

UNITED STATES FIREARM MORTALITY RATE AS INFLUENCED BY GUN CARRY LAWS AND CONTRIBUTING FACTORS

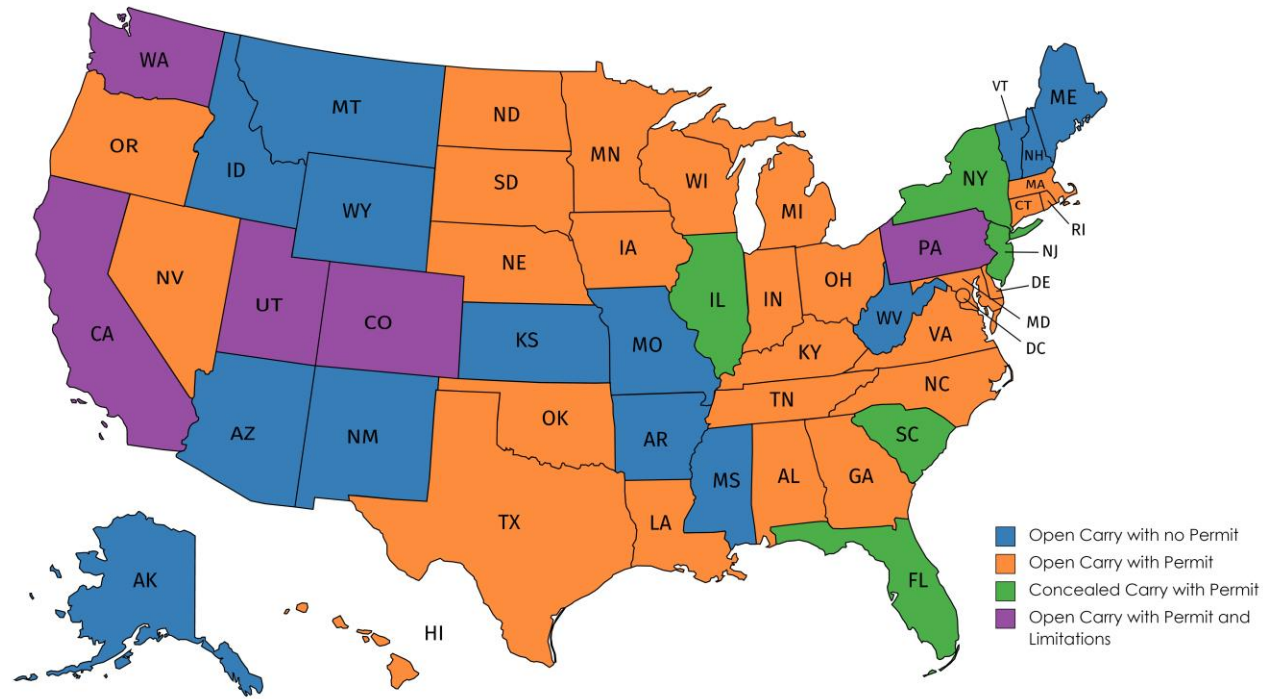
Jayden N. Reece and Alanna Lecher, Ph.D.

Lynn University, Boca Raton, FL | Department of Natural and
Applied Sciences

ABSTRACT

- In the last decade, an increase in gun violence has moved topics concerning gun laws and restrictions to the forefront of the political world.
- I hypothesized that states participating in open carry with no regulations or permit requirements would have the highest firearm mortality rates of any other state.
- Using government databases, I collected firearm mortality rates for each state for 2005, and 2014 to 2018. A boxplot was created to display the data collected from all 50 states and compare the different gun carry laws to determine the highest firearm mortality rate.
 - The data resulted in a statistically significant increase in firearm mortality in the open carry no restriction states than any other category (P-value < 0.0083), supporting the hypothesis.
- A search for contributing factors was conducted, determining suicide, alcoholism, and poverty as possible connections to firearm mortality.
 - I compiled the occurrence rate of each contributing factor by U.S. state and year into a simple regression analysis to determine their correlation to firearm mortality.
 - The regression revealed that both suicide and poverty had significant P-values (P < 0.001), indicating a correlation between the factors and firearm data. However, alcoholism has a significantly higher P-value than 0.05 (P=0.46), showing no correlation between those two factors.
- This revelation of correlating factors is significant because future researchers will reduce firearm mortality when targeting and reducing poverty or suicide due to their statistical correlation to firearm mortality.

