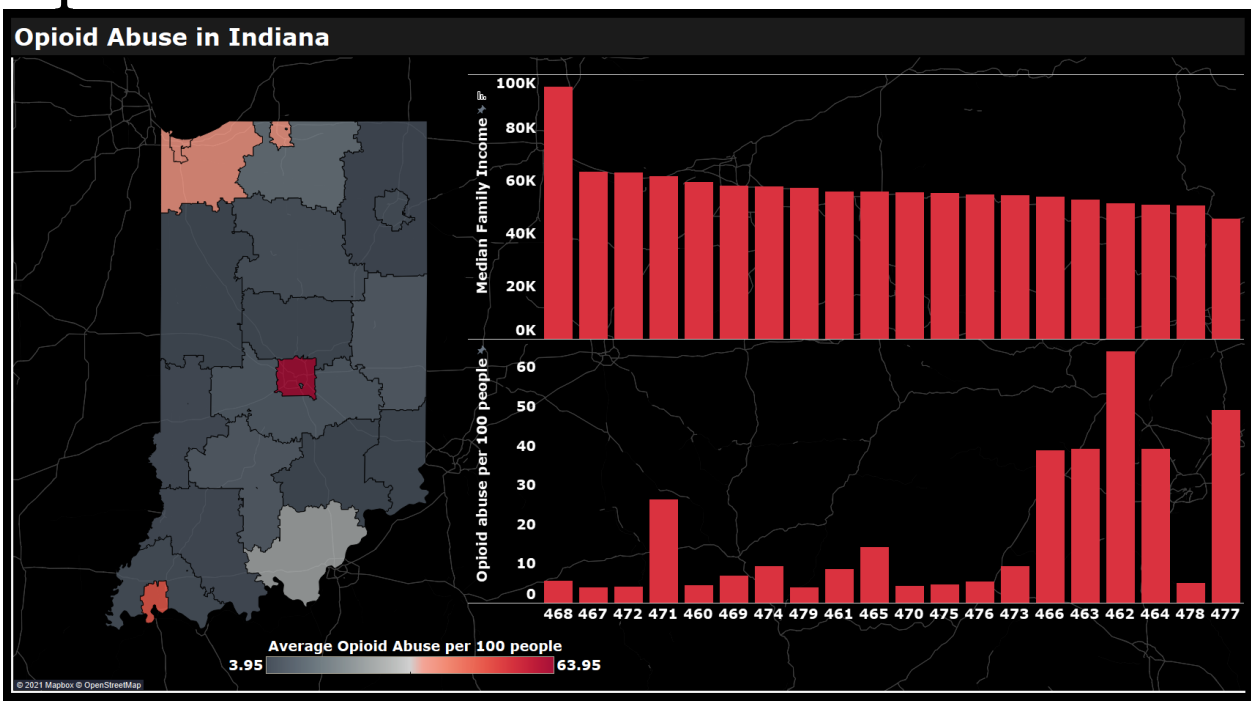
Opioids and Income



Team name: Hackosaurus Rex 2: Electric Boogaloo

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Introduction

We chose to focus on the U.S. opioid epidemic because the current Covid-19 pandemic has raised our awareness of other widespread epidemics that are not being reported on as widely as Covid-19. Despite many Americans knowing that the opioid epidemic is a major problem, not as many people know how it came to be and what the underlying issues are that have led to the current epidemic. Through this project, it is our hope that readers will gain insight into how socioeconomic status plays a big part in the opioid epidemic in America.

Background

Our team chose the opioid use in Indiana. Our team knows opioid use is a major problem going on in the United States. Opioid addiction is a real issue, and we believe that something must be done(drugabuse.gov). Together as a team we wondered if there was a correlation between income and opioid use. We also wondered if opioid use is increasing. The data shows two opioid drugs, 9652 and 9143. The original data goes over how many times these opioids were used in each zip 3 area of Indiana. To get a more accurate visualization we added in two additional data sets. A data set on income by county received from the U.S. Census Bureau. We also acquired data showing each of Indiana's counties zip codes in 5 numerical digits.

Questions

Is median income related to opioid abuse? Is there a relationship between opioid deaths and median per capita income? Who would be interested in the data? These questions are important because we want our audience to push for solutions to these problems if we do find a relationship between opioid abuse and median income. We will be using data that measures the median household income per county in Indiana and opioid abuse per one hundred per in each county. We are trying to target the general American public with our visualization and try to show if there is a relationship between median income and opioid abuse.

There has been research about opioid abuse in Indiana that we will be using to solve the problem regarding median family income and opioids. If we find a relationship, we will try to produce different solutions to our problems.

