Gun violence in United States

Gun Violence: Introduction and background

News about shootings and gun violence is constantly in the news in the United States. There were 44,310 deaths in the U.S. in 2022 (Alfonseca, 2023). As of May 1, 2023, at least 13,959 people have died from gun violence in the United States (Alfonseca, 2023). There is a big debate among politicians and Americans about the right to bear arms or the right to personally own a gun. In 2021, Pew Research Center conducted a survey and found that 48% of Americans see gun violence as a big problem in the United States (Schaeffer, 2021). As this is a huge topic that is seen in the news, our group was curious to learn more and discover any connections between gun violence and other variables. For example, we can learn if certain states have higher rates of gun violence than others. This project could benefit others by finding out ways to decrease gun violence.

Dataset

The datasets we are using are extracted from Gun Violence Analysis (2014-2017) from Tableau Public Cloud. There are three datasets in it, the major dataset is gun violence data, other supporting datasets include gun licenses dataset and US state wise population dataset. The major gun violence dataset has 32 columns with *Incident Id* to index each individual gun violence incident. The dataset also includes address, city, state, date, latitude, longitude, number of injured, number of killed, number of losses of the incident, each individual participant's gender and age group, and source report URL of the incident. The major dataset has 4,286,343 rows of data to cover incidents between 2014 and 2017, the sufficient amount of data allows us to make a dashboard to display gun violence facts in this period of time. During the data preparation phase, we converted the descriptive value for participant's age group and gender to numerical value, this helps us to make charts surrounding age group topic.

All columns detail in the major datasets are list below:

Address: physical address with street name

Characteristics: characteristics of the incident

City or County: the name of city or county where the incident happened

Date: date of incident happened

Gun Stolen: Description of whether the gun in the incident is stolen (value includes unknown, stolen, and non-stolen)

Gun Type: Type of the gun in the incident

Incident Id: The unique ID for each incident

Location Description: Descriptive location of the incident (e.g. Safeway, Walmart)

N Guns Involved Range: number of gun involved, "10+" if number if greater than 10

State: Full name of the state where the incident happened

Congressional District: integer to show the congressional district

Latitude: latitude of the incident

Longitude: longitude of the incident

N Guns Involved: Specific number of guns involved

N Injured: number of people who get injured in the incident

N Killed: number of people who get killed in the incident

N Loss (Injured+Killed): number of people who get injured or killed in the incident

State House District: Integer to show state house district

State Senate District: Integer to show state senate district

Male_count: Integer to count number of male involved in the incident

Female_count: Integer to count number of female involved in the incident

Child_count: Integer to count number of children (age <= 11) involved in the incident

Teen_count: Integer to count number of teenagers (11 < age < 18) involved in the incident

Adult_count: Integer to count number of adults (age >= 18) involved in the incident

Total_participant_count_by_gender: Sum of Male_count and Female_count

Total_participant_count_by_age: Sum of Child_count, Teen_count and Adult_count

All columns in the Gun Licenses dataset:

