ISM6419 – DATA VISUALIZATION

Project Report

A Study of Mass Killings in America

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NOVEMBER 3, 2023

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Introduction

Mass killings in America refer to incidents in which multiple people are killed in a single event, typically involving firearms or other deadly weapons. A high number of casualties often characterizes these incidents and have garnered significant attention due to their tragic nature and the impact they have on communities and society as a whole.

Mass killings can occur in various settings, including schools, workplaces, public spaces, and private residences. They can be carried out by individuals with various motivations, ranging from personal grievances to ideological beliefs or mental health issues.

It's important to note that mass killings are a complex and sensitive topic, and they raise questions about gun control, mental health services, and various societal factors. These incidents have led to ongoing debates and discussions about how to prevent and respond to such tragedies in the United States.

Given this information, I have formulated a few research questions to evaluate the data better.

1. **Which American states are safest/least safe to live in?**
2. **Is race a factor when incidents like these occur?**
3. **Is gender a factor when incidents like these occur?**
4. **Is political inclination a factor when incidents like these occur?**
5. **Is there a correlation between states with high gun ownership and mass killings?**
6. **What happens to the perpetrators after such incidents?**

Given the data collected from various sources, I hope to answer these questions and gain additional insights about such horrible incidents.

Methodology

Mass Killings in America

The Associated Press/USA TODAY/Northeastern University Mass Killings database meticulously records all homicides in the United States since 2006, where four or more people, excluding the perpetrator, are killed within a brief timeframe of 24 hours. This inclusive approach encompasses incidents regardless of the weapon used, location, the relationship between the victims and the offender, or the underlying motive. The database provides comprehensive information on various aspects of these incidents, including details about the events, the individuals responsible, and the victims.

Link: https://data.world/associatedpress/mass-killings-public

State-wise Population by Race

The Population and demographic data are based on an analysis of the Census Bureau's American Community Survey (ACS).

Link: https://www.kff.org/other/state-indicator/distribution-by-raceethnicity/?dataView=1&currentTimeframe=0&selectedDistributions=white--black--hispanic--asian--american-indianalaska-native--native-hawaiianother-pacific-islander--multiple-races--total&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Gun Ownership by State

The data is collected from a 2020 study published by the RAND Corporation on adults who say they live with at least one gun.

Link: https://worldpopulationreview.com/state-rankings/gun-ownership-by-state

US Census Bureau Regions and Divisions by State

Link: https://github.com/cphalpert/census-regions/blob/master/us%20census%20bureau%20regions%20and%20divisions.csv

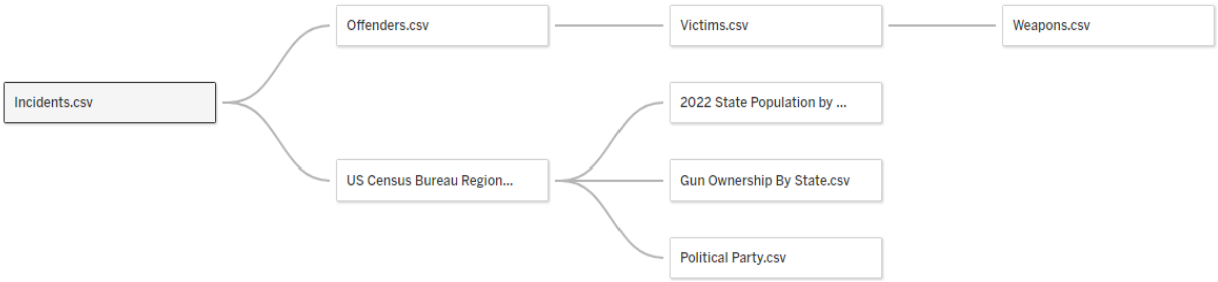
This dataset is http://www.census.gov/geo/maps-data/maps/pdfs/reference/us_regdiv.pdf data converted into a CSV format.

State Political Parties

Link: https://www.kff.org/other/state-indicator/state-political-parties/?currentTimeframe=0&selectedDistributions=state-house-majority-political-affiliation&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

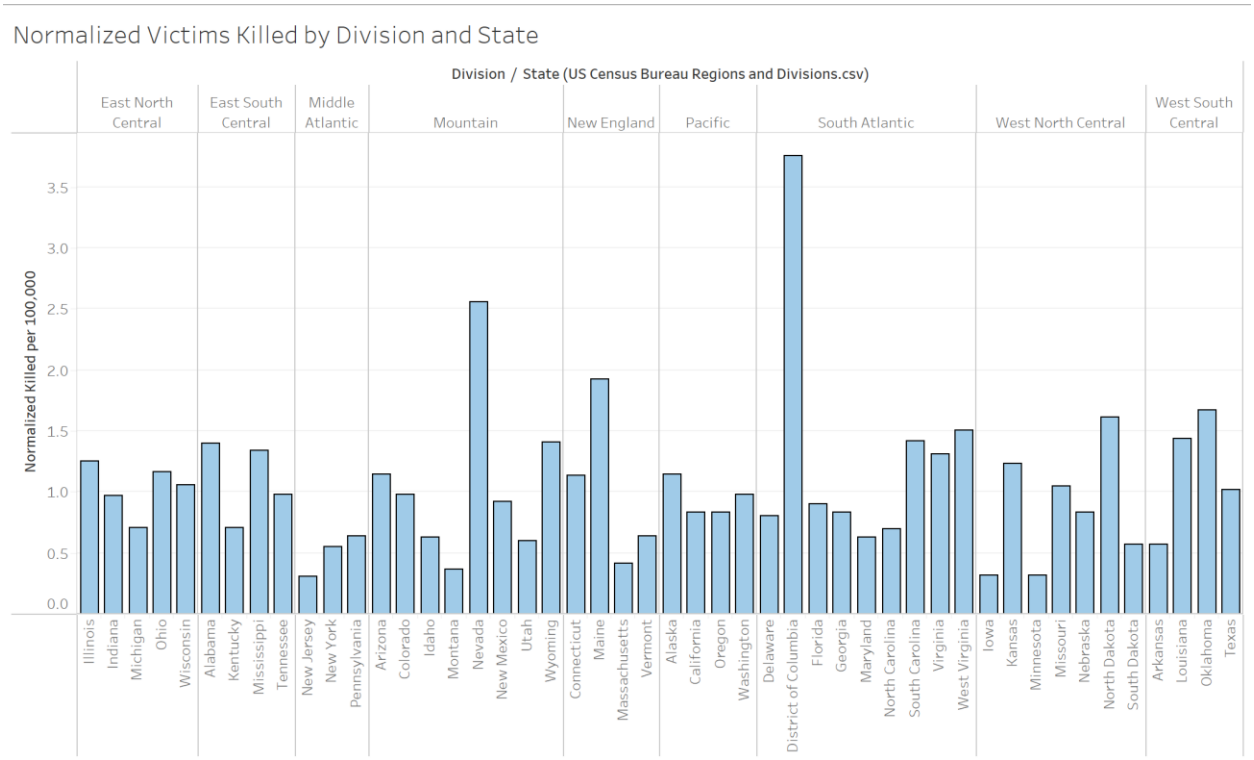
This dataset is information synthesized from "2023 State & Legislative Partisan Composition, National Conference of State Legislatures (NCSL), as of January 17, 2023."