Problem Statement

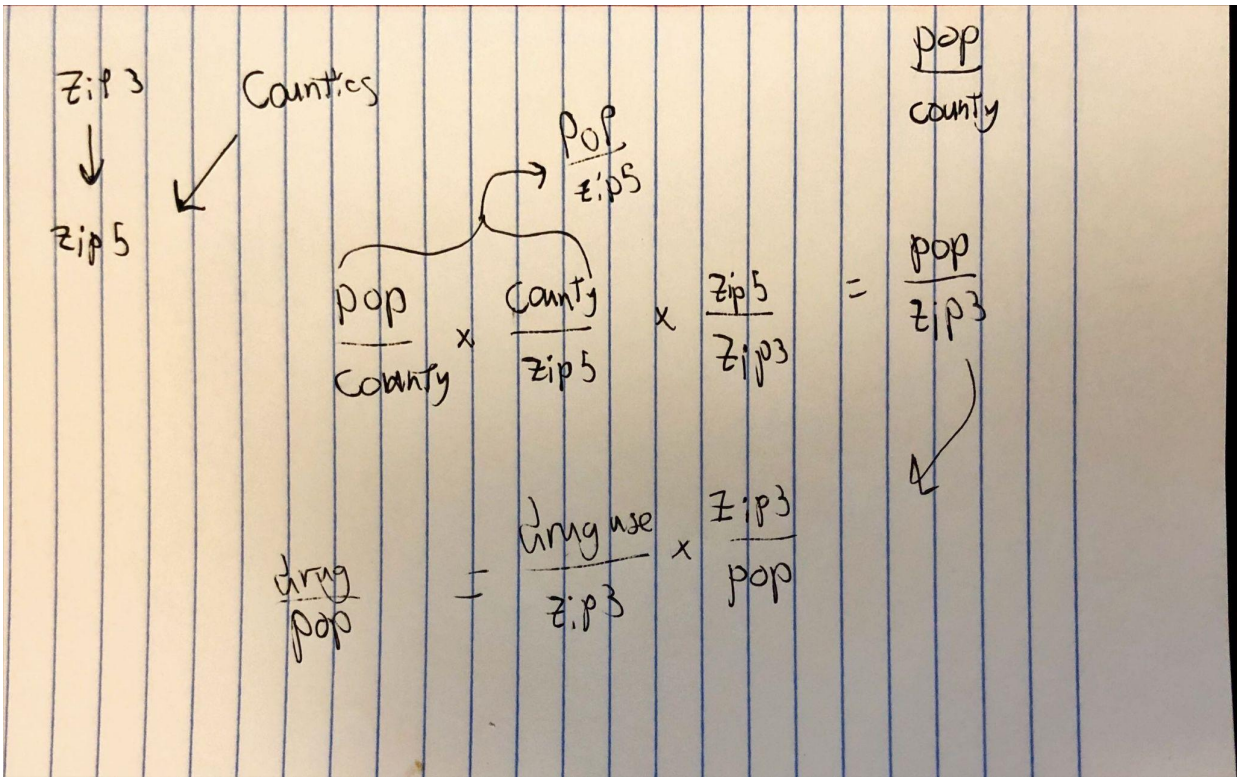
We wanted to find out if there was a correlation between opioid abuse and median income by collecting data from counties and zip codes in Indiana in order to find possible factors of the opioid epidemic in Indiana. Previously, there have been visualizations regarding opioid use between 1999 - 2019 and pie charts that reveal that 1 in 5 nonelderly adults that have opioid use disorder are uninsured.

We are assuming that the columns labelled drug_9143 and drug_9652 are opioids and that the units for these columns are drug abuse instances per quarter. By finding out if there is a relationship between median household income and abuse rates, people can be more informed on the effects of wealth disparity and medical treatment.

