adjourn @ 3:20

# + Delaware Opioid Metric Intelligence Project (DOMIP)

The screenshot shows the website for the University of Delaware Center for Drug & Health Studies. The header includes the university logo and navigation links for 'Visit', 'Apply', and 'Give'. Below the header, there is a 'Quick Links' dropdown menu. The main navigation bar lists 'ABOUT US', 'PEOPLE', 'PROJECTS', 'PUBLICATIONS', 'RESOURCES', 'SEOW', and 'NEWS FROM THE FIELD'. The 'PROJECTS' section is expanded to show 'DOMIP'. A sidebar on the left contains a 'CONNECT' section with 'Make a Gift' and social media icons. The main content area displays the 'DOMIP' project title, a map of Delaware, and the names of the Principal Investigator (Tammy L. Anderson, PhD) and Co-Investigator (Daniel O'Connell, PhD).

<https://www.cdhs.udel.edu/projects/domip>



STRENGTHEN SCIENCE. ADVANCE JUSTICE.

Support is provided by Award No. NIJ Grant 2017-IJ-CX-0016, of the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice.

# + DOMIP Project Description

***The Delaware Opioid Metric Intelligence Project (DOMIP) – seeks to improve drug intelligence and community surveillance to help reduce Delaware’s Rx opiate, heroin, opioid and related problems.***

- Goal #1. Build a six-year (2013-2018) de-identified dataset with critical opiate, heroin, and opioid-based NPS public health and crime metrics.
- Goal #2. Perform trend analyses to investigate over time changes.
- Goal #3. Perform pre & post-test analysis of new Rx opiate, heroin and opioid-based NPS policies to assess the impact on public health and crime metrics.
- Goal #4. Conduct hot spots mapping for place-based interventions.
- Goal #5. Statistically model theories of negative opioid and crime outcomes.

# + DOMIP Dashboard

About DOMIP



## Overdose Deaths By Census Tract

Center for Drug and Health Studies

- 2018
- 2017
- 2016
- 2015
- 2014
- 2013



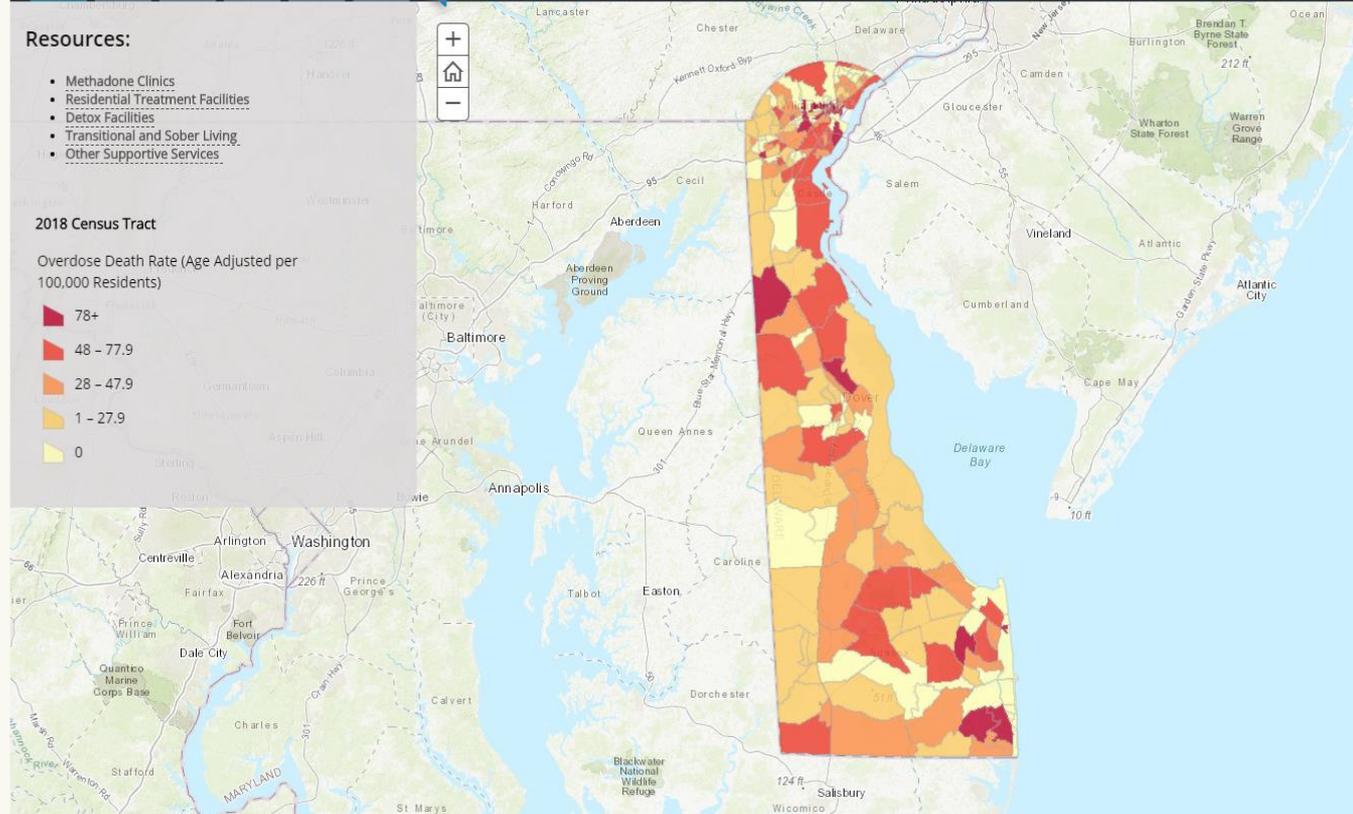
### Resources:

- Methadone Clinics
- Residential Treatment Facilities
- Detox Facilities
- Transitional and Sober Living
- Other Supportive Services

### 2018 Census Tract

Overdose Death Rate (Age Adjusted per 100,000 Residents)

- 78+
- 48 - 77.9
- 28 - 47.9
- 1 - 27.9
- 0



## Delaware Opioid Metric Intelligence Project (DOMIP)

Census Tract



### Printed Maps:



- o [2018](#)
- o [2017](#)
- o [2016](#)
- o [2015](#)
- o [2014](#)
- o [2013](#)

Zip Code



### Printed Maps:

- o [2018](#)
- o [2017](#)
- o [2016](#)
- o [2015](#)
- o [2014](#)
- o [2013](#)

# + DOMIP Dashboard- Compare Years

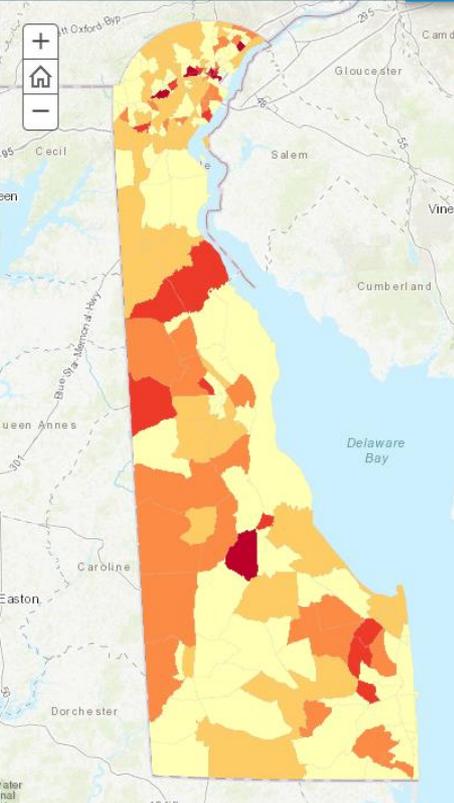
## Overdose Deaths By Census Tract

2018 2017 2016 2015 2014 2013

### 2013 Census Tract

Overdose Death Rate (Age Adjusted per 100,000 Residents)

