

Reproducible Visual Analytics of Public Opioid Data

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The Problem – 500% Increase in Drug Poisoning Deaths

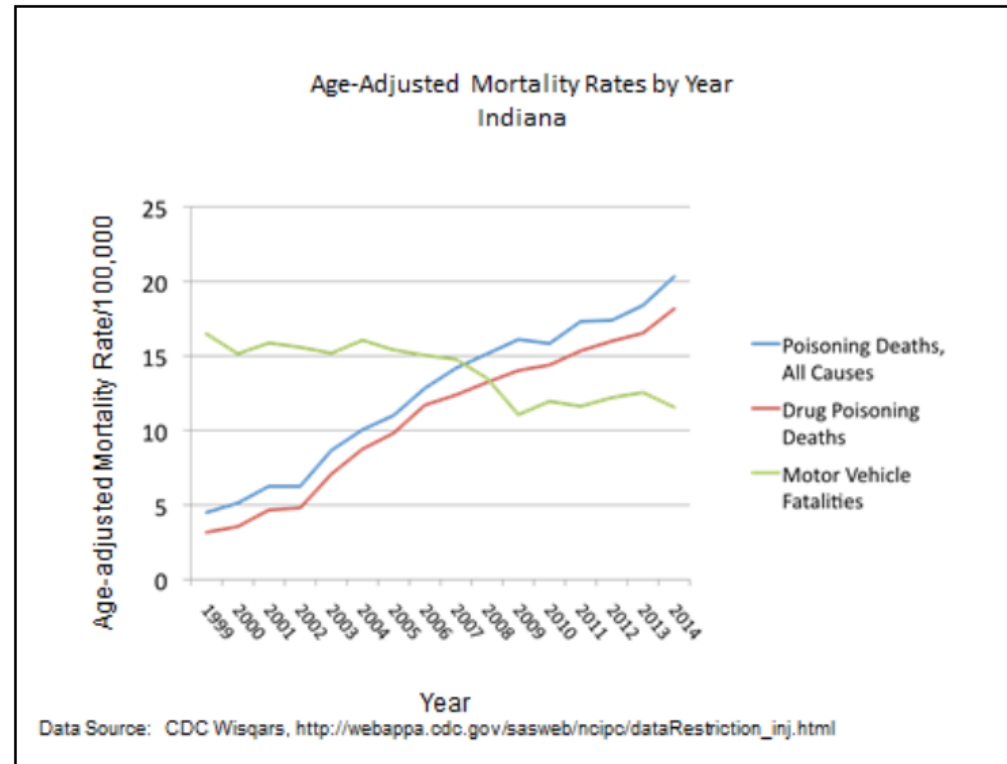
REPORT ON THE TOLL OF OPIOID USE IN INDIANA AND MARION COUNTY

With Recommendations for Improving Health and Well-Being

Prepared by
IU Richard M. Fairbanks School of Public Health at Indiana University-Purdue University Indianapolis

The leading cause of injury death in Indiana is poisoning, with drug overdoses causing more than 9 of 10 poisoning deaths. Drug overdoses overtook the number of motor vehicle deaths in the Hoosier state in 2008. [23]

Figure 3 Drug overdose death rates compared to motor vehicle death rates, Indiana, 1999-2014. [23]



In 2014, Indiana had 1,152 deaths from drug poisonings, up from 184 in 1999, more than a 500% increase.

Key Reasons for Drug Poisoning Deaths



- People do not know the potency of drugs.
- They will take a dosage of the drug considering it to be the same as the previous batch.
- If the potency is high the user is overdosed.
- Synthetic drugs are cheaper to manufacture and generally more potent than the semi-synthetic ones.
- Fentanyl is 100 times more potent than heroin while Carfentanil is 100,000 times more potent than heroin.
- Considering this, the illicit manufacturing of these drugs is increasing over time.