State: Full name of the state

 # gun laws 2014: number of gun laws in year of 2014

 # gun laws 2015: number of gun laws in year of 2015

 # gun laws 2016: number of gun laws in year of 2016

 # gun laws 2017: number of gun laws in year of 2017

 # Of Guns Registered: number of gun registered at 2017

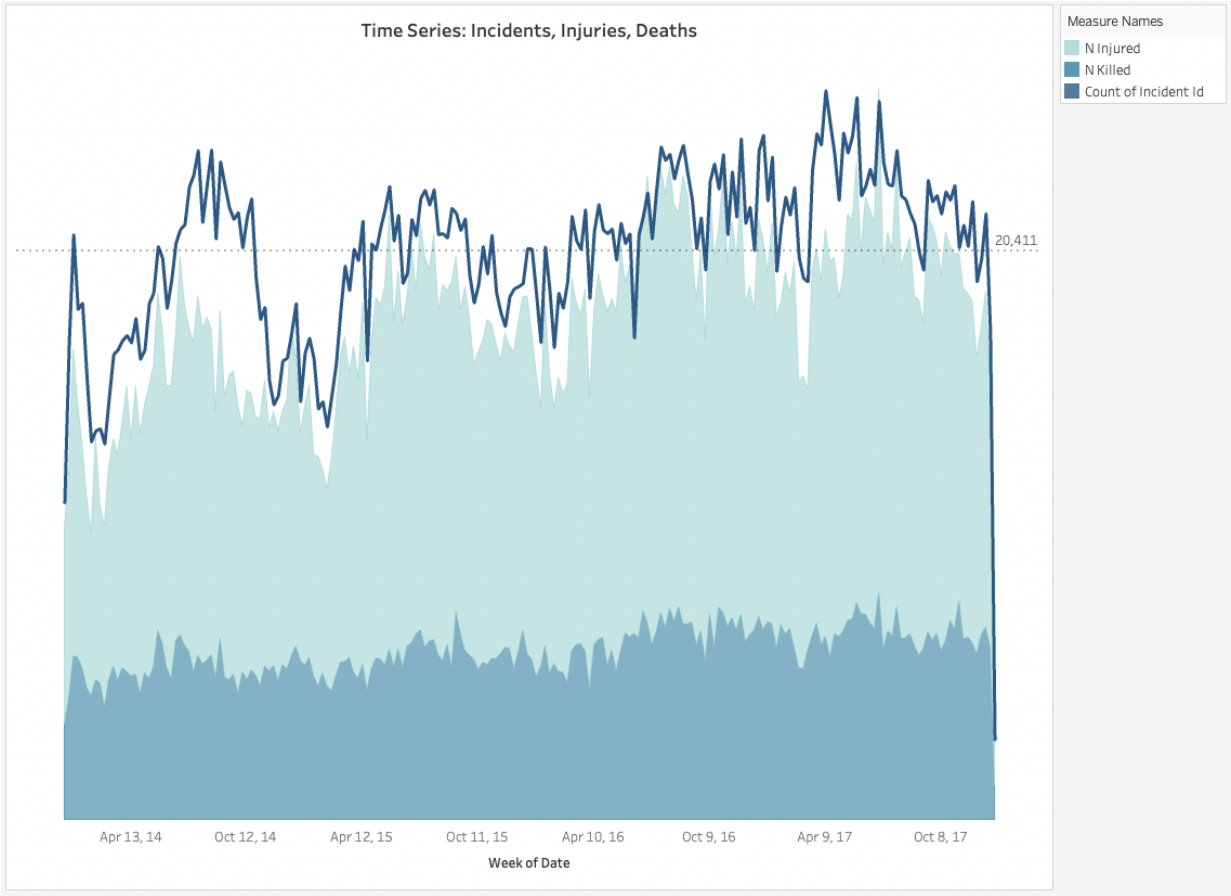
All columns in the US State Wise Population dataset:

State1: Full name of the state

Population (2017): Total population number of the state in 2017

Data Story

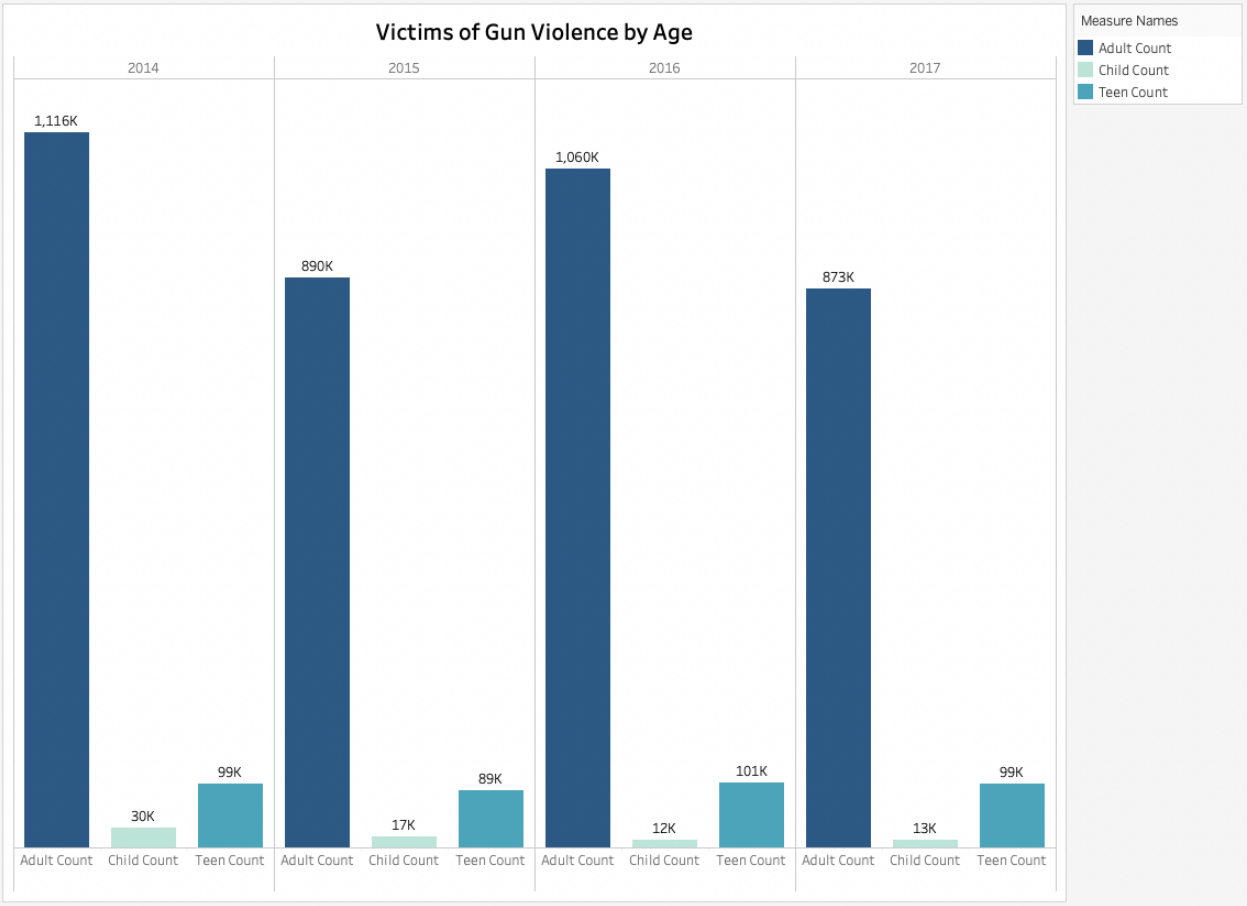
1. Time Series: Incidents, Injuries, Deaths



The time series on incidents, injuries and deaths graphic indicates the number of gun violence incidents, injured people and dead people by a combination of area chart and line chart. The column is the report date data presenting in the week number of the year. The rows data are supported by sum of *N Injured*, *N killed*, and count of *Incident ID* columns from the data set. The darker blue area chart represents the number of people killed of the week and the lighter blue area chart represents the number of people injured. Since *N Injured* and *N Killed* are in the unit of number of humans, *Count of Incident* is in the unit of number of gun violence event, we decided to display its value in a line chart instead of the same style of area chart.

With this chart, we can see that while the number of gun violence incidents has been fluctuating from week to week, the three shooting-related numbers have been increasing between 2014 and 2017. This implies a failure of gun control in the United States during these three years. In the trend line representing these three data, we can see that the trend line for *N Injured* has a higher slope, which means that more people are being harmed in gun crime incidents now than in the past.

