Statistical Analysis Summary

Below is a summary of key findings from the statistical analysis process.

The full statistical analysis with select code and plots is available here:

<https://github.com/datahoundz/Springboard_Data_Science/blob/master/04_Stat_Analysis_Summary.md>

<https://github.com/datahoundz/Springboard_Data_Science/blob/master/02_stat_analysis.R>

Firearm Suicide as an Important Area for Intervention

1. Firearm suicides vastly outnumber firearm homicides, nearly 2X
2. Firearm suicides climbing steadily since 2007
3. Virtually no correlation of firearm suicides with firearm homicides
4. Only six states where homicide rates exceed suicide rates
5. Five of these score B+ to A- on Giffords Gun Law Grade
6. All five have below average homicide rates as well

Suicide Rates and Methods Vary by Geographical Region

1. Mountain states have disproportionately higher overall suicide rates
2. State population NOT a factor in this anomaly
3. Population density IS a factor, though Mountain & Plains states diverge
4. Weak relationship between firearm suicide and suicide by other methods
5. Lower and flatter firearm suicide trendline for Northeast and Pacific
6. Higher and rising firearm trendline in South and Mountain
7. Above average state suicide rates accompanied by greater firearm share

State Gun Ownership Levels Correlated with Higher Suicide Rates

1. Gun ownership below average in Northeast, above in South and West
2. Relationship between gun ownership and firearm suicide at r2 of 0.547
3. Tercile breakout supports ownership to firearm suicide relationship
4. Ownership data for only 2013 poses issue for more detailed analysis

Giffords Center Data: Relationship between Laws and Gun Deaths

1. Half of states receive an F grade on gun laws, seven receive A or A-
2. Between 18-20 of highest gun death states received F grade
3. Strongest connection between law and death rankings in South and West
4. Relationship between law rank and firearm suicide at r2 of 0.594
5. Above average *overall* suicide rate associated with F grade on gun laws

Number of State Gun Laws Strongly Related to Firearm Suicide Rate

1. Highest law count in Northeast, rising in South and West, flat in Midwest
2. Median state count shows lack of broader change, all regions flat to falling
3. Significant strengthening of laws in just one fourth of states
4. Solid negative correlation between laws and firearm suicides, r2 of 0.617
5. Relationship even stronger when parsed by region, South is exception
6. States that reduced gun laws averaged 2.42 increase firearm suicide rate
7. States that significantly increased laws saw average 0.47 increase

Conclusions from Analysis

1. Firearm suicides account for twice as many deaths as firearm homicides
2. Firearm suicide rates vary dramatically across states and regions
3. Region, gun ownership and strength of laws are key variables of interest
4. Ownership data for only 2013 is a weak spot of study plan
5. Ownership data for 1999-2016 would strengthen analysis findings
6. Explore difference in type of laws not just total number
7. Explore variation within regions
8. Explore variation between states with similar population density
9. Consider impact on analysis of rising national suicide rate overall