Analysis of Effectiveness of Gun Laws in Reducing Homicide Rates in the US

MIE368H1F Analytics in Action

Prepared by Team 2

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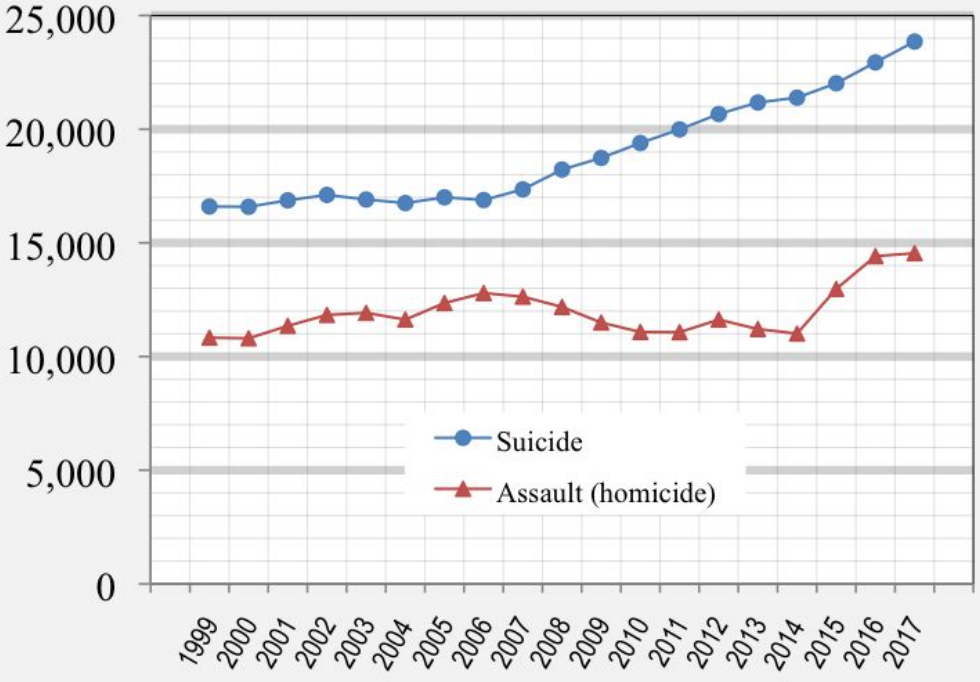
Context