Data Credits



Data Credits

Drug Deaths in United States and Indiana

- Frequency data – FIPS – [2000 to 2014], [Indy Big Data](#)

Substance Abuse Facilities

- Substance Abuse and Mental Health Services Administration - <https://findtreatment.samhsa.gov/locator>

Opioid Prescription with Drug Related Deaths Overlay

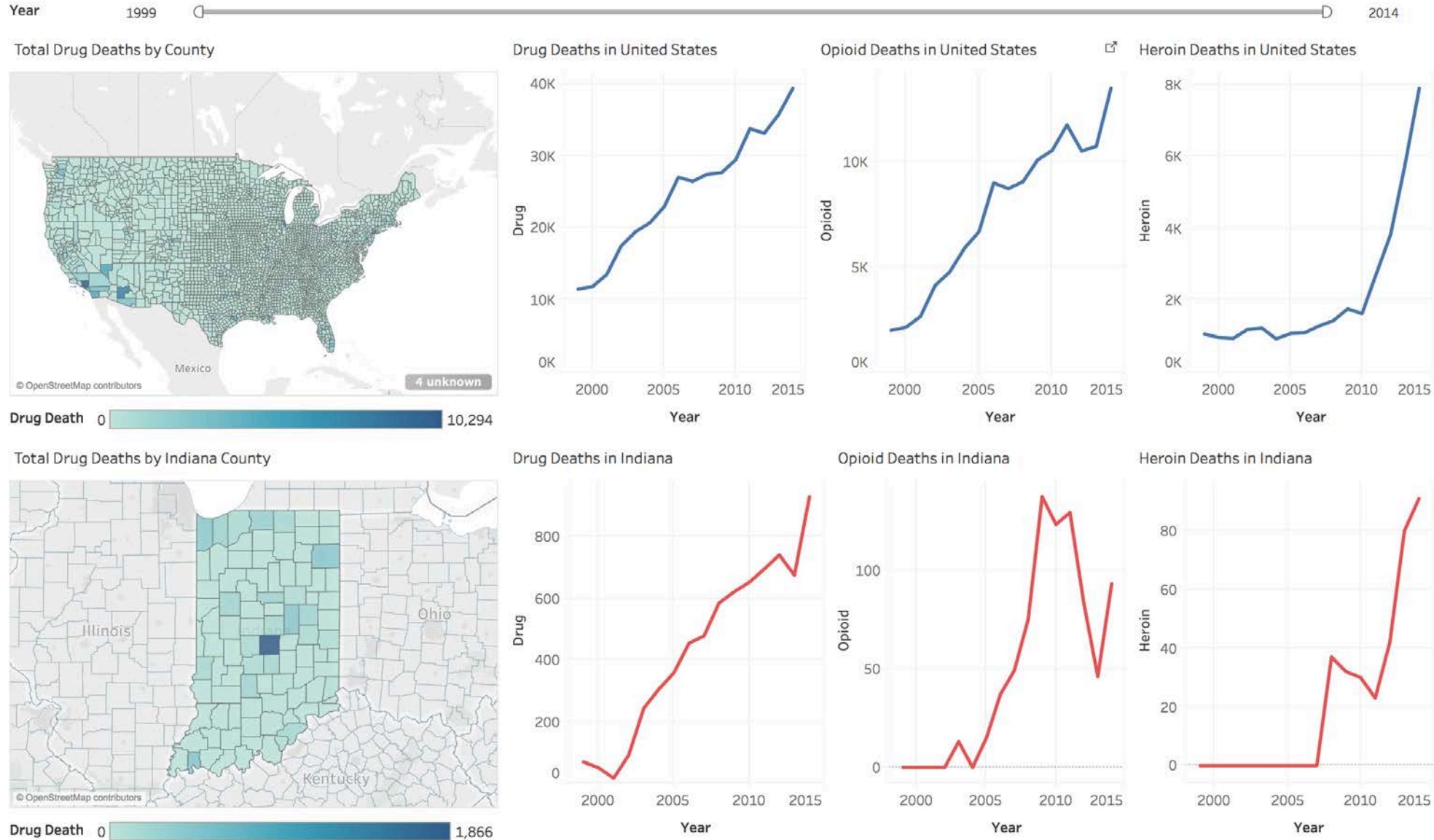
- Frequency data – FIPS – [2000 to 2014], [Indy Big Data](#)
- Demographic data – ZIP3 – [2006 to 2016], [Indy Big Data](#)
- Indiana state ZIP5 and county area coverage data, STATS Indiana - http://www.stats.indiana.edu/maptools/county_zips.xls, <http://www.stats.indiana.edu/maptools/GeographyTools.asp>
- Indiana State County Population data – FIPS – [2000 to 2014], STATS Indiana - <http://www.stats.indiana.edu/topic/population.asp>

