The Impact of Gun Ownership on Gun-Related Deaths and Violence

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ABSTRACT

The purpose of this report is to discuss the impact of gun ownership on gun related deaths and violence in comparison to other factors such as population density, gun ownership rates and number of gun homicides per year. To perform this research, factors will be analyzed to determine the impact of more guns on gun related violence. Necessary data will be located to create graphs to illustrate our statistics on an over time basis. Additionally, data will be analyzed on population density, gun ownership rates, number of homicides committed with firearms per year, number of suicides committed with guns per year, number of accidental deaths or injuries with guns per year, and political affiliation (calculated as a percentage of the population identifying with different political parties or ideologies).

INTRODUCTION

In 2023, there have been 17 mass shootings resulting in the deaths of 90 people, which begs the question, "Is gun ownership the prime factor for more violence, specifically gun-related deaths and violence?" This report will analyze evidence to prove that gun ownership is the prime factor for more gun-related deaths and violence.

The topic of gun control in the United States is more prevalent than ever. In the United States alone, more than 500 people die daily from gun-related violence—the Overwhelming majority being minorities and people in low-income areas. There are several reasons why poor people and minorities are disproportionately affected by gun violence. Those being a lack of access to social safety nets: affordable housing, school, healthcare, population density (urban areas tend to have more gun violence), and there is a persuasive stereotype that people of colour are inherently more violent, which can cause police officers and people to act maliciously.

Furthermore, firearms ownership is ingrained in American culture, making political discourse extremely contentious. The firearm industry is a powerful force in US politics, making up a large portion of donor capital to the Republican party. The NRA (National Rifle Association) spent 5 million dollars on corporate lobbying alone. Finally, a significant part of America is very protective of the 2nd amendment as it personifies the American dream: freedom and independence.

On the contrary, there are gun control advocates whose ideology is primarily associated with the Democrats. Gun control advocates support stricter gun laws to help reduce violence. They support measures such as background checks, bans on specific firearms, and red flag laws that allow law enforcement to remove guns from people at risk of suicide temporarily.

The increase in gun violence in the US is at unprecedented levels. The cause or causes of increased gun violence are incredibly multifaceted, and a solution for gun control seems more ambiguous than ever. However, there is enough information to vilify gun ownership as the prime factor for the historical increase in gun-related violence. We hope to inform ordinary people about the nuances of gun control and the bureaucratic practices involved in devising legislation for gun control. We also want to disprove a common talking point used by Republican pundits: "More guns make America safer." The sentiment that "more guns make America safer" is not supported by the data on gun violence in the United States. While it is true that some states with higher rates of gun ownership have lower rates of gun violence, this correlation does not prove causation.

