



# United States Firearm Mortality Rate as Influenced by Gun Carry Laws and Contributing Factors

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

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

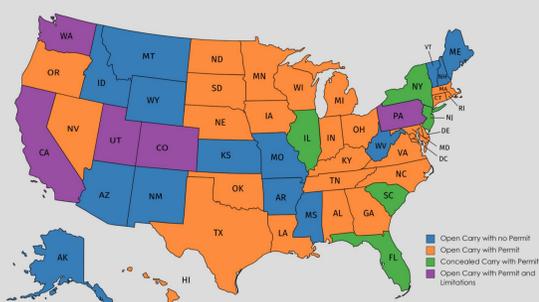
\*jreece@email.lynn.edu

## Abstract

- ❑ **Hypothesis:** States participating in open carry with no regulations or permit requirements will have the highest firearm mortality rates of any other state.
- ❑ Firearm Mortality Rate data and tested using ANOVA and t-tests resulting in an increase in firearm mortality in the open carry no restriction states than any other category (P-value < 0.0083).
- ❑ Suicide, alcoholism, and poverty were determined as possible connections to firearm mortality.
- ❑ The occurrence rate of each contributing factor was compiled into a simple regression analysis, revealing both suicide and poverty had significant P-values (P < 0.001), indicating a correlation between the factors and firearm data.
- ❑ This revelation is significant because future researchers will reduce firearm mortality when targeting and reducing poverty or suicide due to their statistical correlation to firearm mortality.

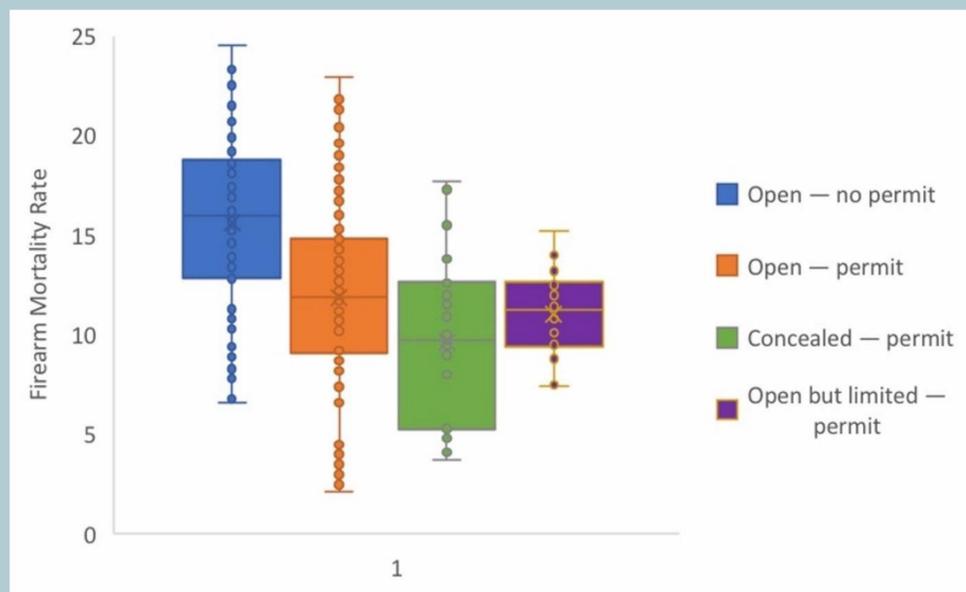
## Methodology

- ❑ 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.

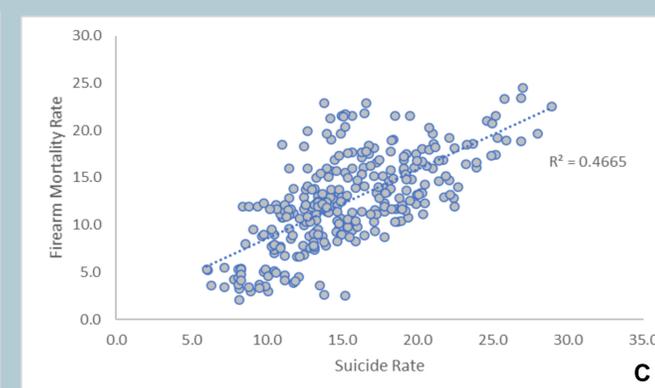
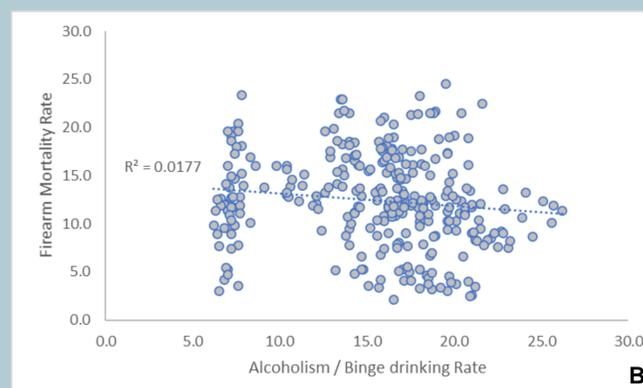


**Figure 1:** United States map depicting the gun carry laws of each individual state (Made using MapChart.net).

## Results



**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).



**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<sup>2</sup> value of each factors' 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.

## References

Alcohol Data Sets: [https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH\\_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&isIClass=CLASS01&isITopic=TOPIC07&isYear=2019&rdRnd=42239](https://nccd.cdc.gov/BRFSSPrevalence/rdPage.aspx?rdReport=DPH_BRFSS.ExploreByTopic&irbLocationType=StatesAndMMSA&isIClass=CLASS01&isITopic=TOPIC07&isYear=2019&rdRnd=42239)  
 Firearm Data Sets: [https://www.cdc.gov/nchs/pressroom/sosmap/firearm\\_mortality/firearm.htm](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>