Data Source



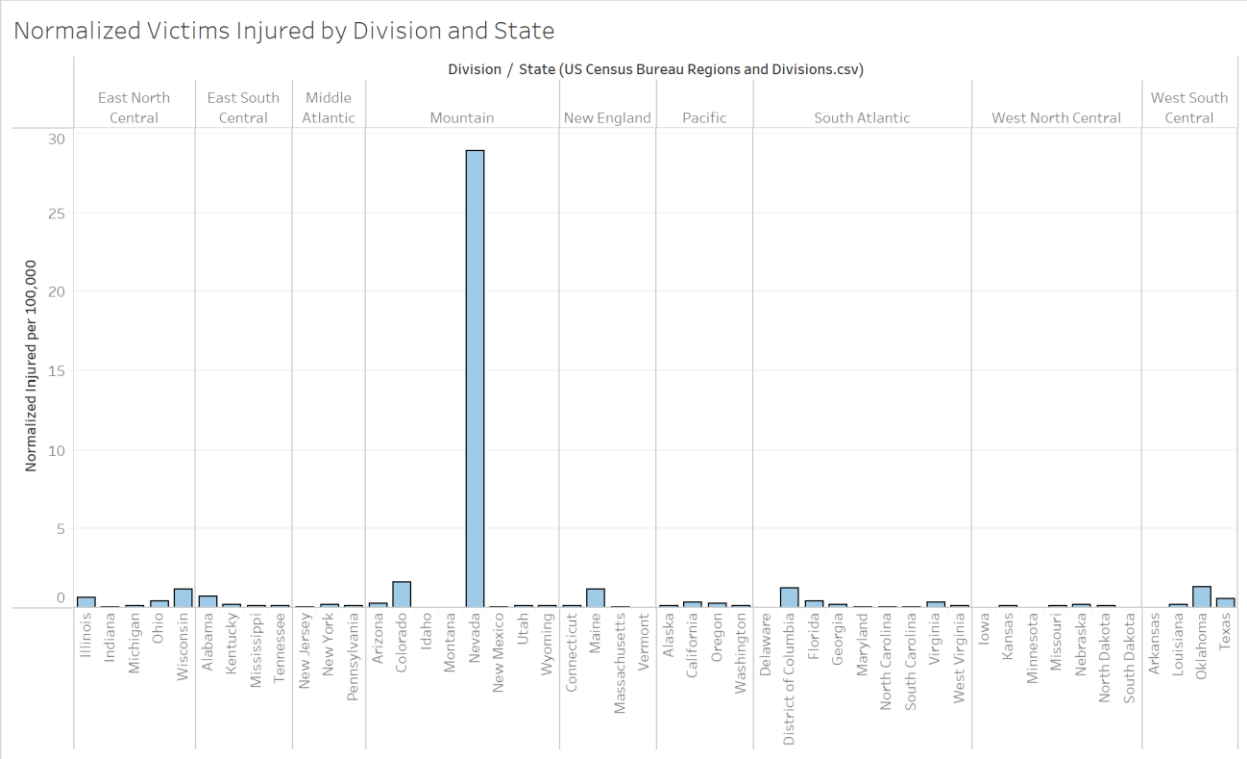
Analysis

1. Normalized Victims killed by Division and State



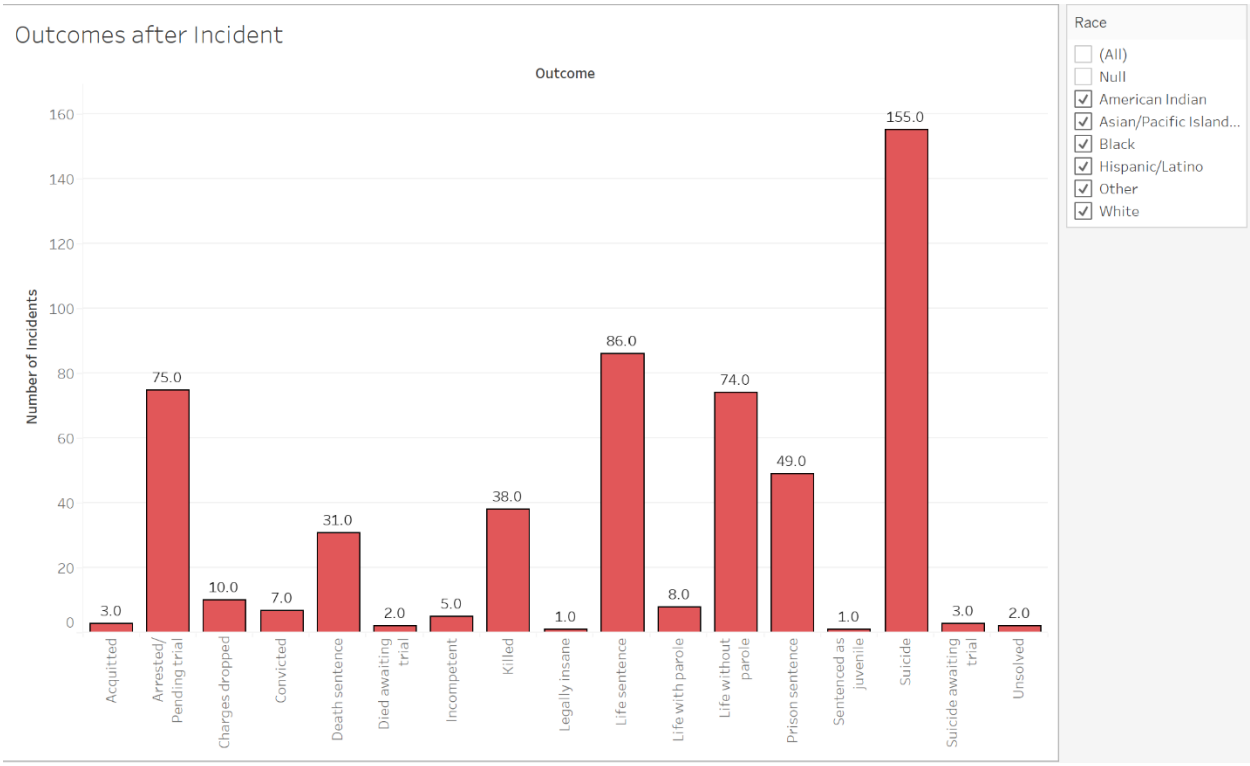
The metric "Normalized killed per 100,000" is used as a standard measure to compare states with different populations. From the chart, it is evident that there is significant variation between other states and regions. A particularly notable insight is the peak observed in the South Atlantic division, suggesting a higher normalized rate of victims in that region than in others. States in the Mountain and Pacific divisions show moderate figures, whereas most states in the West North Central and West South Central divisions exhibit lower normalized rates. This visualization enables a comparative analysis of regional differences in the rates of victims killed, which could be vital for policymakers, researchers, and public health officials in understanding regional disparities and focusing resources and interventions accordingly.