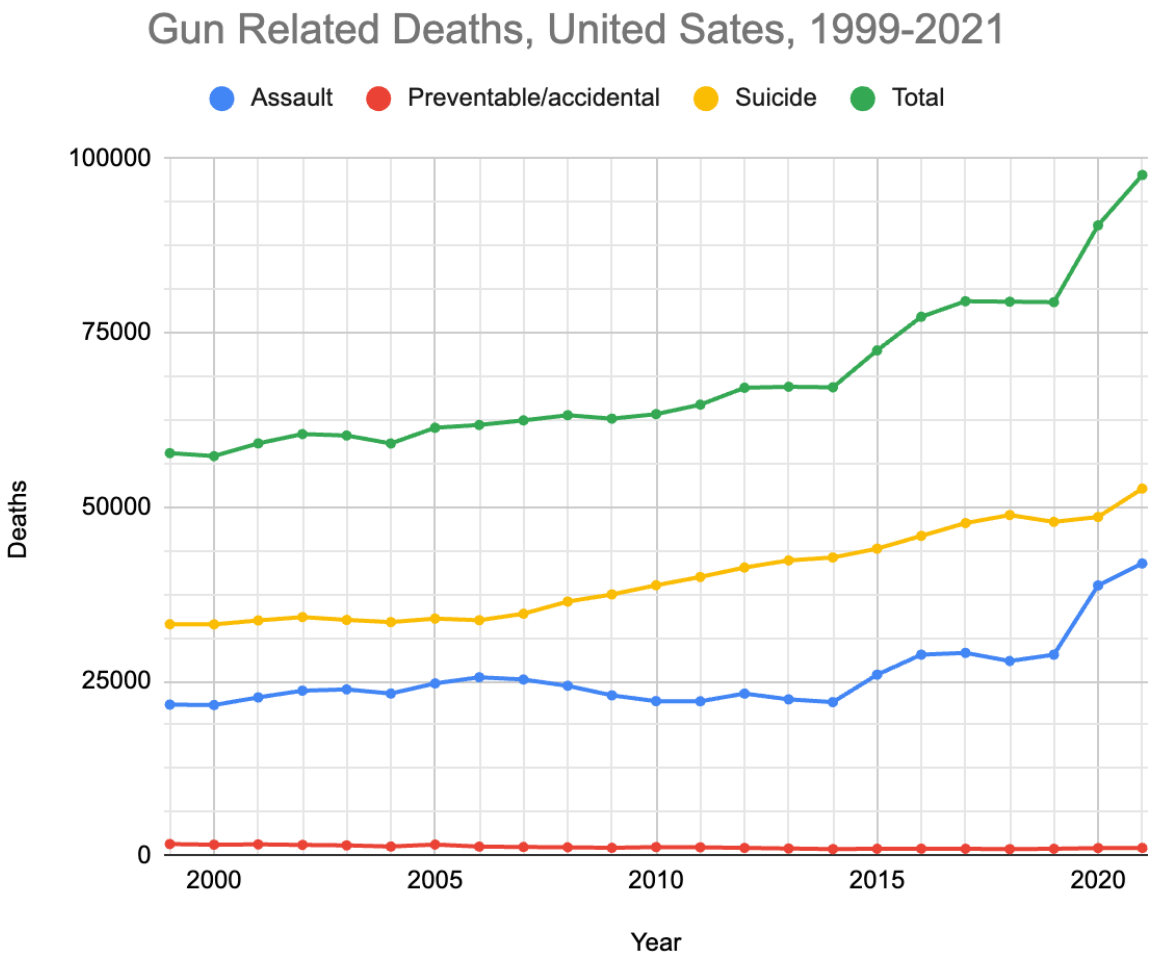
To prove that gun ownership is the primary factor for gun-related deaths and violence, gun ownership patterns will be examined and rates of death as well as how political affiliation comes into play in each state of the United States.

ANALYSIS

Gun-Related Deaths in the United States between 1999 to 2021:

Examining gun violence requires a comprehensive understanding of the societal factors that may contribute to its occurrence. Often, the influence of contextual circumstances is overlooked. In order to gain deeper insights into the dynamics of gun-related deaths, it is crucial to analyze the distinct categories of these incidents and track their progression over time. By doing so, the underlying causes behind the fluctuations in gun-related deaths can be inferred and determine

whether they are linked to reasonable societal events or directly attributed to the presence of widespread gun ownership. This approach allows for a more nuanced exploration of the complex relationship between gun violence and the broader social context in which it unfolds.



This graph provides a comprehensive overview of gun-related deaths in the United States from 1999 to 2021. The accompanying legend distinguishes various categories of violence, including death by assault, preventable/accidental deaths, suicides, and the total number of deaths.

Upon analysis, a clear trend emerges: the total number of gun-related deaths exhibited a consistent upward trajectory over the examined time period. Specifically, between 1999 and 2019, there was a gradual increase in the total number of gun-related deaths. However, from 2019 to 2021, a notable spike in gun-related deaths is observed, representing a sharp acceleration in this distressing trend.

The average rate of change for gun deaths from 1999 to 2019 is:

A(1999, 57748)

B(2019, 79414)

$$m = \frac{rise}{run}$$

$$m = \frac{79414-57748}{2019-1999}$$

$$m = \frac{21666}{20}$$

$$m \approx 1083$$

Therefore, the gun related deaths increase by about 1814 people per year up until 2019

The average rate of change of gun deaths from 2019 to 2021 is:

A(2019, 79414)

B(2021, 97660)

$$m = \frac{rise}{run}$$

$$m = \frac{97660-79414}{2021-2019}$$

$$m = \frac{18246}{2}$$

$$m = 9123$$

Therefore, the gun related deaths increased by about 9123 people per year in the time period between 2019 to 2021.