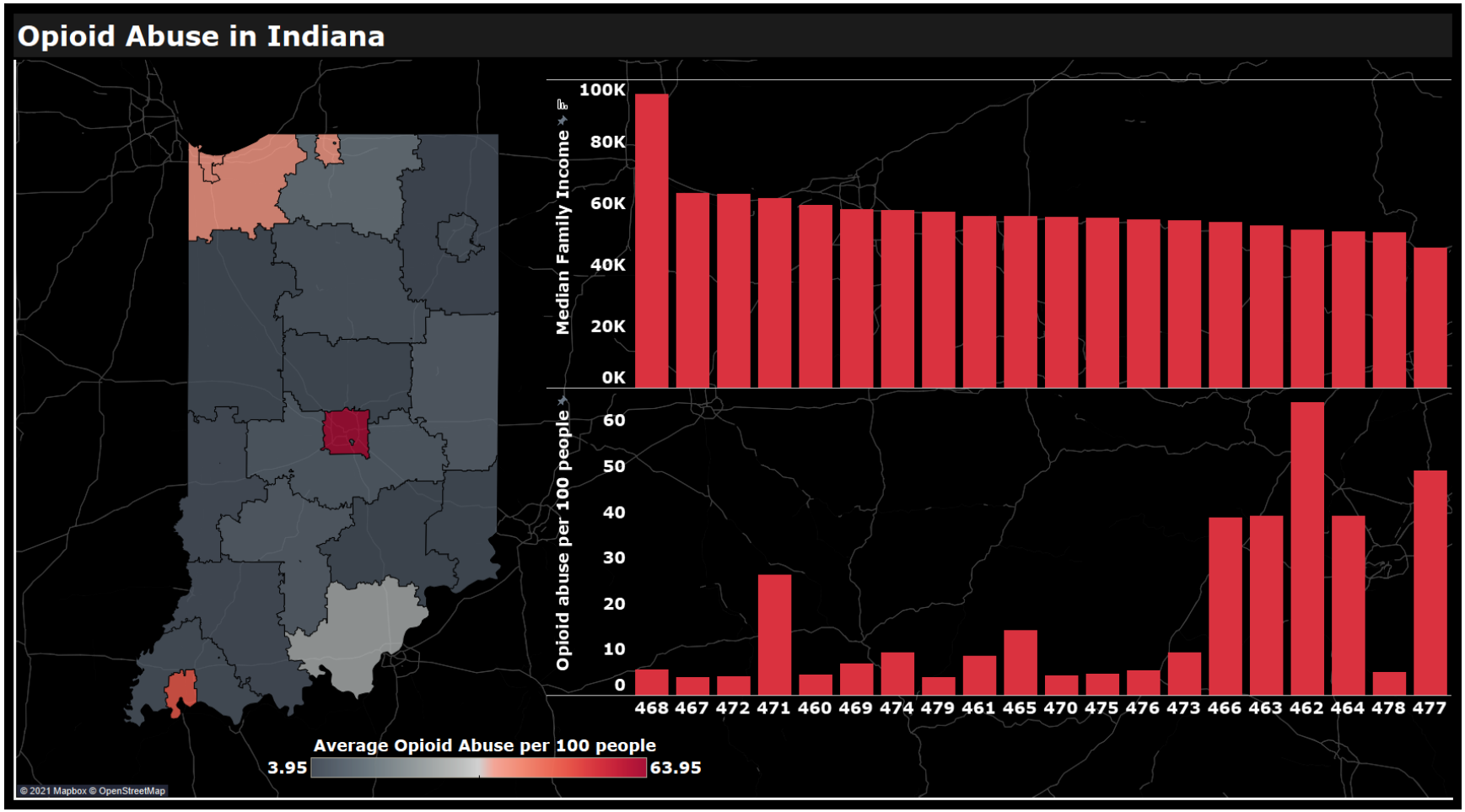
The opioid epidemic is a complicated issue and many approaches like the “tough on crime” or heavy regulation of opioids have been introduced as possible solutions; however, if we are able to find a correlation with median household income and opioid deaths or usage, we will be able to find a different solution than that of just heavily regulating the drug.

Methodology

Our team started out by taking the demographic data given to us in class and throwing it into Tableau. We first tried to map out the zip code data, but the given data used zip3 data which has the final 2 zip code digits removed. To map this data in Tableau, we gathered zip code data from the US Government to match zip3's to full zip codes. From this we were able to map the different zones in Tableau. We then thought about what we wanted to analyze with this data. We thought about how opioids might have trends in different communities and what those communities would be. Because healthcare in the United States is not federalized, a family's income could be linked to quality of healthcare and therefore how their ailments are treated. Our next step was to display this data in a meaningful way. Because we already displayed our data to a map, we wanted to include that in our final visualization. By creating a dashboard with both the map and an easy to read, precise bar chart. This way readers get the best of both words for readability and specificity.