- 78+
- 48 - 77.9
- 28 - 47.9
- 1 - 27.9
- 0



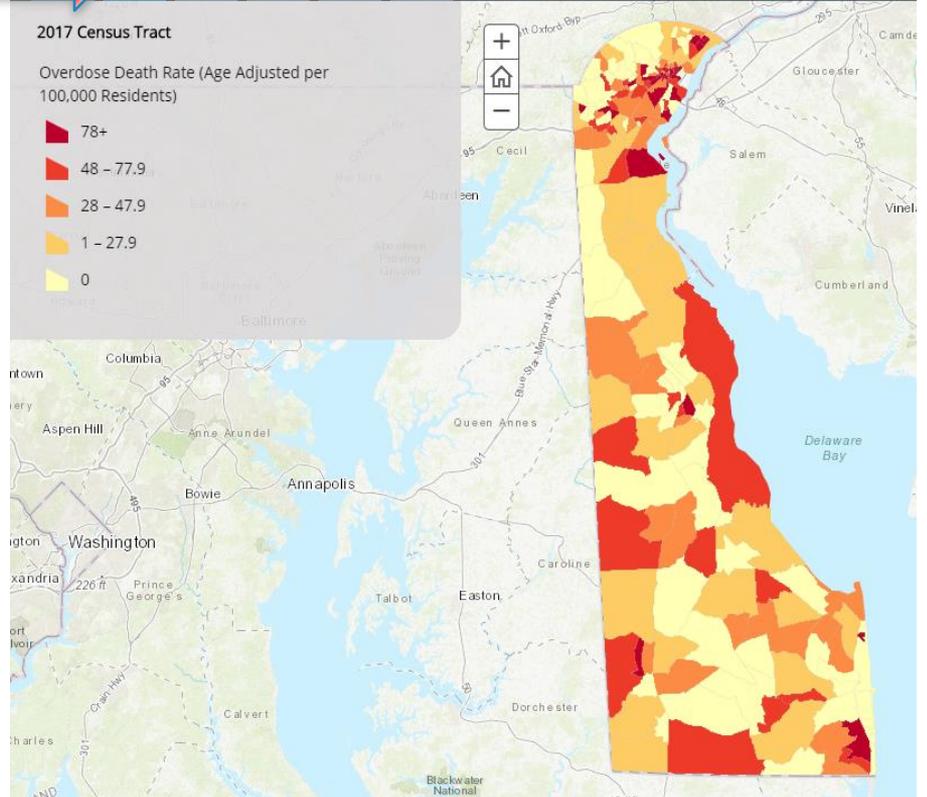
## Overdose Deaths By Census Tract

2017 2016 2015 2014 2013

### 2017 Census Tract

Overdose Death Rate (Age Adjusted per 100,000 Residents)

- 78+
- 48 - 77.9
- 28 - 47.9
- 1 - 27.9
- 0



# + DOMIP Dashboard- Change Units

## Overdose Deaths by Zip Code



2018 2017 2016 2015 2014 2013

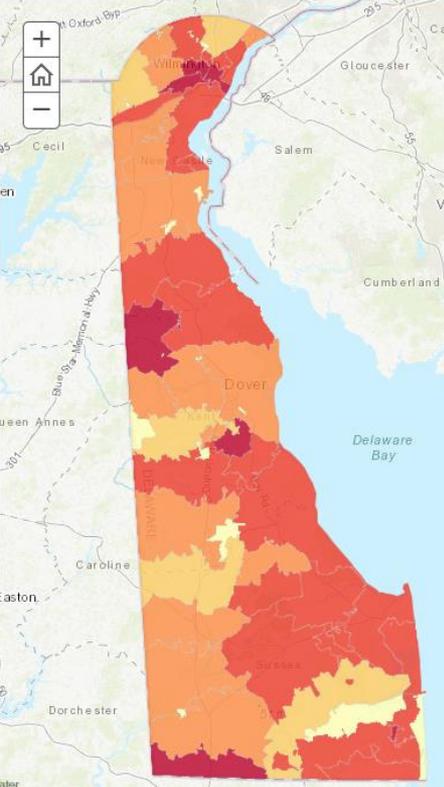
### Resources:

- [Methadone Clinics](#)
- [Residential Treatment Facilities](#)
- [Detox Facilities](#)
- [Outpatient Treatment Facilities](#)
- [Transitional and Sober Living](#)
- [Other Support Services](#)

### Zip Code 2018

Overdose Death Rate (Age Adjusted per 100,000 Residents)