2. Normalized Victims Injured by Division and State



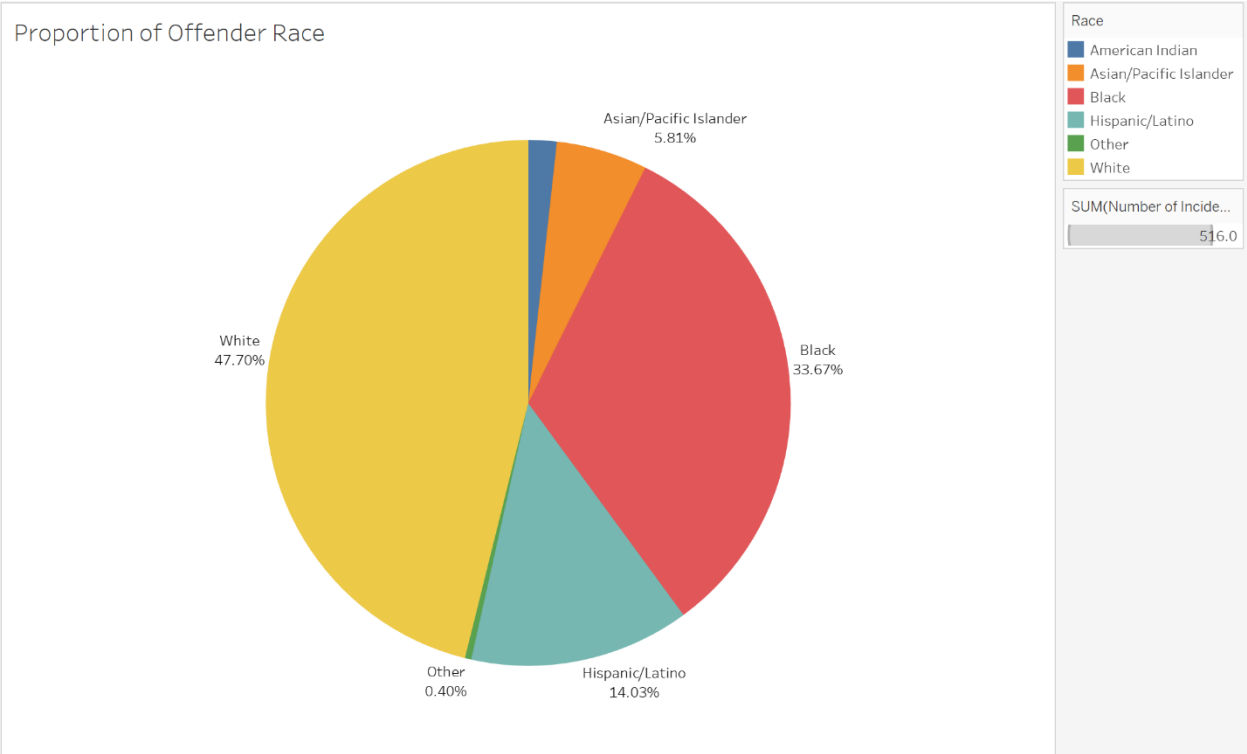
The data shows a striking outlier in the Mountain division, where one state—Nevada—exhibits a significantly higher rate of normalized victims injured compared to other states. The rest of the states, spanning across different divisions such as New England, Pacific, and West South Central, show relatively lower and more uniform rates. This kind of data visualization can be critical for identifying and understanding the prevalence and distribution of injuries across different geographic regions, which can inform public safety strategies, resource allocation, and targeted interventions.

3. Outcomes after Incidents



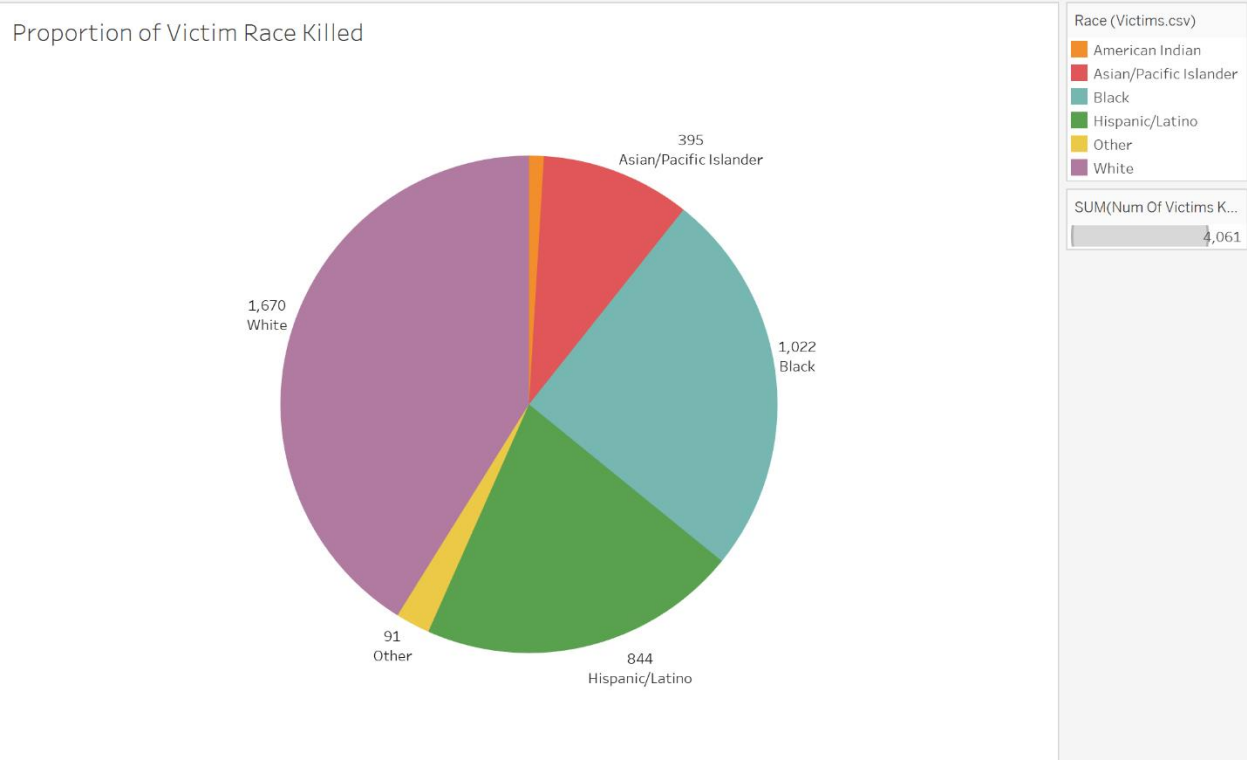
The bar chart categorizes the number of incidents by the outcome for individuals of different races, where the races are indicated by checked boxes, including American Indian, Asian/Pacific Islander, Black, Hispanic/Latino, Other, and White. This visualization suggests disparities in legal outcomes among different racial groups, with some outcomes, like life sentences without parole, being markedly more prevalent. Such data can be instrumental in discussions about racial biases in the justice system, the severity of sentences, and the overall outcome distribution of legal proceedings following incidents.

