

Connecticut: Drugs, Death, and the Data

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Dream Team

David “The Code Wizard” Hinton: chief coder and project mastermind

Allison Gallant: background information, research, pharma intel, David’s support system

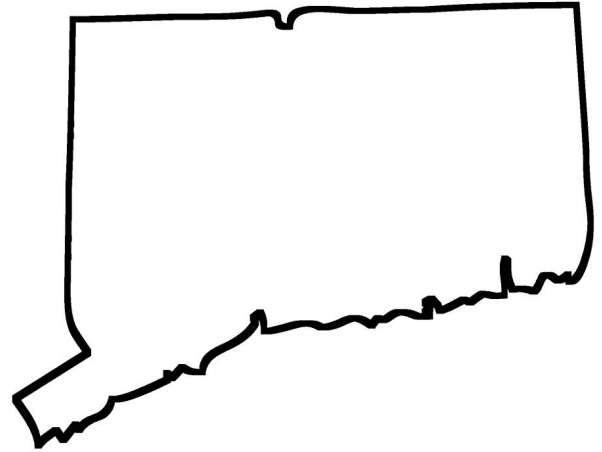
Shivani Sampathkumar: results analysis, pharma intel, David’s supporter part 2

An Opioid Crisis: *How did we get here?*

- 1914: Harrison Narcotics Act
- 1980's: "Addiction Rare in Patients Treated with Narcotics"
- 1998: FDA approves first drug containing Fentanyl for prescription use
- 2007: Purdue Pharma is sued by state governments for misleading advertising of OxyContin
- 2010's: FDA approves abuse-deterrent OxyContin formulation
- 2016: CDC guidelines for prescribing opioids for chronic pain management
- 2017: President's Commission on Combating Drug Addiction and the Opioid Crisis

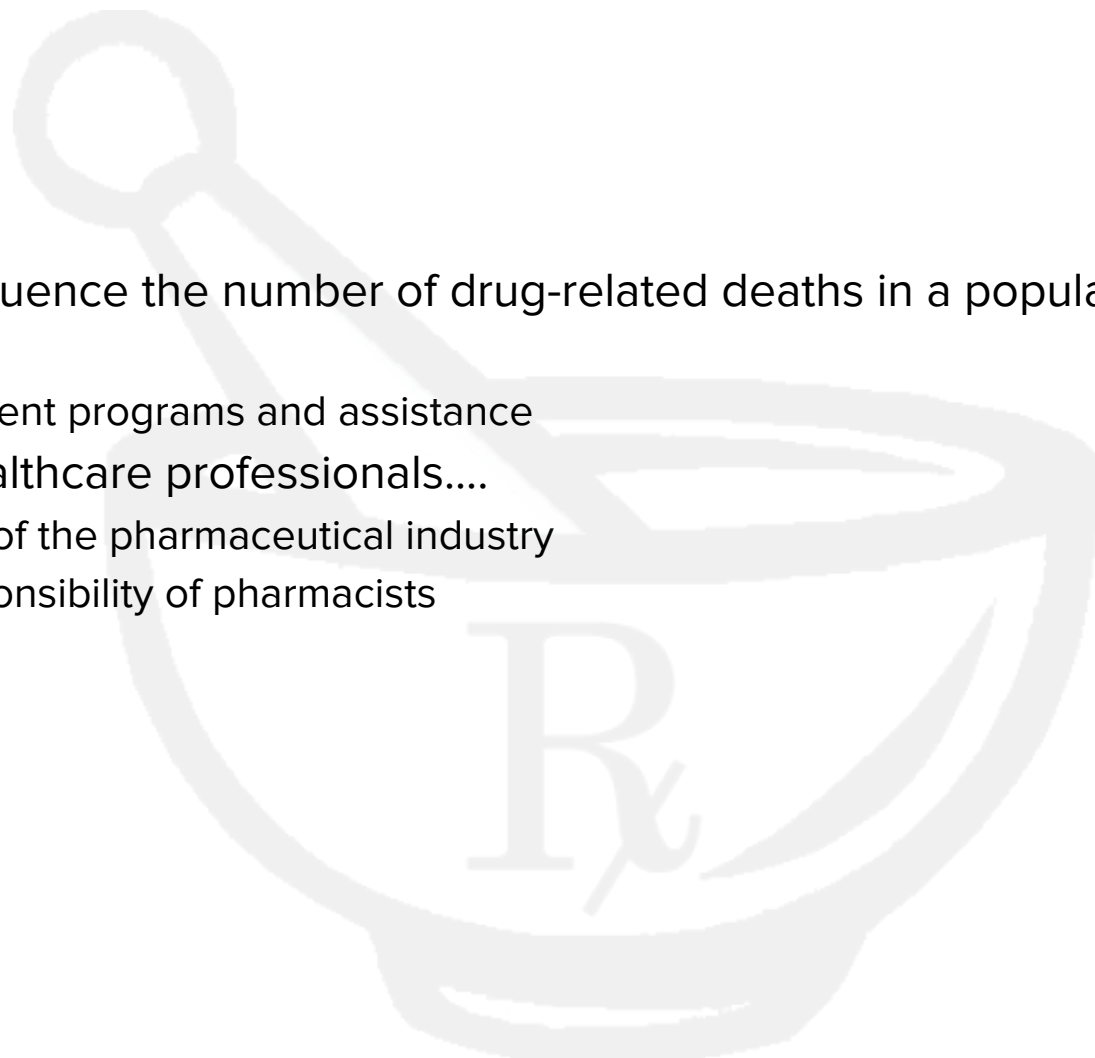
Our Research

- Connecticut counties 2012-2016
 - Opioid overdose deaths
 - Admittance to opioid treatment facilities
 - Access to government housing assistance
 - Specific drug found in system at time of death
- How have accidental drug-related death rates changed in Connecticut counties between 2012 and 2016 compared to the number of opioid-related treatment admissions, government housing assistance, and what specific drug was found in the system at the time of death?