Results


Opioid Abuse in Indiana
Median Family Income
100K
80K
60K
40K
20K
0K
Opioid abuse per 100 people
60
50
40
30
20
10
0
468 467 472 471 460 469 474 479 461 465 470 475 476 473 466 463 462 464 478 477
Average Opioid Abuse per 100 people
3.95
63.95
© 2021 Mapbox © OpenStreetMap

Discussion and Conclusion

Our visualization addresses the problem statement and we found out that there is a slight inverse relationship between household median income and opioid use per 100 people. As household income goes down, opioid usage goes up. Our visualization also reveals that income is not the only factor when taking into account opioid abuse. Areas that are more expensive to live in could also have higher wages making it have the same difficulty as a cheaper area to live in with lower wages. We also did not consider taxes in each city which would take into account the difficulty of living in different counties in Indiana. Our visualization showed that Indianapolis had high opioid usage, and this could be due to the fact that low-income people often use public transportation as a means for travel since they are not able to afford cars. Seeing that Indianapolis has somewhat decent public transit, there are a lot of low-income residents living in Indiana; therefore, Indianapolis has a lot of opioid usage.

Our solutions would be to make healthcare more affordable and have healthcare that does not push drugs into treatment. By making healthcare more affordable, people would be able to get access to higher quality healthcare. Another solution would be to send people with opioid use disorders to rehabilitation facilities so that they are able to find better treatment than to just use opioids. Nationalizing the drug industry and nationalizing healthcare would also be a viable solution too since nationalized healthcare and nationalized drug industries would be treated like programs for people instead of being used for profit incentives. It would also be far cheaper too, and people of lower income would be able to receive proper and more effective treatment and would lower opioid abuse among lower income people.

References

If references are listed, make sure they are cited in the body of the document.

National Institute on Drug Abuse. (2021, February 25). *Overdose death rates*. Overdose Death Rates.Retrieved December 9, 2021, from https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates.

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Appendix A – Resources Used

Datasets

List the name of the data set provided and a description of the additional data set acquired.

Opioid Abuse in Indiana Data from Brightspace

Zip Code Data: https://namecensus.com/zip-codes/indiana/

SELECTED ECONOMIC CHARACTERISTICS 2006-2010 American Community Survey 5-Year Estimates: Archive.is

Tools used

List all tools used in the project and a brief description (see the examples below); add more if applicable.

Tool/Application	**Description**
Excel	Data cleaning
Tableau	Data visualization
Webnode	Web development

Appendix B – Percent Contribution

Group Contributions

- Main Data Acquisition: Trey Cluff and Jack Myers
- Main Data Parsing: Trey Cluff
- Main Data Mining: Trey Cluff
- Main Data Representing: Trey Cluff
- Edited Video: Jack Miller
- Website maintaining: Trey Cluff and Shahmun Jafri
- Individual Visualizations and Research: Trey Cluff, Jack Myers, Jack Miller, and Shahmun Jafri
- Rotating Team Leader: Trey Cluff
- Writing Hackathon report: Trey Cluff, Jack Myers, Jack Miller, and Shahmun Jafri
- Reviewing Hackathon Report: Trey Cluff

Individual Contributions

In the table below list each team member's full name, their contribution (body of work) and their % of the work completed. The total must add up to 100%

Team Member	**Description**	**Contribution**
Thomas Cluff	*Created main visualization in Tableau, wrote the methodology section, and organized team structure*	*35%*
Jack Myers	*Responsible for gathering written contributions from the team and combining them into a cohesive story, data wrangling (parsing, filtering) ,*	*25%*
Jack Miller	*Videographer for the 5-minute video (recording and editing)*	*20%*
Shahmun Jafri	*Creating visualizations of the data, revising and refining*	*20%*
	Total	100%

Appendix C – Individual Contributions

In this appendix each team member must contribute a one-page document relating the team's topic/data to their hometown or home country. The one-page document must contain: (1) a description of the problem, (2) a comparison of the team's findings with insights about your hometown/country related to the hackathon data (3) a visualization to support items (1) and (2).

Each person should create their individual page **(1-page only)** and make it available to the designated team member who will upload the final document.

This will be viewed and assessed as part of each person's individual contribution.

Leave this page as is.

Start adding individual page content on the next page.

