Gun Violence Data Analysis in America

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November 2021

There are more guns than people in the United States[1]

- US Citizens own the highest number of firearms in the world!
- Gun laws are enforced by federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and the state agencies.

The objective of this project is to perform Exploratory Data Analysis on gun violence related data to provide insights on this subject matter.

What is the Public Opinion on Current Gun Laws?

57% Favor **more restrict laws**

9% Favor **less restrict laws**

34% Favor **kept as now**

What's the Problem?

The Goal: Understand the gun violence in the US by performing **Exploratory Data Analysis** on the data. Find opportunities for improvement and better allocating federal and states resources.

Proposed Data Science Solution:

- Use **Poisson regression** modeling to predict the number of casualties in a gun violence incident based on location, offenders' demography, city events, number of law enforcements in the vicinity, type of arms involved etc.
- Use the **unsupervised clustering** to segment state counties and locations that have higher rates of gun violence in more detail for better allocation of resources.

Methodology

Data Collection

US gun violence and mass shooting data from open source:

data.world

Exploratory Data Analysis

Tools:
Google Sheets
DB Browser for Sqlite (SQL)
Tableau



Building Models

Supervised
Poisson Regression

Unsupervised
Clustering

Future Work

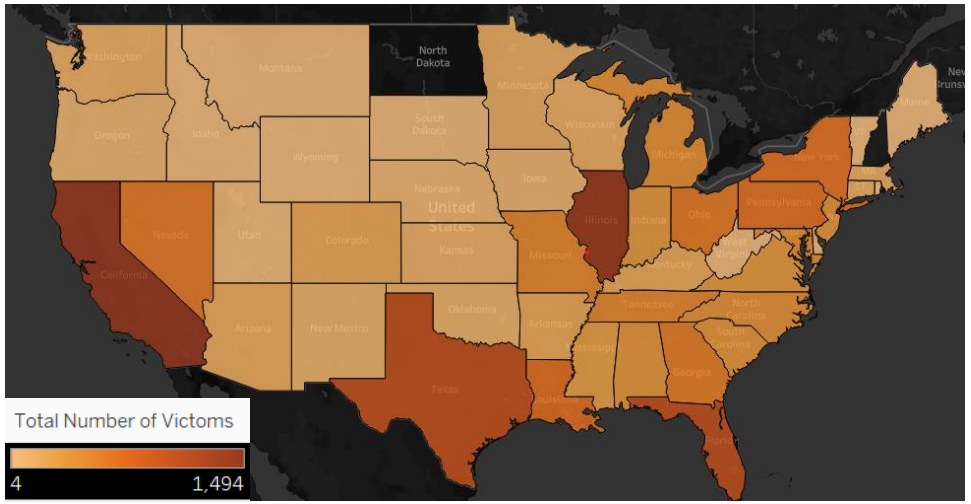
Insights

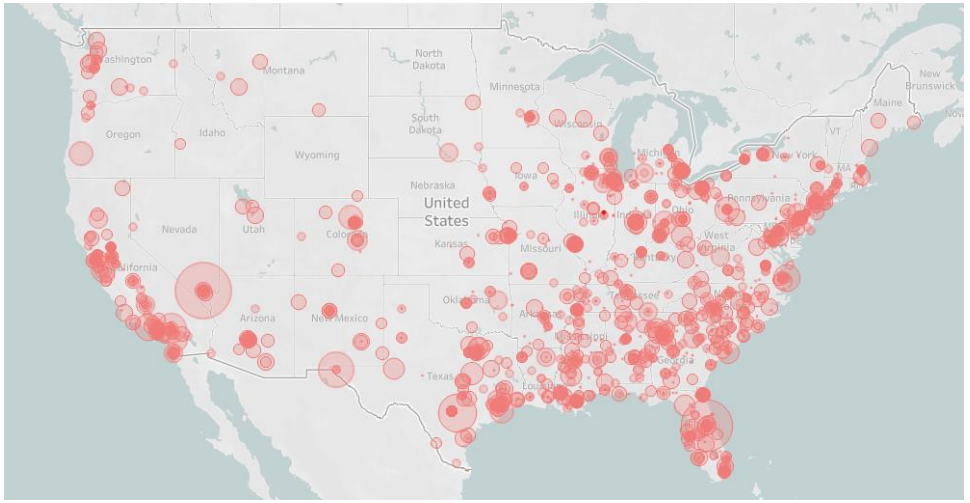
Location Data from 2014 – 2021

Top States with Gun Violence Incidents:

- **California**
- **Illinois**
- **Florida**
- **Texas**

Interact with the data

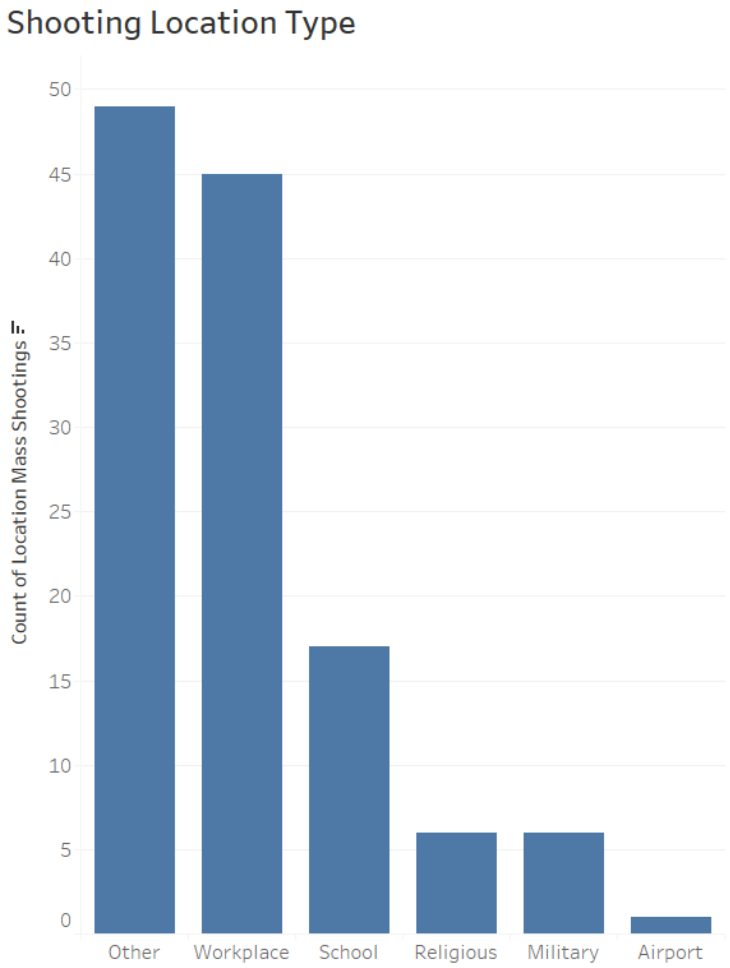




Insight

Data from 1982 – 2021
US Mass Shooting Location Type

Workplaces and schools are among most vulnerable locations.

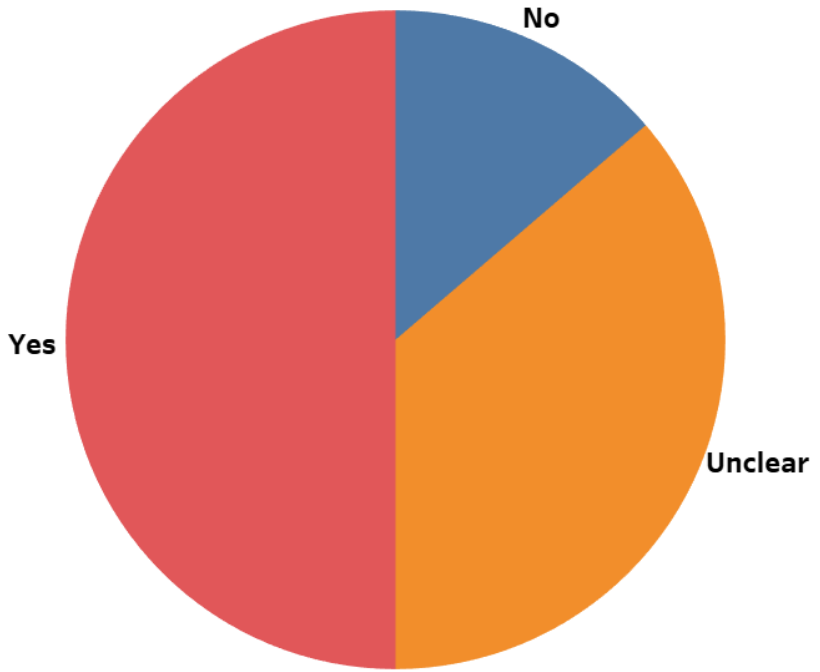


Insight

Data from 1982 – 2021
US Mass Shooting Offenders Demography

- **50% of offenders had been diagnosed with a type of mental health issues prior to the mass shooting.**
- **Around 96% of the mass shootings have been conducted my male.**
- **Shooters between age of 40 – 45 had the highest number of incident counts.**

Shooters' Prior Mental Health Diagnosis



Conclusion

ATF can optimize resource allocations by performing EDA on US gun violence data.

California has the highest number of gun violence incidents among all States.

Workplaces and schools are the most vulnerable places for shootings.

50% of the shooters were diagnosed with a type of mental health prior to the shooting. 95.9% of the mass shootings were conducted by male. Shooters between 40-45 had the highest count.

