

Analysis of Gun Violence in America

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Project goal

Gun violence in the US results in tens of thousands of deaths and injuries annually. The motivation behind this project is to highlight the situation of Gun violence in United States and to explore the impact of these incidents. The incident characteristics in the dataset offer a wealth of information which can be used by aspiring data scientists and statisticians to study gun violence and make predictions about future.

Data Set

The Dataset contains information about the gun violence incidents in US over the years 2013-2018 comprising of over 260k records. In 2013, there were over 70k nonfatal firearm injuries which included homicides, suicides, deaths due to accidental or negligent discharge of a firearm, and deaths due to firearms use with "undetermined intent". The Dataset includes the following attributes,

- Date (2013-2018) - Date of crime (Temporal, Quantitative)
- Location – Location of incident (Spatial)
- Number of fatalities (0-50) – Number of people killed (Quantitative)
- Number of injured (0-53) – Number of people injured (Quantitative)
- Age – Age group of the participant at the time of crime (Categorical)
- Gender – Gender of the participant (Categorical)
- Sources – Incident reporting sources (Categorical)
- Gun Type – Type of gun used in the incident (Categorical)
- Latitude (Spatial)
- Longitude (Spatial)

Dataset Link: <https://www.gunviolencearchive.org/query>

Analytical Questions and Proxy Tasks

In this project, we will perform a deep exploration on the dataset of gun violence incidents reported in US since 2013 and answer the following questions.

1) What is the trend in Gun violence incidents in US over time?

Proxy Tasks: Analyzing the number of gun violence incidents that took place in different states since 2013.

Proxy Value: Trend will translate to the increase or decrease in the number of total incidents. It can be made more specific by visualizing it over the years from 2013-2018.

2) Which are the most serious gun violence incidents known so far?

Proxy Tasks: The most serious can be defined by the total number of victims (killed + injured) for the incidents with the maximum number of victims for different regions.

Proxy Values: We can make the term most serious incident more concrete by taking the incidents with top 10 incidents where the number of victims (killed + injured) are maximum.

3) In which regions is gun violence most prevalent?

Proxy Task: Prevalent can be defined by the total number of gun violence incidents across the states with the maximum number of incidents.

Proxy Value: Prevalent can be defined by the total number of incidents which can be found by summing up the number of incidents for each state. Most gun violence prevalent regions can be known by finding the top 10 regions with the maximum number of incidents.

4) How do the statistics of gun violence incidents under Obama's administration vary compared to Trump's administration?

Proxy Task: The effect of administration on gun violence can be known by comparing the number of gun violence incidents that took place in the years under Obama administration and then under Trump.

Proxy Value: can be defined by the total number of incidents which can be found by summing up the number of incidents for each state. Most gun violence prevalent regions can be known by finding the top 10 regions with the maximum number of incidents.

5) Which age group is involved the most in gun violence incidents?

Proxy Task: We analyze the number of incidents for each age group since 2013.

Proxy Value: We can check the age of the person involved in the gun violence and get the sum for all age groups.

6) Which venue types are targeted the most in gun violence?

Proxy Task: We need to analyze the number of incidents that occur in each venue type.

Proxy Value: Most targeted can be defined as the venue types which has the maximum number of Incidents occurring. Venue types include Parks, Bars, Clubs, Religions Places etc. We can use a threshold for the visualization such as top 10.