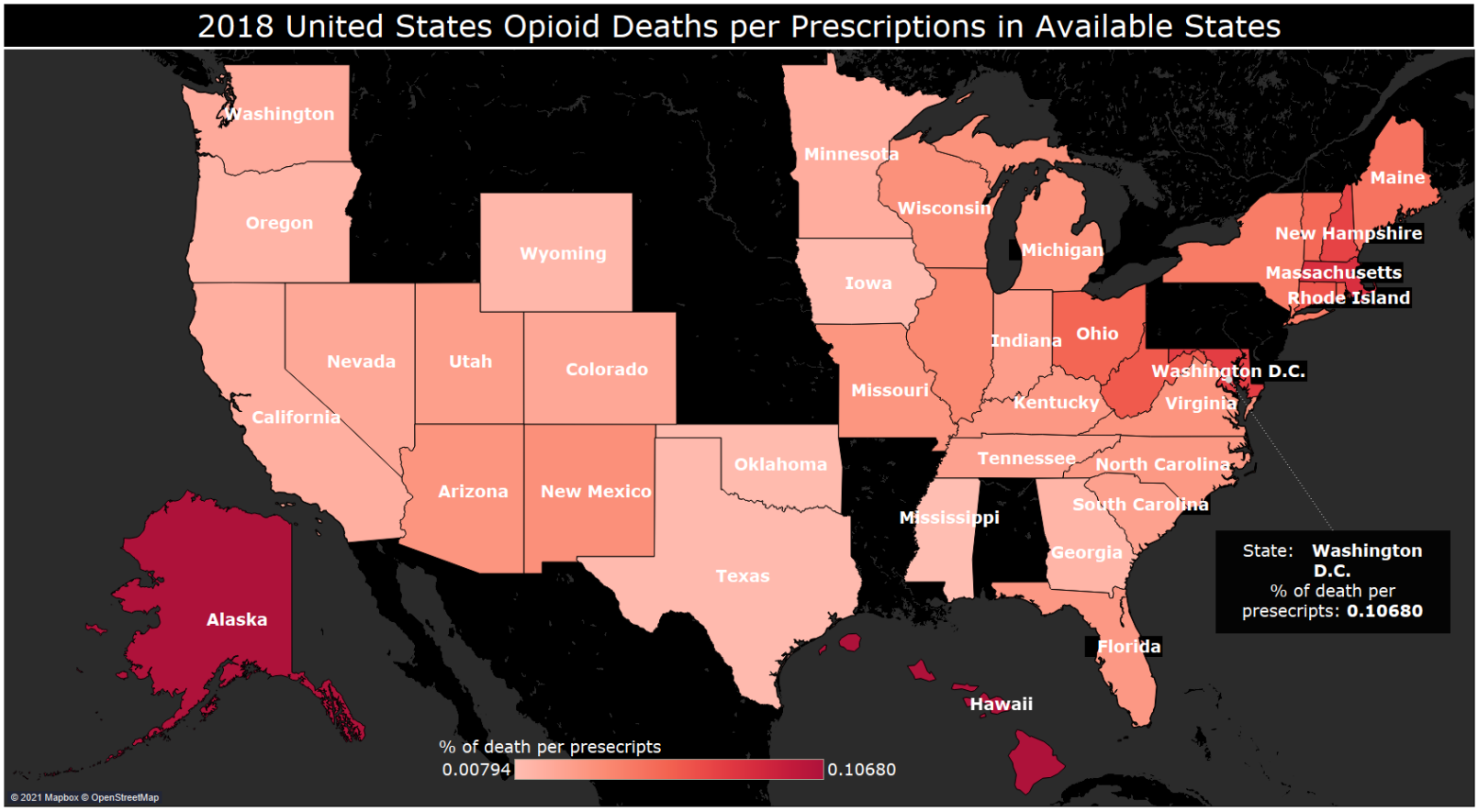
REMOVE any blank pages before submitting.

Team Member #1: Thomas Cluff

My Home City: Washington DC

Hackathon Topic: Indiana Opioid Abuse

Opioid abuse is a problem that plagues most of the United States. However the District of Columbia is the seventh highest region for Opioid overdose related deaths. With just over twenty-six deaths per 100,000 people in DC, this makes overdoses a big problem. Especially related to Indiana's 16th rank and 17.5 deaths per 100k. What makes DC unique is that the rate of prescriptions for opioids (25/100 people) is relatively low compared to deaths. This means that unlike other states (Indiana has a prescription rate of 65.8 to their 17.5 deaths) there are more people dying of opioid overdoses among the population of prescribed individuals. In fact every state above DC in deaths has a higher ratio of prescriptions to death than DC. This, means that DC has the highest percentage of deaths to Opioid prescriptions.