The US & its continuous battle with gun-control laws

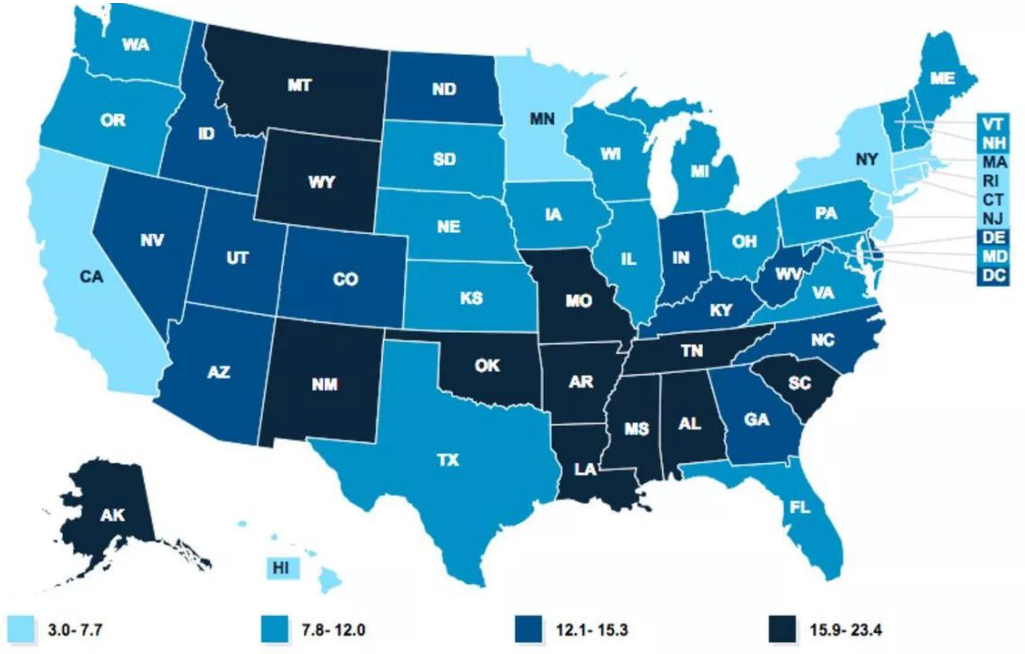


Gun-related deaths in the United States

Source: US Centers for Disease Control and Prevention

Context

The US & its continuous battle with gun-control laws



Source: DeseretNews

Objective

What we hope to achieve

- Assess whether gun control laws are effective at predicting number of homicides in each state

- Determine the effects of a implementation of the most effective law

Data

With reference to a policy study by The Rockefeller Institute of Government

1. State Firearm Codebook

1.1. Universal Background Checks

1.2. Violent Misdemeanor Laws

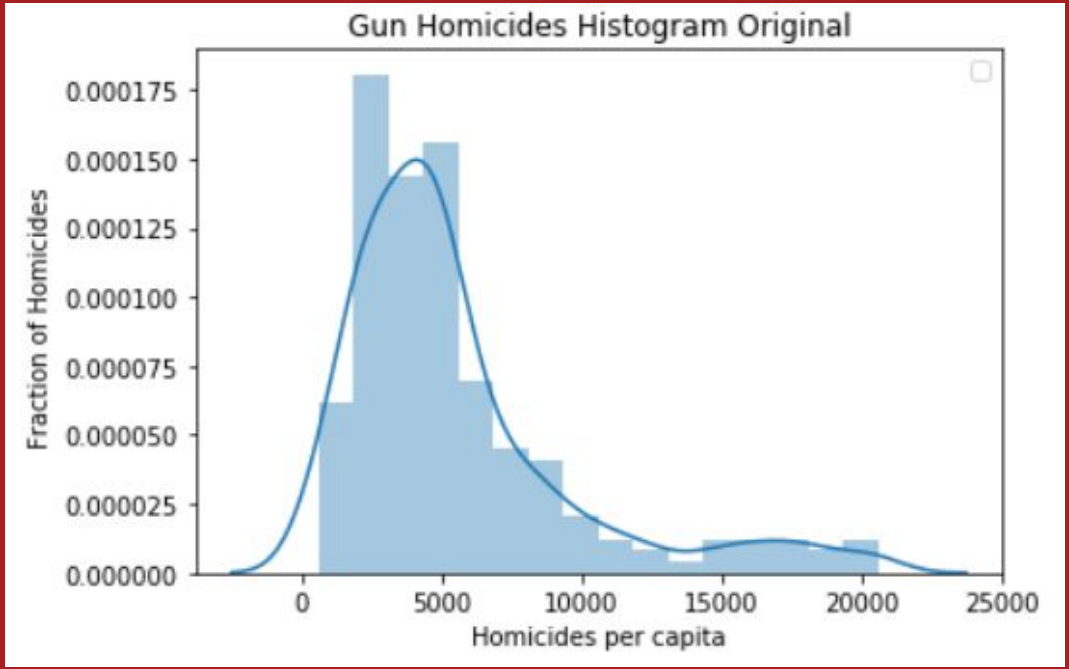
1.3. High Risk Checks

Data

With reference to a policy study by The Rockefeller Institute of Government

2. **Homicides***
3. **Population**
4. Demographics
5. % of Population that is Male
6. Federal Firearms License per Capita
7. Alcohol Consumption per Capita

EDA



- Normalization of Homicides
- Removed Outliers

Methods

Automated Feature Selection

- Ridge Regression
  - Training Score is -1338.97
  - Testing Score is -1402.42

- Lasso Regression
  - Training Score is 0.651
  - Testing Score is 0.638

Methods

Manual Feature Selection

- Determine correlation between features
- Sort features by the amount of high correlations they have with other features
- Remove highly-correlated features