This is a percent difference of:

$$\%\, diff = \frac{|1083-9123|}{\frac{1083+9123}{2}} \times 100$$

$$\%\, diff = \frac{8040}{5103} \times 100$$

$$\%\, diff = \frac{8040}{5103} \times 100$$

$$\%\, diff \approx 157.55$$

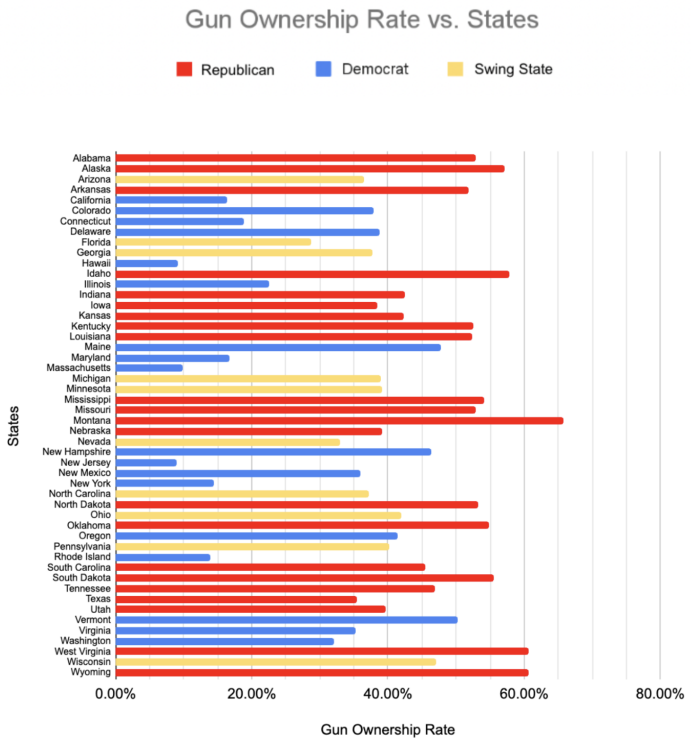
Notably, there was a staggering 157.55% increase in gun-related deaths during the period from 2019 to 2021. This sharp surge coincided with the onset of the COVID-19 pandemic, suggesting a potential correlation between these events and the rise in gun-related violence.

Examining the specific categories of gun-related deaths, it becomes evident that the preventable deaths rate and suicide rate displayed a steady increase over time. However, it is the rate of assault that experienced a significant spike from 2019 to 2021, thereby exerting a considerable influence on the total number of deaths. This surge in assault-related gun deaths can be attributed to various societal factors, including passive protests and civil unrest during the pandemic, as well as the emergence of anti-Asian hate crimes linked to COVID-19.

The observed increase in gun-related deaths during the COVID-19 pandemic and the period of social unrest underscores the crucial role of access to firearms in facilitating acts of violence. This finding strongly supports the notion that unrestricted gun ownership permits the freedom to engage in violent behaviors. It stands to reason that limiting access to guns would result in one less option for individuals to commit heinous crimes, thereby leading to a decrease in gun-related deaths and overall violence.

Gun Ownership Rate vs. States:

This analysis aims to explore the relationship between gun ownership rates and political party preference and its potential implications on gun-related deaths and violence.

