



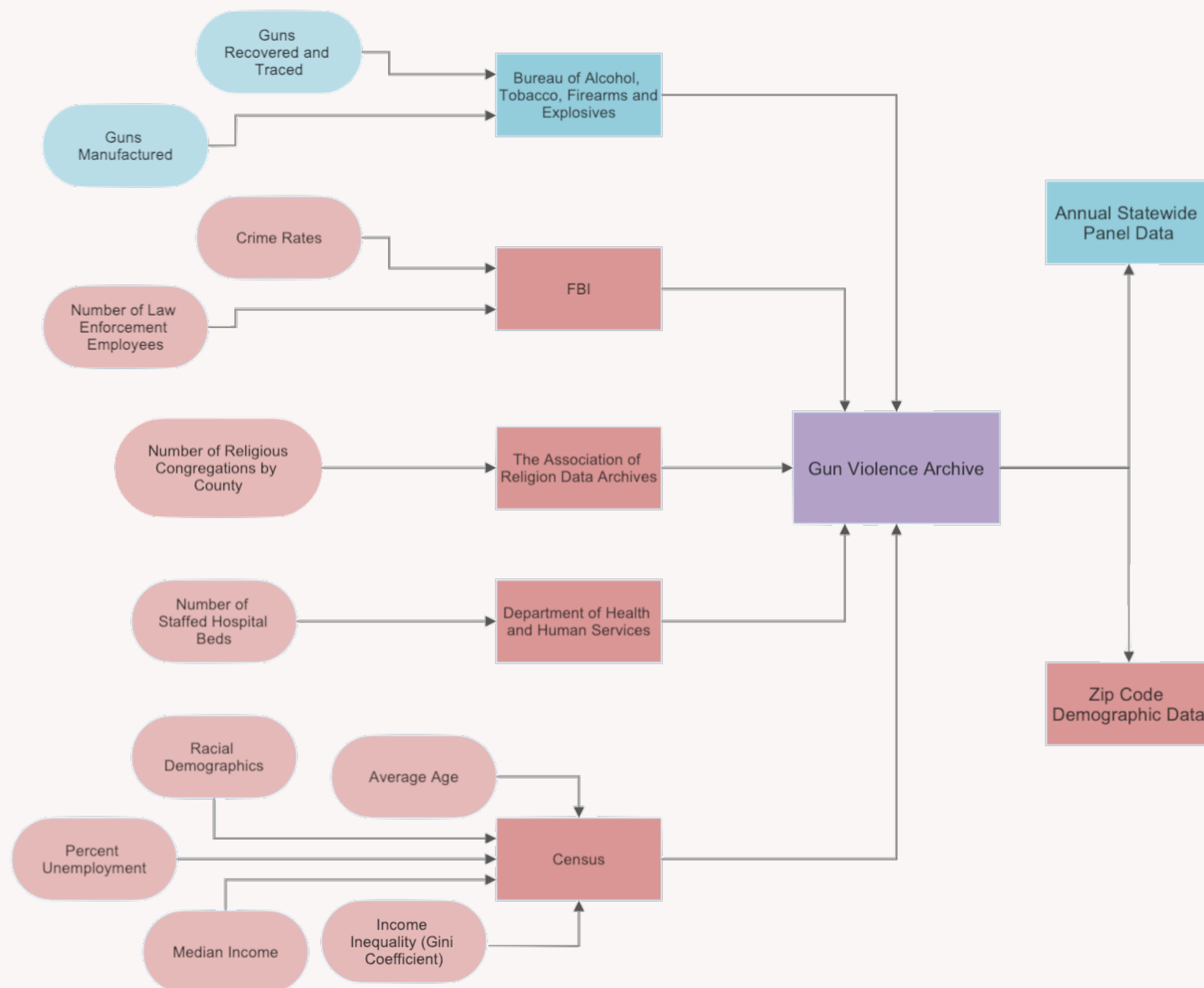
Demographic and Geographic Factors Influencing Gun Violence



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Data Sources and Variables Used

Figure 1



Introduction and Methods

Introduction

- Gun violence is a day-to-day reality for most Americans with the Gun Violence Archive reporting that 41,141 were injured or killed by gun violence from 2014 to 2022.
- This research examines relationships between the number of people killed and injured by gun violence with characteristics of the zip code or state in which the shooting occurred (Figure 1).