- 55+
- 32 - 54.9
- 17 - 31.9
- 5 - 16.9
- 0 - 4.9



## Overdose Deaths by House District



2018 2017 2016 2015 2014 2013

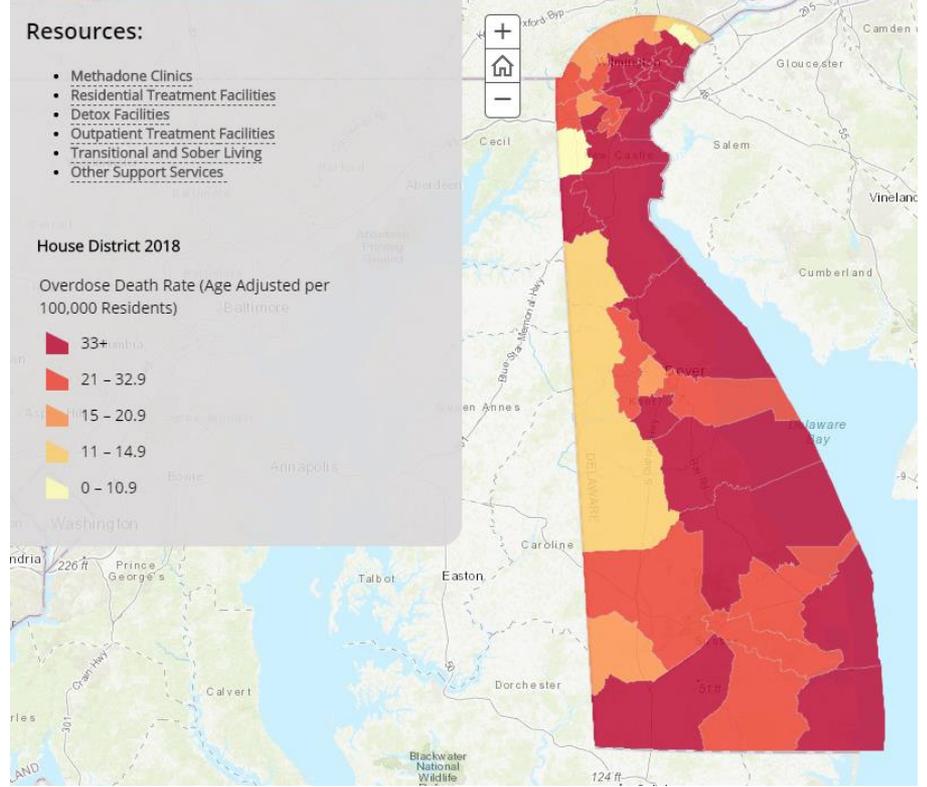
### Resources:

- [Methadone Clinics](#)
- [Residential Treatment Facilities](#)
- [Detox Facilities](#)
- [Outpatient Treatment Facilities](#)
- [Transitional and Sober Living](#)
- [Other Support Services](#)

### House District 2018

Overdose Death Rate (Age Adjusted per 100,000 Residents)

- 33+
- 21 - 32.9
- 15 - 20.9
- 11 - 14.9
- 0 - 10.9



# + DOMIP Dashboard- Print Maps

About DOMIP    

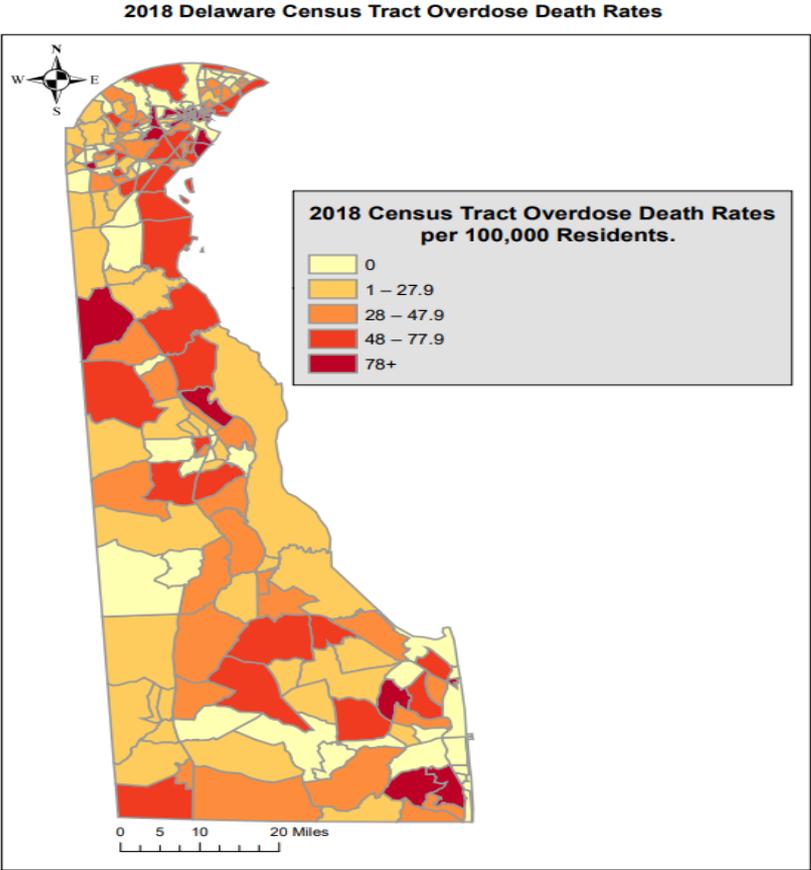
## Delaware Opioid Metric Intelligence Project (DOMIP)