Visualizations of Drug Deaths in the United States and Indiana



Drug Deaths in United States and Indiana, 1999- 2014

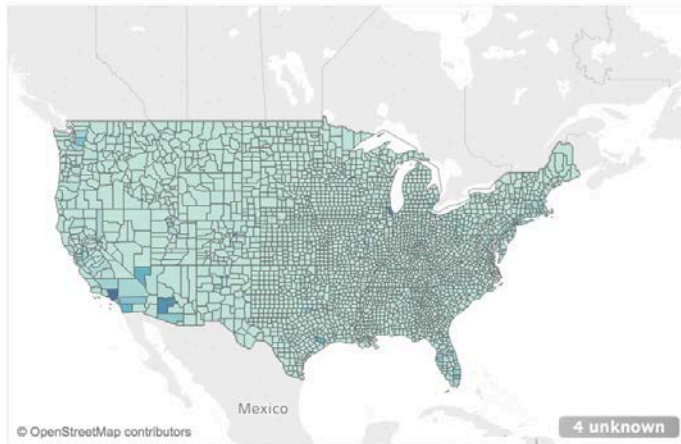
Drug Deaths in United States and Indiana



Drug Deaths in United States and Indiana

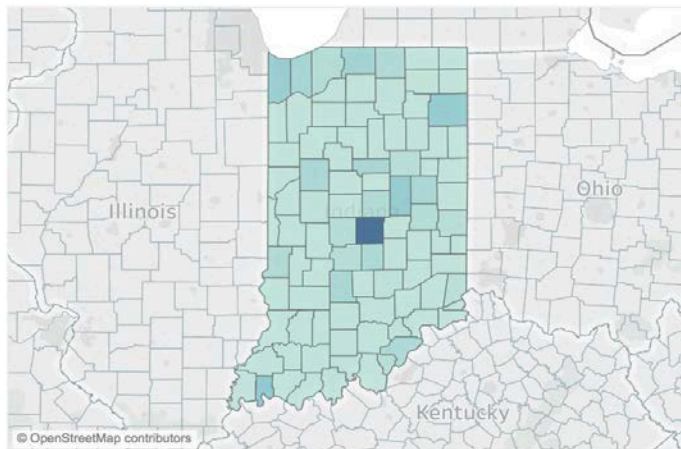
Drug Deaths in United States and Indiana

Total Drug Deaths by County



Drug Death 0 10,294

Total Drug Deaths by Indiana County



Drug Death 0 1,866

Choropleth shows total drug deaths by county per year. Use link to interactive Tableau visualization to explore changes over time.

Line graphs on right of Tableau visualization show the number of all drug related as well as Opioid and Heroin cases over time.

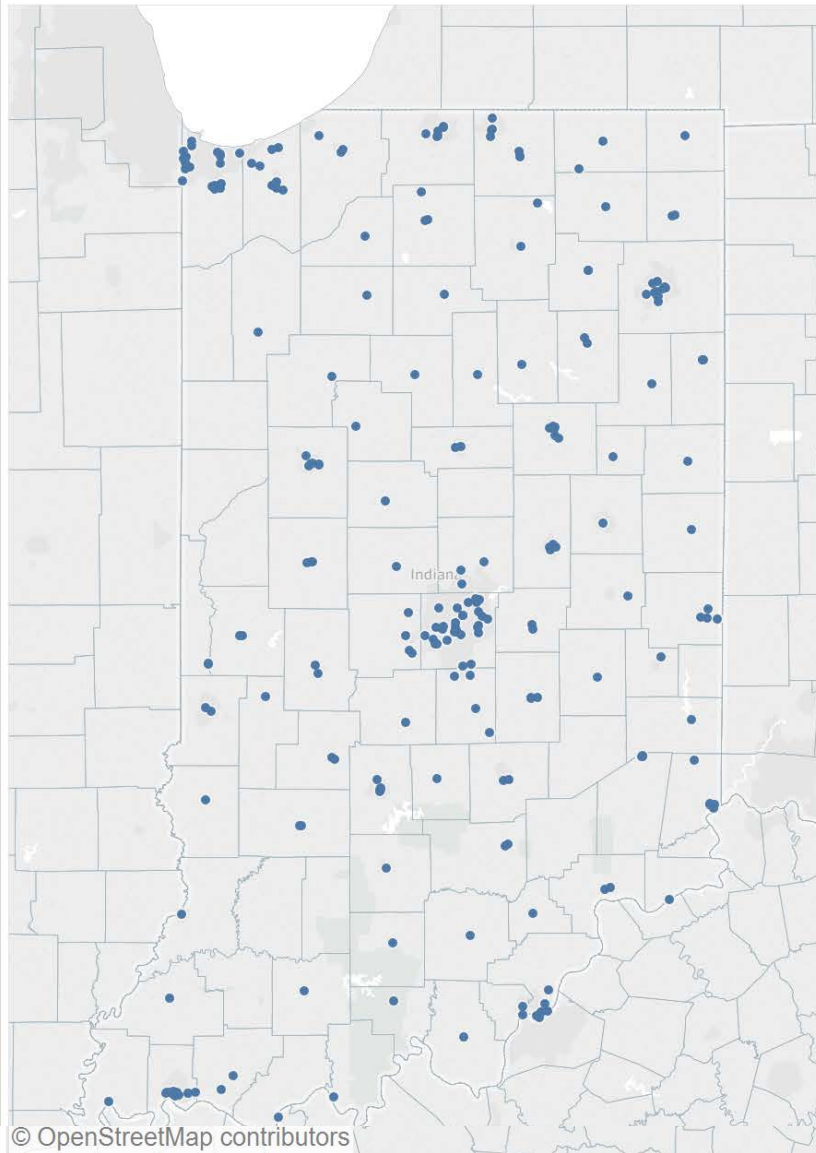
In recent years, the number of cases has increased substantially—in the US overall and in Indiana.