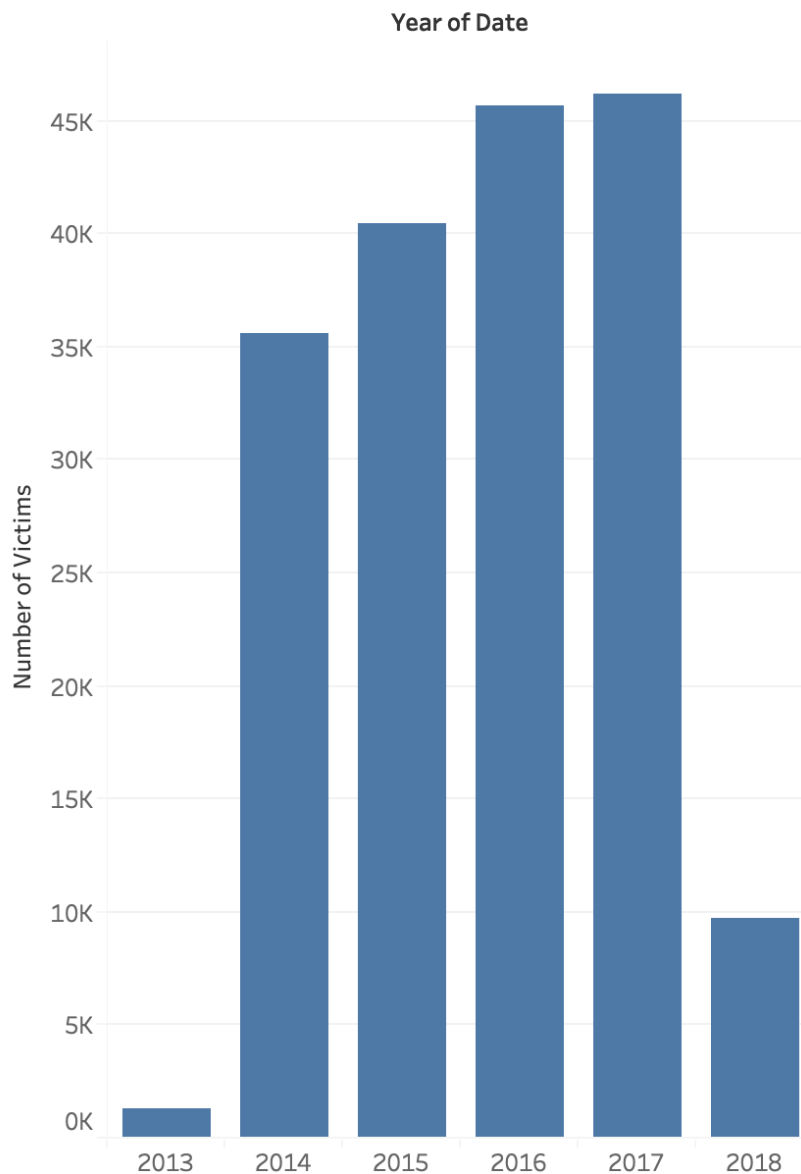
7) Does the gun type have any effect on the number of injured or fatalities in the incident?

Proxy Task: We analyze the number of victims (killed and injured) for the incidents and check the effect by comparing the sum of victims for all incidents involving each gun type.

Proxy Value: We can visualize the effect of gun types on the number of victims by getting the to 10 for each incident involving that gun type and comparing it for each gun type.

Data Analysis

1. What is the trend in Gun violence incidents in US over
People effected by Gun Violence over the
years



time? Sum of Total Peoples Infected for each Date Year.

- The above bar chart shows the number of people injured or killed over the years
- Since 2014, total firearm injuries are up by nearly 50 percent
- Since the dataset contains only half of 2018 incidents, the number of victims is low.

2) Which are the most serious gun violence incidents known so far?