4. Proportion of Offender Race



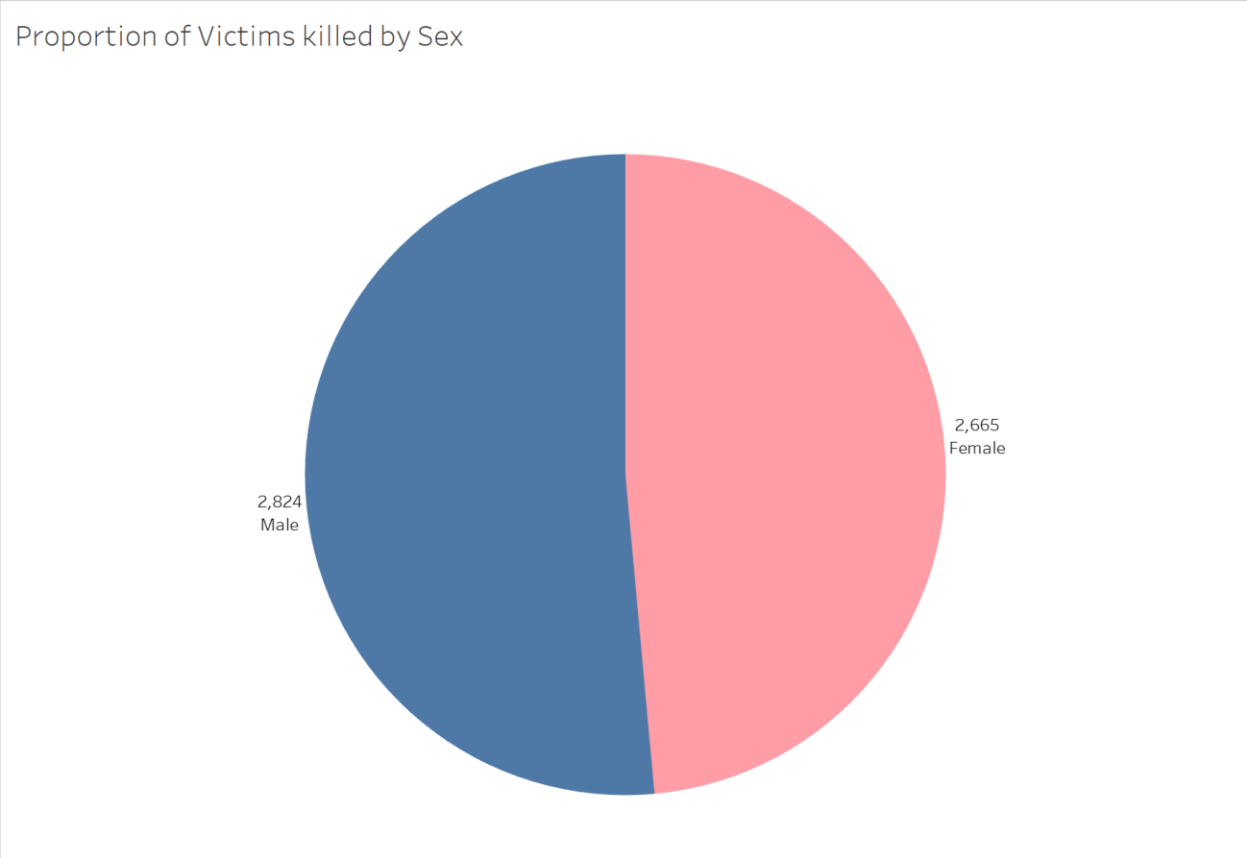
The pie chart illustrates the racial composition of individuals categorized as offenders, with the data summing up to 516 incidents. This distribution provides a visual representation of the racial breakdown of offenders in the dataset, which could reflect various factors including, but not limited to, demographic composition, reporting practices, or systemic issues within the criminal justice system. This kind of analysis is often used to discuss and address questions of equity and representation within societal structures.