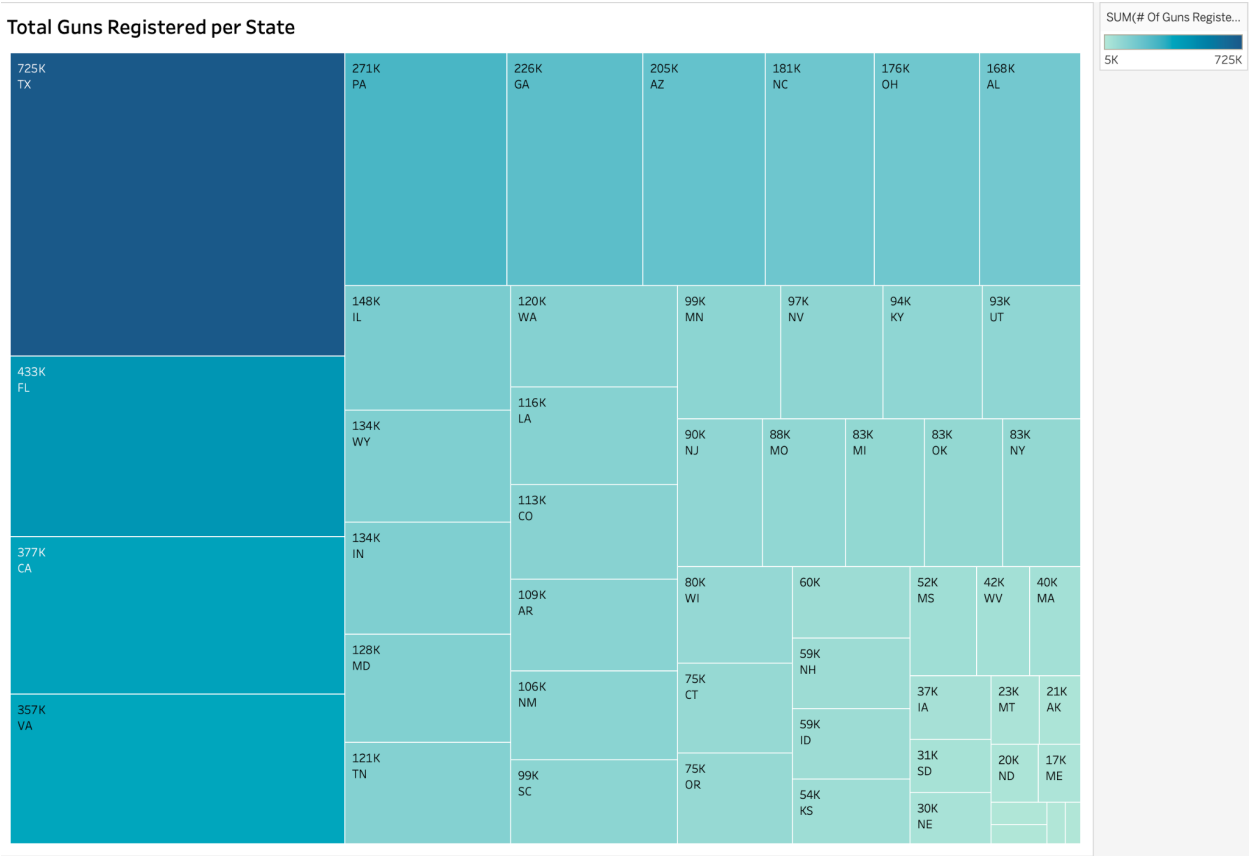
2. Bar Chart: Victims of Gun Violence by Age



This histogram counts all those implicated in shootings by age. Those under the age of 12 are recorded as *child*, those between the ages of 12 and 18 are recorded as *teen*, and those older than

18 are recorded as *adult*. From this chart, it is reassuring to know that the number of children threatened by guns is declining, but more than 100,000 children are still implicated in shootings each year, warning that only further gun control can protect children in the United States. Another piece of information to keep an eye on is that the number of teenagers involved in shootings had a steady number between 2014 and 2017. This suggests that the U.S. needs to increase education for youth to stay away from potential gun threats and needs to educate students on how to protect themselves in this dangerous social environment.