Most serious gun violence incidents

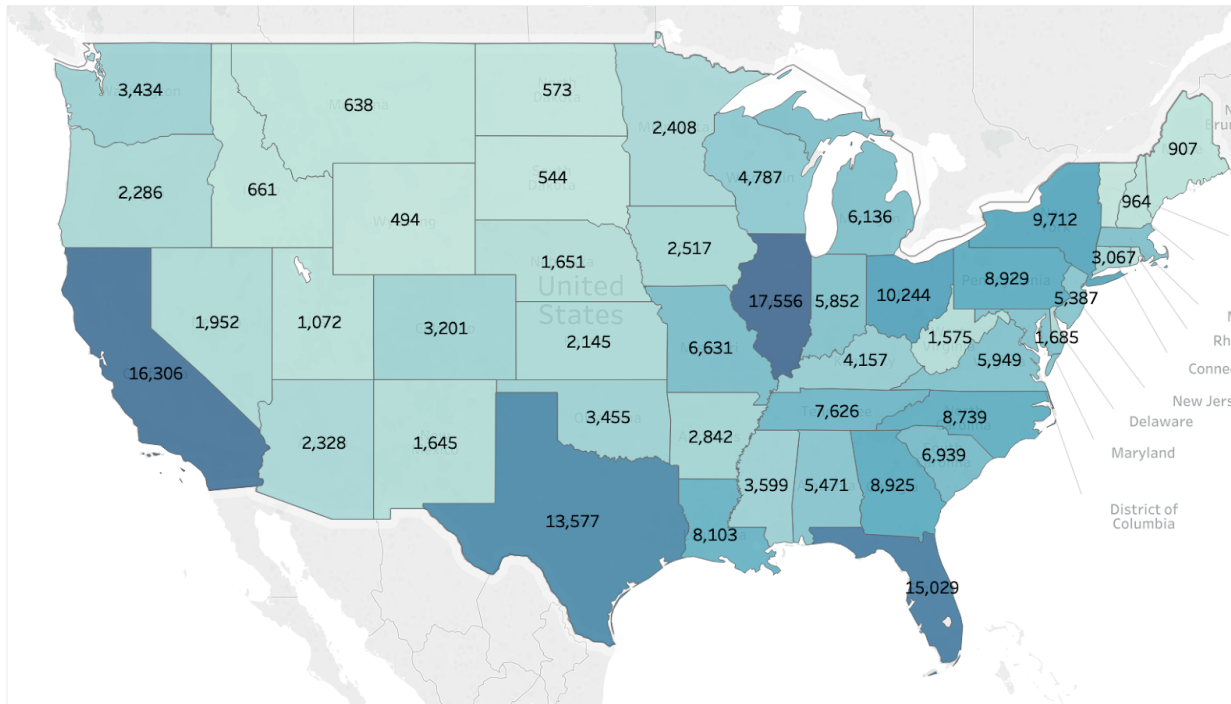
Day of Date	City Or County	Address		Total Peoples Infected
May 12, 2013	New Orleans	Frenchmen Street	19	 19 103
April 2, 2014	Fort Hood	Motor Pool Road and Tank..	20	
May 17, 2015	Waco	4671 S Jack Kultgen Fwy	27	
October 1, 2015	Roseburg	1140 Umpqua College Rd	19	
December 2, 2015	San Bernardino	1365 South Waterman Av..	35	
June 12, 2016	Orlando	1912 S Orange Avenue	103	
July 25, 2016	Fort Myers	3580 Evans Ave	21	
July 1, 2017	Little Rock	220 W 6th St	25	
November 5, 2017	Sutherland Springs	216 4th St	47	
February 14, 2018	Pompano Beach (Parkland)	5901 Pine Island Rd	34	

Sum of Total Peoples Infected broken down by Date Day, City Or County, Incident Id and Address. Color shows sum of Total Peoples Infected. The marks are labeled by sum of Total Peoples Infected. The view is filtered on Incident Id, which keeps 10 of 239,677 members.

- We measure the seriousness of an incident by calculating the number of victims in that incident.
- The above table shows the top 10 incidents that occurred over the years 2013-2018 based on the maximum number of victims in those incidents.
- The incident that occurred on June 12, 2016 in Orlando had total 103 people injured or killed which is the highest according to our dataset.

3.a) In which region is gun violence most prevalent ?

Regions Most Prevalent to Gun Violence



Top 10

State	
Illinois	17,556
California	16,306
Florida	15,029
Texas	13,577
Ohio	10,244
New York	9,712
Pennsylvania	8,929
Georgia	8,925
North Carolina	8,739
Louisiana	8,103

Guns are expected to surpass car crashes for the number of American deaths caused in 2015. In 2013, there were 33,636 Americans killed by guns versus 33,783 fatal crashes.

With a value of 17,556 it's Illinois which had the most number of recorded incidents.

3.b) Which region is least gun violence prevalent ?

With a recorded 494 incidents it's Wyoming.

5) Which age group is involved the most in gun violence incidents?

The figure consists of two donut charts. The left chart, titled 'Suspects', shows that 93.5% of suspects are male (represented by a light blue segment) and 6.54% are female (represented by a pink segment). The right chart, titled 'Victims', shows that 81.7% of victims are male (represented by a light blue segment) and 18.3% are female (represented by a pink segment).