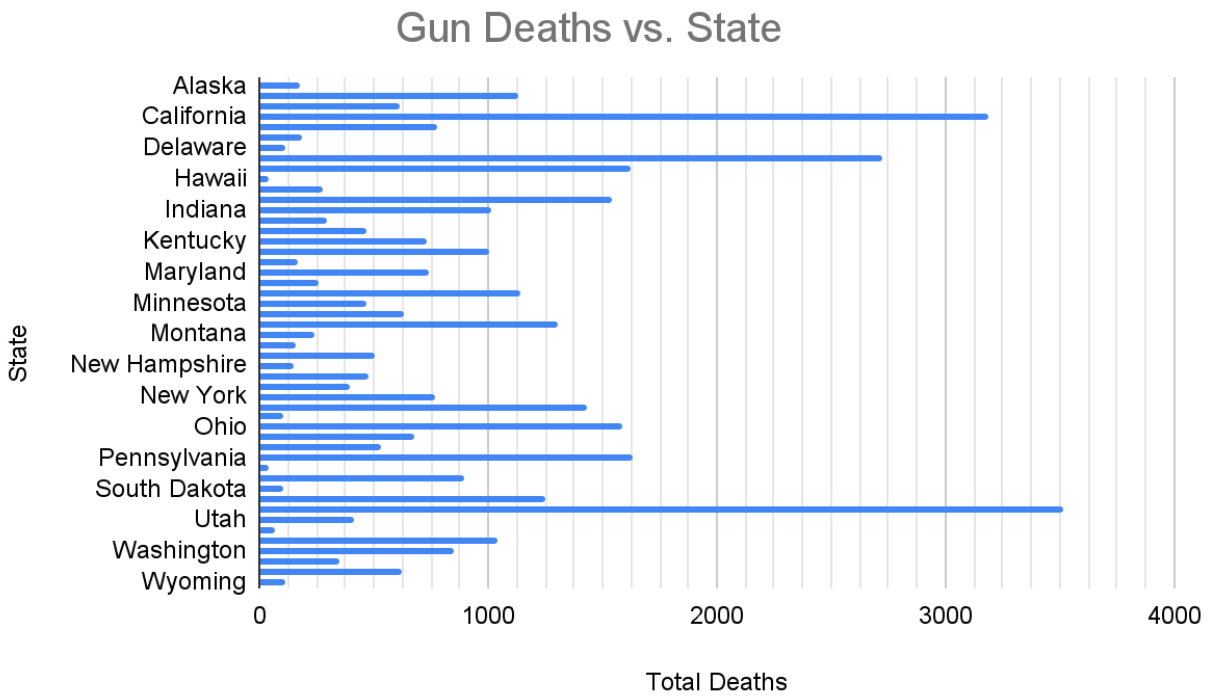


This graph showcases people who own guns in each state and which political party they support. From this graph, it is evident that Democrats and swing states have fewer guns per capita on average in comparison to Republican states. Missouri is the state with the most guns per capita and is also a Republican-dominated state. While Hawaii has the least guns per capita and is a democratic-dominated state.

It is apparent that Republican-dominated states tend to exhibit higher gun ownership rates on average, while Democratic-dominated states and Swing states tend to have lower gun ownership rates.

These findings suggest that gun ownership rates may be a prime factor contributing to increased gun-related deaths and violence. States with higher rates of gun ownership could be more susceptible to elevated levels of gun-related incidents. This correlation aligns with the argument that the accessibility and availability of firearms directly influence the likelihood of their misuse in criminal activities.

Gun Deaths vs. States:



This graph illustrates the total amount of deaths in a state compared to gun related deaths in each state. From the data gathered, Utah had the most gun related deaths with around 3500 in 2022. This observation suggests a potentially alarming correlation between the prevalence of gun ownership and the incidence of gun-related fatalities. It aligns with the argument that higher levels of gun ownership within a state could contribute to an increased risk of gun-related deaths and violence.