3. Total number of guns registered per state:

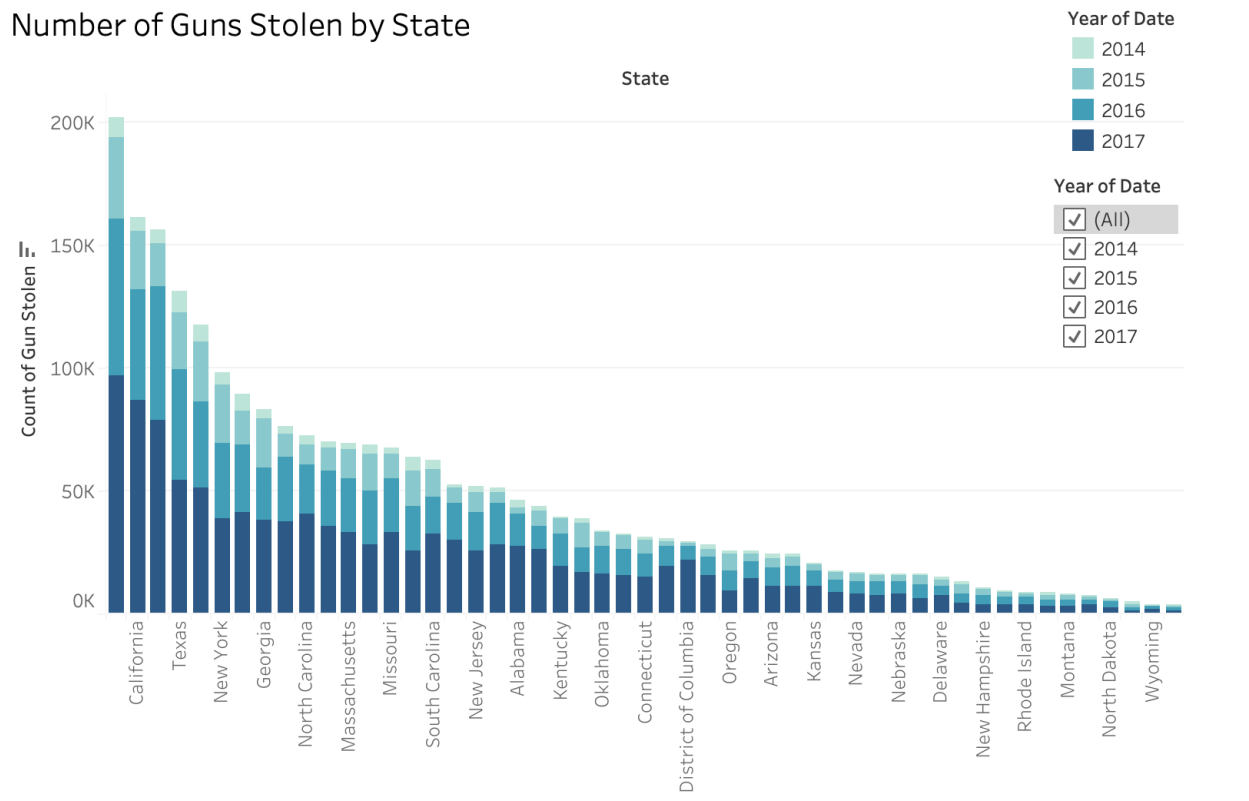


The tree map is created using gun violence dataset and States dataset. Number of guns registered is taken from gun violence data and state and state abbreviation is taken from States dataset.

State abbreviation and sum of guns registered is added in text and detail to show in each tile as well as pop up while hovering. The size of the tile represents comparative numbers in each state.

Maximum guns are registered in Texas followed by Florida and California.

4. Bar Chart: Number of Guns Stolen per State



This bullet bar chart is created using gun-violence dataset with count of guns stolen in rows and state in columns. A filter for year wise visualization has also been added to compare the number over the years as well as individually for every year. It shows the number of guns stolen per state from 2014 to 2017 with each stack in bullet representing a year. It can be inferred that in 2017, the number of guns stolen has increased drastically in comparison to previous 3 years.

