CSE 5544 Final Project

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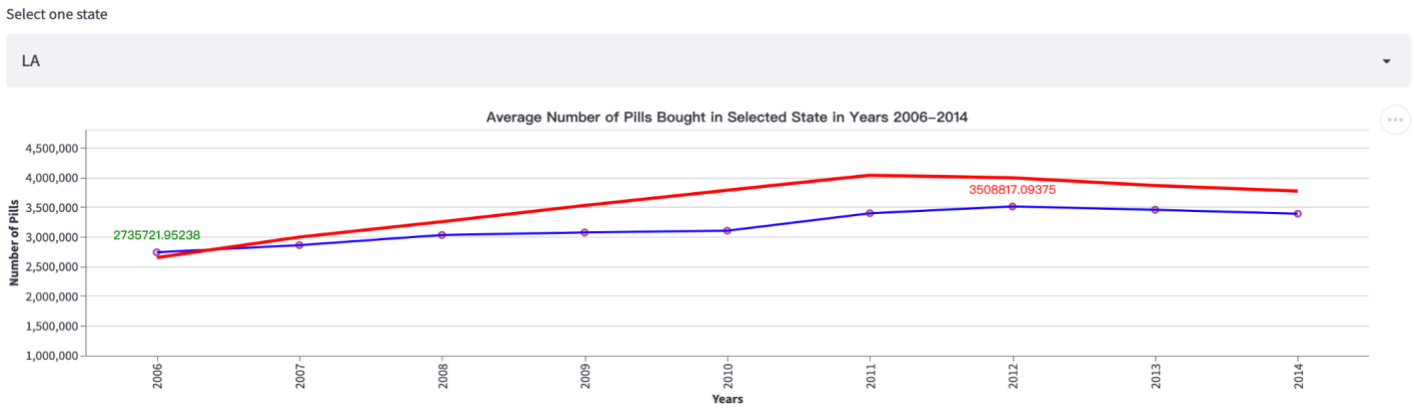
Introduction

The dataset tracks the path of every opioid pain pill, from manufacturer to pharmacy, in the United States between 2006 and 2014. We use a national dataset to construct the overall pills' trend by counting the average number of pills bought in selected states from 2006 to 2014. In order to analyze the pills buying and manufacturing trend, we use the subset of national dataset to construct a treemap with coloring to find out the proportions of counties' buying power. For more detailed visualization, we point out the amount of pills produced by each manufacturer in Delaware county from 2006 to 2014. The graphs and descriptions listed below.

Graph 1:

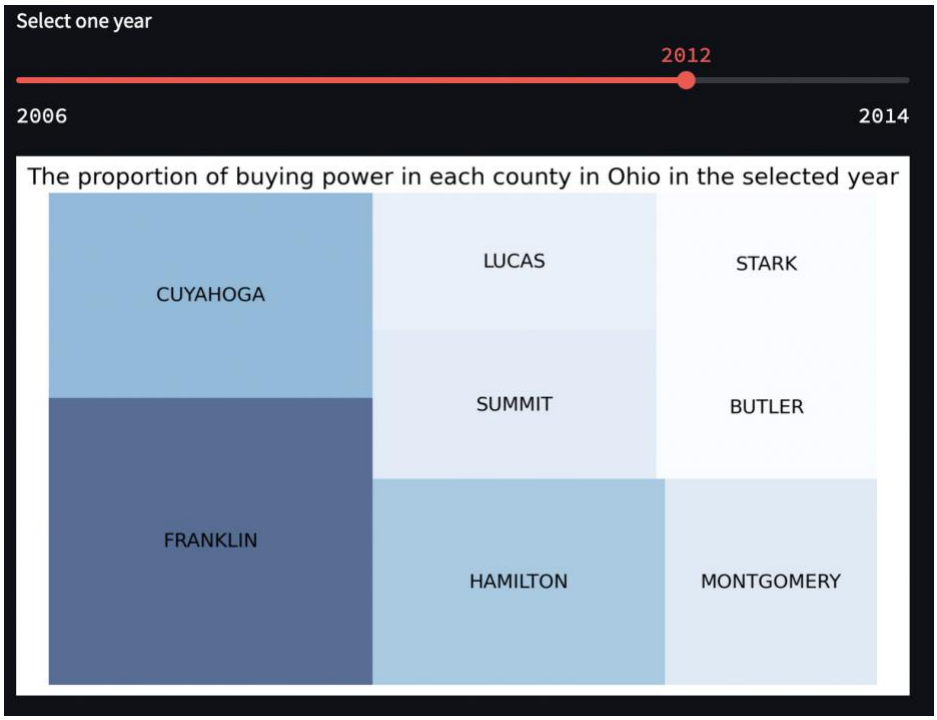


This line chart represents the average number of pills bought in the selected state from 2006 to 2014. Line charts can give users a more direct perspective of the trend of the number of pills.

Users can select one state from all the states in the United States, and the chart would correspondingly show the trend of the number of pills bought in the selected state. The blue line on the chart shows the average number of pills bought in the selected, and the red line on the chart shows the overall average number of pills bought in the United States. The maximum point is highlighted with the red color, and the minimum point is highlighted with the green color. Additionally, if the user put a mouse on any of the points, the chart would display the exact number of pills bought in that year.