Motivation

- What can influence the number of drug-related deaths in a population?
 - Policies
 - Government programs and assistance
- As future healthcare professionals....
 - The role of the pharmaceutical industry
 - The responsibility of pharmacists



Data Description

- The Primary dataset
 - Office of the Chief Medical Examiner - accidental drug related deaths, which includes toxicity reports, death certificate, as well as a scene investigation.
- Supporting datasets
 - Department of Mental Health and Addiction Services - opioid related treatment admissions, which includes Town level data on depicting the number of entries, and individuals served per year in treatment programs.
 - Department of Housing - affordable housing, which includes counts of assisted housing units or housing receiving financial assistance under any governmental program.

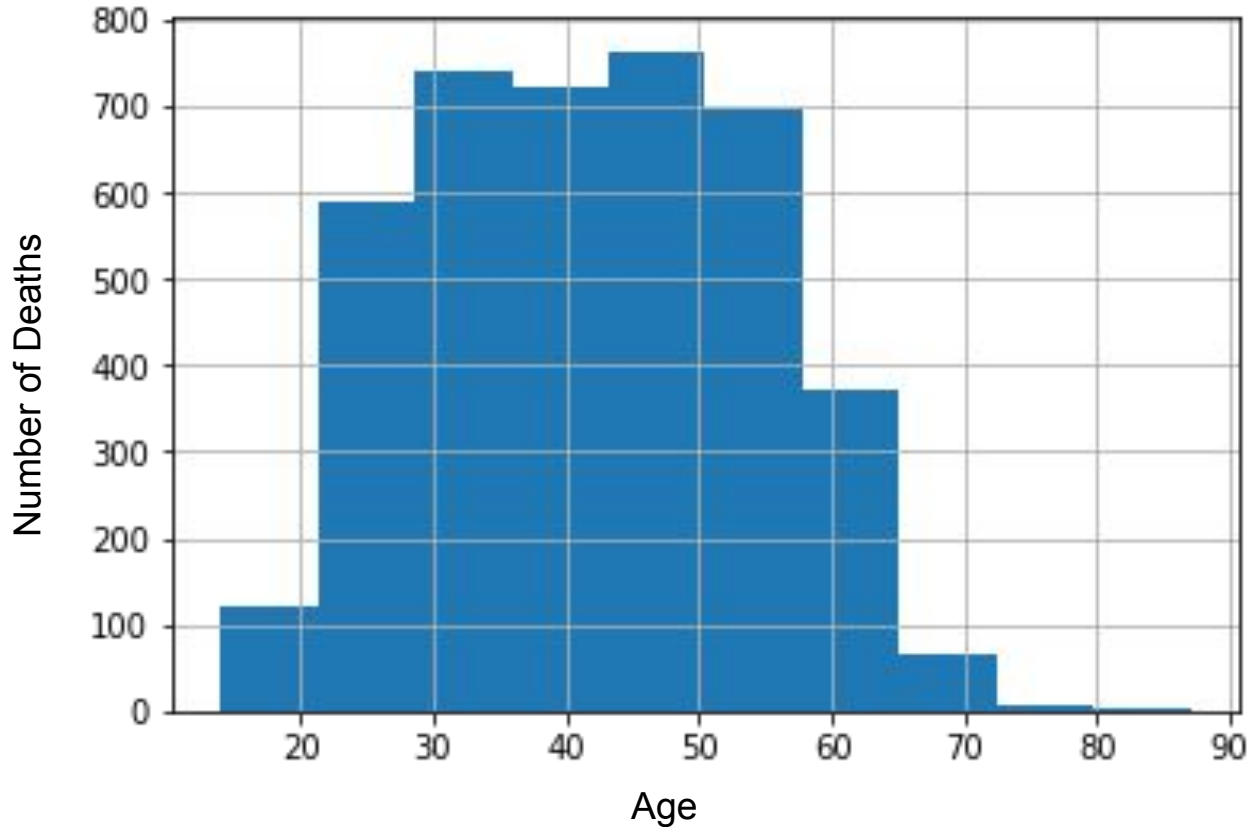
Methods

The group of interest in this study are those factors resulting in an opioid-related death.

