**THE RESEARCH REPORT**

**INTRODUCTION OR BACKGROUND**

As a Canadian, I see much written in the Canadian media about the large differences between Canada and the US in relation to gun ownership, gun regulations and the rate of gun murders, but I had never seen an analysis of the relationships between gun regulations and gun murders or between gun ownership and gun murders. The US is also believed to have high levels of income inequality and poverty which might be associated with more crime. This general knowledge led to my study objective.

**OBJECTIVE:**

To conduct an exploratory analysis of factors that may explain the high rates of murders by firearms in the United States. (Note that this investigation focused on gun murders and does not include gun deaths by suicide or accidental gun deaths.)

**METHODOLOGY:**

I began by exploring other research reports to see what is known on the subject before deciding on my specific objectives and hypotheses. I looked for reports and international datasets that compared homicides between countries. These reports confirmed that the US has one of the highest rates of homicides of countries around the world, and that there are many more registered guns per capita in the US than in Canada.

I then began by searching for data sets relating to gun homicides in the United States as a whole, by state, and by year These were mostly found through Statista, FBI data records, Statistics Canada, the US Census Bureau, and Data Commons, with separate datasets found through the United Nations office on Drugs and Crime, and Kaggle.

One limitation of my study was that gun ownership cannot be comprehensively measured. Gun ownership can be measured by the number of guns that are registered or self-reported on surveys, but this will not include the number of guns that are not registered or are held illegally.

**DATA DESCRIPTION**

*Homicides per 100,000 people in OECD Countries* - United Nations Office on Drugs. All countries' data from 2013, except for South Korea, Israel, Chile, and Turkey, which are from 2012.

*Number of Victims of Intentional Homicide, per 100,000 population, by Sex in Canada and in the United States* – Global SDG Database. Two separate datasets, one for each country, from 2000-2021, comparing homicide rates.

*Gun laws in the United States in 2023, by state* - World Population Review. Dataset includes whether state requires permit to purchase gun, and firearm registration.

*Number of registered weapons in the United States in 2021, by state* – ATF. (October 2021)

*Number of murders involving firearms in the U.S. in 2021, by state* - FBI. (October 5, 2022).

*Poverty rate in the United States in 2022, by state* – US Census Bureau (September 13, 2023). The U.S. Census Bureau uses a set of dollar value thresholds that vary by family size and composition to determine who is in poverty. The percentage of people in poverty is calculated using 3-year averages: 2020, 2021, 2022.

**ANALYSES**

**Hypotheses:**

I developed three hypotheses to be tested statistically:

* Hypothesis 1: Higher rates of gun murders in the United States are associated with higher levels of registered gun ownership.
* Hypothesis 2: Higher rates of gun murders in the United States are associated with lower levels of gun regulation.
* Hypothesis 3: Higher rates of gun murders in the United States are associated with higher levels of poverty.

**Study sample:**

For each of the analyses, my sample consisted of the 50 states in the USA.

**Statistical procedures and findings:**

Hypothesis one was tested using correlation analyses. The findings showed a small positive correlation of 0.174 between the number of registered weapons in each state and the number of gun murders per 100,000 population. This means that states with more registered guns tended to have more gun murders, but the relationship was very weak. Therefore, the hypothesis was not supported. Findings were also illustrated using a scatter plot.

Hypothesis two was tested using independent t-tests. These analyses focused on (1) whether the state required people to obtain a permit to purchase a gun, and (2) whether there was a regulation requiring firearms to be registered. Two separate t-tests were conducted, one for each regulation.

Both t-tests showed statistically significant results (with p < .05), indicating that, on average, the states with gun regulations have a much lower number of gun murders per 100,000 population than states that do not have gun regulations. The average number of gun murders per 100,000 population was 1.91 for states that required a permit to purchase, compared with 4.47 for states that did not have this regulation. The average number of gun murders per 100,000 population was 1.94 for states that required that guns be registered, compared with 4.10 for states that did not have this regulation. Therefore, the hypothesis was strongly supported. Findings were also illustrated using bar graphs and a heat map.

Hypothesis three was tested using correlation analyses. The findings showed a positive correlation of 0.52 between the poverty rate in each state and the number of gun murders per 100,000 population. This means that states with greater poverty tended to have more gun murders, and the relationship was moderately strong. Therefore, the hypothesis was supported. Findings were also illustrated using a scatter plot.

**CONCLUSION**

The evidence suggests that gun murders in the US are not related to the number of registered guns. This unexpected finding may be because gun murders are committed with guns that are not registered (that is, unregistered or illegally owned guns).

The findings of this study indicate that higher rates of gun murders can be explained by low levels of gun regulations.

The evidence also suggests that higher rates of gun murders may be associated with poverty. It is possible that poverty increases desperate behaviour, resulting in increased crime rates.

This analysis did not determine which factor has a stronger effect, gun regulations or poverty. It would be useful to conduct an additional analysis, beyond the scope of this project, to determine the effect of poverty in states that have and do not have gun regulations.