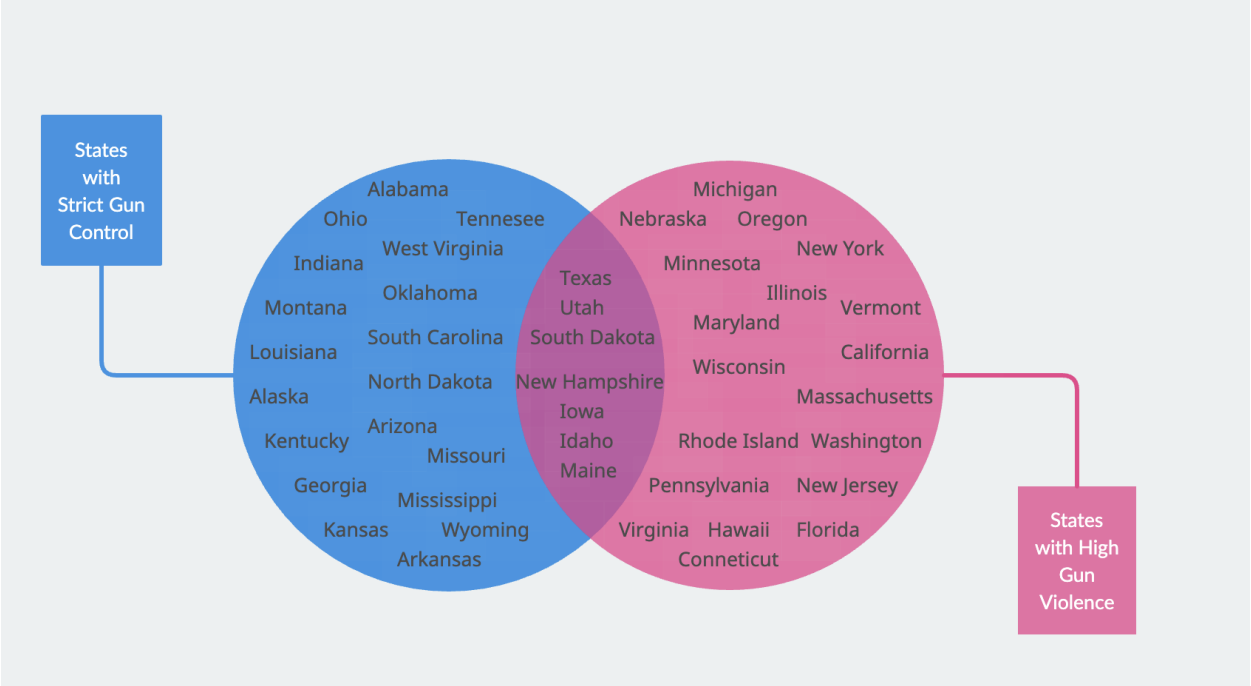
Conversely, Hawaii exhibits the lowest number of gun-related deaths, with approximately 200 deaths in the same year. This finding is consistent with the previous analysis, which indicated that Hawaii has the fewest guns per capita and is predominantly associated with Democratic party dominance. The lower incidence of gun-related deaths in Hawaii reinforces the notion that

stricter gun control measures and lower rates of gun ownership may potentially contribute to reducing gun violence.

By connecting the findings from both graphs, a compelling case can be made for the influence of gun ownership on the occurrence of gun-related deaths. The states with higher rates of gun ownership, such as Utah, tend to demonstrate higher numbers of gun-related fatalities. Conversely, states with lower rates of gun ownership, such as Hawaii, exhibit lower numbers of gun-related deaths.

States with strict gun control vs states with high gun violence:

This Venn diagram illustrates the relationship between states with strict gun control measures and states with high levels of gun violence. The diagram is constructed based on the top 25 ranked states in each category, considering states that fall exclusively into either the "strict gun control" or "high gun violence" category, as well as those that overlap in both categories.



This Venn diagram provides a visual representation of the complex relationship between strict gun control and high levels of gun violence. By examining this diagram, valuable insights into the intersection of gun control policies and the prevalence of gun violence at the state level will be gained.

$$P(Strict\ Gun\ Control \cap High\ Gun\ Violence) = \frac{n(Strict\ Gun\ Control \cap High\ Gun\ Violence)}{n(s)}$$

$$P(Strict\ Gun\ Control \cap High\ Gun\ Violence) = \frac{7}{45}$$

$$P(Strict\ Gun\ Control \cap High\ Gun\ Violence) \approx 0.156$$

$$P(Strict\ Gun\ Control) = \frac{n(Strict\ Gun\ Control)}{n(s)}$$

$$P(Strict\ Gun\ Control) = \frac{26}{45}$$

$$P(Strict\ Gun\ Control) = 0.578$$

$$P(High\ Gun\ Violence \mid Strict\ Gun\ Control) = \frac{P(High\ Gun\ Violence \cap Strict\ Gun\ Control)}{P(Strict\ Gun\ Control)}$$

$$P(High\ Gun\ Violence \mid Strict\ Gun\ Control) = \frac{0.14}{}$$

$$P(High\ Gun\ Violence \mid Strict\ Gun\ Control) = 0.27$$

The Venn diagram reveals that 19 states fall within the left half, representing states with strict gun control policies but not ranking among the top 25 states with high levels of gun violence. Similarly, the right half of the diagram includes 19 states characterized by high gun violence rates but not classified as having strict gun control measures. These findings suggest that the presence of strict gun control does not necessarily correlate with lower levels of gun violence. Moreover, the overlapping portion of the Venn diagram consists of seven states that exhibit both strict gun control policies and high rates of gun violence. This intersection highlights the complexity of the issue, indicating that factors beyond gun control measures play a significant role in determining the prevalence of gun violence within a state.