*Census Tract*

- Printed Maps:
  - [2018](#)
  - [2017](#)
  - [2016](#)
  - [2015](#)
  - [2014](#)
  - [2013](#)

*Zip Code*

- Printed Maps:
  - [2018](#)
  - [2017](#)
  - [2016](#)
  - [2015](#)
  - [2014](#)
  - [2013](#)



Overdose death data was provided by the Delaware Department of Forensic Science.  
2010 data from the US Census Bureau was used for age adjustments.  
The Delaware Opioid Metric Intelligence Project (DOMIP) is funded by the NIJ.

## Predicting Opioid Prescriptions

## Understanding Differences in Types of Opioid Prescriptions Across Time and Space: A Community-Level Analysis

Journal of Drug Issues  
2019, Vol. 49(2) 405–418  
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Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/0022042618815687  
journals.sagepub.com/home/jod



## Predicting Overdose Death Rates

[Journal of Community Health](#)

April 2019, Volume 44, [Issue 2](#), pp 272–283 | [Cite as](#)

## Understanding Geographic and Neighborhood Variations in Overdose Death Rates

## Predicting Opioid Arrest Rates by Race

## Revisiting Neighborhood Context and Racial Disparities in Drug Arrests Under the Opioid Epidemic

Race and Justice  
1-22  
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sagepub.com/journals-permissions  
DOI: 10.1177/2153368719877222  
journals.sagepub.com/home/raj



# + DOMIP Scientific Contributions

## Predicting Opioid Prescriptions

- **Population characteristics linked to prescribing rates**
- **PDMP payment also affects prescriptions**

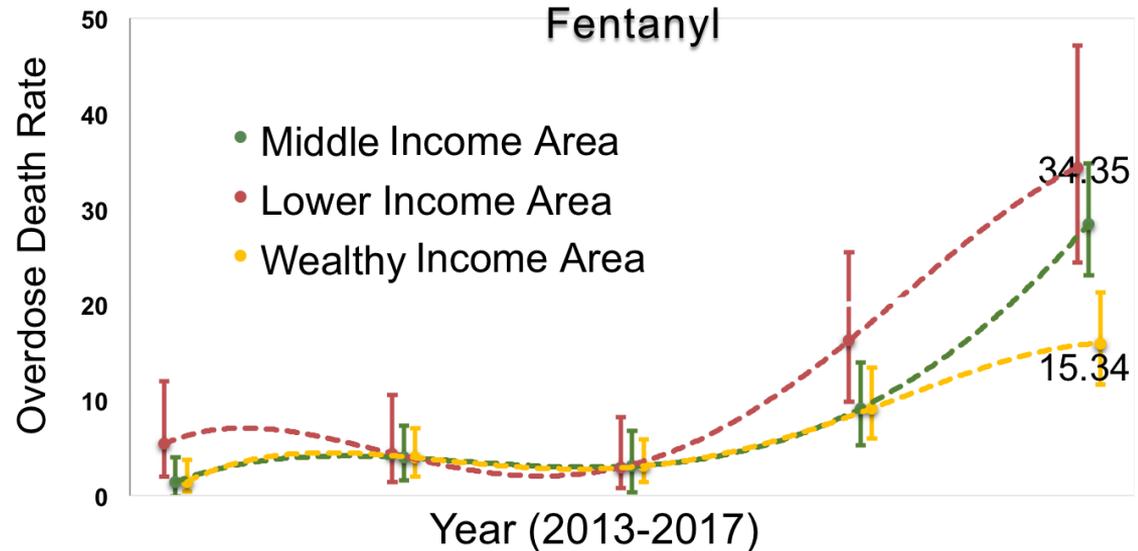
Community Predictor	Effect on Change in Prescriptions (2010-2013)
Percent White Pop.	0.57 (0.23)*
Percent Veteran Pop.	3.76 (1.02)*
Rate Rx paid by Commercial Insurance	-0.66 (0.12)*
Rate Rx paid by Medicaid/Medicare	0.49 (0.14)*

Anderson et al. (2018). *Journal of Drug Issues*.