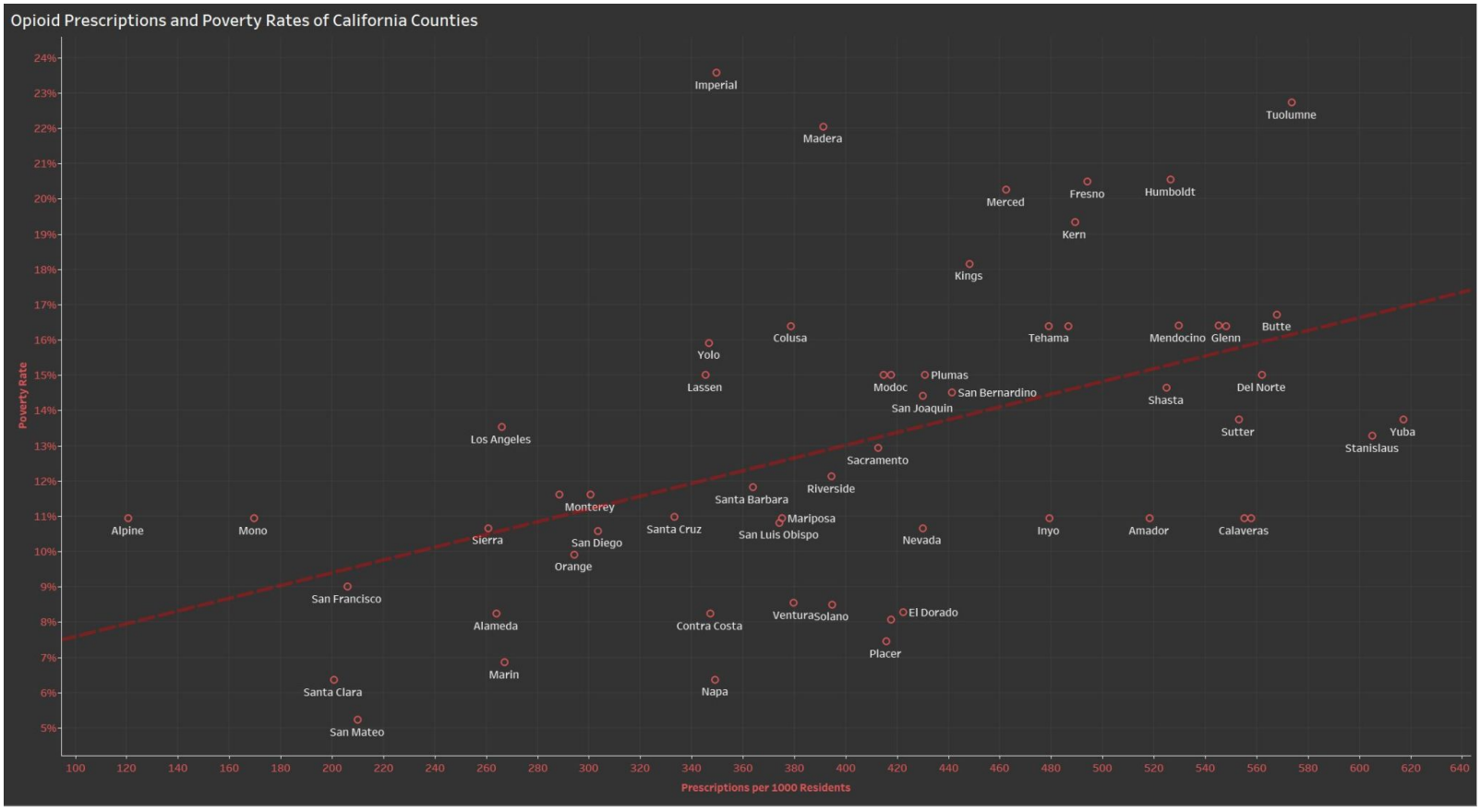
Caption: This visualization shows a map of the United States and which states have the highest reported Opioid deaths compared to their reported amount of Opioid prescriptions. The data was gathered from the National Institute on Drug Abuse. States not labelled did not report enough data to be compared.

Team Member #2: Jack Miller

My Hometown/City/Country: Los Angeles, CA Hackathon Topic (dataset): Indiana Opioid Abuse

Include your story and visualization below.

For my visualization, I wanted to look at the relationship between the number of opioid prescriptions and the poverty rate of every county in California. What I found is that there is a correlation between counties with higher rates of poverty and higher amounts of opioids being prescribed. While the correlation on the visualization is not that strong, there is still a noticeable trend. Having grown up and traveled through California, I know which counties are well known for being generally wealthy and which ones are notorious for having drug problems. My lifetime anecdotal experiences lined up with the data shown on my chart. For example, some of the most expensive counties, such as San Mateo and Marin, have low rates of poverty and far fewer amounts of opioids being prescribed. I suspect that this is because the residents of those counties, being generally wealthier, have access to higher quality healthcare which offers better treatments which don't default to opioids for pain management.