Category	Gender	Percentage
Suspects	Male	93.5%
	Female	6.54%
Victims	Male	81.7%
	Female	18.3%

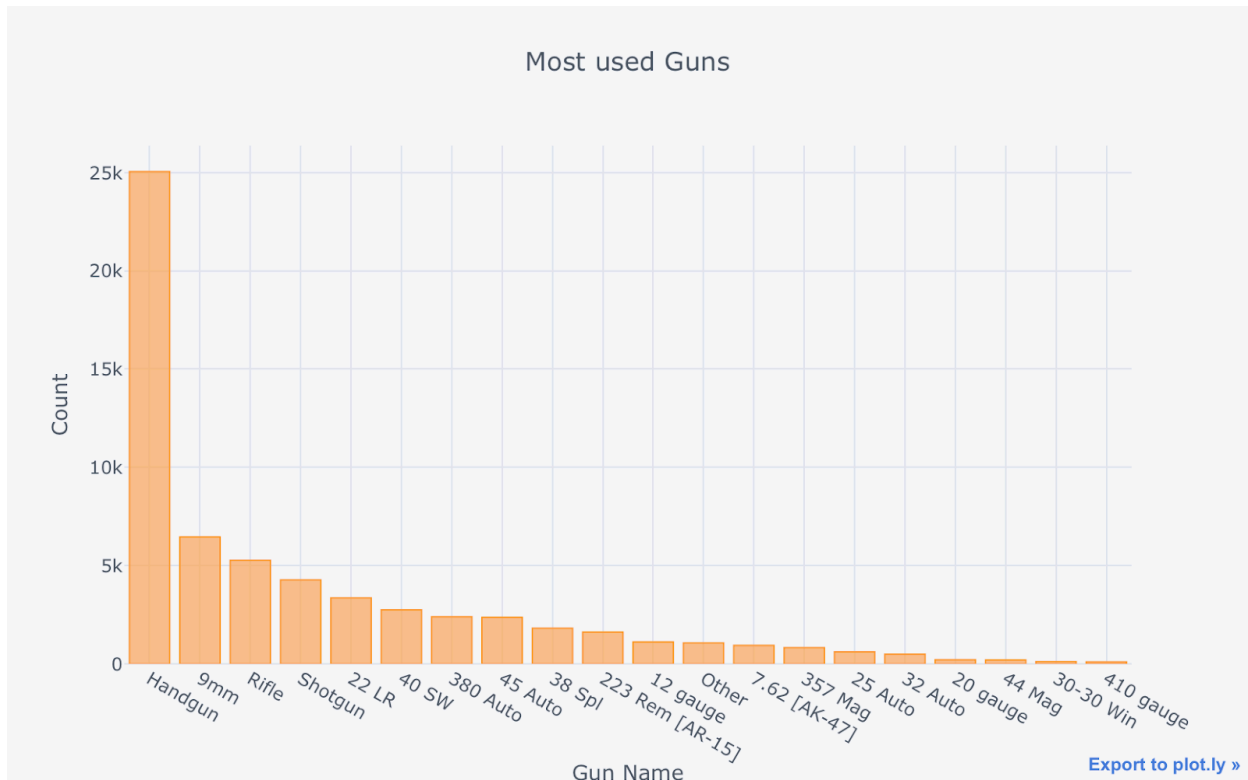
- 6) Which venue types are targeted the most in gun violence?



- The word cloud above uses the location description and shows the keywords that occur most in our dataset.

- Most common venue types are Apartment, High School, Park and Clubs.

7) Does the gun type have any effect on the number of injured or fatalities in the incident?



- The above bar chart shows the type of gun used the most in gun attacks over the years 2013-2018.
- Handgun was the most used weapon followed by the 9mm and Rifle.

Storyboard

When the world looks at the United States, it sees a land of exceptions: a time-tested if noisy democracy, a crusader in foreign policy, an exporter of beloved music and film.

But there is one quirk that consistently puzzles America's fans and critics alike. Why, they ask, does it experience so many mass shootings?

Perhaps, some speculate, it is because American society is unusually violent. Or its racial divisions have frayed the bonds of society. Or its citizens lack proper mental care under a health care system that draws frequent derision abroad.

These explanations share one thing in common: Though seemingly sensible, all have been debunked by research on shootings elsewhere in the world. Instead, an ever-growing body of research consistently reaches the same conclusion.