# + DOMIP Scientific Contributions

## Predicting Overdose Death Rates

- **Overdose death rates vary up to 13 fold by community type**
- **Death rates growing & often similar across SES**

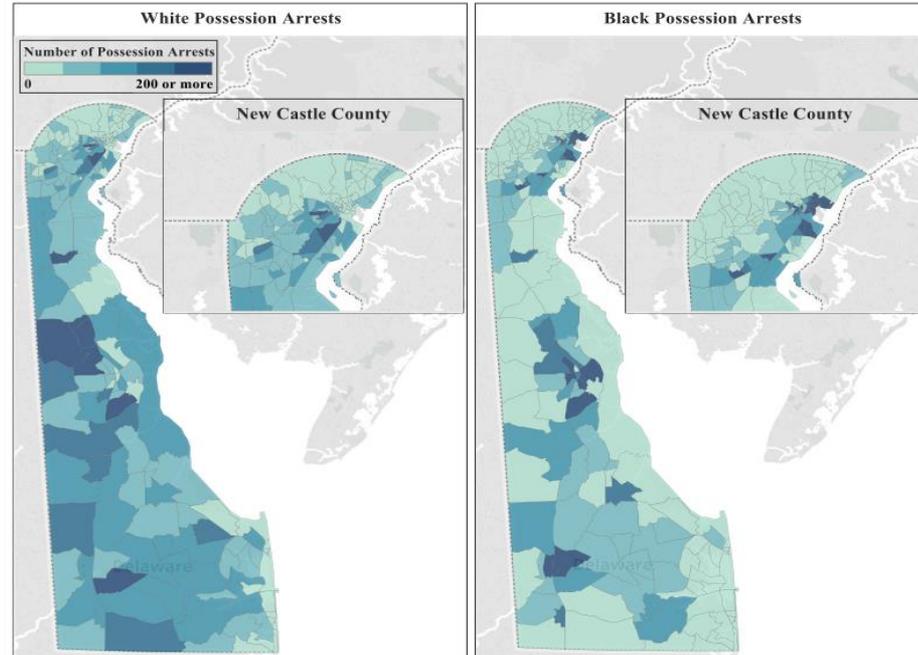


Wagner et al. (2019). *Journal of Community Health*.

# + DOMIP Scientific Contributions

## Predicting Opioid Arrest Rates by Race

- **Most opioid arrests among Whites**
- **Overdose calls predict White arrest rates**
- **Disadvantage & racial diversity predict Black arrest rates**



Donnelly et al. (In Press). *Race and Justice*.

# + DOMIP Funding Information

- This project was supported by Award No. NIJ Grant 2017-IJ-CX-0016, awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The opinions, findings, and conclusions or recommendations expressed in this publication/program/exhibition are those of the author(s) and do not necessarily reflect those of the Department of Justice.



# Data Science and Opioids

Chris Delcher, PhD  
Associate Director, Institute for Pharmaceutical Outcomes & Policy  
College of Pharmacy  
University of Kentucky  
11/15/2019





## Publications & Reports

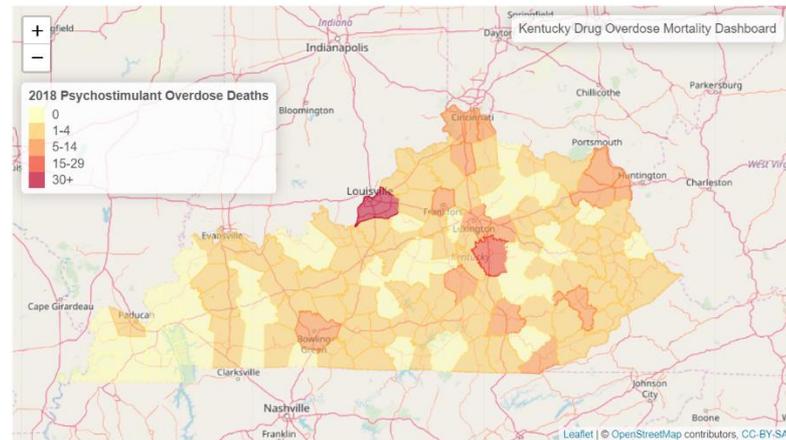
[Reports](#) | [Peer-Reviewed Articles](#) | [Presentations](#)