Sample and Measures

- Data in the Gun Violence Archive is collected from over 7,500 law enforcement, media, government, and commercial sources daily to provide near real time data about the results of gun violence.
- N=452,787 shootings from 2014 to 2022.
- The ATF Trace data indicates the location of the first retail purchase of guns (categorized as pistols, derringers, rifles, machine guns, and combination weapons) that were recovered during a police investigation and submitted to the ATF.
- Gun manufacturing is assessed through the number of weapons (categorized as shotguns, rifles, pistols, revolvers, and miscellaneous) produced and the number of licenses for dealers, collectors, and manufacturers.

Research Questions

- Which demographic factors of a zip code impact the number of individuals killed or injured by gun violence?
- Is there a relationship between gun ownership or the presence of nearby gun manufacturing and gun violence?

Results

Univariate

- In 58.7% of shootings, only one person was killed or injured.
- Casualties increased from 2020 to 2021 the most in Illinois and Texas while they decreased in Missouri (Figure 2).

Bivariate

- Percent of the population that was Black or Asian as well as in the level of income inequality, crime rate, number of staffed hospital beds (Figure 3), and percentage of people who were Muslim was positively correlated with the number of people killed or injured.
- Average age, percent of white population, and percent of people who were Mainline Protestants was negatively correlated with the number of people killed or injured.
- The number of pistols, rifles, derringers, machine guns, and combination weapons traced to the state where they were first purchased as well as the number of shotguns, rifles, and pistols manufactured, and the number of ATF licenses were positively correlated with the number of people killed or injured.

Multivariate

- The variance in annual statewide trends was best explained by the number of pistols, derringers, machine guns, and combination weapons traced to each state (Adj R2 = 0.507).
- Pistol manufacturing was most strongly positively correlated with the number of casualties (Figure 4).
- The variance in trends across zip codes was best explained by the percent of Black residents, Mainline Protestants, number of staffed hospital beds, and crime rate (Adj R2 = 0.53).
- The percent of population that was Black was most positively correlated with the number of casualties. Mainline Protestants were negatively associated with casualties, but its impact is small (-2.279e-02) (Figure 5).