Visualizations of Substance Abuse Facilities

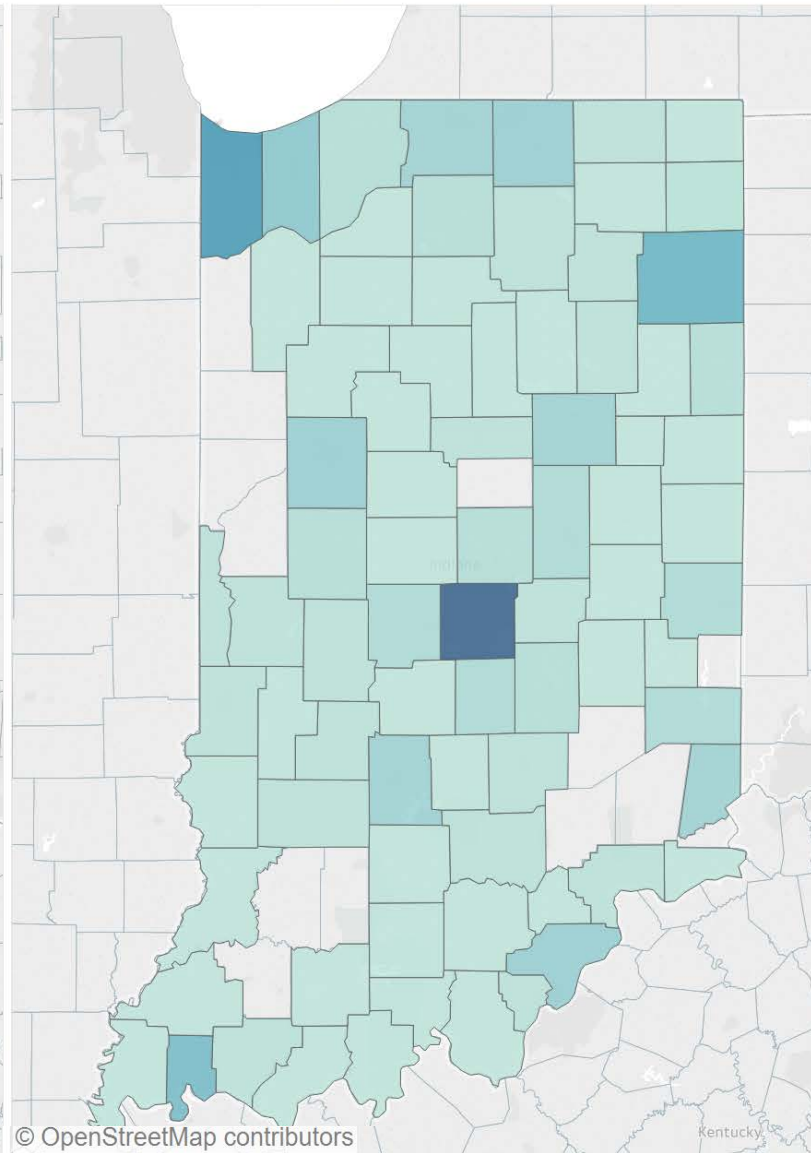


Substance Abuse Facilities (Public and Private)