Future Work

A more uniform data collection is needed to be able to perform a more accurate analysis.

Using data science solutions such as a Poisson Regression, ATF can predict the count of casualties using location data, offenders' demography, number of law enforcements, city events etc. as the features.

An unsupervised clustering model can be used to detect cities and counties that require more resources.

Thank you!

Appendix

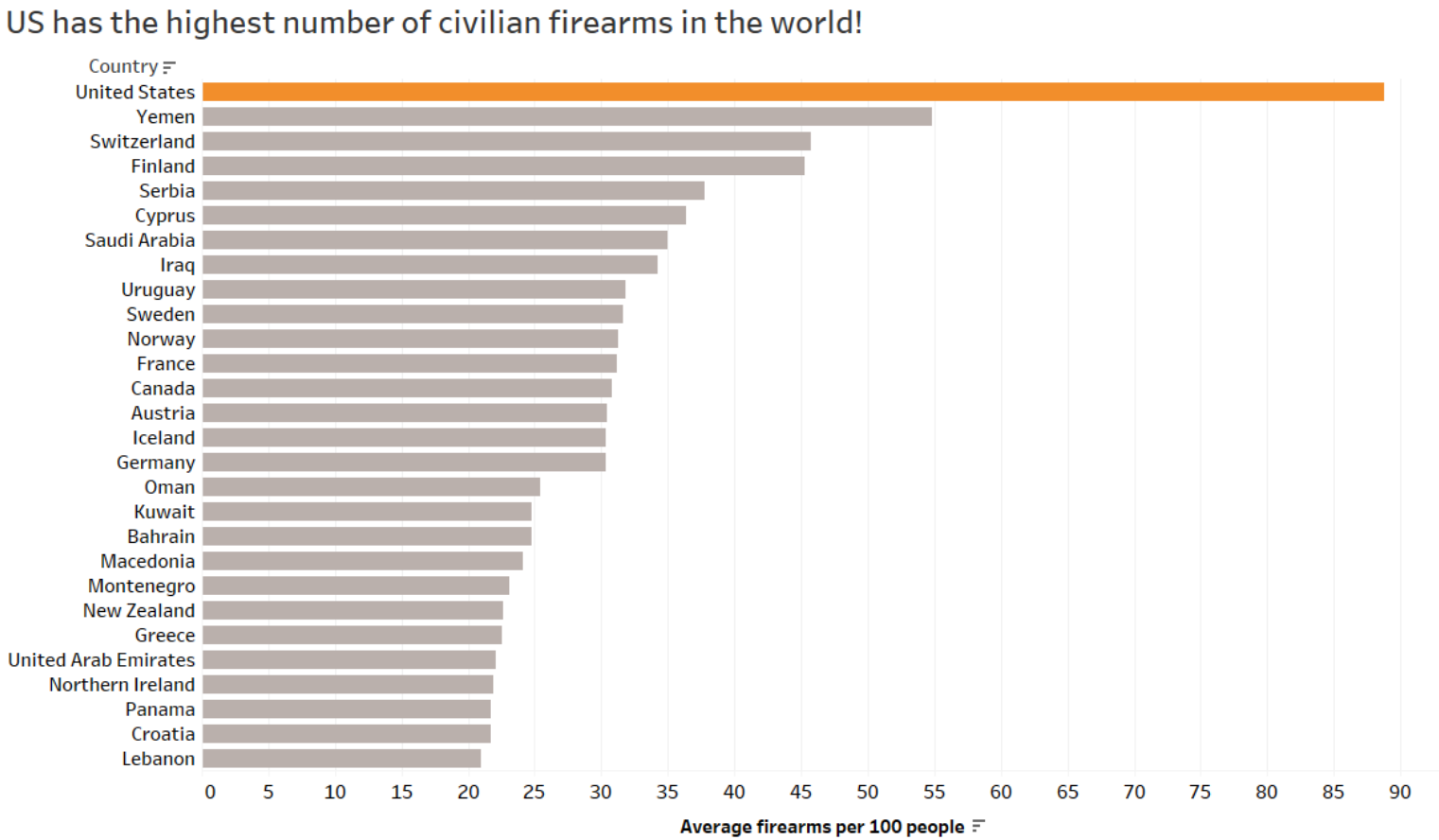
References

1- Washington Post: There are more guns than people in the united states
2- Washington Post: 2021 has already been a very bad year for mass shooting
3- Los Angeles Times: Article
4- Gallup Survey on Guns