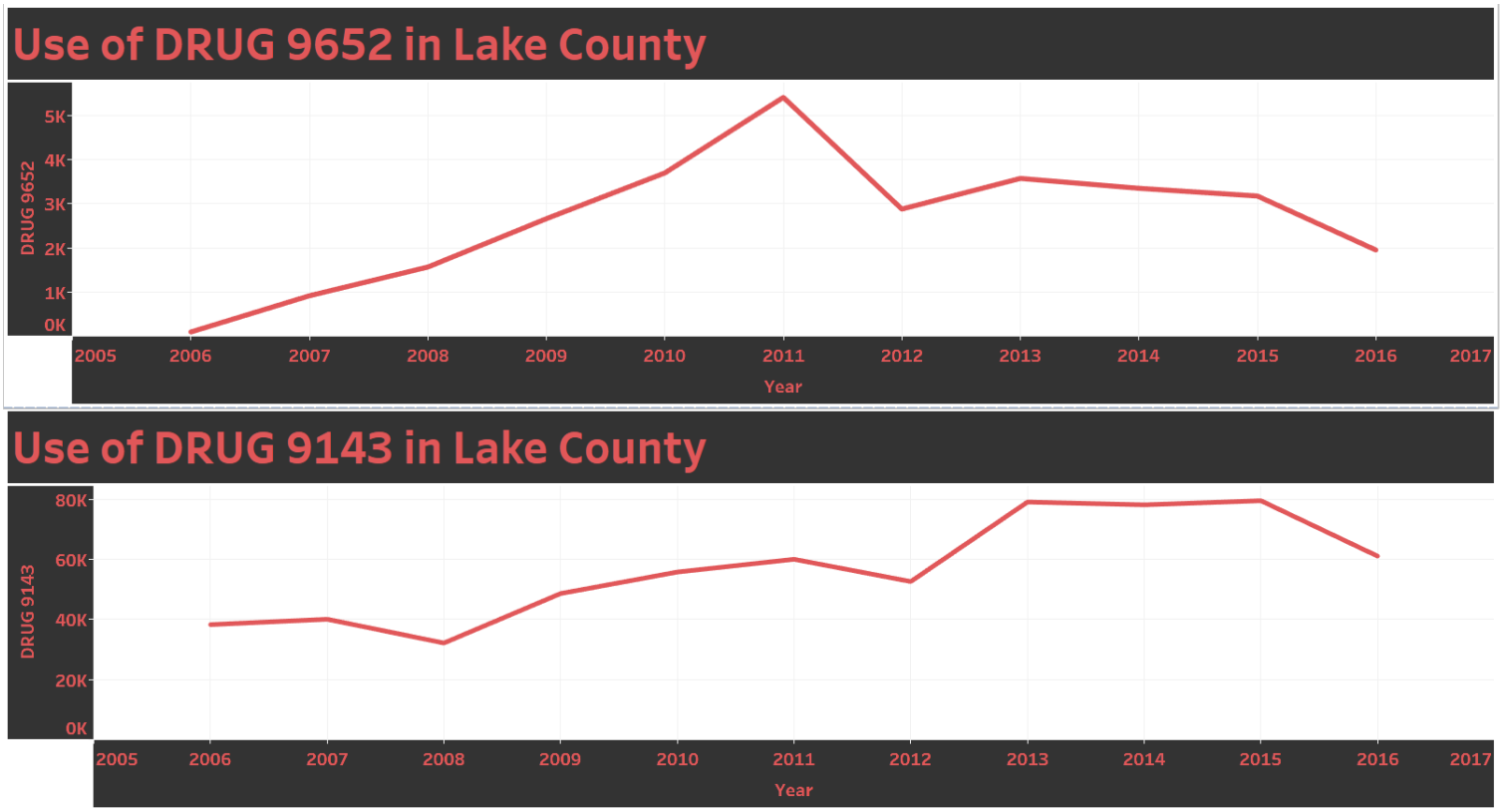
Team Member #3: Jack Myers

My Hometown/City/Country: Saint John/Lake County/Indiana

Hackathon Topic (dataset): Indiana Opioid Abuse

Include your story and visualization below.

As we saw that there was no correlation between income and opioid use in Indiana, I was wondering if opioids were affecting my hometown county in Indiana. I assumed that they were and are rising. I also assumed that these two drugs showed a good look at overall opioid use. I found that data was missing for my county in Q3 of 2008, 2012, and 2016. This makes the graphs less of an increase.