Facility Locations



Proportion of clinics by county



Count per County
1 33

Most IN counties have at least one substance abuse facility. Compared to other states, IN has very few facilities:

State	Total facilities	Per 1M residents
Indiana	245	37
Illinois	596	46
Kentucky	302	68
Ohio	339	29
Michigan	423	42

<https://findtreatment.samhsa.gov/locator>

Visualization of Opioid Prescription with Drug Related Deaths Overlay



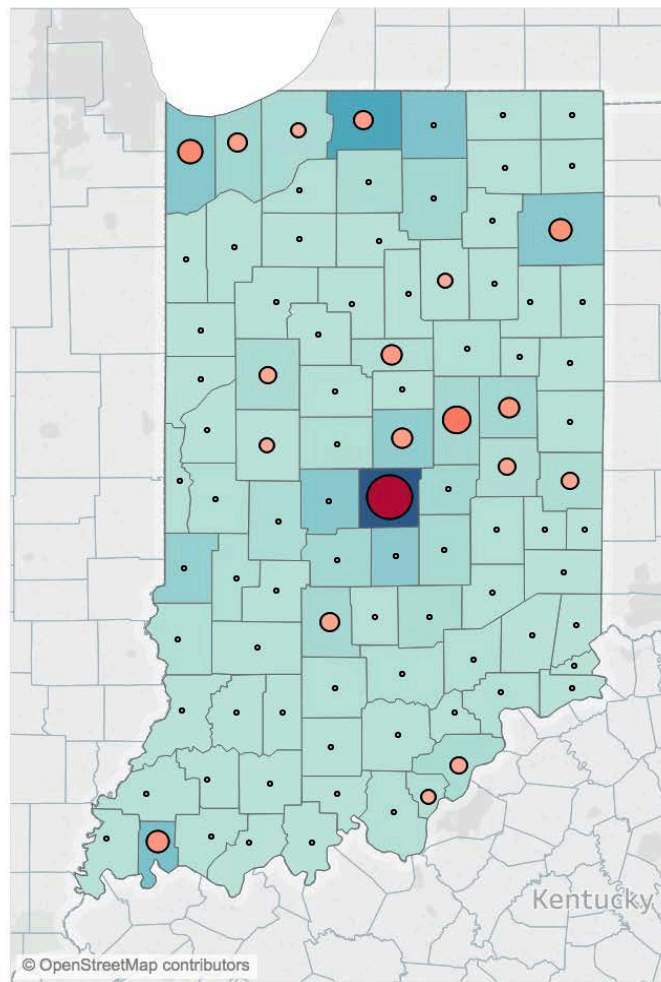
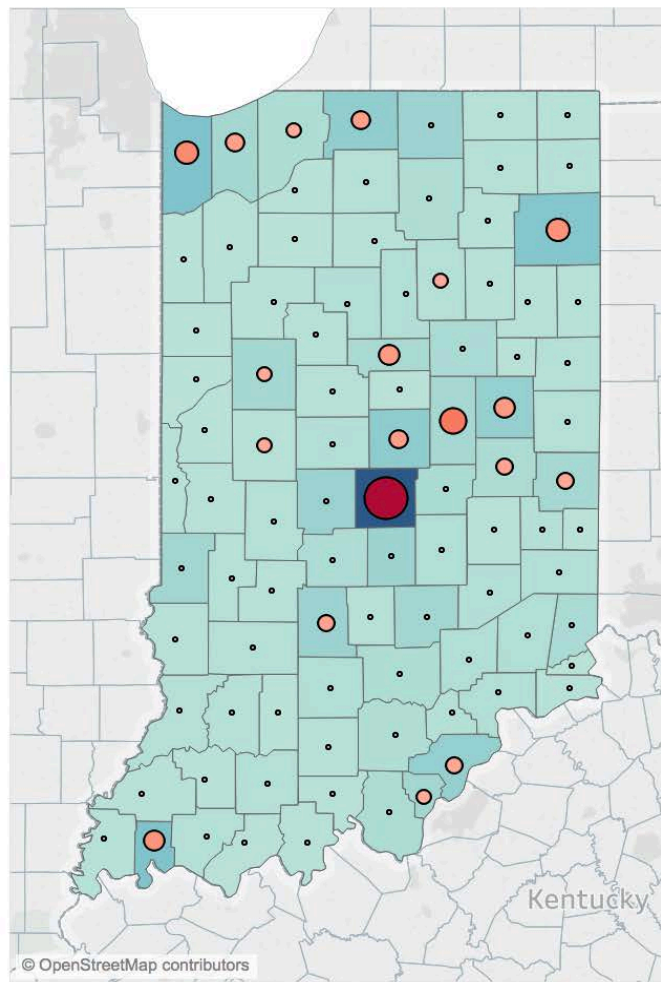
Opioid Prescription with Drug Related Deaths Overlay