The only variable that can explain the high rate of mass shootings in America is its astronomical number of guns. And the mass shootings are getting deadlier, not more frequent.

Everyday, **96 Americans are killed with guns** and hundreds more are shot and injured. The effects of gun violence extend far beyond these casualties—gun violence shapes the lives of millions of Americans who witness it, know someone who was shot, or live in fear of the next shooting. The news stories and statements by political leaders write themselves, with only the location, name of the shooter and number of casualties changing. It all seems so routine.

But this perception isn't because of some unprecedented rise in the rate of mass public shootings—far from it. They're roughly as common now as they were in the 1980s and '90s. And the data offer a stark finding: Over the past decade, mass public shootings haven't become particularly more prevalent, they've simply become deadlier.

A mass public shooting, as defined in one of the research, is any incident in which four or more victims are killed with a firearm within a 24-hour period at a public location in the absence of other criminal activity (robberies, drug deals, gang "turf wars"), military conflict or collective violence. For instance, last year's mass murder at the Pulse nightclub in Orlando would qualify, but the 1890 massacre at Wounded Knee would not, nor would a familicide in a private home, nor a shootout between rival gangs.

*we will add graphs on the story board for the following

- **What is the trend in Gun violence incidents in US over time?**
- **Which are the most serious gun violence incidents known so far?**
- **In which region is gun violence most prevalent?**
- **Which age group is involved the most in gun violence incidents?**

- **Which venue types are targeted the most in gun violence?**

- **Does the gun type have any effect on the number of injured or fatalities in the incident?**

- **Mass Public Shooting Rate (per 100 million) from 2013-2018**

- **Total Victims in Mass Public Shootings (per 100 million) from 2013-2018**

- **Total Victims in Mass Public Shootings (per 100 million) from 2013-2018**

- **Attacks in US become deadlier:** The Orlando Nightclub attack was the worst in recent US history - and five of the shootings with the highest number of casualties happened within the past 5 years. Around 54 people were injured and 49 were killed.
- **What types of guns kill Americans**

Story Board updates:

Our Most Prevalent Gun Problem: Suicide

Suicides by gun are one of the most difficult types of gun violence to track in real time, as U.S. media organizations generally don't cover self-inflicted gun deaths, and privacy laws prevent reporting on a lot of the cases.

However, data show that suicide deaths have been on the rise over the past decade.

Ninety percent of people who die by suicide have a mental disorder at the time of their deaths, according to the American Foundation for Suicide Prevention (AFSP)

*we will add graph for the following

- **Rise in suicide deaths**

Gun Violence Survivors

Here are some heartbreaking stories from gun-violence survivors in America

1. Kenny, Brooklyn, New York, 1996

After leaving a bar, Kenny was accosted and mugged by a group of teens. Trying to get back to the bar for help, he was then shot by one of them who thought Kenny was following him.



2. Gabrielle, Berkeley, California, 1973

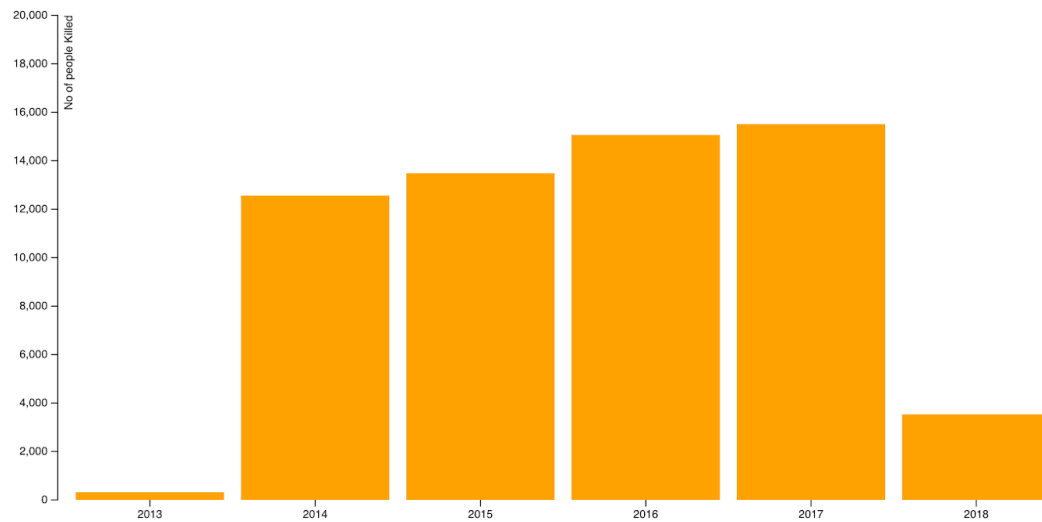
Former Berkeley Barb reporter Gabrielle fled from a slow-moving van after being robbed and raped on a quiet street. She was able to open the door and roll out of the van before her assailant shot her in the back.



