# First Versions of Individual Project

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# Finding 1:

From the article, we know that America has six times as many firearm homicides as Canada, and nearly 16 times as many as Germany. For this homicides visualization in the article, I can only know some advance countries' situation. First of all, I think the author did the cherry picking for this visualization work by putting America as the country of highest homicide rate. Secondly, I am so curious about the situation in other countries and their historical trends. As for the 1st visualization finding , I plan to reproduce the homicides rate around the world.

For the visualization process, here are my steps.
Step 1 : Download and check data.
According to the problem statement, I already find the data resource which is an excel file that can be download from http://www.smallarmssurvey.org/?id=1253. After downloaded the file, I checked information and decided what variable and type of graph is better to use. Here are some key information from the data which will decided the visualization chart and limitations. There are 221 countries data. Violent Deaths rate data is a time series data from 2004 to 2016 and Violent Deaths by firearm in 2016 with count and rate.

| Country Code (ISO 3166 Alpha-3) | Country | Violent Deaths Rate trends - 2004–16 | Violent Deaths by firearm 2016:Count, Rate |
|---|---|---|---|
| SLV | El Salvador | Time Series Data | 5280,83 |

According to the data, Violent Death by firearm is more relevant to what I want. So, I reproduced the excel file and just keep the County Code, County and Violent Deaths by firearm 2016 Count and Rate information. Rate are calculated per 100,000 inhabitants.

Step 2 Data Manipulation:

a. I use Tableau Map to do this visualization. I found that the Tableau can't recognize 5 location names in the data. First of all, I use the Tableau "Edit Location" function to fix two locations" Congo and State of Palestine". Three locations , such as UK(England, Wales), UK(Scotland) and UK(Northern

Ireland), can't be solved by Tableau. So, I need to edit and recalculate their counts and rate information on excel.

b. Due to the data has too many countries. I remove some data by filtering the death number over 1,000.