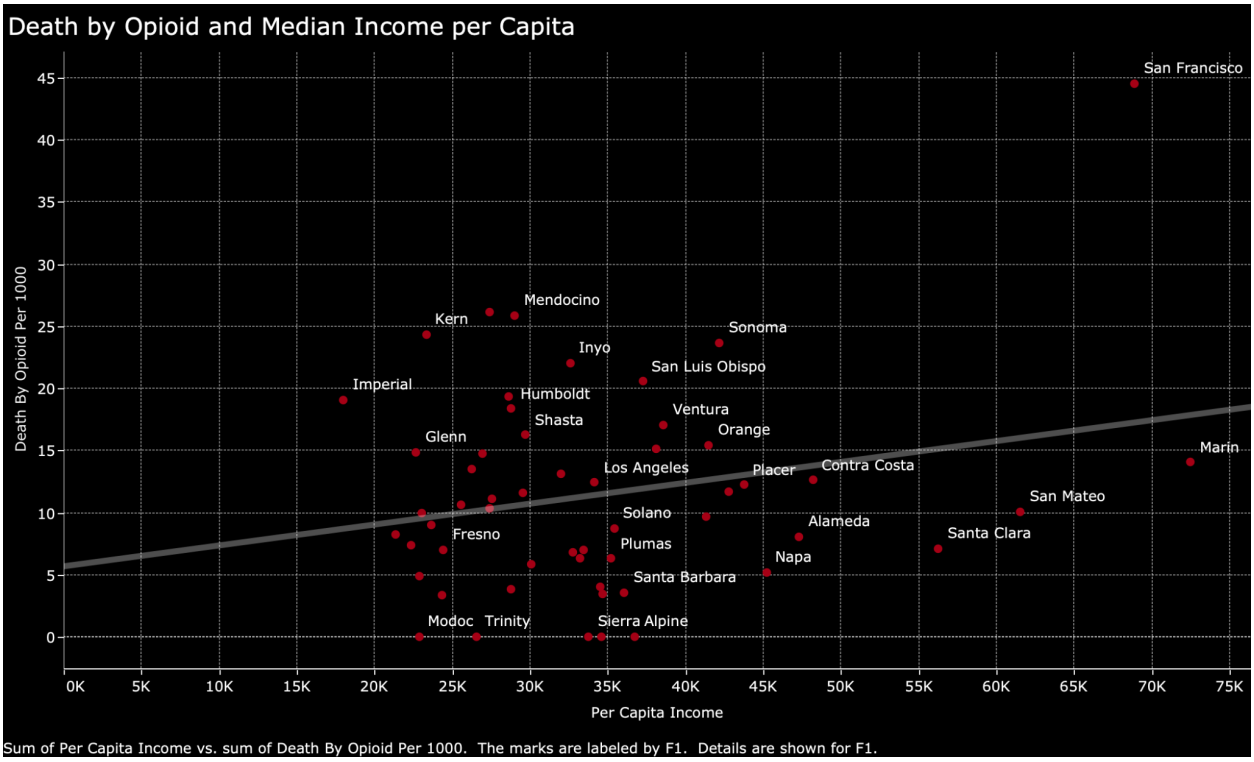


Team Member #4: Shahmun Jafri

My Hometown/City/Country: Saratoga, California (Santa Clara County).

Hackathon Topic (dataset): Indiana Opioid Abuse

We saw that there was very little correlation between income and opioid use in Indiana and I was curious if there was a relationship between deaths caused by opioids and per capita income in Santa Clara County. I found out that Santa Clara County was under the trend line since it has a high per capita income with low opioid deaths.



Appendix D - Diversity Statement

Our team Hackosaurus Rex 2: Electric Boogaloo has a diverse group of team members pursuing a variety of different majors located in the Computer Graphics Technology department of Purdue University. Our team members also have hometowns scattered across the United States leading to diverse backgrounds. Jack is in his second year of college but having his first year at Purdue University as he is a transfer student from Lake Country Indiana and is majoring in User Experience Design. Thomas Cluff is a Junior studying Web Programming and Design. He comes from a military family, moving around the country during his childhood. Jack Miller is also a Senior but is majoring in Building Information Modeling. He is from the west coast, California. Shahmun Jafri is a freshman studying User Experience Design. Like Jack Miller he is also from California. Together as a team we shared our views, used teamwork, and shared unique perspectives on the opioid crisis plaguing Indiana and the rest of the country.

Appendix E – Team Consensus

Team Consensus

I have read and approved of the content as a representation of the team's work and my contribution.

Team Member (full name)	Signature	Date
Thomas Cluff	Thomas Cluff	12/09/2021
Jack Miller	Jack Miller	12/09/2021
Jack Myers	Jack Myers	12/09/2021
Shahmun Jafri	Shahmun Jafri	12/07/2021