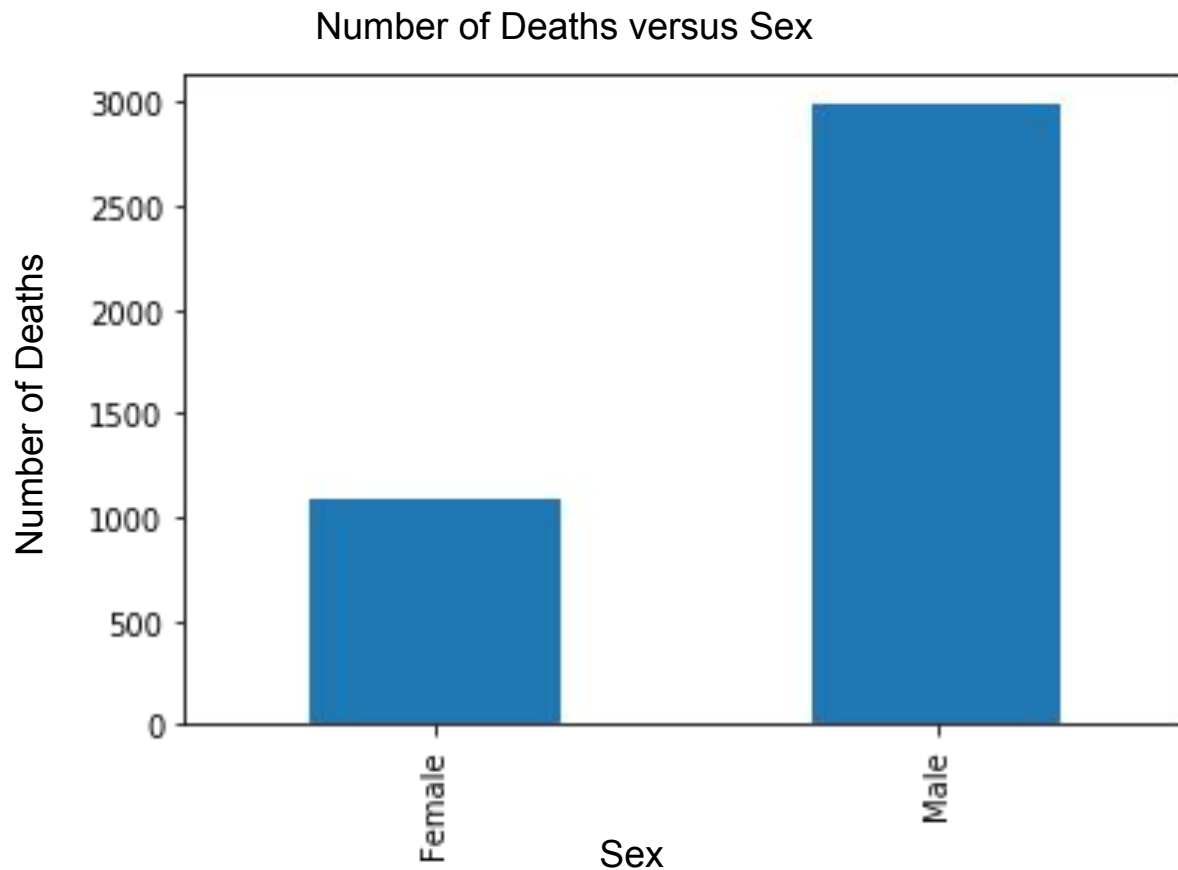
- Linear - Regression:
 - Coefficient: Total Assisted Units (0.9355) and Admissions (0.7938).
 - Intercept: 0.004821
 - Total Assisted Units vs Fentanyl Deaths
 - R-squared: 64%
 - Total Admissions vs Fentanyl Deaths
 - R-squared: 52%
- Clustering:
 - K-means: 3
 - X: Total Assisted Units and Admissions to Treatment
 - y: Fentanyl related deaths