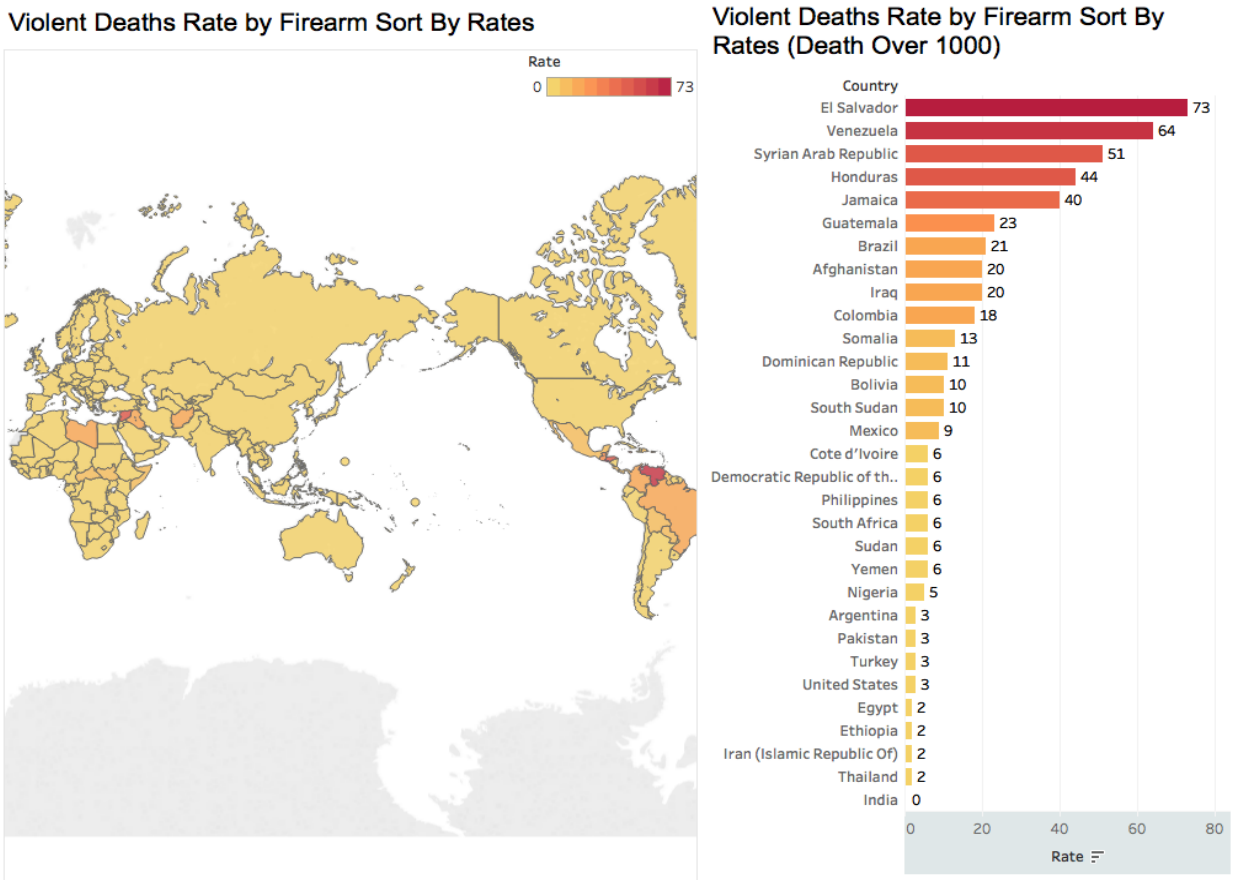
Step 3 Visualization

a. First of all, I import the data into Tableau from Excel and use the map to show the homicide rate in different counties. I use the color to show the different 10 level of homicide rate. For this, readers can easily tell the severity situation of different countries. At this graph, we can tell America's homicide rate is relative low level in the world.
b. However, I think the color is easy to do comparison but not good for memory and get the specific situation of homicide rate. So, I put another graph beside the map graph by showing the sorted Top homicide rates of different countries. At this graph, I filtered the countries whose number of the homicide are less than 1000 then I can't show America on this graph.

Step 4 Road Map with Future Feature and Development.

a. Since the data I have is not a time series data, this graph can't let the reader to dig more deeply for historical trend. I am thinking to try collect historical data and make the reader to see the change of homicide rate for any country on the list. The feature I want will be similar to this article(225-Charts) The industry will turn into the country , the job number changes will turn into homicide rate.
b. Another feature I like to have is to combine the number of death in the graph but still make the graph look clean and simple. The reason to combine the number of death is the number is bigger than rate, then the reader can get clearer idea how

many people was killed in a year.




Data resource:
Interactive Maps and Charts of Armed Violence Indicators
http://www.smallarmssurvey.org/?id=1253

Reference:
International Firearm Homicide Rates ,last updated on: 8/7/2017
https://gun-control.procon.org/view.resource.php?resourceID=006082

# Finding 2

Although I found the homicide rate by firearm is relatively lower than other countries. To dig the homicide by firearm situation in America deeper. I would like to do the visualization to find out the number of homicide in different states in America.

For the visualization process, here are my steps.
Step 1 : Download and check data.

a. The main date resource is database of the Gun Violence Archive website. The data format likes the below table.

| Incident Date | State | City or County | Address | # Killed | # Injured | Operations |
|---|---|---|---|---|---|---|
| December 31, 2016 | Tennessee | Knoxville | Highland View Drive | 1 | 0 | N/A |

The user can customize the filters to download data. So, the filters I use includes

A. Date: Year in 2016, which is consistent with finding 1.
B. Incident character: contains Shot-death(murder,accidental,suicide)
C. Incident character: doesn't contain Shot-death(accidental)
D. D.Incident character: doesn't contain Shot-death(suicide)

I consider this customized data are fit the definition of homicide death by firearm.

b. Another data I need to use is the population by state in 2016. So, I download from United Census Bureau.

Step 2 Data Manipulation.

a. The columns will be used for finding 2 are State and number of killed. So, I deleted other information and group the number of killed by states.
b. Using the number of killed by states and population of each states, I get the homicide rate per 1,000,000 inhabitants.