The observed low probability (0.27) of a state having high gun violence given the presence of strict gun control further strengthens the argument that gun control alone is not a decisive factor in limiting gun violence. This statistical finding underscores the weak correlation between gun violence and strict gun control measures, providing evidence that gun ownership has a more substantial influence on gun-related deaths.

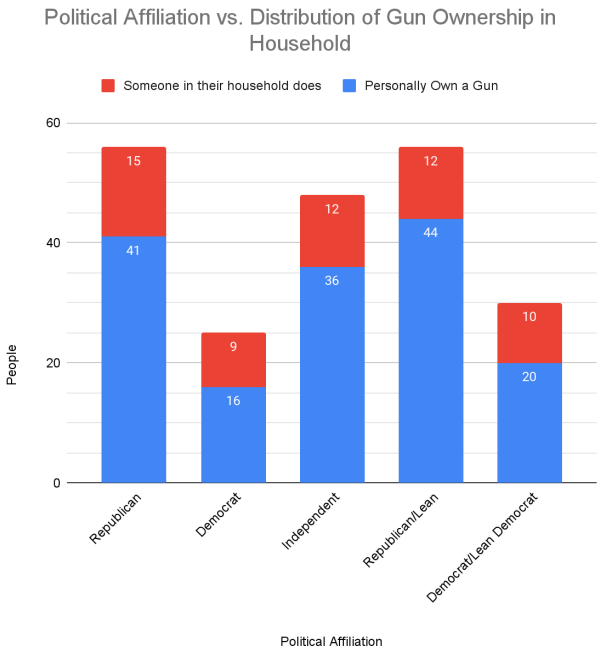
When considering the scatter plot graph comparing gun ownership and gun deaths, it becomes evident that gun ownership has a much higher impact on gun deaths compared to the presence of

strict gun control. This reinforces the notion that the accessibility and ownership of firearms have a direct bearing on the occurrence of gun-related deaths, while the stringency of gun control policies alone may not effectively curb gun violence.

These findings challenge the belief that strict gun control measures alone can sufficiently address the issue of gun violence.

Therefore, the analysis of the Venn diagram and the correlation between gun ownership and gun deaths suggests that gun ownership plays a more substantial role in impacting gun-related deaths than strict gun control measures.

Political Affiliation vs. Distribution of Gun Ownership in Household:

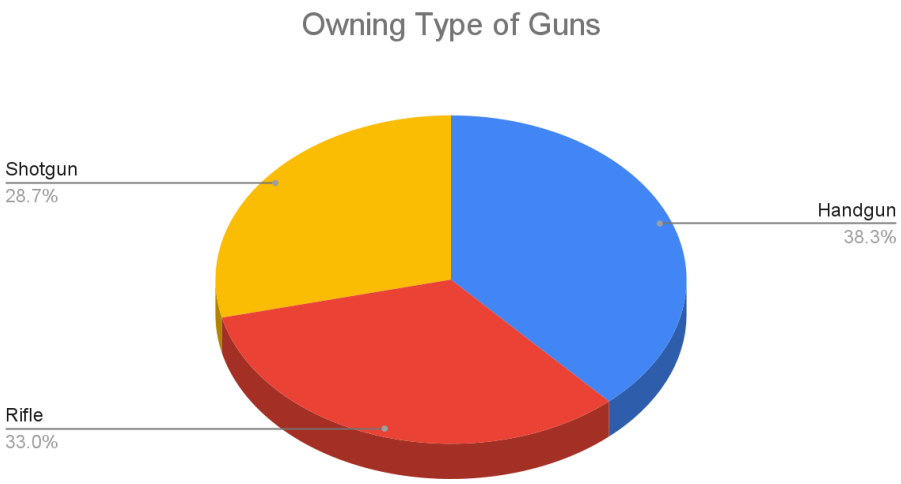


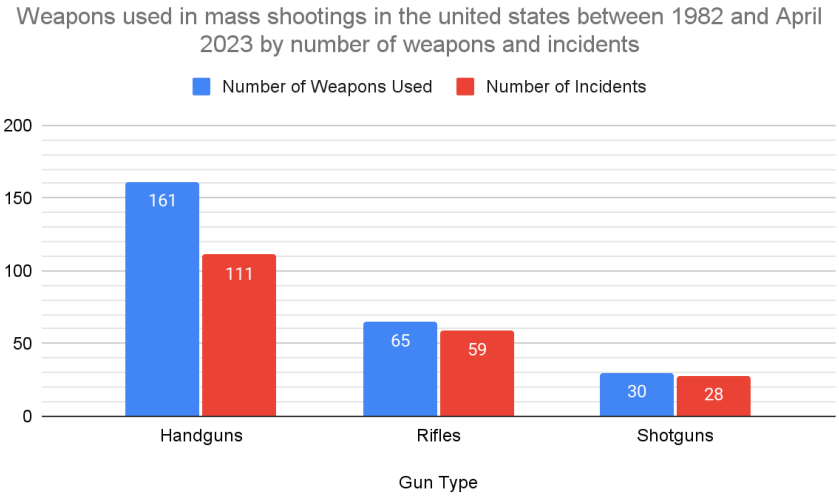
This graph demonstrates United States citizens political leniency in comparison to if they personally own a gun or if someone if their household owns a gun,(Parents, Siblings, etc). It is clear from this graph that the people with little to no political affiliation and people who are more republican leaning tend to have more guns in their possession.

Distribution of gun ownership by type of firearm and the number of each type of firearm used in mass shootings from 1982 to 2023:

The analysis of gun ownership and its relationship to mass shootings provides valuable insights into the dynamics of gun-related incidents. By examining the distribution of firearm ownership across different types of guns and the corresponding numbers utilized in mass shootings, understanding of these tragic events can be understood. This data sheds light on the prevalence and utilization of various firearm categories in mass shootings, offering a comprehensive

perspective on the landscape of gun-related violence.





From the bar graph:

Total mass shootings = 111 + 59 + 28 = 198

Total handgun incidents = 111, Total rifle incidents = 59, Total shotgun incidents = 28

Percentage of handgun incidents = 111/198 ≈ 0.56

Percentage of rifle incidents = 59/198 ≈ 0.30

Percentage of shotgun incidents = 28/198 ≈ 0.14

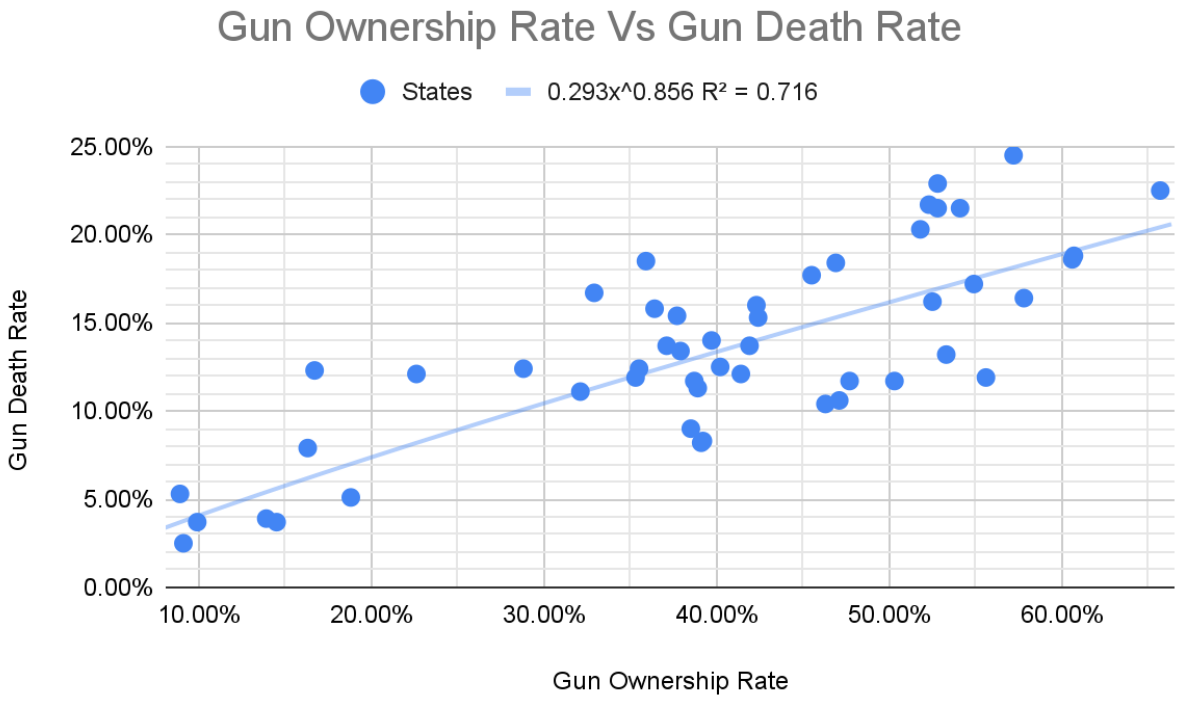
Evidence from the analysis of mass shootings in the United States reveals a consistent trend: handguns and rifles are the primary weapons used in these horrific acts. Both the pie chart and bar graph confirm that handguns have the highest representation, followed by rifles and shotguns. This data reinforces the direct link between gun ownership and the methods employed in gun-related crimes.