Results: Population Age

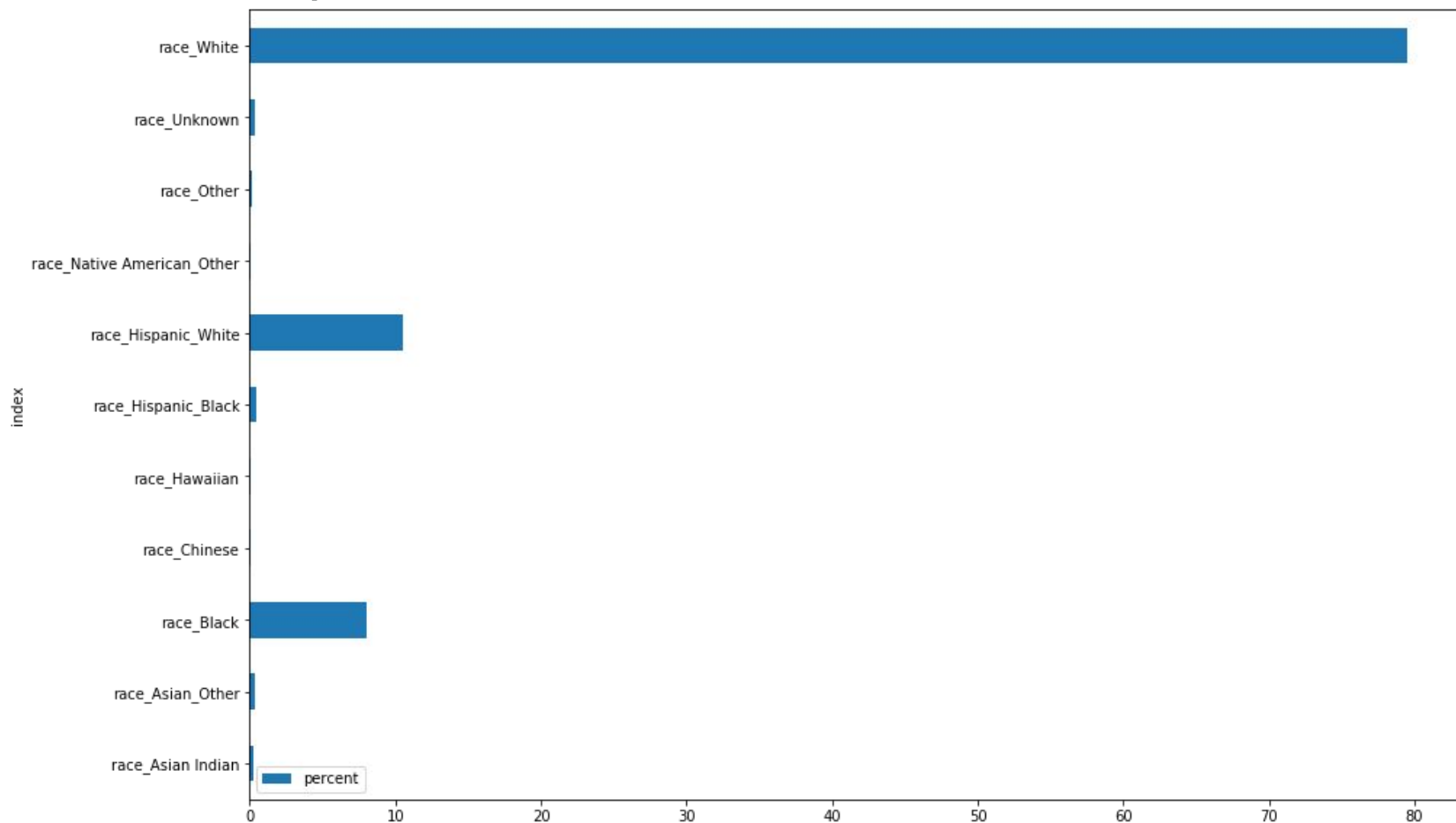
Age versus Overdose Deaths



Results: Population Sex