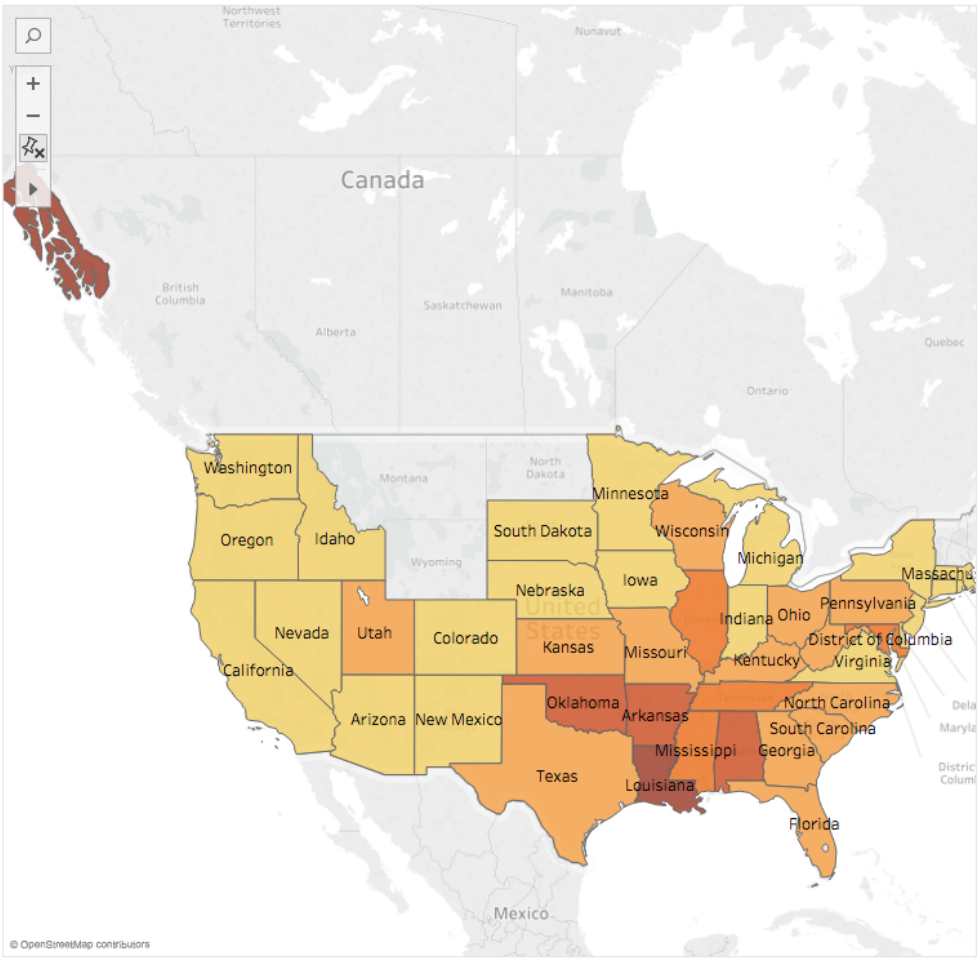
Step 3 Visualization

a. First is to draw a graph to show the states that has higher homicide rate. I found out that states locate in middle south of US have the higher homicide rates.
b. Secondly, I created a table to show the specific homicide rate of each states. It is helpful to check the numbers.

Step 4 Future Improvement

a. For the map, I need to figure out how to show US map only, instead of including Canada and Mexico that have empty information.
b. For the homicide data, there are time series data. I think I can include one column in the table to show the change in near 5-10 years.

State Map of Homicide Death Rate by Firearm




State Homicide Rate

| State | |
|---|---|
| District of Columbia | 5.845 |
| Alaska | 5.394 |
| Louisiana | 5.121 |
| Oklahoma | 4.335 |
| Alabama | 3.703 |
| Arkansas | 3.681 |
| Mississippi | 3.350 |
| Maryland | 3.154 |
| Illinois | 3.038 |
| Tennessee | 3.008 |
| North Carolina | 2.461 |
| Kansas | 2.407 |
| Missouri | 2.298 |
| Texas | 2.078 |
| Georgia | 2.036 |
| Wisconsin | 1.905 |
| Utah | 1.642 |
| West Virginia | 1.641 |
| South Carolina | 1.613 |
| Kentucky | 1.578 |
| Florida | 1.549 |
| Pennsylvania | 1.486 |
| Ohio | 1.463 |
| Nevada | 1.361 |
| Indiana | 1.357 |
| Michigan | 1.208 |
| California | 1.196 |
| Virginia | 1.188 |
| South Dakota | 1.161 |
| New Jersey | 1.114 |
| Delaware | 1.050 |
| Arizona | 1.013 |
| Oregon | 0.979 |
| Rhode Island | 0.946 |

Data Resource:
Gun Violence Archive
http://www.gunviolencearchive.org/

State Population Totals and Components of Change: 2010-2017
https://www.census.gov/data/tables/2017/demo/popest/state-total.html

# Finding 3

For finding 3, I try to exam the relationship between mass shooting and gun ownership in different state. At first , I demonstrate the number of death from mass shooting in different states to get the feeling which states have the serious mass shooting situation and then I compare the number of mass shooting with the gun ownership.

I use the mass shooting data to visualize the number of mass shooting and the number of death in each state from 2016 till today. I use the gun ownership information in 2013 which is the latest gun ownership information I found.

For the visualization process, here are my steps.

Step 1 : Download and check data

a. The main data was downloaded from the Gun Violence Archive. This data shows the number of killed and the number of mass shooting happened in different days and states.
b. Another dataset used is the gun ownership. I get this data from a research paper and transfer to excel file.

Step 2 Data Manipulation.

a. The mass shooting dataset is at the event level. Since I want to compare the state level gun ownership. I aggregate the event level data into state level.
b. Then I combine the number of master shooting and gun ownership in each state.

