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Project #4

Gun violence remains a deeply entrenched issue in the United States, affecting communities in a variety of different ways depending on factors such as when and where incidents occur. While national media tends to narrow in on mass shootings or raw death counts, these figures often overlook important nuances such as the role of population size, regional differences, or shifting trends over time. This project explores those nuances through a series of data visualizations on Tableau that examine how gun violence varies across U.S. states. Specifically, factors such as when gun violence tends to happen most frequently, and which states consistently rank among the most impacted. By using per-capita measures with the help of interactive charts and graphs, the visualizations aim to highlight patterns that might otherwise go unnoticed. To deepen the analysis, the project also draws on Dylan Matthews' comparison on U.S. and Canadian gun laws, using Canda's stricter policies as a point of contrast to help contextualize what the visualized outcomes may reflect about broader regulatory differences.

The Tableau dashboard contains three visualizations that work together to unpack the geographic and time-based dimensions of gun-violence in the United States. The first visualizations being the hex map which displays the normalized impact rate of gun violence in each state, calculated as the total number of people killed and injured per 100,000 residents. The adjustment controls for population size, making it easier to compare states accurately. States like Delaware and Alaska consistently show higher impact rates across multiple years. The map also utilizes a time slider, allowing users to explore changes in rates from 2014 to 2017. The heat table illustrates when gun violence is most likely to occur, breaking down incidents by day of the week and month. It can be filtered by state, offering a more detailed view of localized trends. In

South Carolina, for example, gun violence trends tend to spike during July and on Saturday and Sunday, which reflects broader seasonal patterns with more violence during the summer and on the weekends. The bump chart ranks the top 10 states by impact rate over time, helping to identify both persistent leaders and states that have moved up or down in the rankings. Louisiana tends to remain near the top throughout the time period of 2014-2017, while Mississippi shows a noticeable rise from 7th ranked all the way up to 4th in the same time period. This view is particularly useful for tracking trends and can help prompt further questions for policy changes, enforcement, or maybe cultural shifts in shaping these trends.

The project uses a combination of raw variables from the Gun Violence Archive and calculated measures created in Tableau to capture the scale and distribution of gun violence across time and geography. The core raw variables include n_killed and n_injured, which represent the number of people killed and injured in each reported gun violence incident. These two fields are combined to create a new measure, Total Impacted, which reflects the full human toll of each incident. To allow for meaningful comparisons across states with different population sizes, I calculated the Impact Rate by dividing the total number of people impacted by the state's population, then multiplying by 100,000. In the bump chart, I used Tableau's RANK_UNIQUE() function to generate the State Impact Rank, which ranks states by their total Impact Rate in each year. This measure helps identify which states consistently experience the highest levels of gun violence on a per-capita basis.

To create the visualizations, I combined data from three main sources: the Gun Violence Archive, U.S. Census population estimates, and a hexagonal shape file for state mapping. The Gun Violence Archive served as the primary dataset, containing over 200,000 incident-level observations from 2014 to 2017. Each record included the number of people killed (n_killed),

injured (n_injured), the state where the incident occurred, and the date. Because the dataset does not include population data, I supplemented it with yearly state population estimates from the U.S. Census Bureau. This allowed me to calculate population-adjusted measures such as the impact rate. I connected the GVA and population data in Tableau by linking the two datasets using the shared State and Year fields. A third data source, an Excel file containing state coordinates for hex mapping, was joined to enable the creation of a more visually balanced U.S. map.

Dylan Matthews' article comparing U.S. and Canadian gun laws highlights how drastically different regulatory approaches can influence gun violence outcomes. Canada enforces a range of strict policies such as mandatory licensing, comprehensive background checks and restrictions on carrying firearms. In contrast, many U.S. states lack even basic safeguards like universal background checks or mandatory safety training, and few require registration of firearms. These differences in regulation help contextualize the patterns seen in my visualizations. The hex map, which reveals consistently high impact rates in states like Alaska, mirrors Matthews' claim that weaker U.S. laws may contribute to more widespread violence. The bump chart further underscores this point, showing how certain states maintain top rankings in per-capita impact year after year. This suggests a structural, policy-level issue rather than random fluctuation. Even the heat table, which reveals predictable time patterns in violence, speaks to the absence of effective preventative infrastructure in the U.S.

This project reveals how population-adjusted data can uncover meaningful trends in gun violence across the United States. The visualizations highlight when incidents are most frequent and which states are consistently most impacted. Viewed alongside international comparisons, the data suggests that policy decisions play a critical role in shaping gun violence outcomes.