Opioid Prescription with Drug Related Deaths Overlay

Year

Oxycodone

Oxymorphone



Drug Deaths



Drug Deaths



Oxycodone MME



Oxymorphone MME



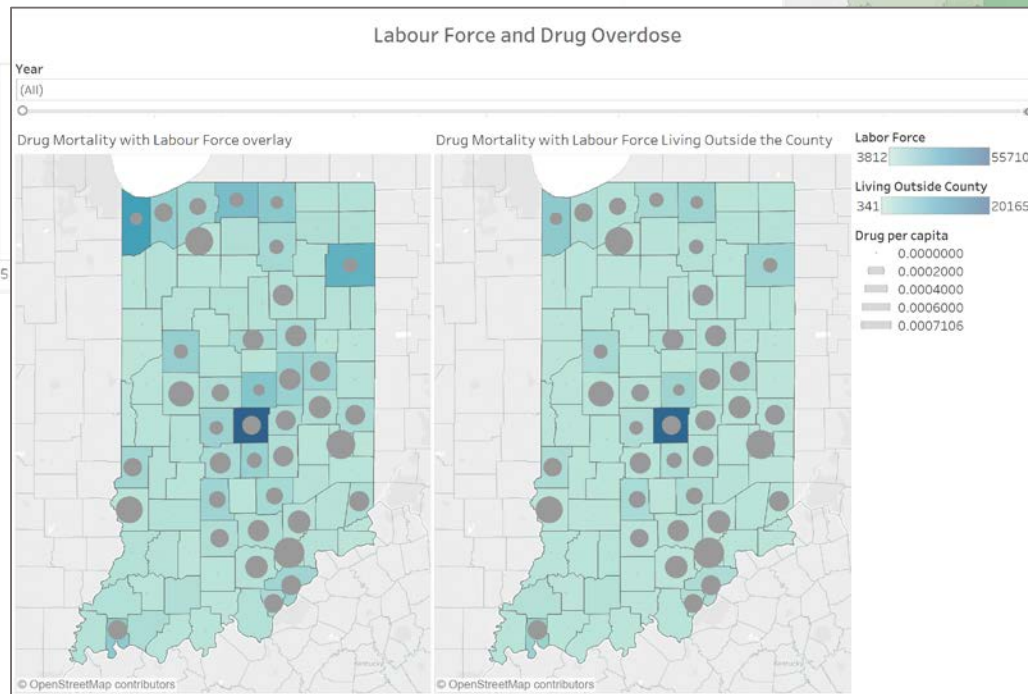
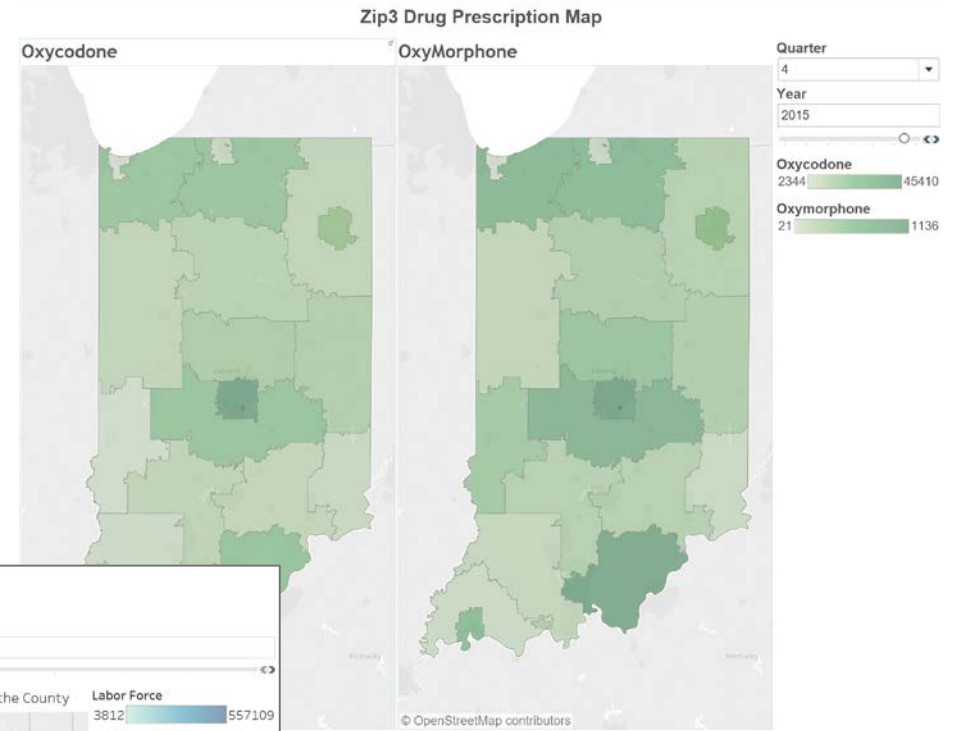
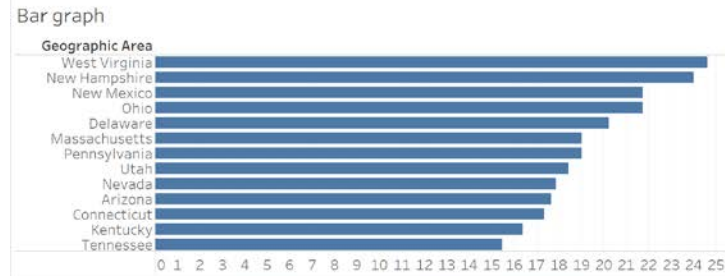