Change Log

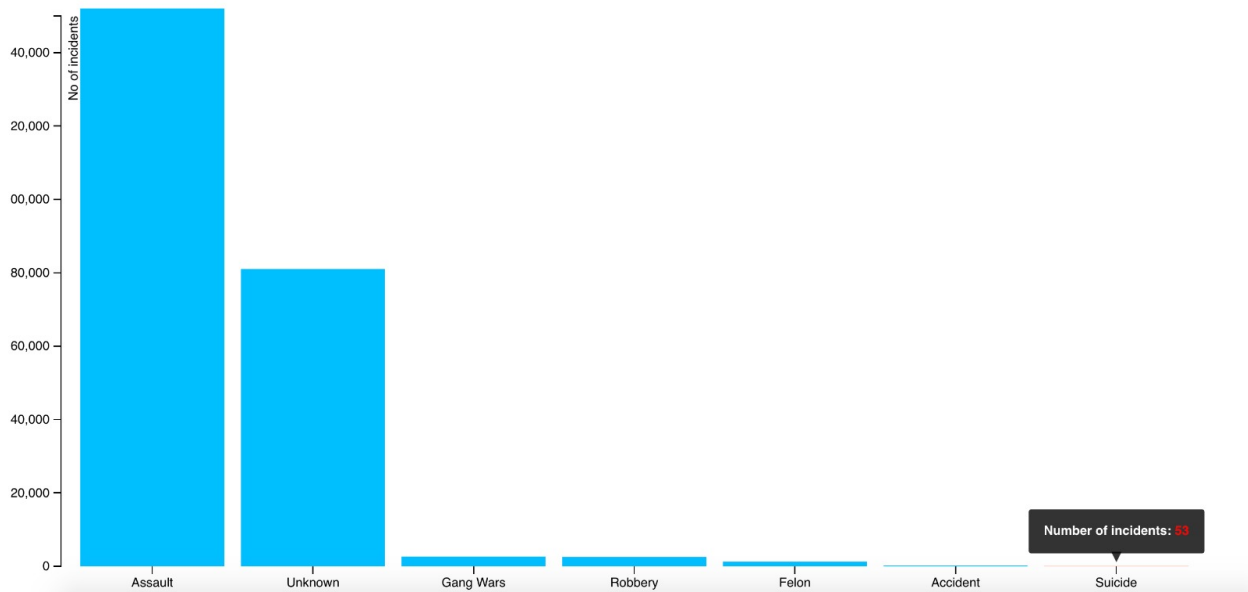
1. We have removed the Trump versus Obama administration graph as it was unable to provide a valid insight how it affected the gun violence trend in America.
2. We have added the graph showing the suicide killings, however the nlp model we trained to classify the event based on the notes obtained in our dataset is to be developed further.
3. For further research we are considering to learn about the gun laws which were enacted during this time frame and which made a real impact on the gun trend.

Graphs Implemented in D3



- The above bar chart shows the number of people killed over the years.
- This answers the question about the how the killings varied over the time frame between 2013 and 2017.
- The graph is an interactive graph which shows the exact no of killings on mouse over.

Graph 2



- The above bar chart shows no of records of a type of event.
- The suicide no is low because our NLP model considers an event where the killer kills himself after a crime as a assault rather than a suicide and assault. Similarly it has to be further trained to obtain better results.
- The graph is an interactive graph which shows the exact no of events on mouse over.

Github Repository

Link: <https://github.com/NYU-VIS-FALL2018/Analysis-of-Gun-Violence-in-America>