5. Percentage of Population Affected by Gun Violence

This heatmap table is created using gun-violence dataset and placing Date(Year) in columns and State in rows. A calculated field named ‘Pop affected’ was created to get percentage of population affected by gun violence with below mentioned query:

Pop affected | gun-violence-data_01-2013_03-2018

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SUM([N Loss (Injured+Killed)])/SUM([Population (2017)])*100
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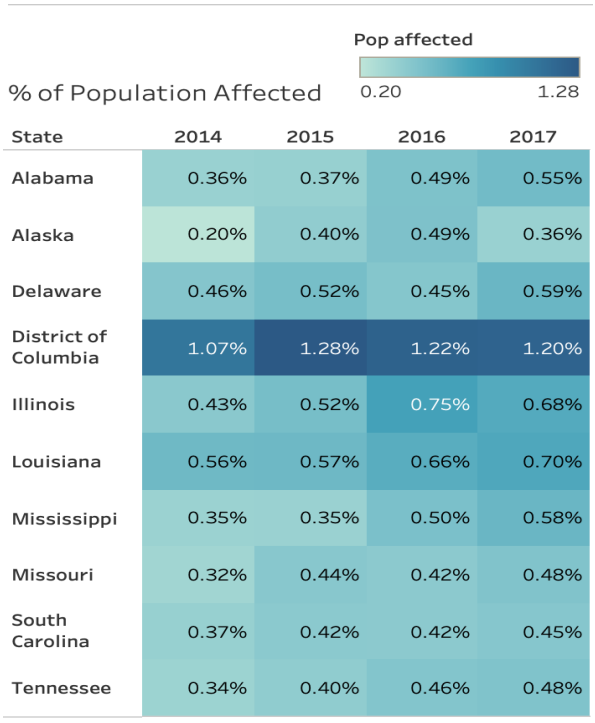
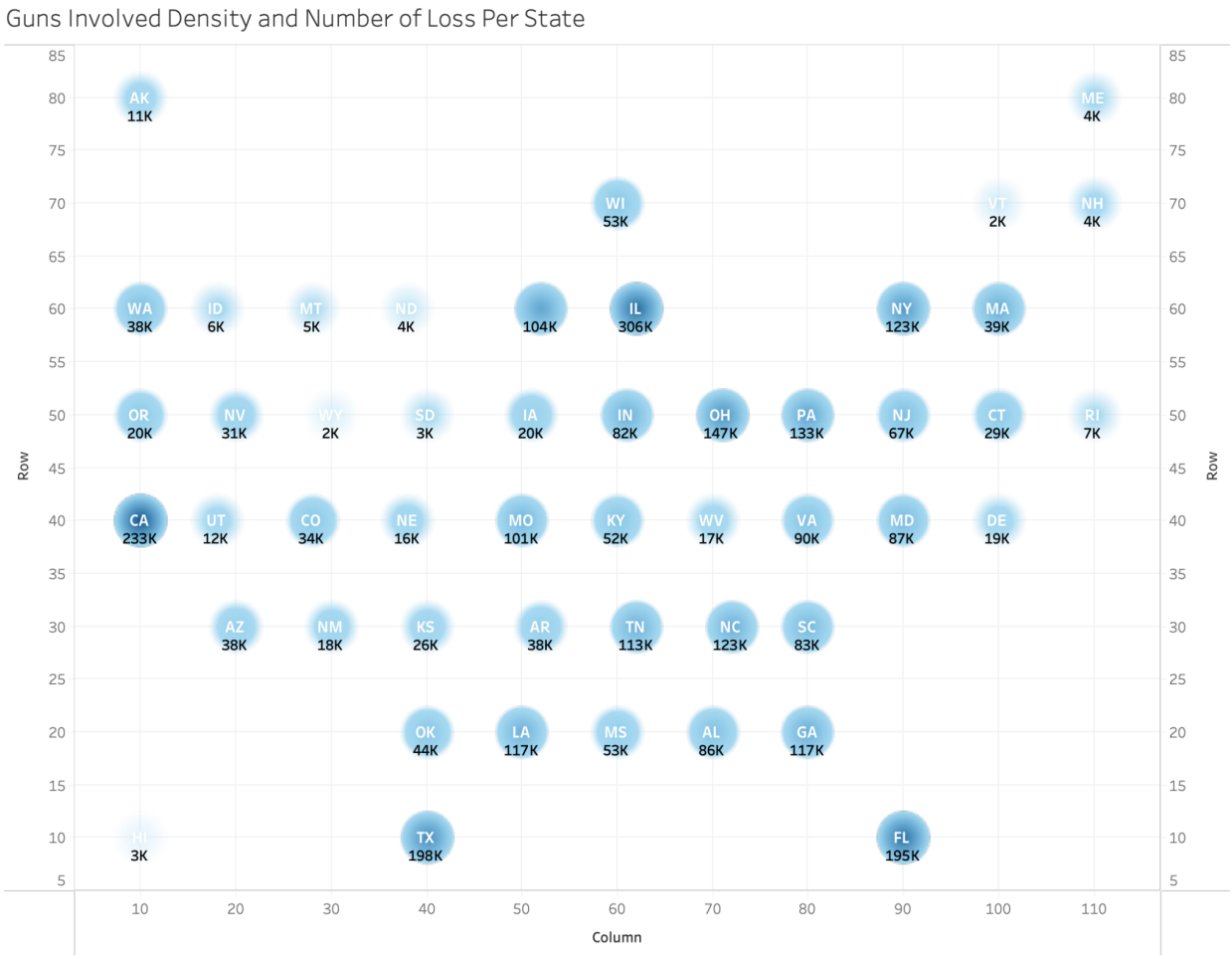
Population affected by gun violence(Pop affected) is placed in text as well as color to create the heatmap. Lastly, a filter is applied on State with a condition to show the top 10 states sorted by Population affected by gun violence.