The prevalence of handguns and rifles in mass shootings highlights the connection between the accessibility and ownership of these firearms and their misuse in criminal activities. This pattern emphasizes how the availability of specific types of guns influences the tactics used in these violent acts.

These findings underscore the urgent need to address gun ownership and its impact on public safety. Recognizing the most frequently used firearms in mass shootings emphasizes the importance of implementing targeted gun control measures. By limiting access to these specific firearms and promoting responsible ownership, we can mitigate the risks and devastating consequences associated with gun-related crimes.

Gun Ownership Rate vs. Gun Death Rates:

A scatterplot analysis was conducted to examine the association between Gun Ownership Rate and Gun Death Rates. This graph provides a visual representation of the data collected and offers insights into the potential influence of gun ownership on gun-related deaths.



This graph shows gun ownership rate in contrast to gun death rate in the United States. The trendline equation of $y = 0.293x^{0.856}$ indicates a positive correlation between gun ownership rate and gun death rates.

The equation suggests that as the gun ownership rate increases, the gun death rates also tend to increase, albeit at a slightly higher rate than a linear relationship (given the exponent value of

0.856). This indicates that the relationship between gun ownership and gun death rates is not a simple linear one, but rather demonstrates a more complex pattern.

The r^2 value of 0.716 indicates that approximately 71.6% of the variation in gun death rates can be explained by changes in the gun ownership rate. This moderate-to-high value suggests a relatively strong relationship between these two variables.

Taken together, these values provide evidence supporting the argument that gun ownership is a significant contributing factor to higher gun death rates and violence. The positive trendline indicates that as gun ownership increases, there is a corresponding increase in gun death rates. The moderate-to-high r^2 value indicates that a substantial portion of the variation in gun death rates can be attributed to changes in gun ownership.

CONCLUSION

In conclusion, the analysis of multiple graphs examining different aspects of gun ownership, political affiliations, and gun-related deaths provides compelling evidence that gun ownership is a significant factor contributing to increased gun-related deaths and violence.

The scatterplot comparing gun ownership rates to gun death rates demonstrated a positive correlation between the two variables. The trendline equation (0.293x^0.856) and the high r^2 value (0.716) indicate a strong relationship between higher gun ownership rates and increased gun death rates. This suggests that as the rate of gun ownership within a population increases, there is a corresponding rise in gun-related deaths.

The bar graph comparing gun ownership rates in states sorted by political parties revealed a pattern where Republican-dominated states had higher guns per capita compared to Democratic-dominated states and swing states. This finding strengthens the argument that political ideology influences gun ownership rates, and consequently, states with higher gun ownership rates tend to experience higher levels of gun-related deaths and violence.

Additionally, the analysis of the graph depicting gun deaths in each state further supports the relationship between gun ownership and gun-related fatalities. States with higher rates of gun ownership, such as Utah, exhibited higher numbers of gun-related deaths, while states with lower rates of gun ownership, such as Hawaii, experienced fewer gun-related deaths.

Taken together, these findings suggest that gun ownership is a primary factor influencing the occurrence of gun-related deaths and violence. The data consistently indicates that higher rates of gun ownership are associated with increased levels of gun-related fatalities. While other factors may also contribute to variations in gun violence, such as socio-economic conditions and cultural influences, the evidence from the analyzed graphs strongly suggests that limiting access to firearms and promoting responsible gun ownership could potentially reduce gun-related deaths and violence.

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