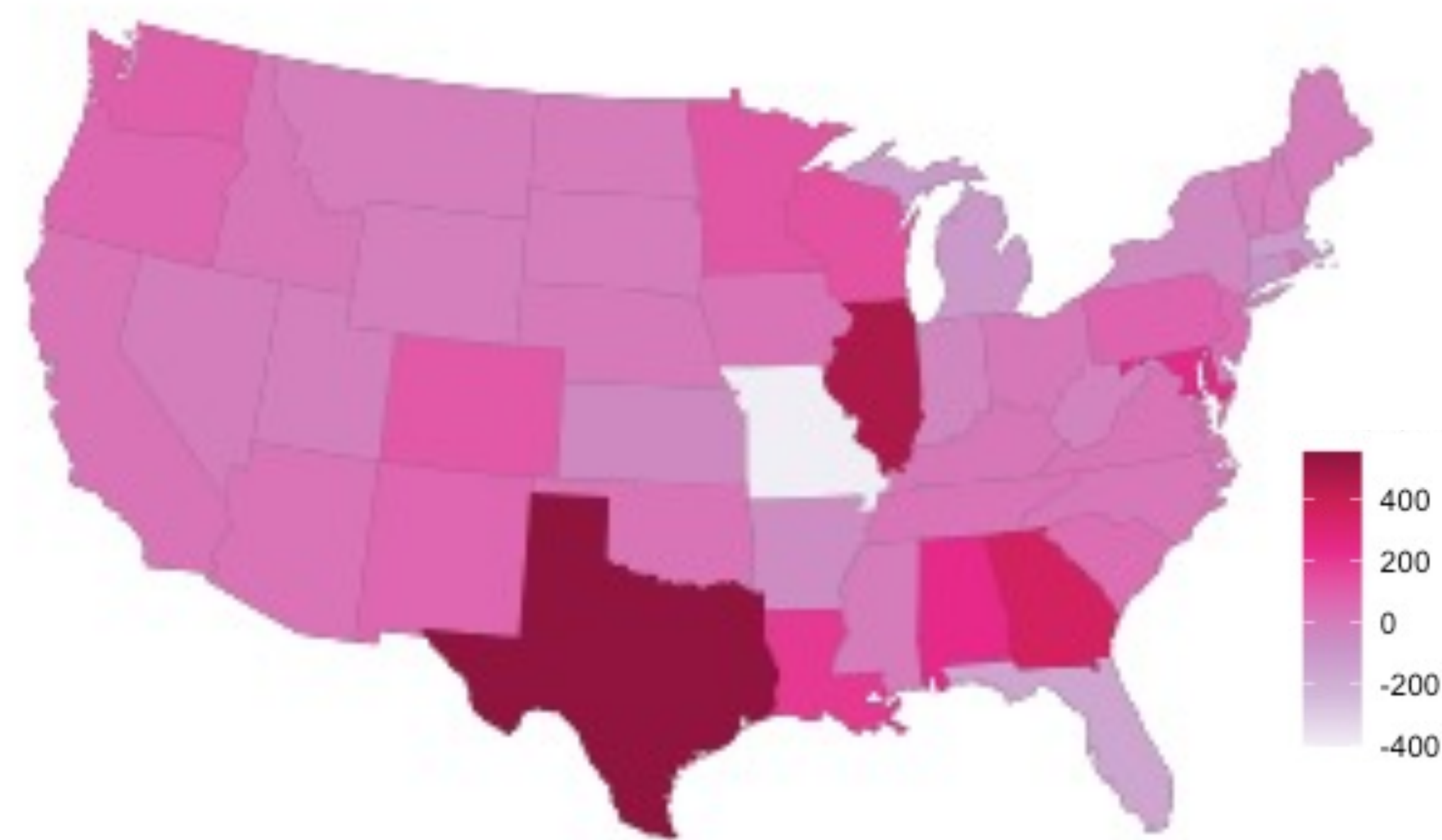


Figure 2: Difference in Casualties (2020 to 2021)