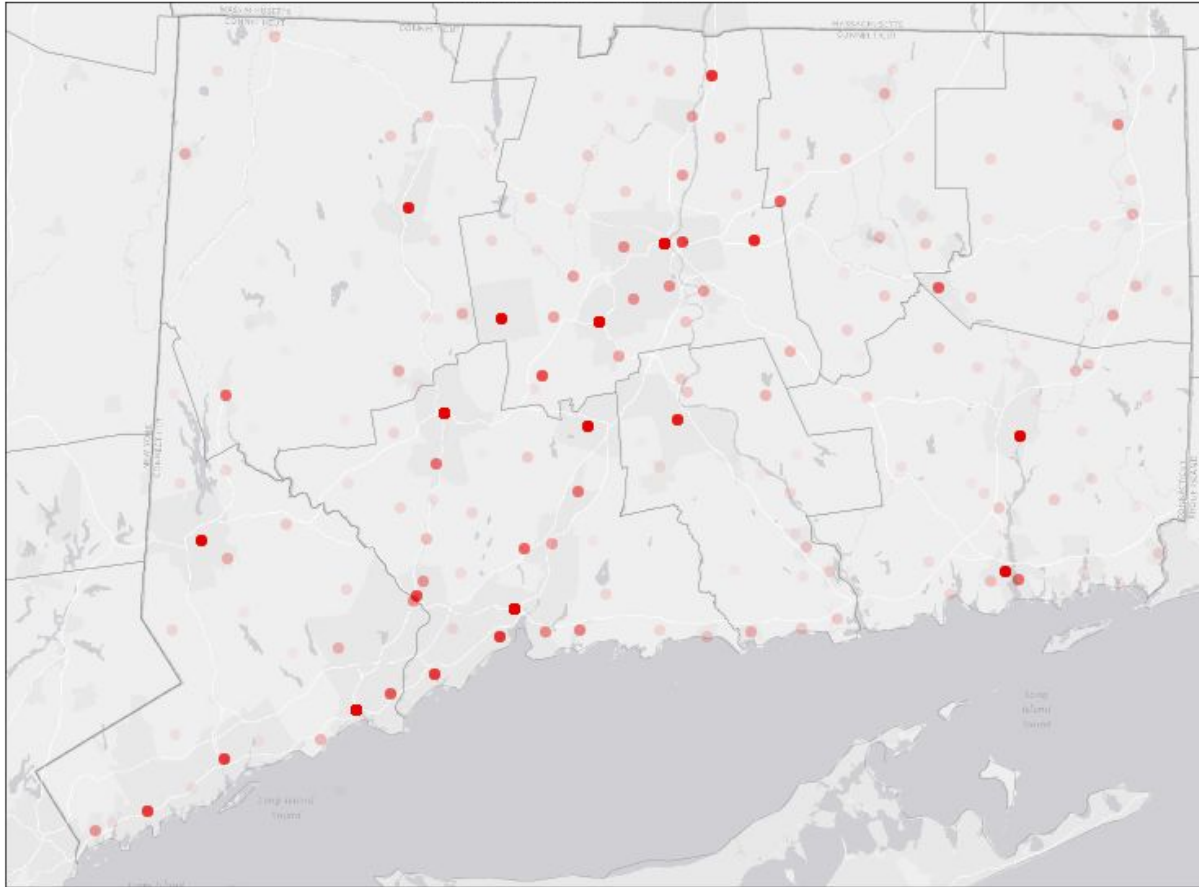


Results: Population Race

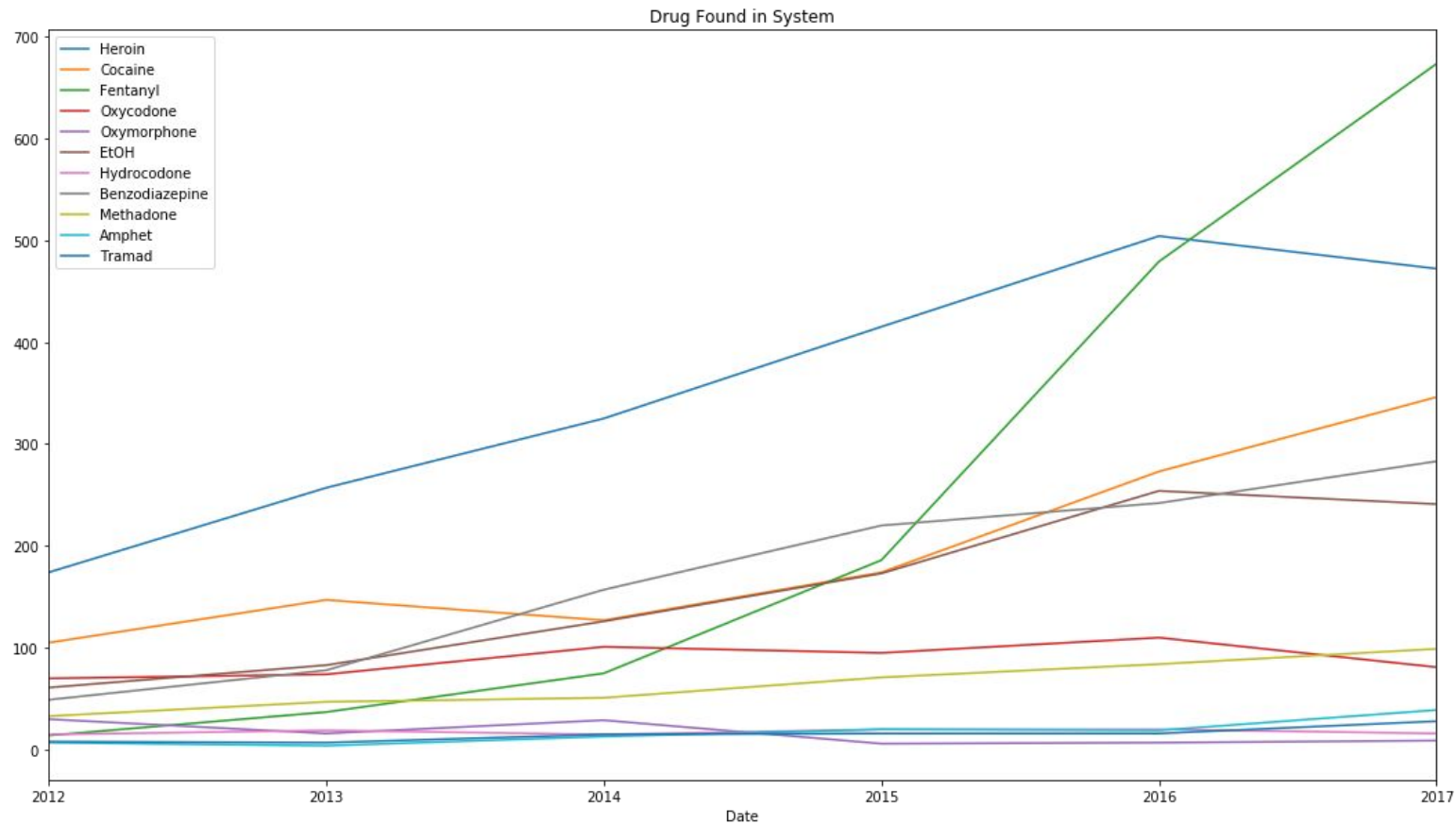


Results: Location

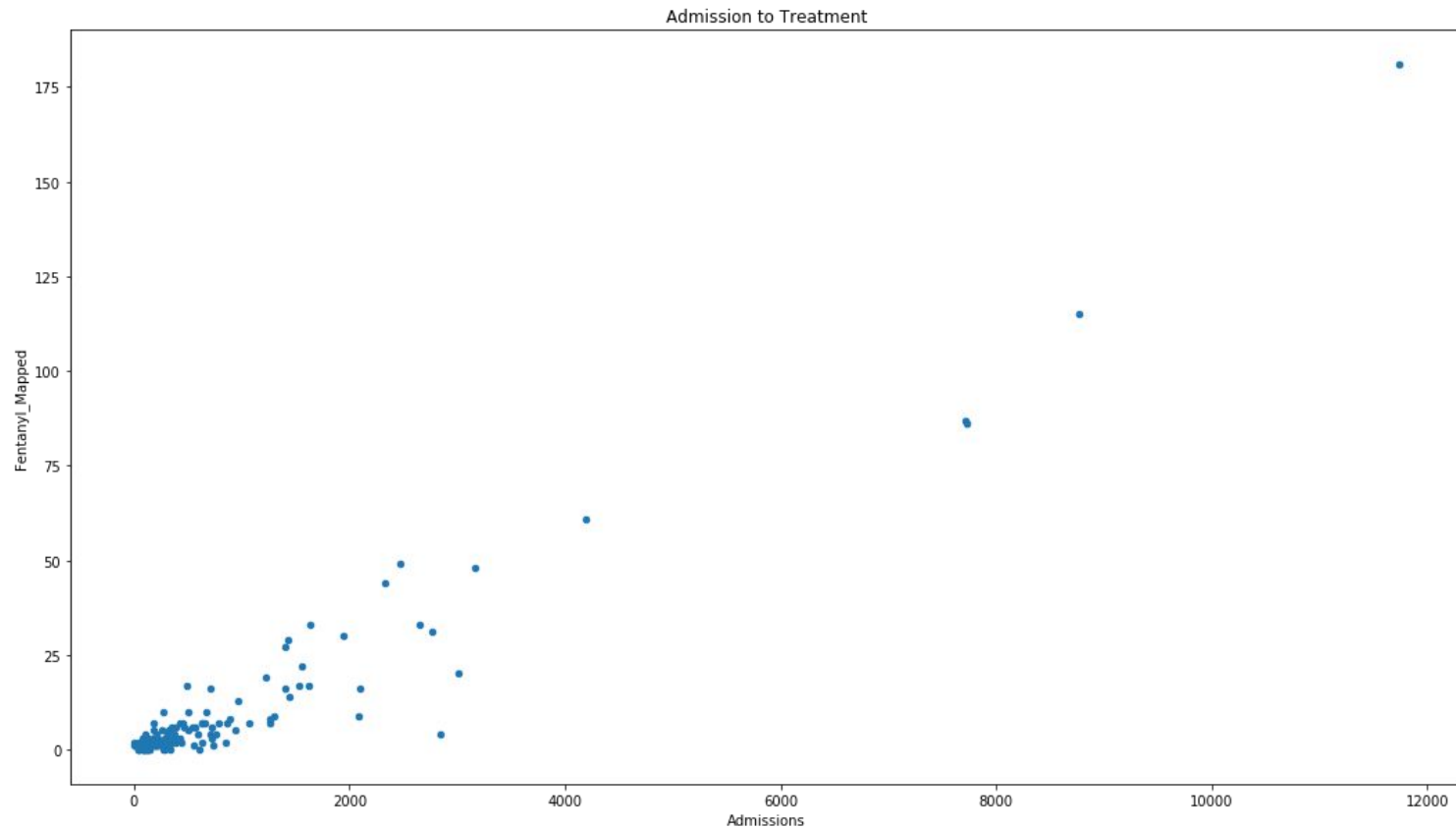
