Reproducible Visual Analytics of Public Opioid Data

Jivitesh Poojary, Olga Scrivner, Katy Börner (@katycns)
with contributions by Ashwed Patil, Saurabh Kumar, Nilima Sahoo, Vinita Chakilam, Sreya Chakrabarti

Cyberinfrastructure for Network Science Center
Department of Intelligent Systems Engineering & Department of Information and Library Science
School of Informatics and Computing and IU Network Science Institute
Indiana University, Bloomington, USA

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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 time more potent than heroine.
- Considering this, the illicit manufacturing of these drugs is increasing over time.
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

https://public.tableau.com/profile/cnsvis#!/vizhome/DrugDeathsinUnitedStatesandIndiana/Dashboard1
Drug Deaths in United States and Indiana

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

<table>
<thead>
<tr>
<th>State</th>
<th>Total facilities</th>
<th>Per 1M residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana</td>
<td>245</td>
<td>37</td>
</tr>
<tr>
<td>Illinois</td>
<td>596</td>
<td>46</td>
</tr>
<tr>
<td>Kentucky</td>
<td>302</td>
<td>68</td>
</tr>
<tr>
<td>Ohio</td>
<td>339</td>
<td>29</td>
</tr>
<tr>
<td>Michigan</td>
<td>423</td>
<td>42</td>
</tr>
</tbody>
</table>

https://findtreatment.samhsa.gov/locator

https://public.tableau.com/profile/cnsvis#!/vizhome/Opioidaddictionmedicationcentermap_0/SubstanceAbuseFacilities
Visualization of Opioid Prescription with Drug Related Deaths Overlay
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.

https://public.tableau.com/profile/cnsvis#/!/vizhome/OpioidPrescriptionwithDrugRelatedDeathOverlay/OpioidPrescriptionwithDrugRelatedDeathOverlay
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](http://cns.iu.edu)

These slides are at [cns.iu.edu/presentations](http://cns.iu.edu/presentations)

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