Methods

Model Fitting

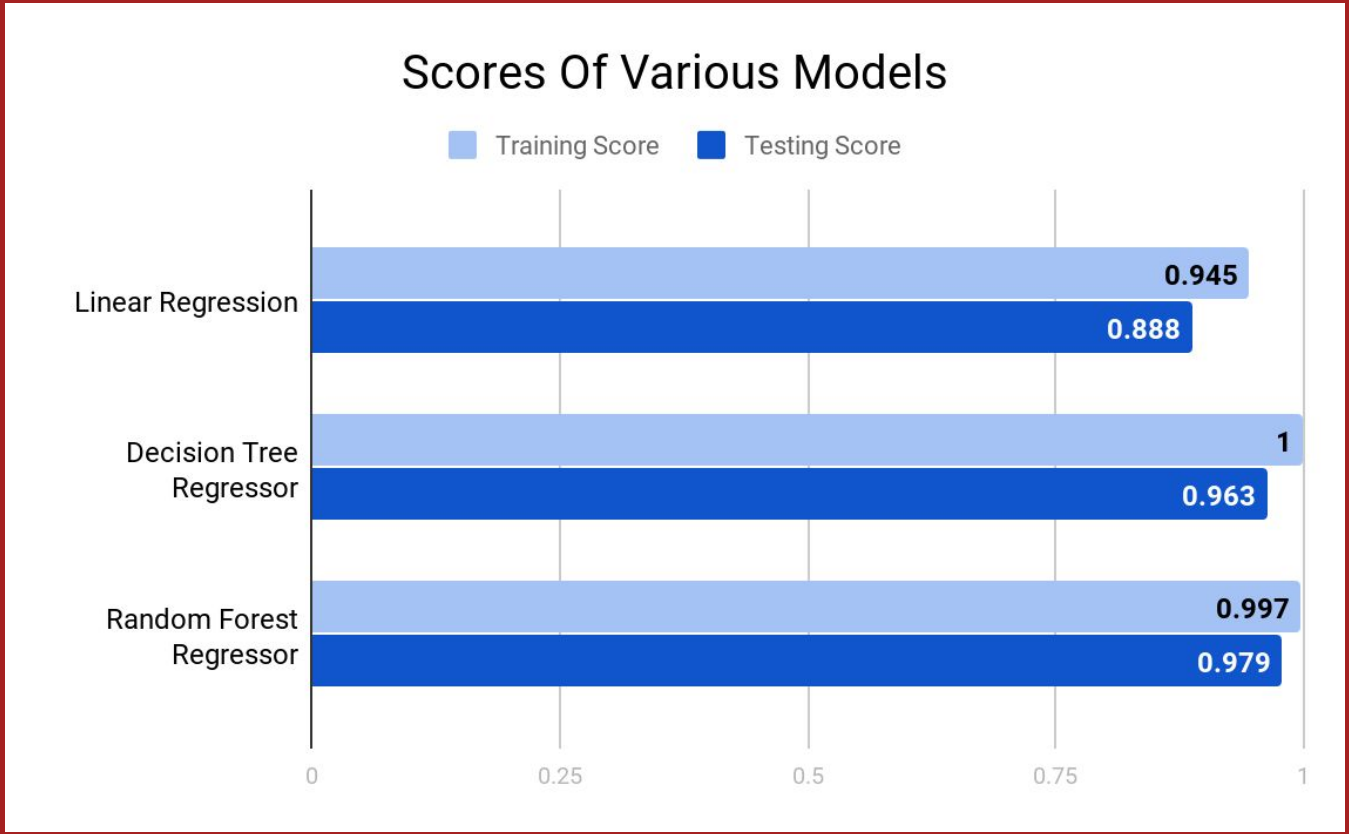
- Linear Regression
- Decision Tree Regressor

Methods

Model Fitting

- GridSearchCV
- Random Forest Regressor

Model Scores



Results

Real Life Implications

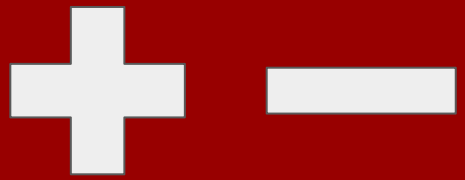
- ERL significant in outputs of both methods
- Population may be influencing model significantly

Results

Extreme Risk Law

Homicides with ERL Implementation

Strengths & Weaknesses



Strengths:

- Variety of methods lead to similar results

Weaknesses:

- Difficult to isolate effectiveness of laws from non law features

Next Steps

- Collect larger dataset
- Better incorporate population & other factors