# Drug Poisoning Mortality Rate Analysis Report

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## The Data we Chose - Link

We chose this data set because we believe that drug overdose and poisoning mortality have been rising quickly, especially among people in our age group, and we felt it would be a fascinating topic to investigate. It also helped because the data set covered a wide time range and was more comprehensive. A drug overdose's severity is determined by the drug, the dosage, and the victim's physical and medical history. Our dataset includes a variety of categories that enable us to divide and distribute the data into a format that is easier to read and more useful.

## ETL Process

We downloaded the CSV File from the CDC site. After Downloading our First step was to Clean the Data Set. Taking a good look at the data we realised that it was a

conglomeration of different factors affecting Deaths caused by Drug Poisoning. So using the Filter in Excel we separated the Data into its multiple Factors that were Age, Sex, State and Race. After performing the initial cleaning process the data was actual quite well put together and to do further analysis we imported the Data to visualization tools such as Tableau and Power BI. Additional Analysis : We thought that we could do an in-depth analysis on States and how different types of state may affect the death rate differently so we downloaded two more CSV files present on the cenus site, 1) Classification of States into geographical regions and 2) Average Household incomes of US states over the same time period. Using commands such as V Lookup and formatting using if statements we created additional columns and did Analysis on it.

## Data Visualization

1) State Map - Using a state map with a red-gold color scheme, which is supported with labels indicating the death rates in each region, we may display the death rate per state. We did not display the number of deaths per state as it would only correlate with the Population of each state. State Maps give us a direct visual of each state without much requirement of reading into data too much.

2) Line Chart - Given that we are displaying a death trend from 1999 to 2015, a similar methodology was utilized for "Deaths of Male and Female by Year" and "Death Rate of Male and Female by Year." We used the color orange for men since they die roughly twice as often as women, who were given the color blue. People who are color blind were given orange and blue. The line chart has data labels at both ends since data labels at each point would be cluttered and difficult to read. As the data title defined the graph, axis titles

were eliminated. We created 2 different charts first using total deaths and secondly death rates we did this to see if there were any major contrasts between them.

3) Tree Map – To visualize the death rate compared by ages we created a tree map that gives us a direct visual on how the different ages are having huge impacts on death rates. Contrasting colors are used to differentiate big impacts and small impacts but the main differentiating factor is the sizes of the boxes. We also added subdivisions of sex which gives a further insight on which sex is most affected in a particular age group.

4) Pie Chart - To show the sum of crude death rate by race and Hispanic origin, we used pie chart where sum with percentage is displayed. Here we excluded "All races – All origins". Pie charts are a fun way to show what percent of total belongs to a particular factor.

5) Stacked Bar Chart - In stacked bar chart, region is at y axis, sum of death rate is at x axis and state is at legend to create stacked bars. It is in descending order(UP to Down). Using the legend we will be able to understand what states have biggest impacts and the overall bar chart helps us to see which regions are most affected by Drug Poisoning.

6) Scatter Plot - Scatter plot is used to show a relation between Income and deaths, a trend line to back the results where we see the line is decreasing showing death decreases as income increases. Here, income was formatted to custom numbers where the units were set to none and decimal points to zero. Scatterplot is useful to from regression models which can be used to forecasting.

## Insights

Based on the visuals we utilized, we made the following observations: from 1999 to 2015, West Virginia had the highest death rate and North Dakota had the lowest. While the death rate for women didn't experience any significant increases or decreases and reached its highest point in 2015, the death rate for men continued to rise until 2006 before declining until 2010 and reaching its highest point in that year. Males are more likely than females to die, thus we can conclude that they are more affected by this issue.

Therefore, we might conclude that drug poisoning-related deaths have been rising over time.

Non-Hispanic White people have a much higher death rate than people of other races. White non-Hispanics experience a death rate of over 46%, whereas Hispanics experience a death rate of about 21%. Non-Hispanic Black people have a 33% mortality rate compared to the general population.

According to calculations made using data from the years 1999 through 2015, the age group of 45 to 54 had the greatest death rate. The lowest death rate, including for both genders from the years 1999 to 2015, is for those under the age of 15. We can also say that the average death rate decreases over time as average income increases. This could be because as incomes rise, more people have better access to services and better healthcare is offered, which leads to a gradual decline in the average death rate.

We may state that between 1999 and 2015, the death rate in the South of the United States was the greatest, while in the Midwest, it was the lowest. As a result, we might conclude that drug use is least prevalent in the Midwest and most prevalent in the South.

**Overall Response**

After analyzing the data and creating visualization we come to the conclusion that the mortality rate of drug poisoning has been increasing over the years which is in line with our original observation of our surroundings. There is also a correlation between income and death rate which suggests that poorer households are much more effected by drug poisoning. Taking too much of a chemical, whether it be prescribed, over-the-counter, legal, or illicit, results in drug poisoning. Overdosing on drugs can happen accidentally or on purpose. Therefore, the Government should take steps against this problem, that could be done by raising awareness, better and cheaper healthcare and promotion of elderly welfare.