# Kentucky Drug Overdose Mortality Dashboards

Updated 09/25/2019

## Kentucky Resident Drug Overdose Deaths by County

[Any substance](#) [Opioids](#) [Heroin](#) [Fentanyl](#) [Psychostimulants with abuse potential](#)



# Death Certificate Processing

Current Epidemiology Reports (2019) 6:263–274  
https://doi.org/10.1007/s40471-019-00201-9

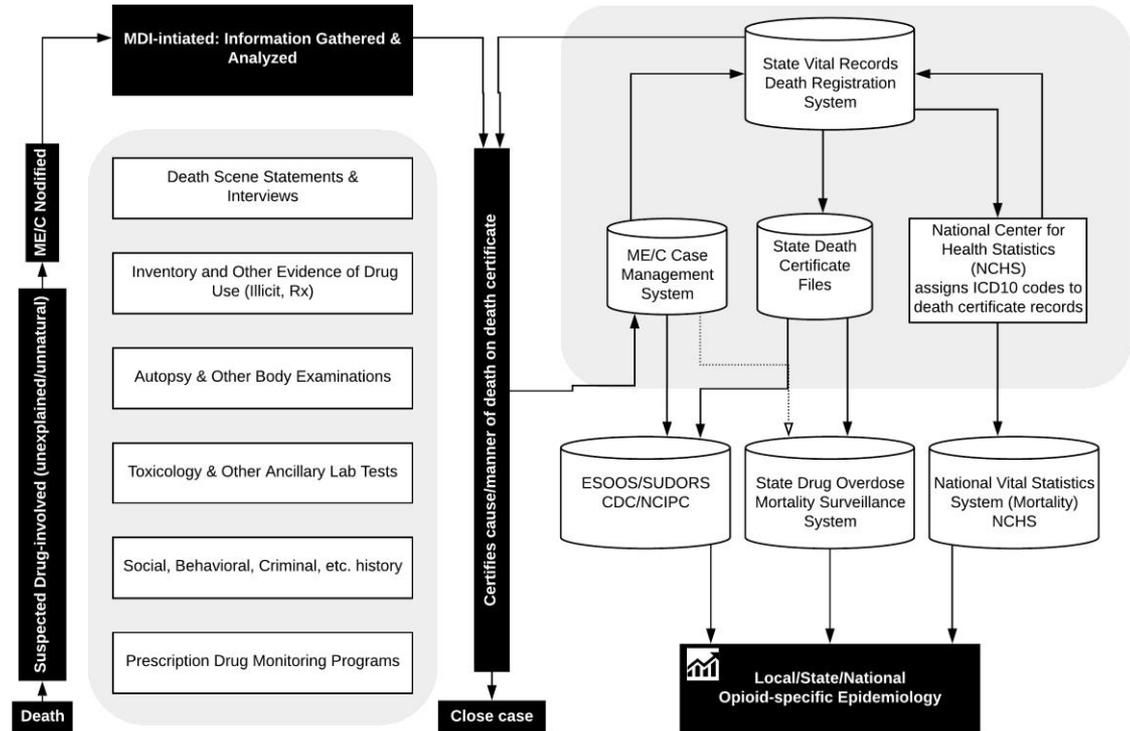
INJURY EPIDEMIOLOGY (S MARSHALL, SECTION EDITOR)



## Methodological Complexities in Quantifying Rates of Fatal Opioid-Related Overdose

Svetla Slavova<sup>1,2</sup> · Chris Delcher<sup>3</sup> · Jeannine M. Buchanich<sup>4</sup> · Terry L. Bunn<sup>2,5</sup> · Bruce A. Goldberger<sup>6</sup> · Julia F. Costich<sup>2,7</sup>

Published online: 2 May 2019  
© The Author(s) 2019



**SUBSTANCE ABUSE**

By Troy Quast, Eric A. Storch, and Svetlana Yampolskaya

DOI: 10.1016/j.addbeh.2017.10.23  
HEALTH AFFAIRS 37,  
NO. 11 (2018) 1844–1859  
©2018 Project HOPE—  
The People-to-People Health  
Foundation, Inc.