Drug Related Deaths 2012 - 2017



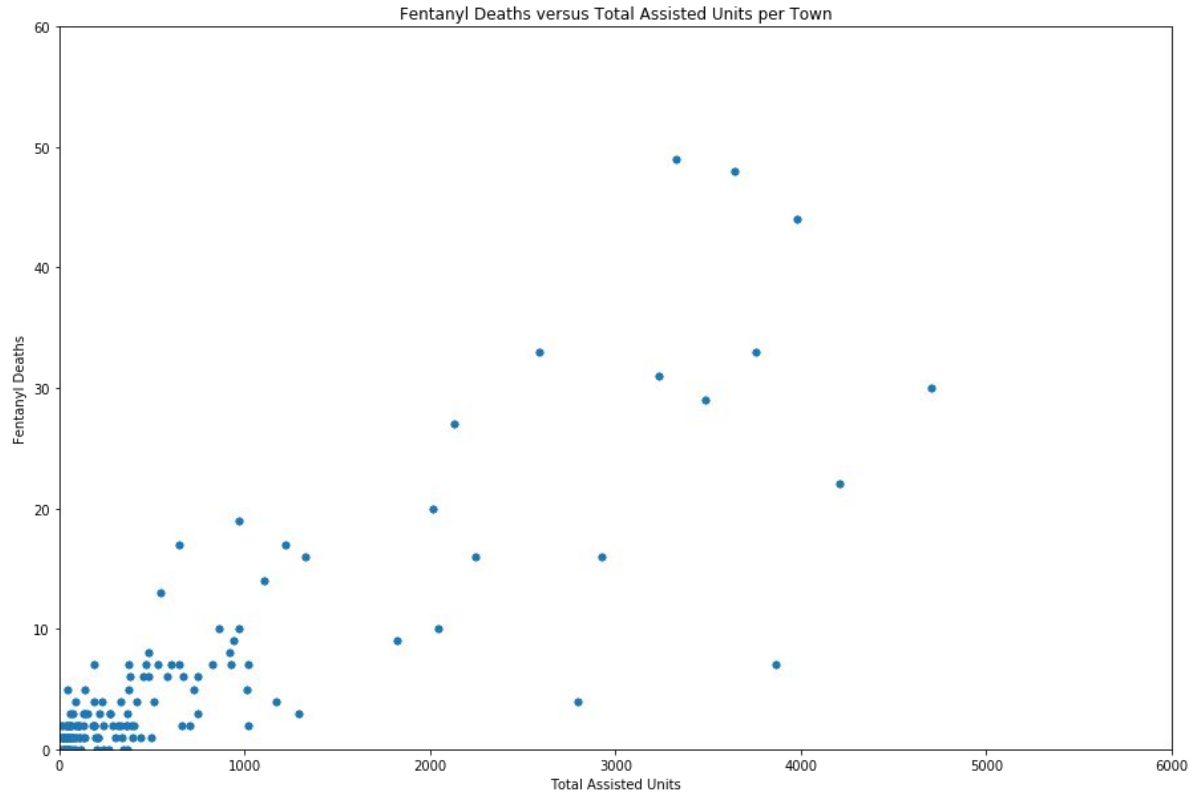
Results: Drug Used



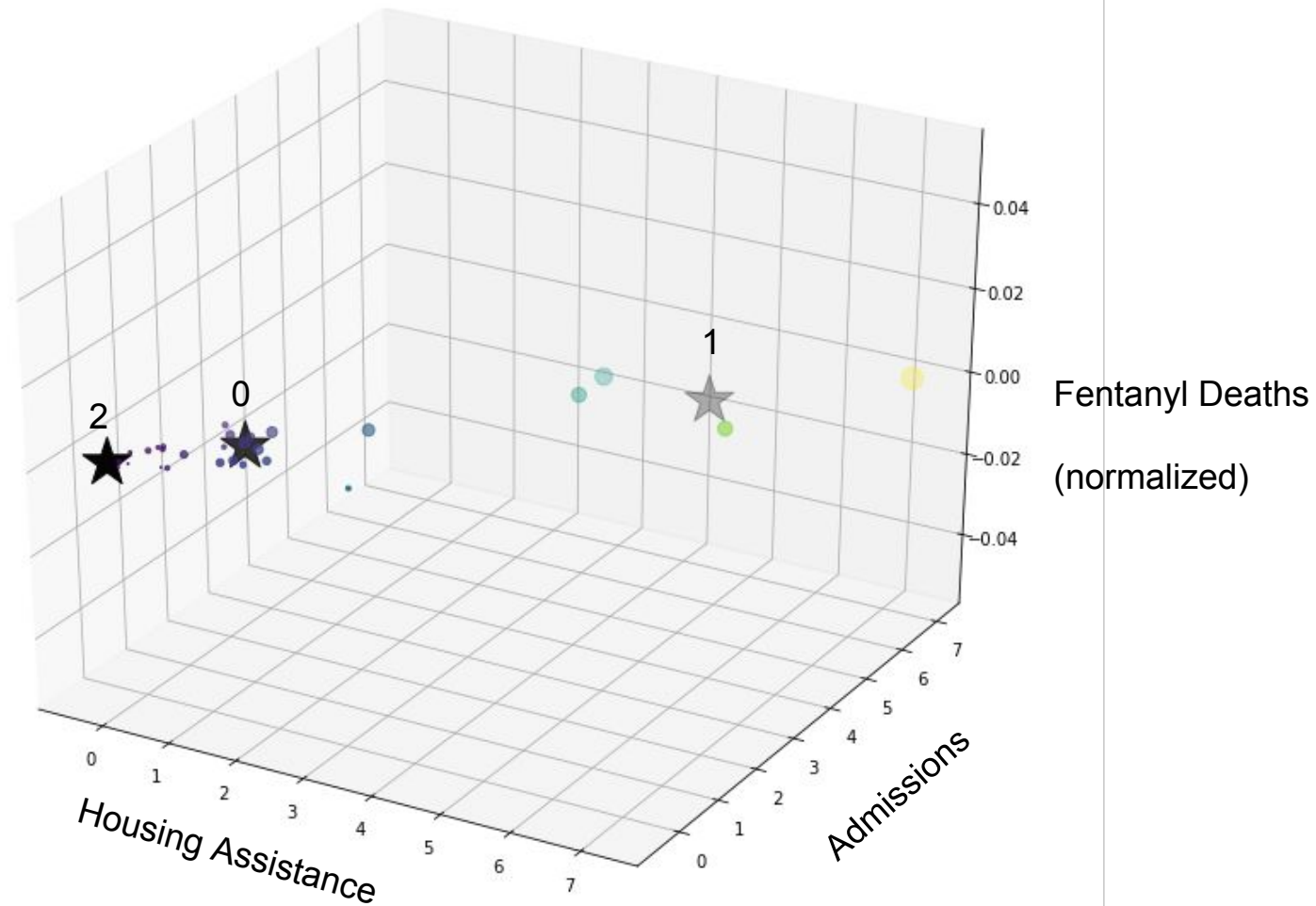