METHODOLOGY



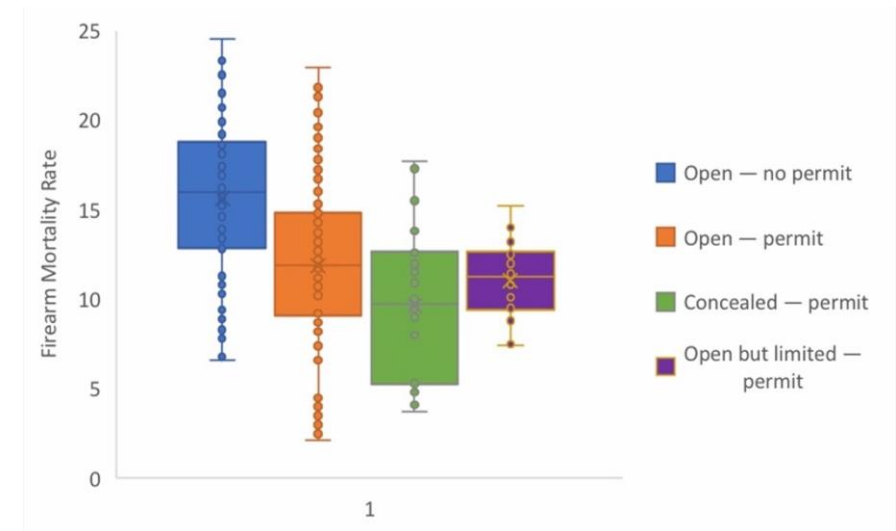
Created with mapchart.net

Figure 1: United States map depicting the gun carry laws of each individual state (Made using MapChart.net).

- Data was collected using CDC databases for the years 2005, and 2014 to 2018.
- Boxplot created to demonstrate significant differences amongst the different gun carry categories.
- ANOVA and t-testing used to as statistical testing to support the data.
- A simple regression was created to determine which contributing factors have a correlation to firearm mortality.