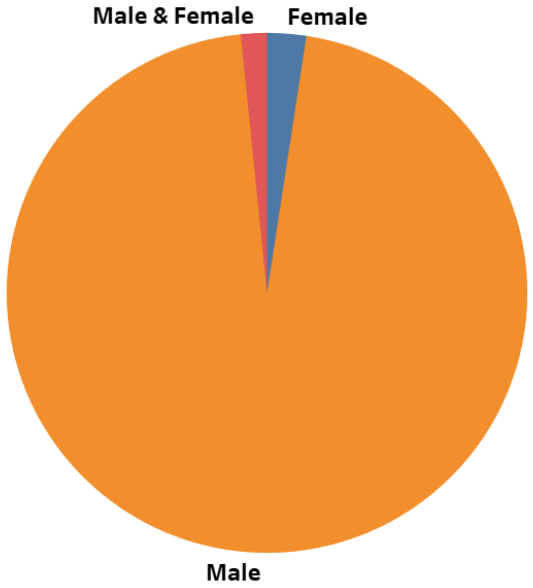
Data Resources

data.world Dataset 1
data.world Dataset 2
data.world Dataset 3

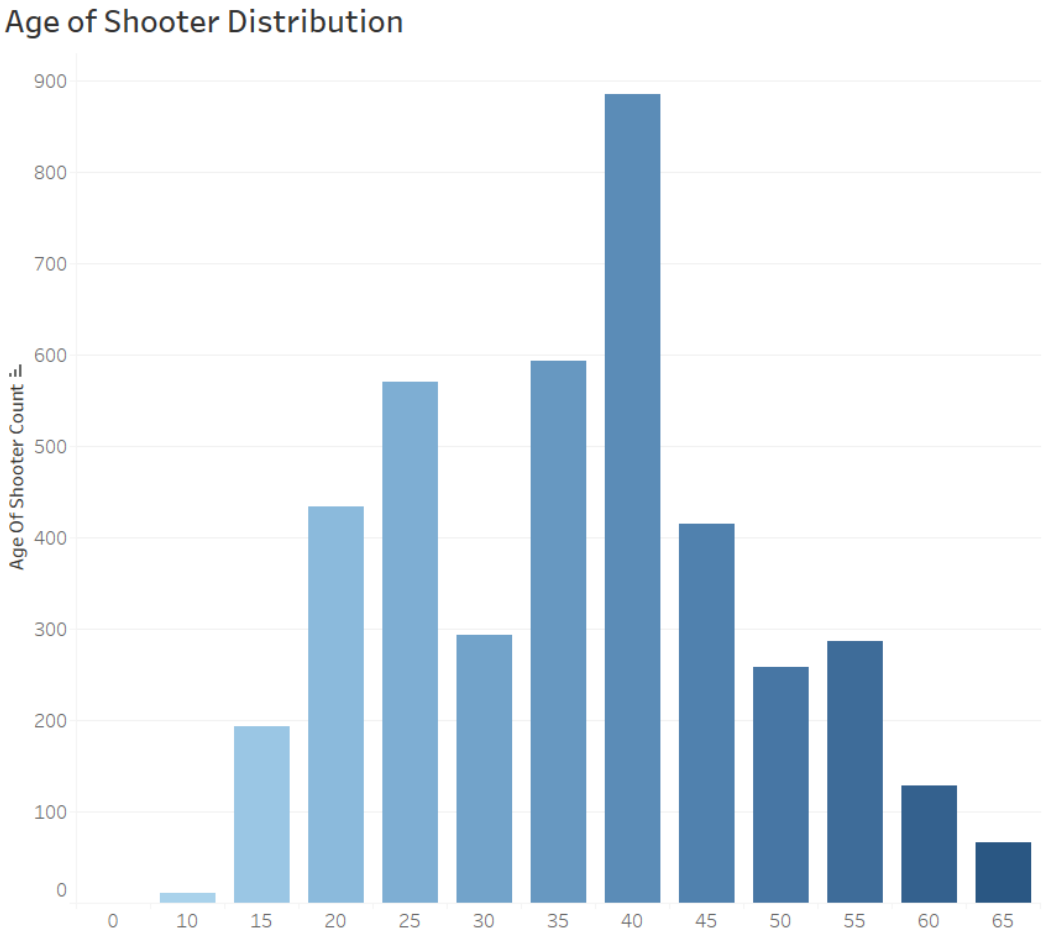
Appendix


US has the highest number of civilian firearms in the world!
Country
United States
Yemen
Switzerland
Finland
Serbia
Cyprus
Saudi Arabia
Iraq
Uruguay
Sweden
Norway
France
Canada
Austria
Iceland
Germany
Oman
Kuwait
Bahrain
Macedonia
Montenegro
New Zealand
Greece
United Arab Emirates
Northern Ireland
Panama
Croatia
Lebanon
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
Average firearms per 100 people

Appendix



Data from 1982 – 2021 for US mass shooting shows 95.9% of the shooters are male.



Appendix

Data from 1982 – 2021 for US mass shooting
(Total of 124 mass shootings in this study)