5. Proportion of Race of Victims Killed



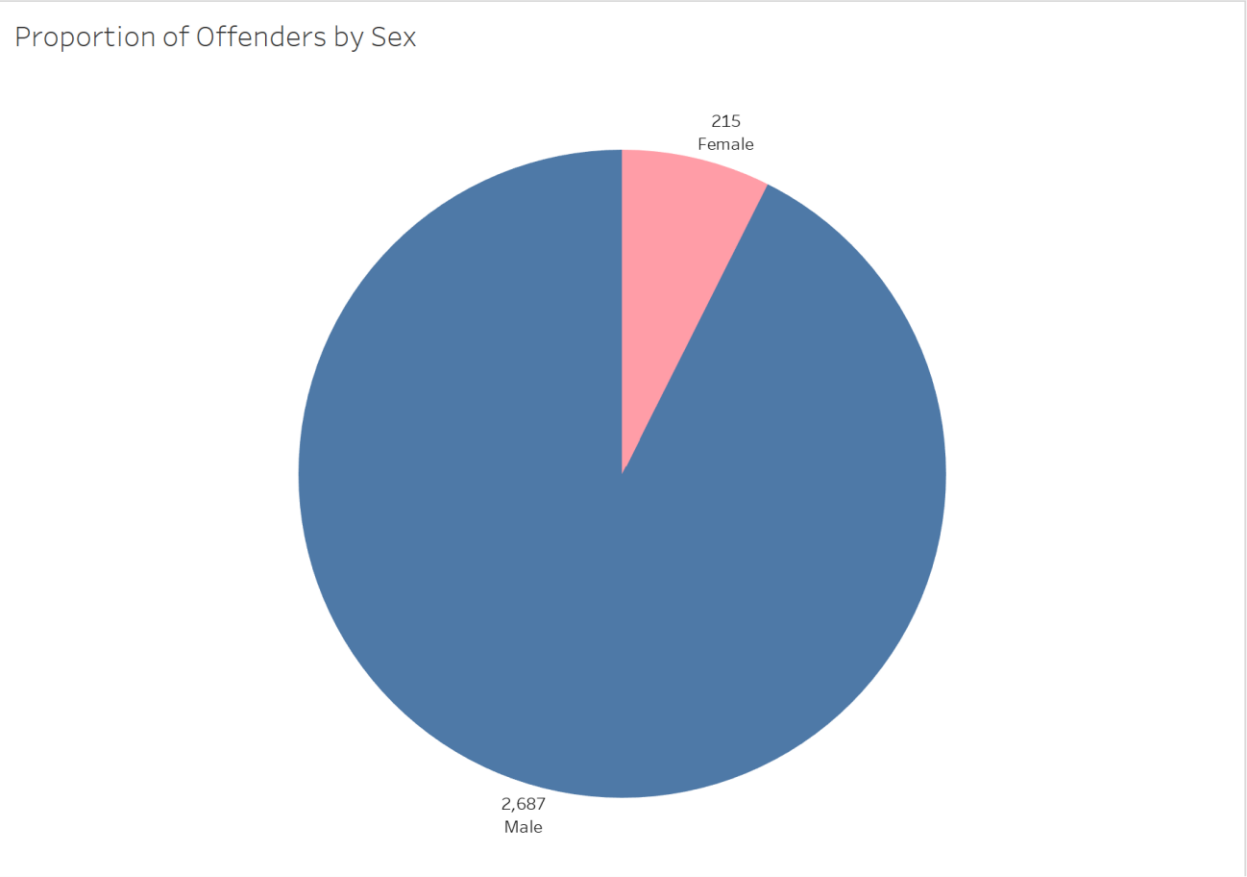
The pie chart displays the distribution of victims' races in a dataset where the total number of victims killed is 4,061. The majority of the victims are White, accounting for 1,670 of the total, followed by Black victims at 1,022. This visual representation highlights the racial breakdown of victims in the dataset, which can provide insights into racial patterns or disparities within the context of the incidents reported. This data is essential for understanding the impact of violent crime on different communities and can be a critical factor in developing targeted prevention and support measures.

6. Proportion of Victims Killed by Sex



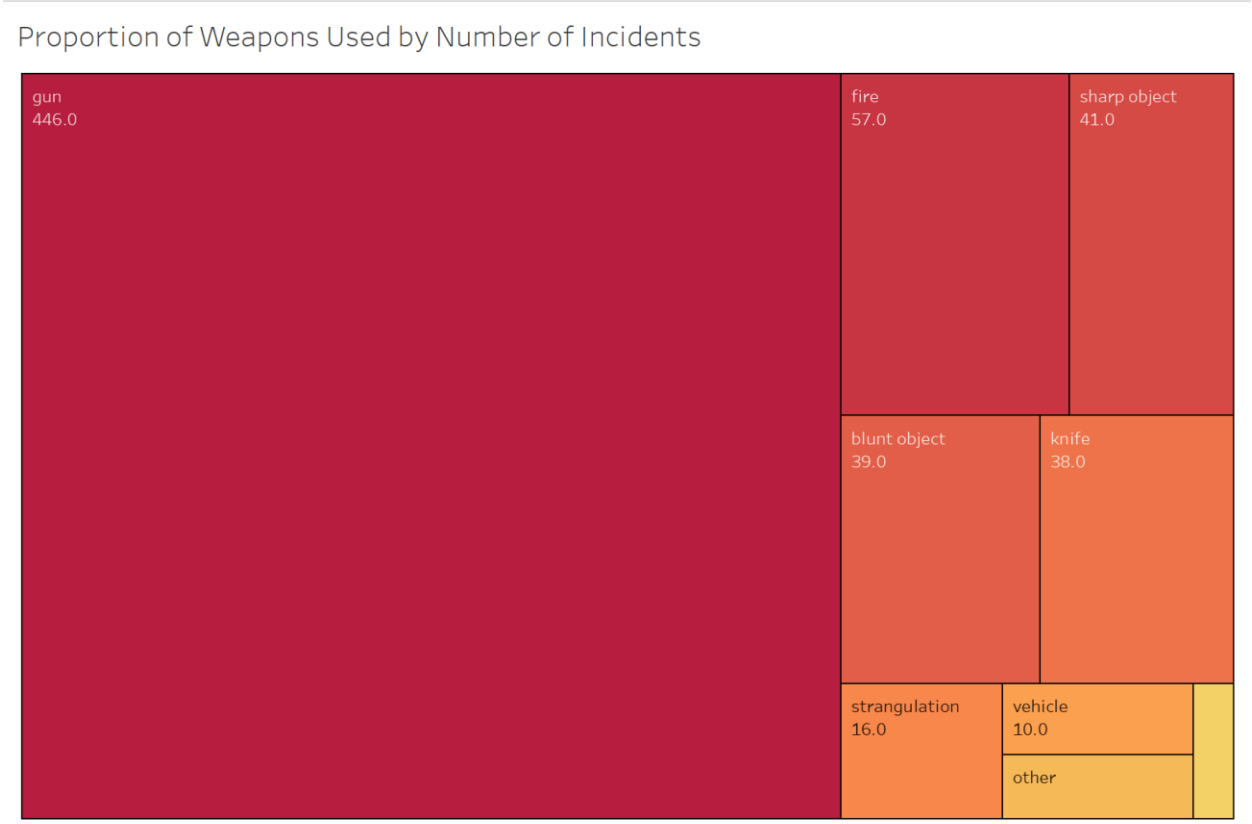
The pie chart depicts the gender distribution of victims who were killed. The total number of victims is divided into 2,824 males and 2,665 females. This nearly even split suggests that both males and females are almost equally represented among the victims in this dataset. The data could be significant for understanding gender-based patterns in violent crimes and may be used to inform initiatives aimed at preventing and addressing lethal violence across different genders.