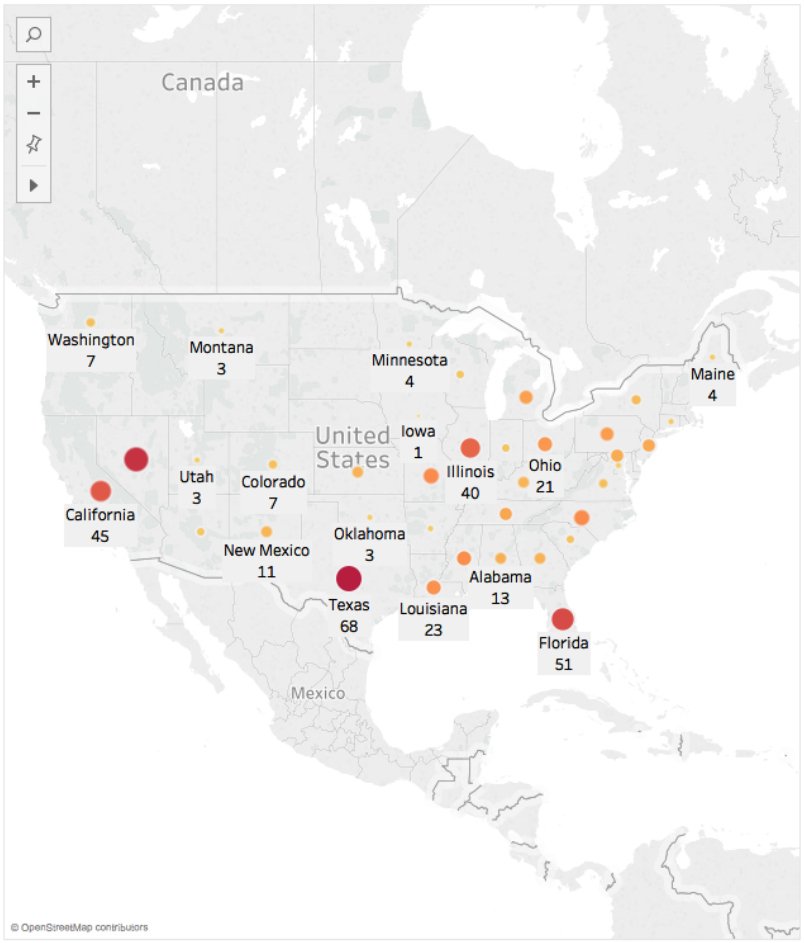
Step 3 Visualization

a. First of all, I visualized the state level mass shooting death number in a map. The top 3 states number of death are Texas , Florida and California.
b. Secondly, I combined two bar charts together to show Gun ownership and number of mass shooting in different states. Afterward, I sort the Gun ownership and found that gun ownership has no highly correlation with the number of mass shooting.

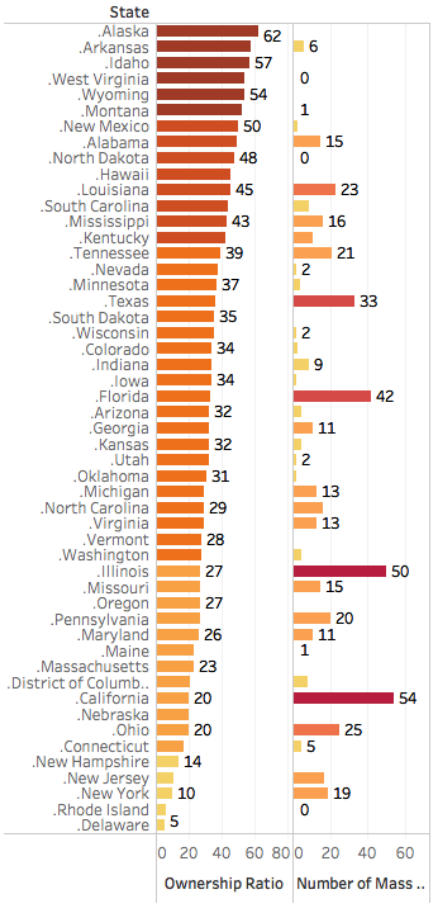
Step 4 Future Improvement

a. For all three finding, I put two or three charts together in a dashboard. Although it is easier to demonstrate all information. However, this is not simple enough. The whole dashboard looks quite complicated. The further improvement is adding interactive function to simply it. For example, in a map graph, I can use color to demonstrate the level of gun ownership and use a circle size in different state to show the number of mass shooting. Another way is to have the select function then user can choose to put either number of death or number of mass shooting in all state.

Number of Death resulted by Mass Shooting




Gun Ownership and Number of Mass Shooting By State




Data Resource:
Gun Violence Archive
http://www.gunviolencearchive.org/

Gun ownership and social gun culture Bindu Kalesan,1 Marcos D Villarreal,1 Katherine M Keyes,1 Sandro Galea
http://injuryprevention.bmj.com/content/injuryprev/early/2015/06/09/injuryprev-2015-041586.full.pdf?keytype=ref&ijkey=doj6vx0laFZMsQ2