District of Columbia or more profoundly known as Washington D.C. now has the highest percentage of population affected by gun violence over all four years.



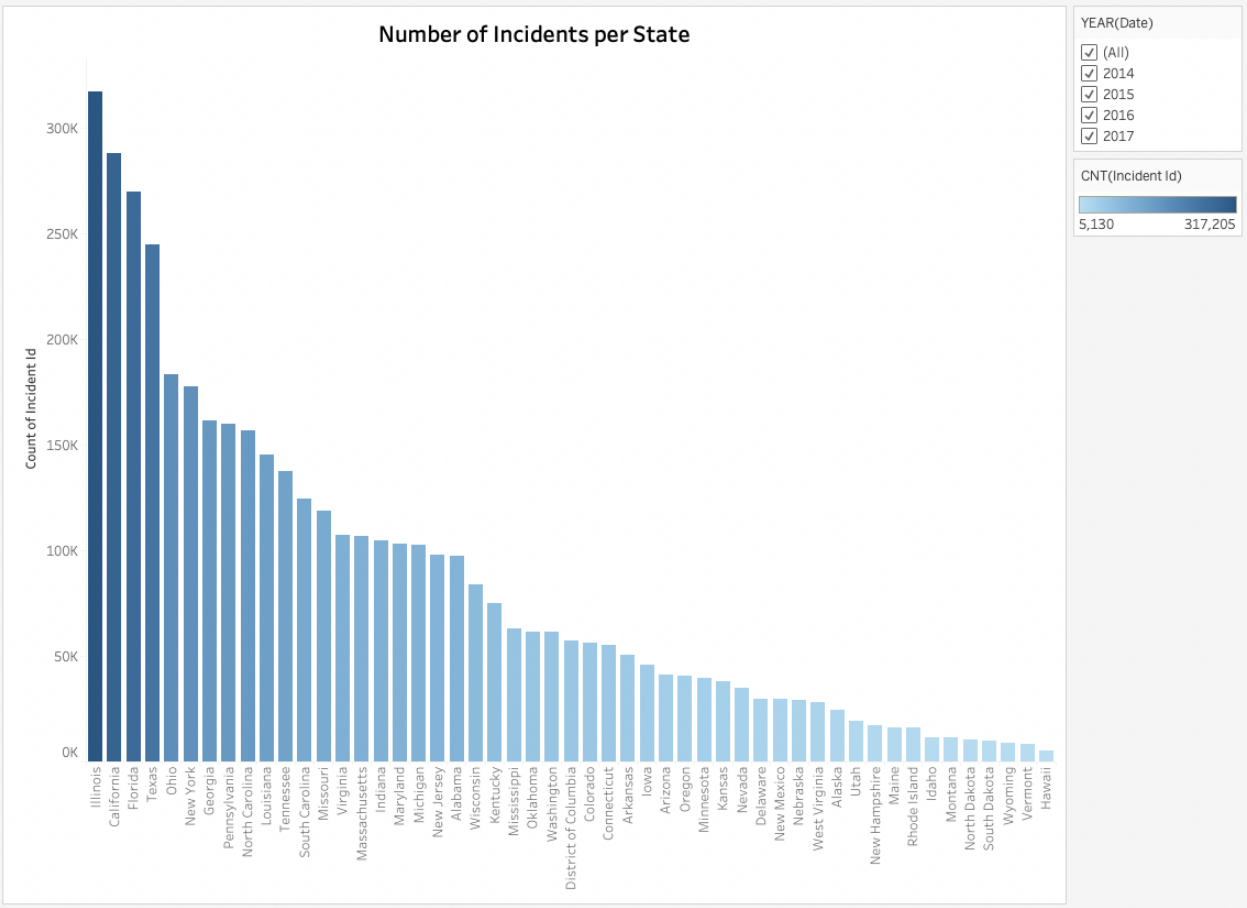
State	2014	2015	2016	2017
Alabama	0.36%	0.37%	0.49%	0.55%
Alaska	0.20%	0.40%	0.49%	0.36%
Delaware	0.46%	0.52%	0.45%	0.59%
District of Columbia	1.07%	1.28%	1.22%	1.20%
Illinois	0.43%	0.52%	0.75%	0.68%
Louisiana	0.56%	0.57%	0.66%	0.70%
Mississippi	0.35%	0.35%	0.50%	0.58%
Missouri	0.32%	0.44%	0.42%	0.48%
South Carolina	0.37%	0.42%	0.42%	0.45%
Tennessee	0.34%	0.40%	0.46%	0.48%