Results: Access to Treatment



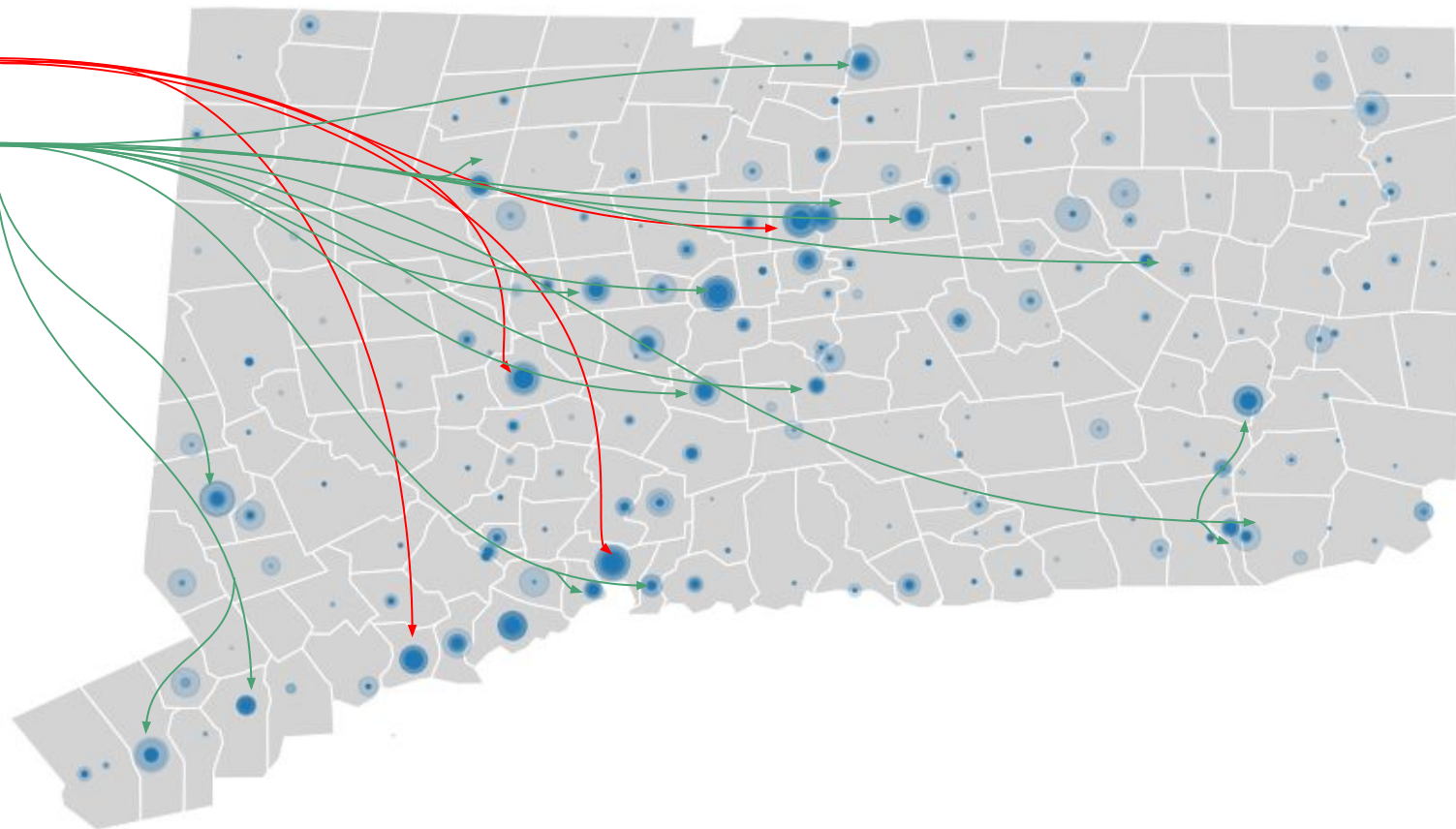
Results: Government Assistance versus Fentanyl Deaths