Works Cited

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Gun Violence in America: State-Level Trends and Temporal Patterns - By Matthias Olson

This dashboard visualizes gun violence across U.S. states from 2014 to 2017. The hex map shows population-adjusted impact rates by state and year. The heat table reveals which days and months see the highest number of people killed or injured, filtered by state. The bump chart ranks the top 10 states by impact rate over time, highlighting shifts in severity. Together, these visuals show where, when, and how gun violence varies across the country.
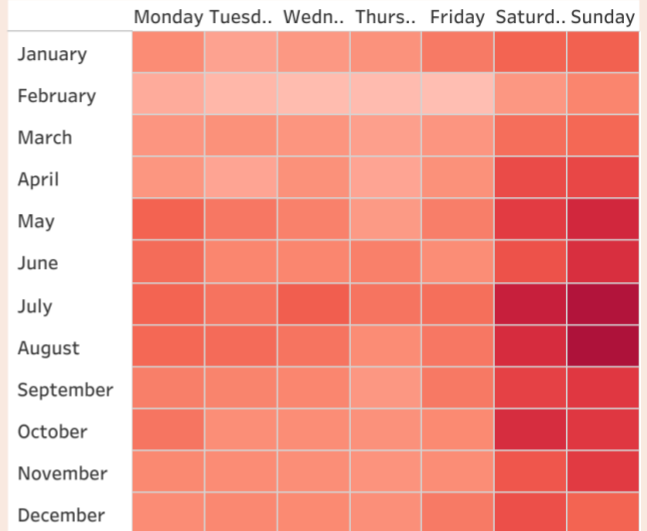
Hex Map – Gun Impact Rate
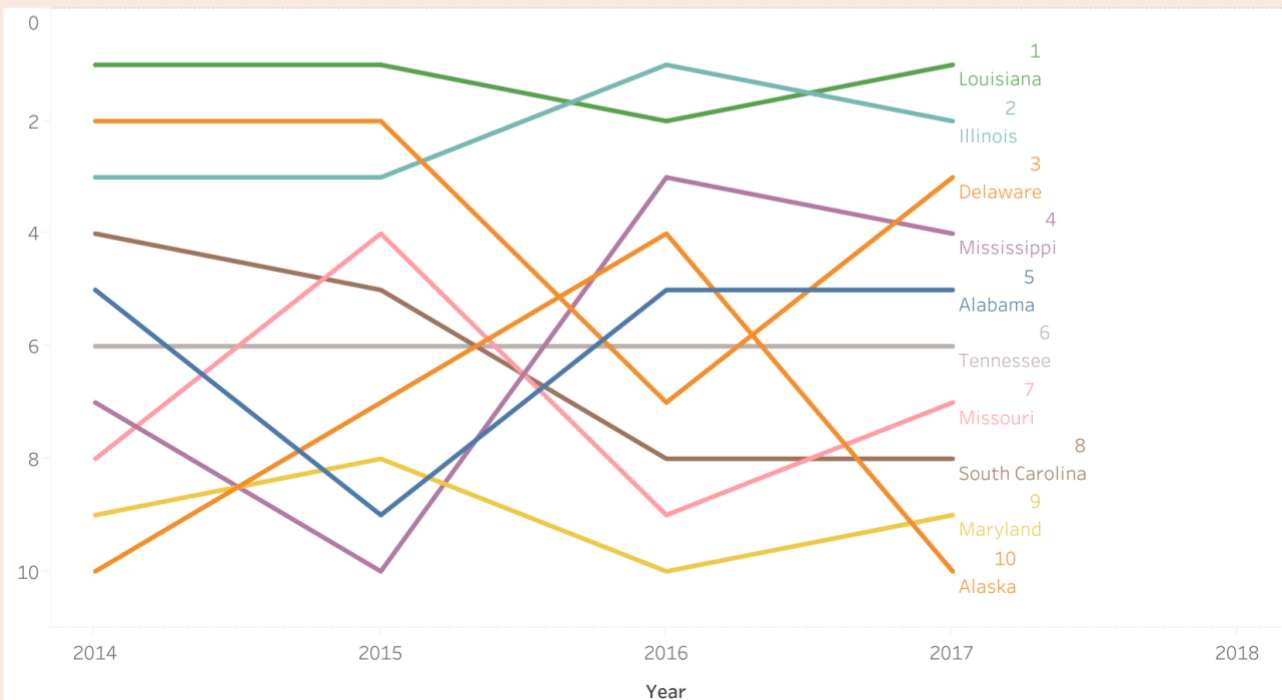
Year2014   ☐ Show history

0.0019 ▭▭▭▭▭ 0.1306

Gun Violence Patterns – All

State
All

Bump Chart – State Rankings

1 Louisiana
2 Illinois
3 Delaware
4 Mississippi
5 Alabama
6 Tennessee
7 Missouri
8 South Carolina
9 Maryland
10 Alaska

Year