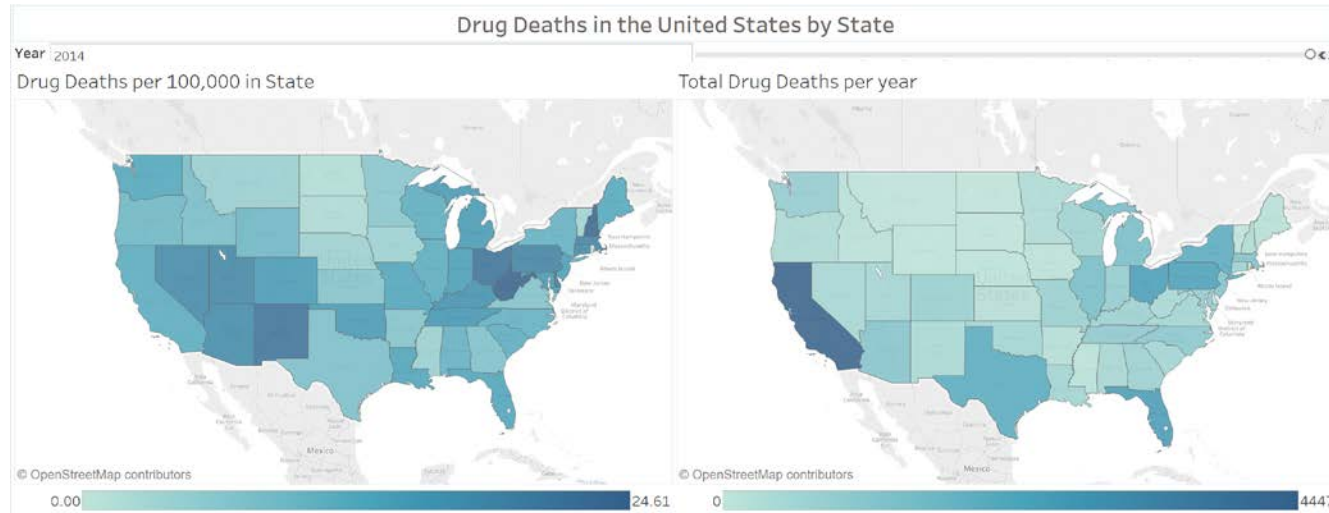
MME - Morphine
Milligram Equivalent

Higher prescription rates correlate with higher numbers of drug deaths.

Over time, deaths do increase AND spread to counties with lower prescription rates.

This might mean that addicts travel between counties to obtain prescriptions.