6. Map chart: Gun Involved Density and Number of Loss Per States.



In this map chart, I implemented the skills we learned in class by blending the relationship between the gun violence dataset and the states dataset that we used in class. By blending the two datasets, we were able to plot the data points and create a map of the United States. We added state abbreviations instead of full state names, making the chart cleaner and less cluttered. Additionally, we converted the numbers to a unit of thousands to make it easier for readers to understand how many people were injured or killed in each state's gun shooting incidents. The density of color represents how many guns were involved in each shooting incident, making it easy for readers to identify dangerous states with higher numbers of guns in those regions.

7. Bar chart: Number of Incidents per State



In the bar chart, we used the variables State, Incident ID, and Date. We listed out all the states and the count of incident ID to find out how many gun violence incidents happened in each state. We ordered it by descending to see the states with the most number of incidents. We added a filter for the year and used the color mark for the count of incident ID. With this chart, we were able to see that the top four states with the highest number of gun violence incidents are Illinois, California, Texas, and Florida.

Summary and Conclusions

Our visual analysis of gun violence data from 2014 to 2017 reveals an increasing trend in the number of incidents, injuries, and deaths across the United States. The states with the highest levels of gun involvement include California, Illinois, Texas, Michigan, Florida, and New York, which also correspond to the highest number of lives lost due to gun violence. Notably, Texas, Florida, California, and Virginia have the highest number of registered guns. Most gun-related incidents occur within the adult age range. This analysis suggests that states with larger populations tend to have more gun registrations and gun-related incidents, thus increasing the likelihood of being affected by gun violence. To reduce gun violence, the government should consider limiting gun registration and reducing the number of firearms in society, ultimately creating a safer environment for all.

References

Alfonseca, K. (2023, May 2). *More than 13,900 people killed in gun violence so far in 2023*. ABC News. Retrieved May 3, 2023, from https://abcnews.go.com/US/116-people-died-gun-violence-day-us-year/story?id=97382759

Schaeffer, K. (2021, September 13). *Key facts about Americans and guns*. Pew Research Center. Retrieved May 3, 2023, from https://www.pewresearch.org/short-reads/2021/09/13/key-facts-about-americans-and-guns/