7. Proportion of Offenders by Sex



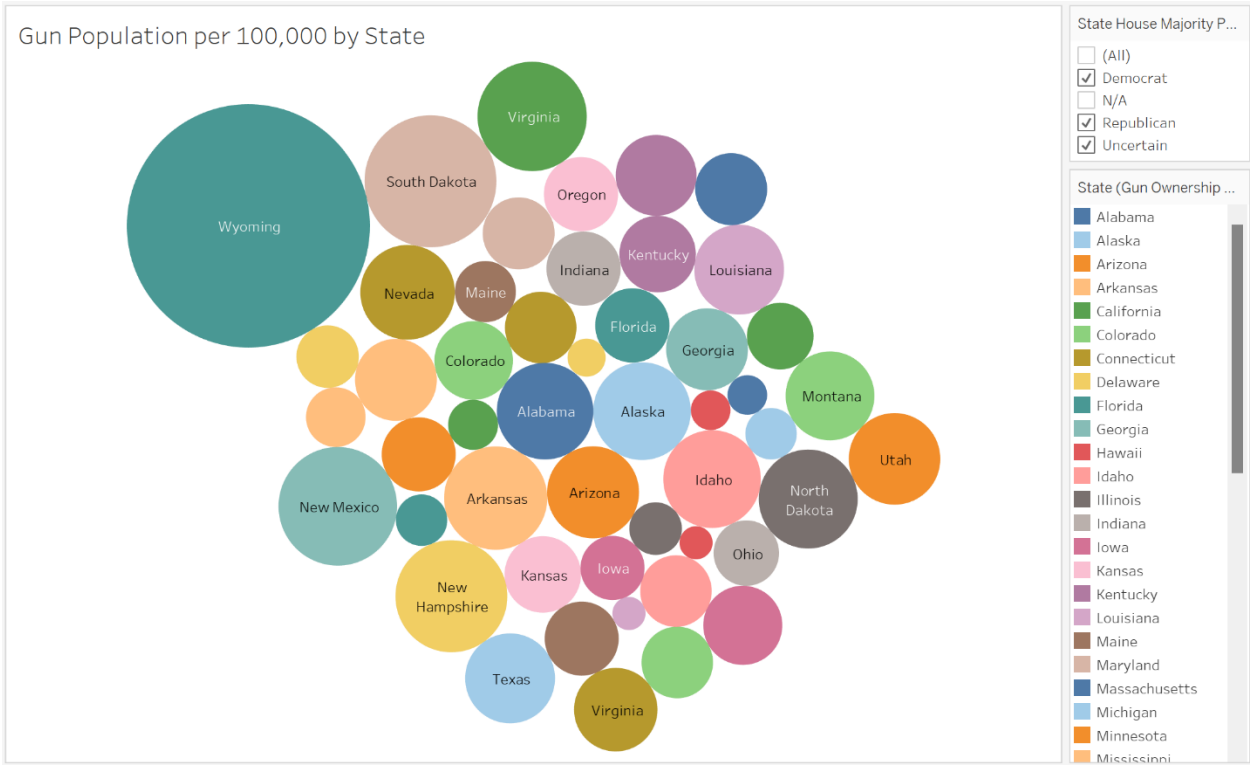
The pie chart shows a significant gender disparity among offenders, with males comprising a majority at 2,687 and females at 215. This distribution indicates that males are far more represented as offenders in the dataset, a pattern often observed in crime statistics. Understanding the gender dynamics among offenders is crucial for shaping gender-responsive prevention strategies. It may reflect broader social issues such as gender roles, socialization, and possibly differential involvement in certain types of criminal activity.

8. Proportion of Weapons Used by Number of Incidents



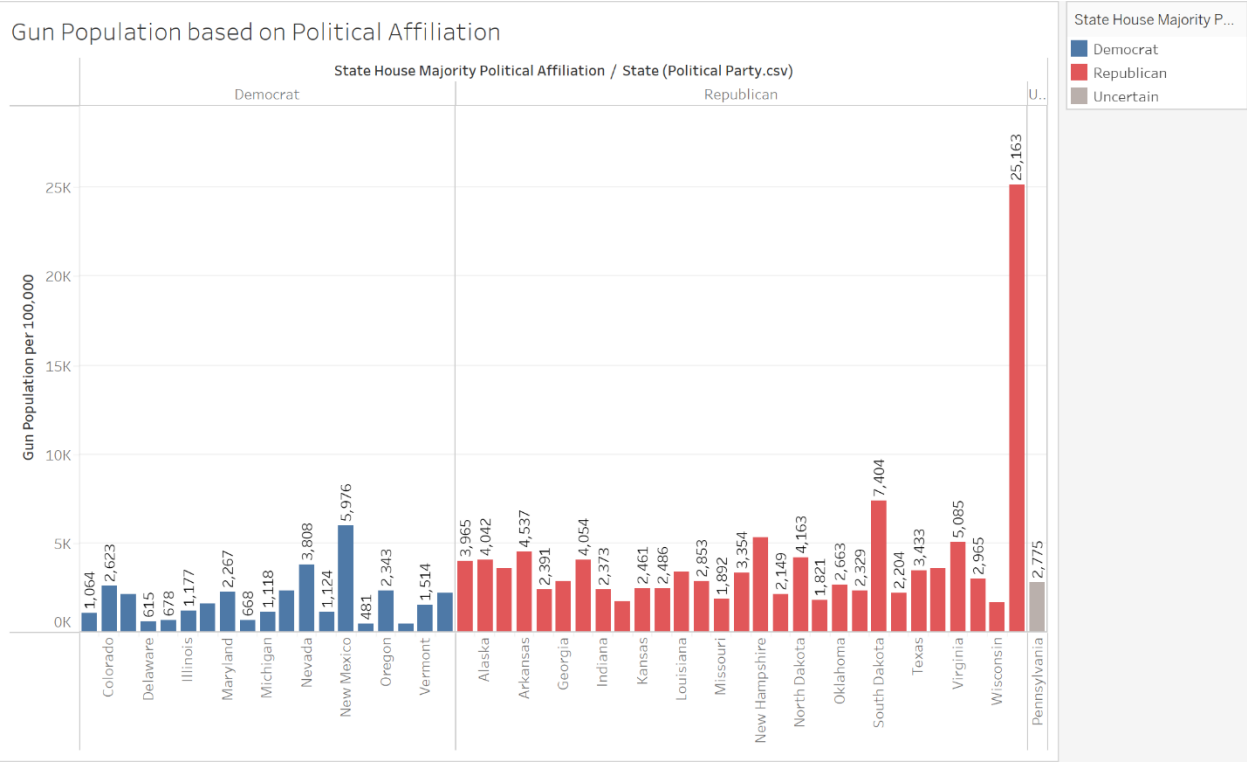
The visualization illustrates the frequency of different types of weapons used in incidents. The most commonly used weapon is a gun, with 446 incidents having them as the weapon used. This visualization provides a clear visual hierarchy of weapon use in these incidents, with guns being the predominant weapon of choice, indicating a potential area of focus for violence prevention efforts.