Take LA as an example. If the user selects LA as the state, the chart would display the trend of the number of pills bought in LA, and the overall trend. We can easily find that the average number of pills bought in LA is in a slightly increasing trend, and it is almost always below the overall average amount.

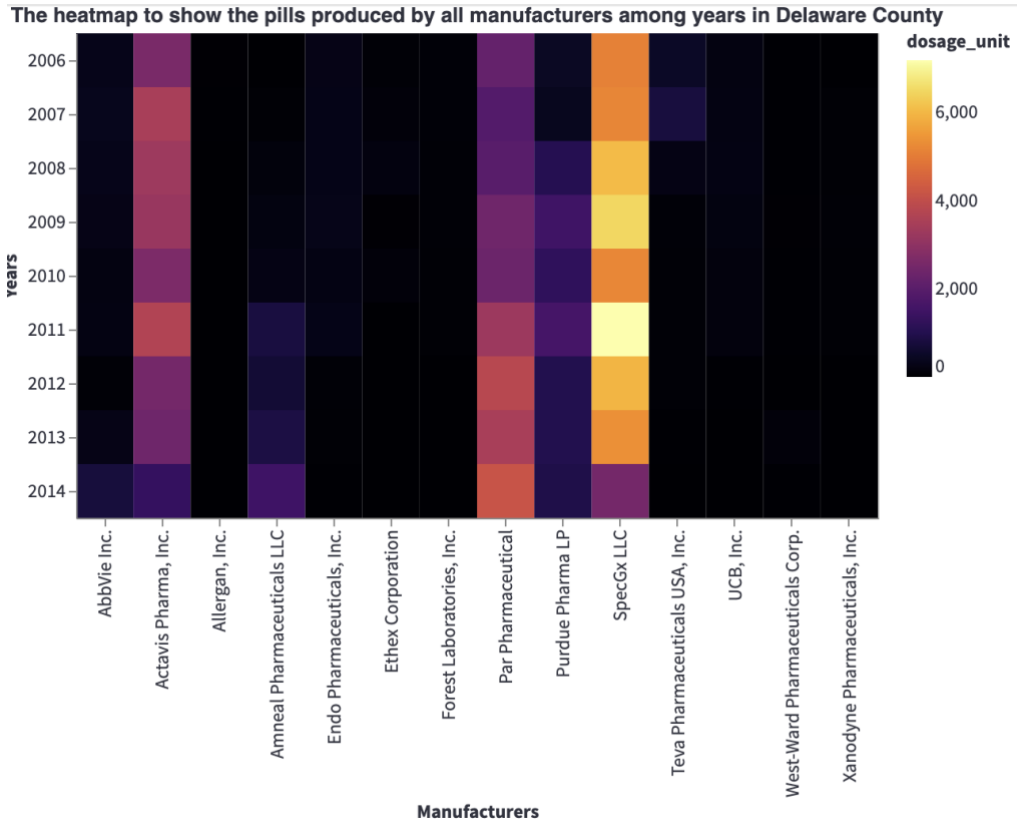
Graph 2:



This graph is the visualization of the buying power in each county within the selected year. The heavier the color in the graph means the larger buying power in that county. Moreover, the size of the area for each county also represents the buying power, which is the larger the area the more the buying power for the county compared to other counties. We can see the timeline above the graph that can be adjusted so that we can see the change of buying power in each county in different years.

By visualizing the data of buying power for each county, we found out that the proportion of buying power in each county did not change a lot from 2006 to 2014, which means the proportions of buying power are stable during the years. Franklin county always had the largest buying power.

Graph 3:



To find the correlation between years and pills produced by each manufacturer in Ohio, we decided to build a heatmap, which is clear to show the trend and easy to compare. Delaware county is a representative county in Ohio, so graph 3 shows the trend of drugs produced by each manufacturer in Delaware county.

In our heatmap, the lighter color means the larger number of pills produced, and the darker color means the fewer pills produced. Additionally, the number of pills produced by a manufacturer in a certain year can be displayed when the mouse moves to one color cell. So, we can find the trend of pills produced by each manufacturer, and the comparison between all manufacturers.

In this graph, it is clear to find that SpecGx LLC is the largest manufacturer in Delaware county from 2006 to 2013. However, Par Pharmaceutical became the largest manufacturer in 2014. The number of pills produced by Par Pharmaceutical has been increasing every year since 2006. In general, the years 2008 to 2012 were the peak years for the number of drugs produced. Since 2012, Delaware county's use of drugs has decreased in parallel with manufacturers' production of drugs.

Conclusion

Through our project, we made graphs to show the number of opioid pain pills used in each state. We can clearly see the changes in the number of people buying the pills in Ohio and the proportion of the county they come from during 2006 - 2014. Additionally, our graphs also show

people's preferences for manufacturers have changed in Delaware county. In general, we can say that the number of opioid pain pills used declined since around 2012.