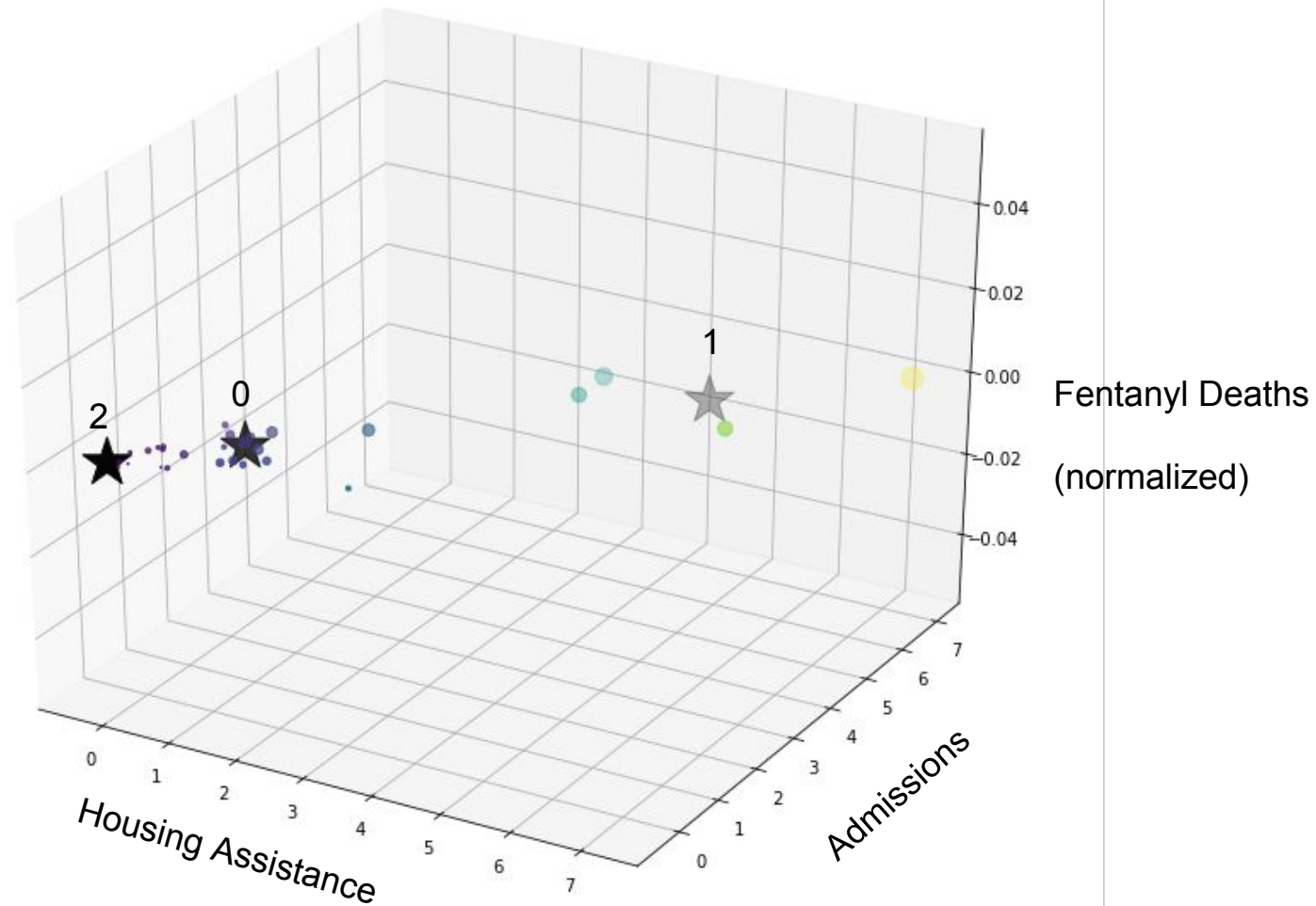
Our Model



- Cluster 1
- Cluster 2
- Cluster 0



Our Model



Limitations

- Linear regression model didn't fit multivariable data
 - $R^2 = 52\%$
- Problems normalizing fentanyl deaths

Resources

1. HHS Office, and Public Affairs. “About the U.S. Opioid Epidemic.” *HHS.gov*, US Department of Health and Human Services, 6 Mar. 2018, www.hhs.gov/opioids/about-the-epidemic/.
2. “Opioid Overdose.” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 23 Oct. 2017, www.cdc.gov/drugoverdose/.
3. Volkow, Nora, and Francis Collins. “‘All Scientific Hands on Deck’ to End the Opioid Crisis.” *Advancing Addiction Science*, National Institute on Drug Abuse , 31 May 2017, www.drugabuse.gov/about-nida/noras-blog/2017/05/all-scientific-hands-deck-to-end-opioid-crisis.

Datasets

1. Accidental Drug Related Deaths 2012-2017.

<https://catalog.data.gov/dataset/accidental-drug-related-deaths-january-2012-sept-2015>.

2. Opioid Related Treatment Admissions by Town in Department of Mental Health and Addiction Services

Programs.<https://catalog.data.gov/dataset/opioid-related-treatment-admissions-by-town-in-department-of-mental-health-and-addiction->.

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Questions!