9. Gun Licenses per 100,000 by State



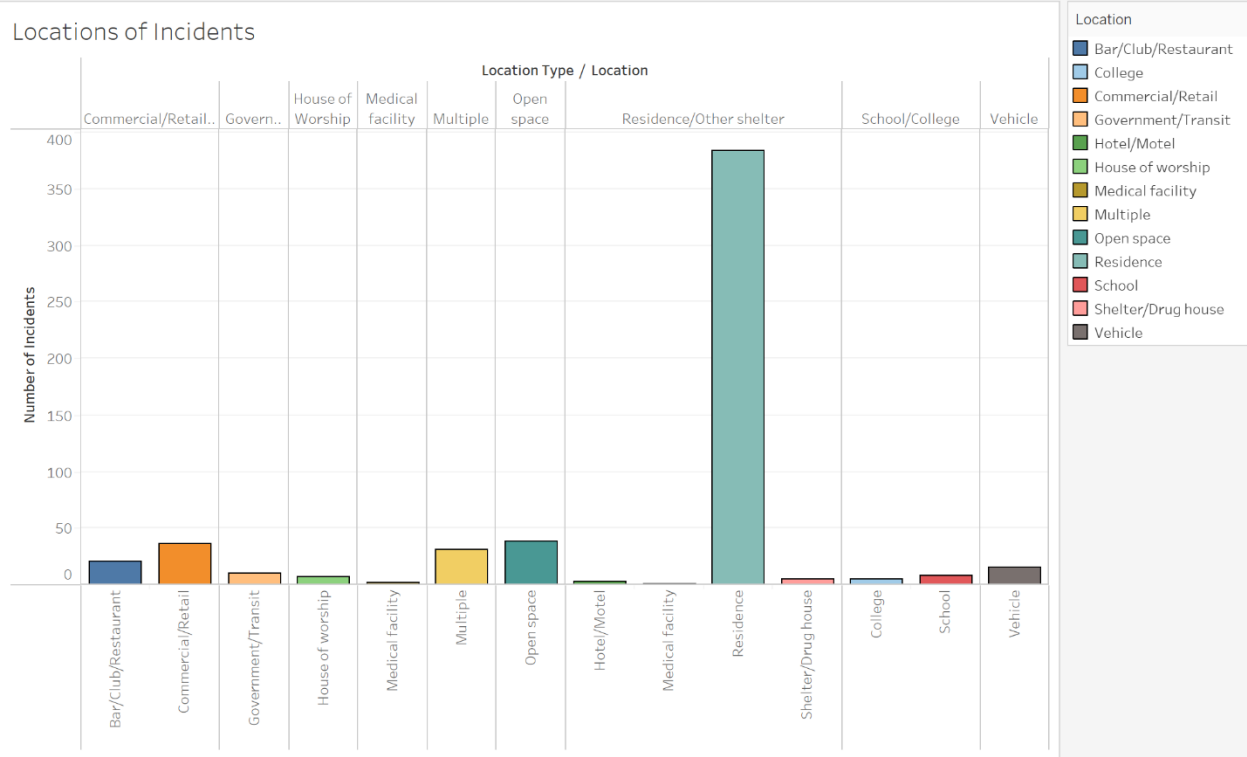
The bar chart displays the number of guns per 100,000 residents in various U.S. states. The chart shows a wide disparity in gun ownership across the states. While most states show gun ownership figures that fall within a lower band, there is a noticeable spike for one state that far exceeds the rest, with a gun population reaching up to 25,000 per 100,000 individuals. This data is essential for policymakers and public health officials as it could correlate with gun-related incidents and might influence decisions on gun control policies and public safety measures. It also provides a quantitative look at how prevalent gun ownership is in different parts of the country, which can be a factor in legislative and law enforcement planning.

10. Gun Availability by State and Political Inclination



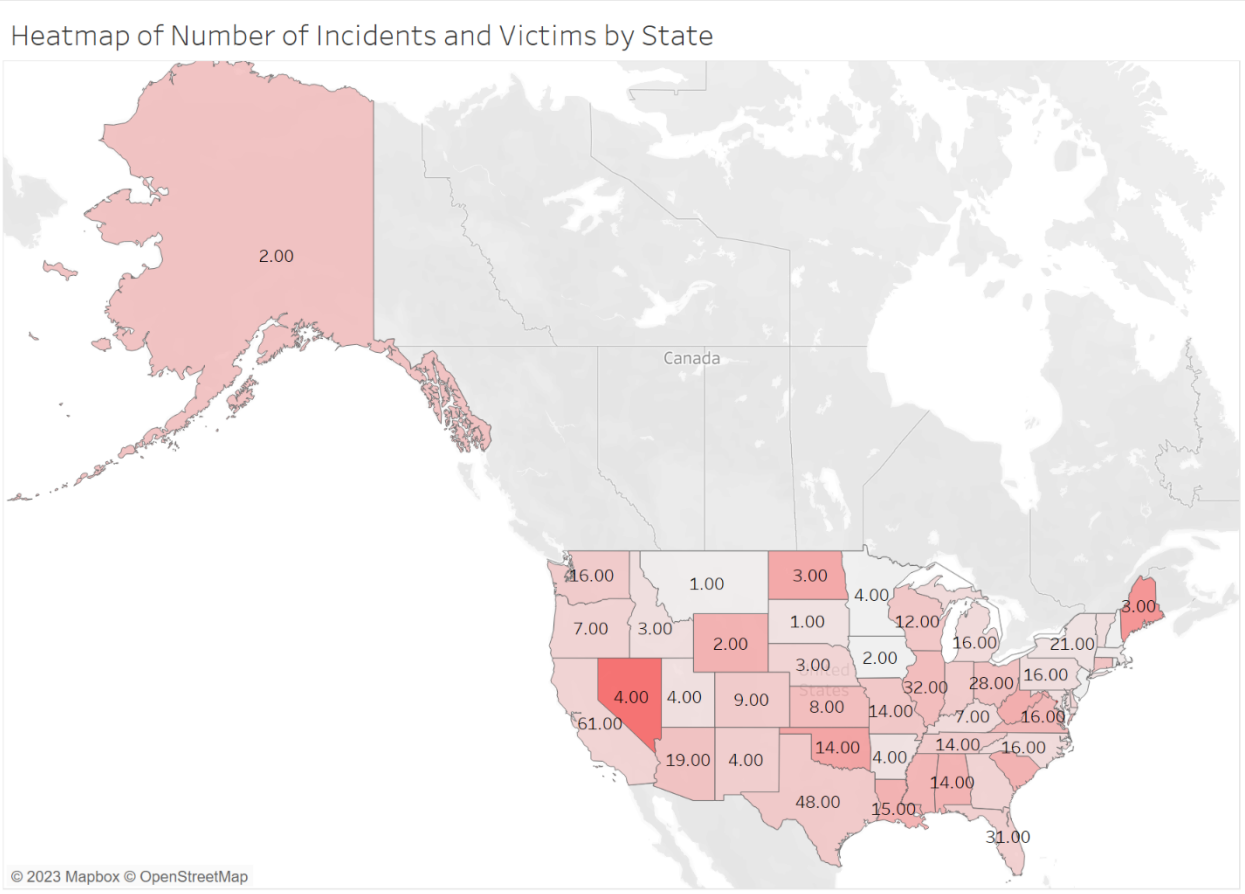
The bar chart correlates the number of guns per 100,000 residents with the political majority of the state house. The data shows that states with a Republican majority tend to have a higher gun population per 100,000 residents, as indicated by the prevalence of red bars. States with a Democratic majority are shown with blue bars and generally have lower gun populations. This visualization suggests a pattern where political affiliation may be associated with gun ownership rates, which could reflect the cultural and legislative differences between states that lean toward different political parties. Such data is valuable for understanding the complex relationship between politics, gun ownership, and potential legislative preferences.