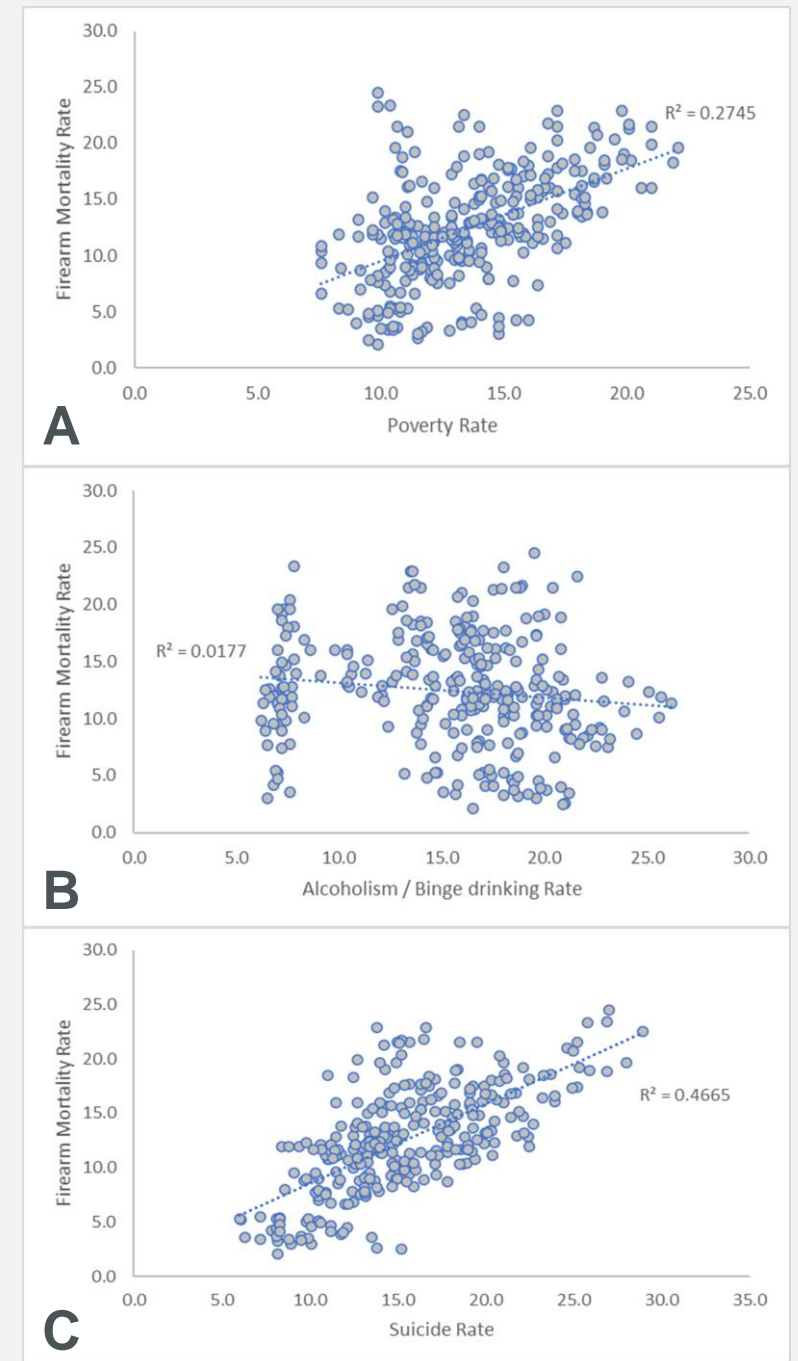
RESULTS – FIREARM DATA

Figure 2: Boxplot representing firearm mortality data collected from all 50 states (circa 2005; 2014-2018) and divided into their respected gun carry categories. “Open Carry with no Permit” has states that possess the largest rates of firearm mortality as seen by the significantly higher median. ANOVA and t-testing determined that there is a statistically significant difference between “open Carry with no Permit” compared to the other gun carry categories (P-value < 0.0083).



RESULTS – CONTRIBUTING FACTORS

Figure 3: Scatterplots representing the data of contributing factors (poverty, alcoholism, and suicide). Occurrence rate of each contributing factor was compiled by state averages for the years 2005, and 2014-2018. A simple regression analysis was conducted to determine the significance of each factor when measured amongst firearm mortality. The R^2 value of each factor's line is calculated to demonstrate the accuracy of each line comparative to the data points. Poverty (A) and suicide (C) have statistically significant values (P -values < 0.001) which indicates a significant correlation to firearm data. Conversely, alcoholism (B) has a non-significant value (P -value > 0.05) indicating no correlation between alcoholism and firearm mortality.





IMPLICATIONS

- ❑ States that have open carry laws and do not require permits for gun usage have the greatest presence of firearm mortality.
- ❑ Poverty and suicide have significant correlations to firearm mortality (P-values < 0.001).
- ❑ Correlations between outside factors and firearm mortality indicates that target reduction to poverty and suicide will reduce firearm mortality as a result.

DATA SET REFERENCES

- Alcohol Data Sets: https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&isClass=CLASS01&isTopic=TOPIC07&isYear=2019&rdRnd=42239
- Firearm Data Sets: https://www.cdc.gov/nchs/pressroom/sosmap/firearm_mortality/firearm.htm
- Poverty Data Sets: <https://www.census.gov/programs-surveys/saipe/data.html>
- Suicide Data Sets: <https://www.cdc.gov/nchs/pressroom/sosmap/suicide-mortality/suicide.html>