Other Visualizations Ready for Demo & Discussion



Data Credits:

IN ZIP5 and county ([link](#))

STATS Indiana ([link](#))

Demographic data Zip3 ([link](#))

IN County Unemployment ([link](#))

IN County Commuting ([link](#))

Census state populations ([link](#))

Other Relevant Data and Planned Future Work

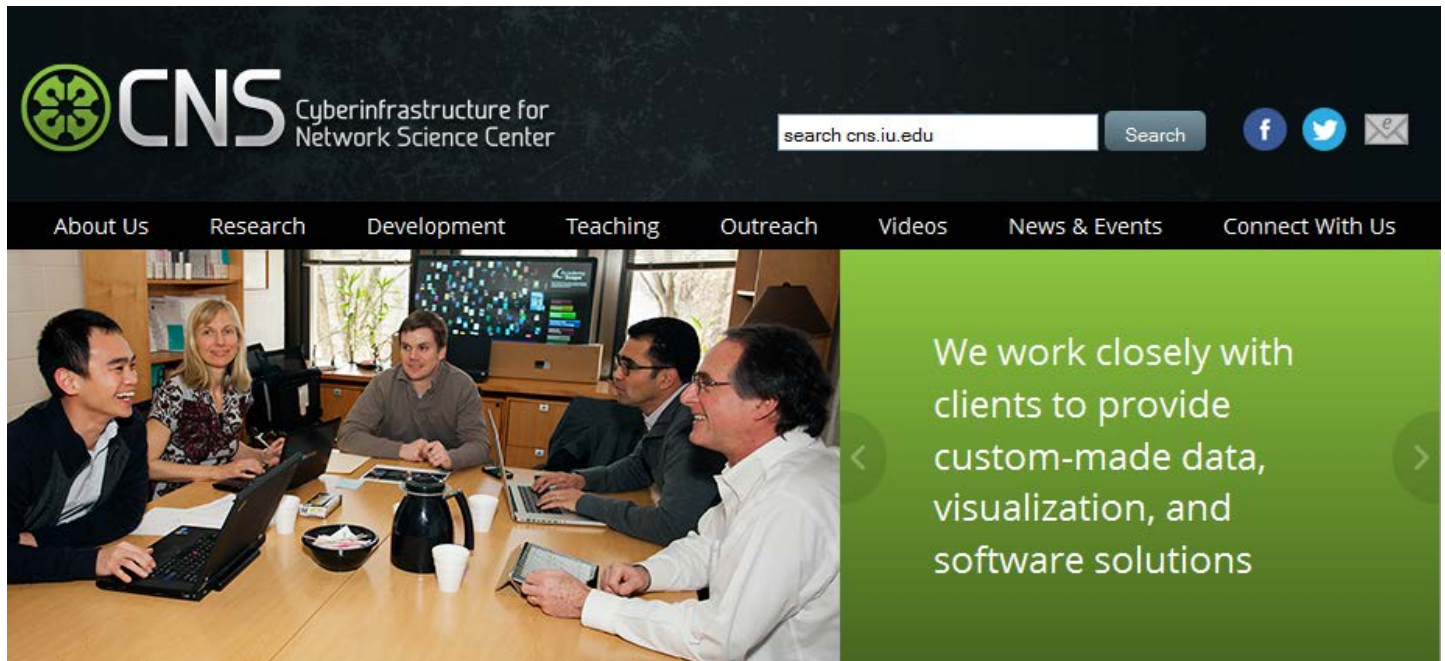
- Pharmacy robberies.
- Area wise sale of Syringes.
- Locations with Needle exchange programs.
- Distance from nearest recovery center.
- Doctors arrested for running 'pill mills'.
- Doctors prescribing fentanyl products.
- Insurance providers covering treatment.
- Recovery rate post treatment.
- Increasing cost of treatment.
- Impact of the 'Good Samaritan Law' for administering Narcan passed in the state.
- Average waiting period to get treatment.

All papers, maps, tools, talks, press are linked from cns.iu.edu

These slides are at cns.iu.edu/presentations

CNS Facebook: facebook.com/cnscenter

Place & Spaces: Mapping Science Exhibit Facebook: facebook.com/mappingscience



Research



Submitted paper: MOOC Visual Analytics

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Our Products



We work closely with clients to provide custom-made data, visualization, & software solutions

Development



Online version of *AcademyScope* now available on the National Academies Press website

Outreach



CDC Museum to Host *Places & Spaces: Mapping Science* Exhibition

Videos



Watch Katy Börner's presentation of *Humanexus* at the IU CEWiT Faculty Alliance Salon

Teaching



Purchase *Visual Insights*, the IVMOOC companion textbook