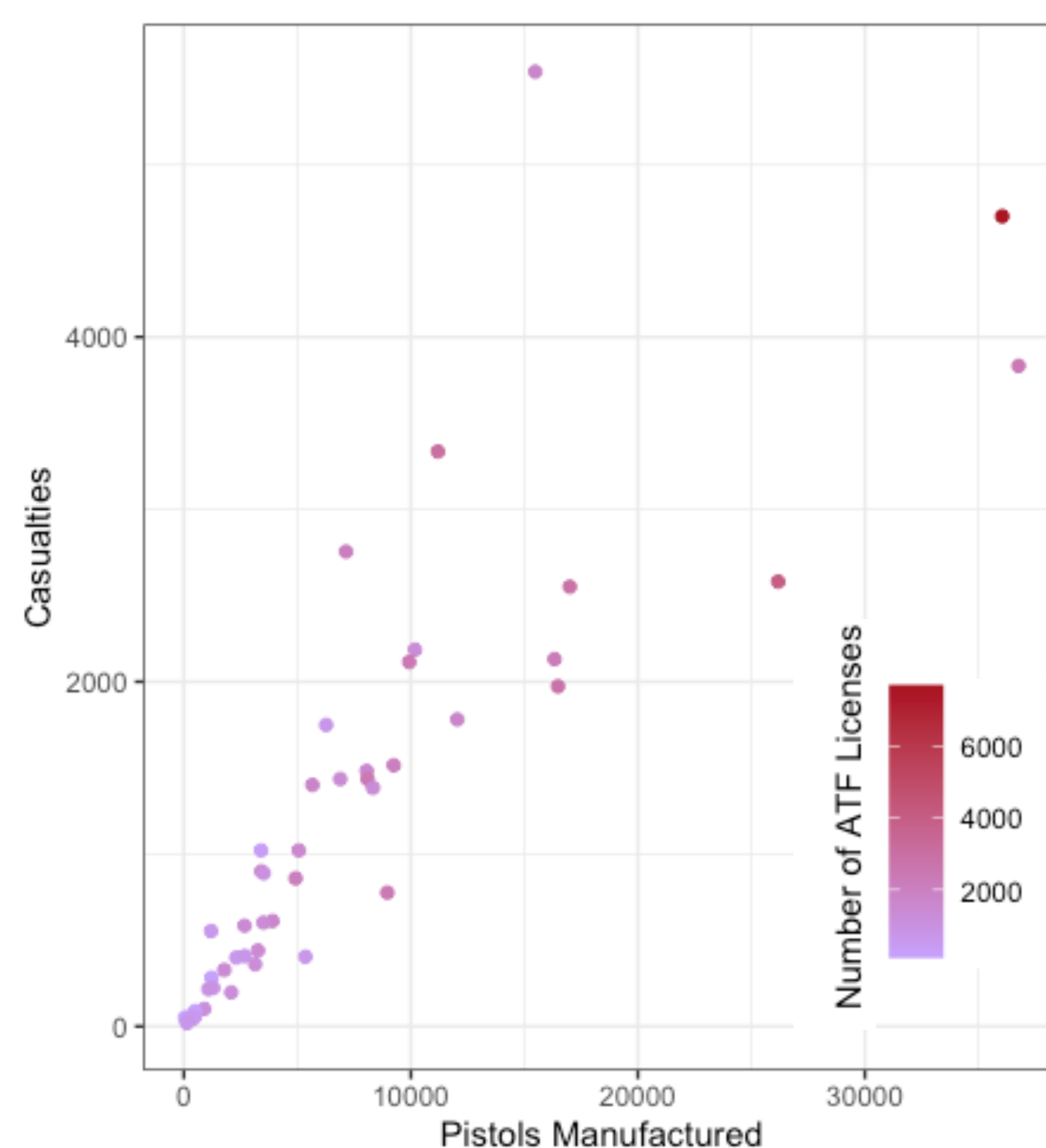


Figure 4: Casualties by Pistols Manufactured and ATF Licenses

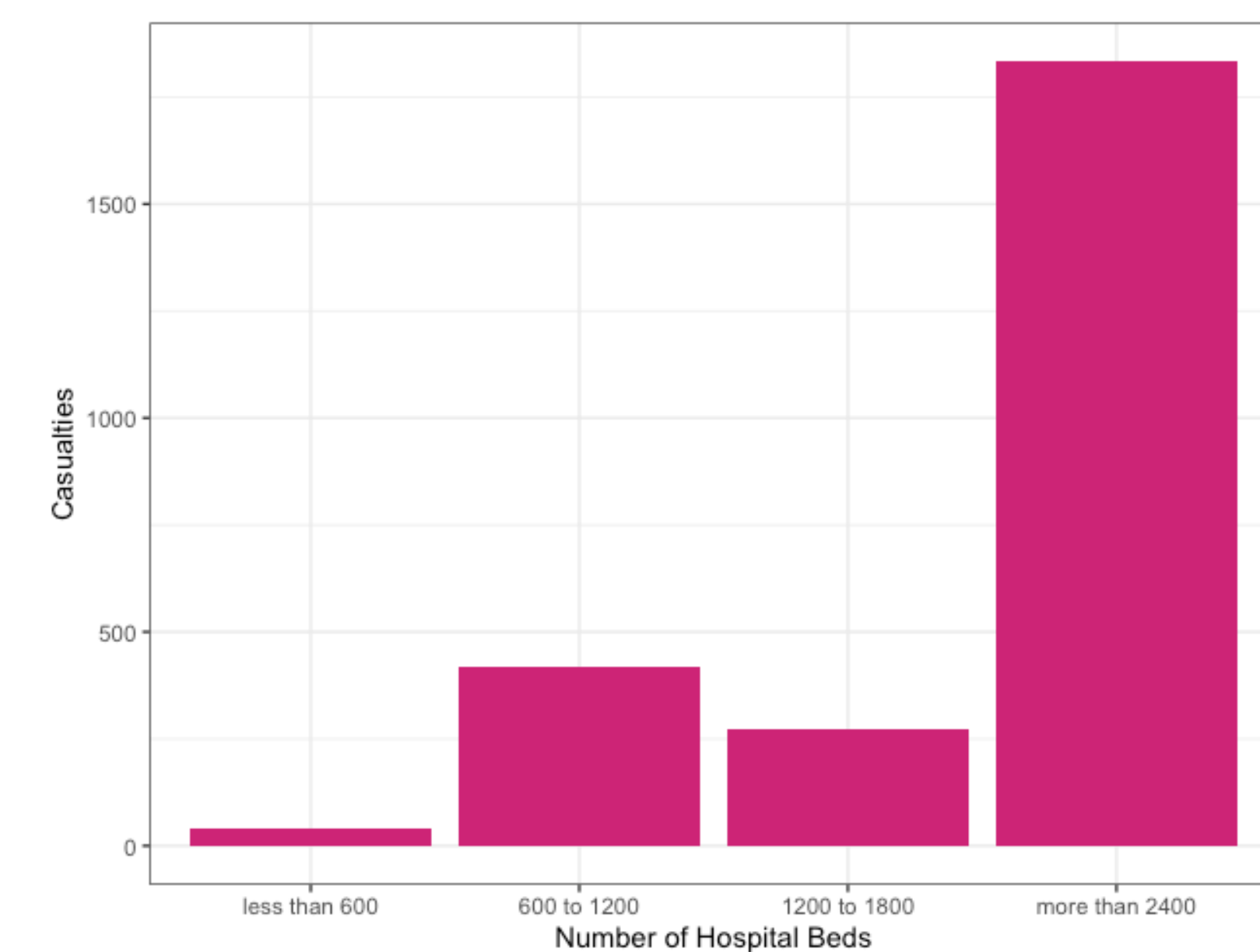


Figure 3: Casualties by Hospital Beds

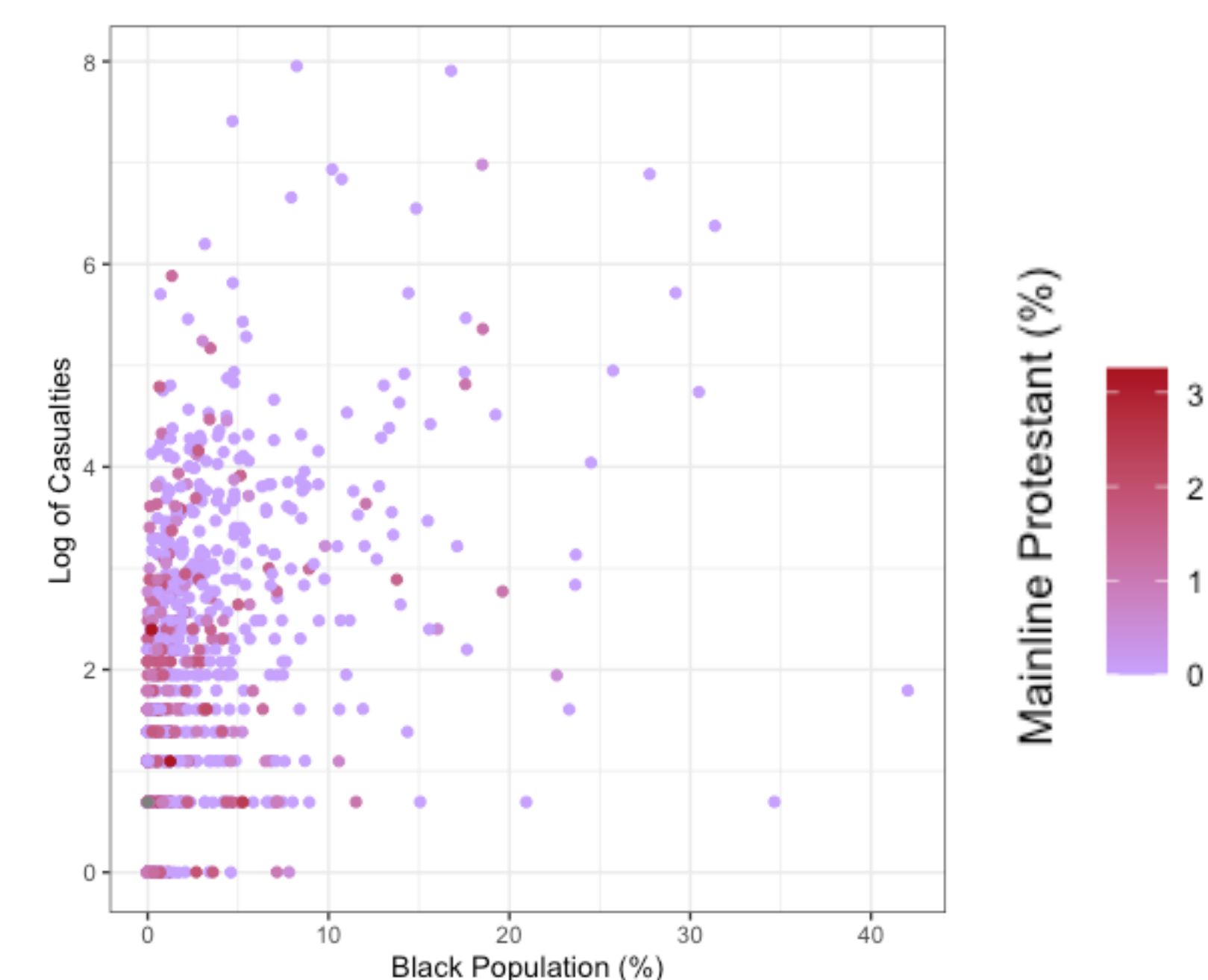


Figure 5: Log of Casualties by Black Population and Mainline Protestants in California

Discussion

- Further research is needed to explain high amounts of the variance given that some of the better performing models were contradictory to the bivariate correlation tests.
- There is a significant amount of missing data which requires further study. There are only 2,753 observations for the average number of staffed hospital beds in a zip code and the religious data is only comprehensive by county which creates redundancies in the zip code format.
- Access to the CDC's National Violent Death Reporting System will allow for more detailed analysis of the geographic and demographic factors impacting the victims of gun violence.

References

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