11. Location of Incidents



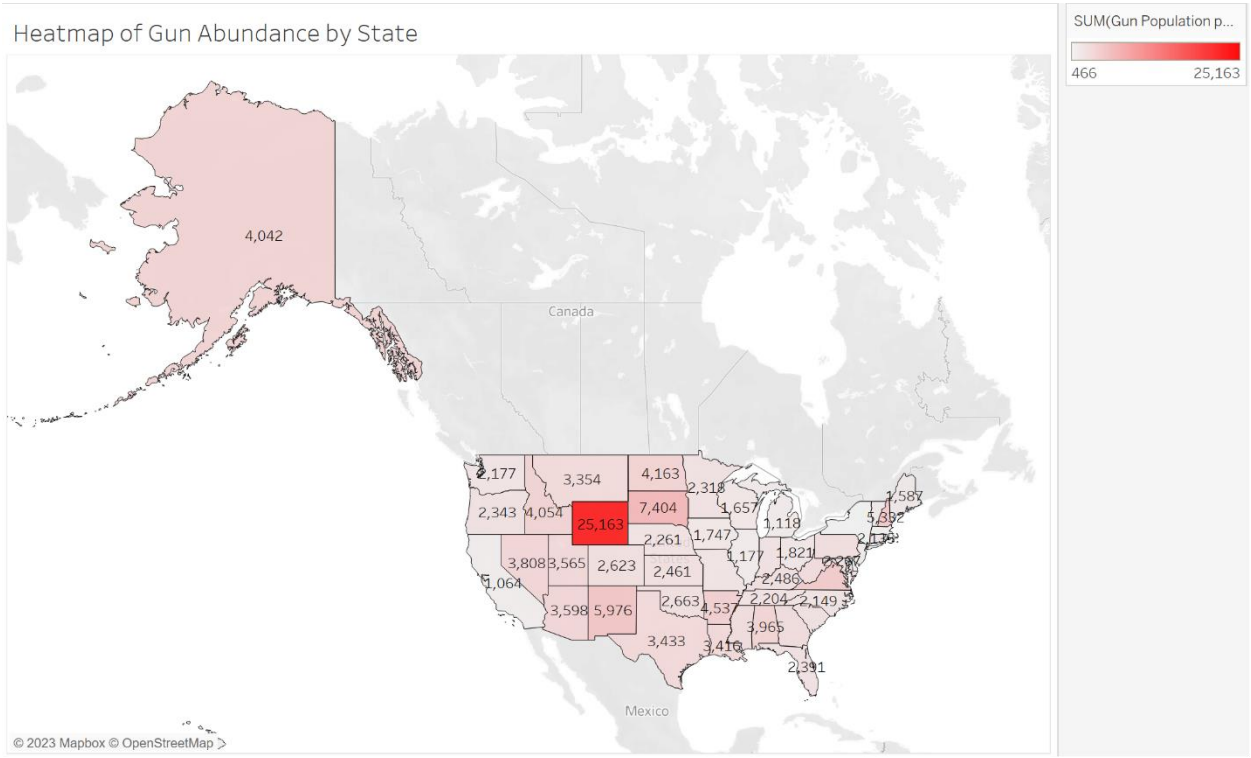
The bar chart displays the number of incidents categorized by the type of location where they occurred. The categories include various venues such as commercial/retail/entertainment, government buildings, houses of worship, medical facilities, and more. The most notable observation from the chart is the significant number of incidents that occurred at residential or other shelter locations, which far exceeds the count in any other category. This indicates that such private or domestic spaces are the most common scenes for the incidents reported in this dataset. The data underscores the importance of focusing on safety and preventative measures in residential areas and could be valuable for law enforcement and public policy efforts aimed at reducing domestic or residential incidents.

12. Heatmap of Number of Incidents and Victims by State



The heatmap provides a visual representation of the geographic distribution of incidents and victims across the United States. The intensity of the color correlates with the number of incidents and victims, with darker shades indicating higher numbers. This map can be a valuable tool for identifying trends and areas requiring more focused attention from law enforcement and public policymakers.

13. Heatmap Gun Availability by State



The heatmap illustrates the distribution of guns across the United States, with the intensity of color representing the quantity of guns in each state. There is a significant variance among the states regarding gun availability. This visual tool allows for easy identification of states with higher concentrations of guns, which could correlate with gun-related incidents, culture, and legislation regarding firearm ownership. Such data can inform discussions and policies on gun control and public safety.

Conclusion

- Regional Variability in Safety: There is a notable variation in the normalized rate of mass killing victims across American states and regions. The South Atlantic division shows a particularly high rate, whereas the West North Central and West South-Central divisions have lower rates. This suggests that safety in terms of mass killings varies significantly by region.
- Role of Race and Gender: The data indicates disparities in the legal outcomes among different racial groups and a significant gender disparity among offenders, with males being far more represented. This points towards the need for more nuanced discussions and policies addressing racial and gender aspects in the context of mass killings.
- Political Inclination and Gun Ownership: The correlation between states with a Republican majority and higher gun populations suggests a complex interplay between political inclinations, gun ownership, and potentially the occurrence of mass killings. This highlights the role of cultural and legislative differences in shaping state-specific patterns in gun ownership and, possibly, related incidents.
- Gun Ownership and Mass Killings: The high prevalence of guns as the weapon of choice in these incidents, along with the correlation between gun ownership rates and mass killings, underscores the importance of considering gun control policies as a significant factor in preventing such tragedies.
- Location of Incidents: The predominance of mass killings in residential areas points to the need for targeted safety and preventative measures in private/domestic spaces, as well as public policy efforts to address this specific context.
- Geographic and Demographic Insights: The use of heatmaps and other visual tools in the analysis has provided valuable insights into the geographic and demographic distribution of mass killings, gun ownership, and victims. These findings can guide more targeted and effective interventions and policies.

In conclusion, this project reveals the multifaceted nature of mass killings in America, influenced by regional differences, racial and gender dynamics, political inclinations, gun ownership, and the

locations of incidents. Addressing this issue effectively requires a comprehensive approach that considers these various factors and involves coordinated efforts across different sectors and levels of governance.

Future Scope

Hopefully, I hope to answer the following research Questions:

- How do mental health services and accessibility vary across regions with high rates of mass killings?
- What are the socio-economic characteristics of regions with high and low rates of mass killings?
- How do media coverage and public perception influence the response and policy-making after mass killings?