## Opioid Prescription Rates And Child Removals: Evidence From Florida

Addictive Behaviors 93 (2019) 52–58

Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: [www.elsevier.com/locate/addictbeh](http://www.elsevier.com/locate/addictbeh)

The relationship between foster care entries and high-dose opioid prescribing in California

Troy Quast<sup>a,\*</sup>, Melissa A. Bright<sup>b</sup>, Chris Delcher<sup>c</sup>

<sup>a</sup> University of South Florida, College of Public Health, United States  
<sup>b</sup> University of Florida, Amis Zuckler Center for Excellence in Early Childhood Studies, College of Education, United States  
<sup>c</sup> University of Kentucky, Institute of Pharmaceutical Outcomes & Policy and Department of Pharmacy Practice and Science, United States

Drug and Alcohol Dependence

Available online 28 October 2019, 107693

In Press, Journal Pre-proof

Full length article

### Overlapping prescriptions of opioids, benzodiazepines, and carisoprodol: “Holy Trinity” prescribing in the state of Florida

Yanning Wang<sup>a,\*,</sup>, Chris Delcher<sup>b,</sup>, Yan Li<sup>c,</sup>, Bruce A. Goldberger<sup>d,</sup>, Gary M. Reisfield<sup>e</sup>

Show more

<https://doi.org/10.1016/j.drugaldep.2019.107693>

Get rights and content

- Increases in opioid prescribing associated with increases in child removals
- High-dose opioid prescribing associated with increases in child removals
- Increases in medication assisted therapy opioids, decreases in child removals.
- High-risk prescribing still occurs despite risks

# ODMAP Initiative (Future) and Book



## 8 STATES SELECTED FOR THE ODMAP STATEWIDE EXPANSION AND RESPONSE GRANT

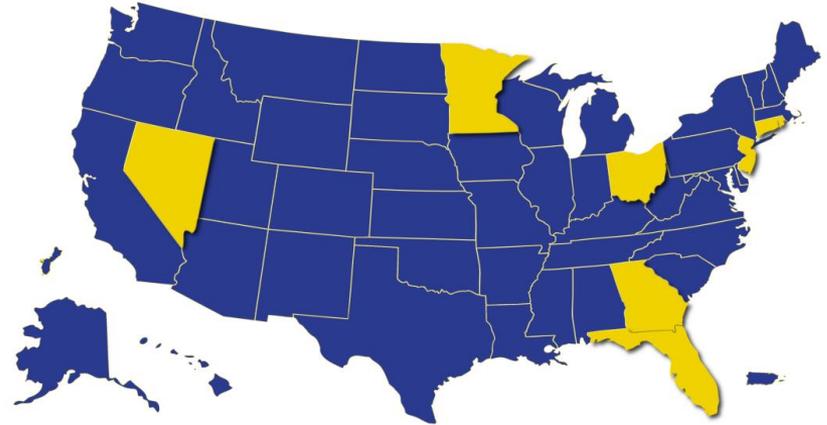
[Click Here to View the ODMAP Statewide Expansion and Response Grant Website](#)

### AN EPIDEMIC

Nationally, in 2017, there were over 72,000 drug overdose deaths with the largest increase in deaths related to fentanyl and synthetic opioids. Provisional data released from the Centers for Disease Control and Prevention (CDC) shows a decrease in fatal overdoses from 2017 to 2018, however, there is an absent methodology nationally to track non-fatal overdoses. ODMAP offers the ability to collect both suspected fatal and non-fatal overdoses, in real time, across jurisdictions, to mobilize a cohesive and collaborative response.



The ODMAP demonstration project supports eight states in achieving statewide adoption of ODMAP and supporting communities in implementing a coordinated response. Select a site to view its profile:



# + Funding Sources & Citation

- Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice (2016-PM-BX-K005; 2017-PM-BX-K038; PIs: Delcher & Goldberger); 2) the Office of National Drug Control Policy (ONDCP) through the South Florida High Intensity Drug Trafficking Area (SFLHIDTA).
- Suggested citation: Wang Y, Goldberger BA, Delcher C. Florida drug-Related Outcomes and Surveillance Tracking System (FROST). University of Florida. 2019.



[Email: chris.delcher@uky.edu](mailto:chris.delcher@uky.edu)

Twitter: @chris\_delcher

# + Moderator dialogue:

## Data Science Challenges

1. Reconciling “academic” interests with “real world realities”
  - Data Use Agreements, MOUs, IRBs
  - Data Quality and Integration
2. Communication w/State Agencies- (Email, Phone, etc. slow!)
3. Data Clearance/Security
  - Security policies
  - Onboarding staff
4. Data Costs
5. Granularity of Data

# + Audience Questions

