

Gun Violence in the U.S.



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Outline



- Introduction
- Understanding the Data
- Analysis
 - Time Series Trends
 - Trends by State
 - Trends by Incident type
 - Gun Ownership per Capita
 - Gun Laws
 - Mental Illness
- Insights

Introduction



- Gun Violence statistics in the United States are truly alarming
- The debate on gun violence and gun control has implications on our human right to life
- Based on data collected by the Gun Violence Archive, this analysis explores:
 - Trends by time and location
 - Trends by the number of gun laws
 - Trends by the number of guns owned per capita
 - Trends between gun violence and mental illness
- We hope this analysis will provide useful information for those who propose regulations and legislation relating to gun usage

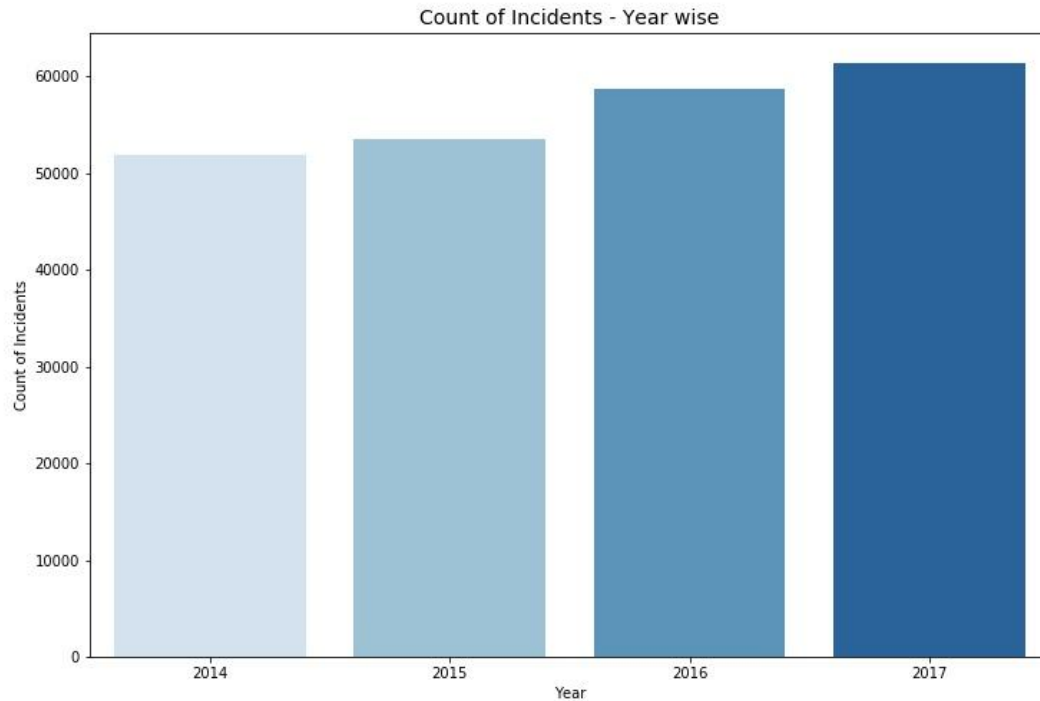
Understanding the Data

Dataset:

- Gun violence dataset from Kaggle
- 29 columns x 300,000 rows
- US Census bureau data
- Gun laws and gun ownership data
- Health Searches by US Metropolitan area

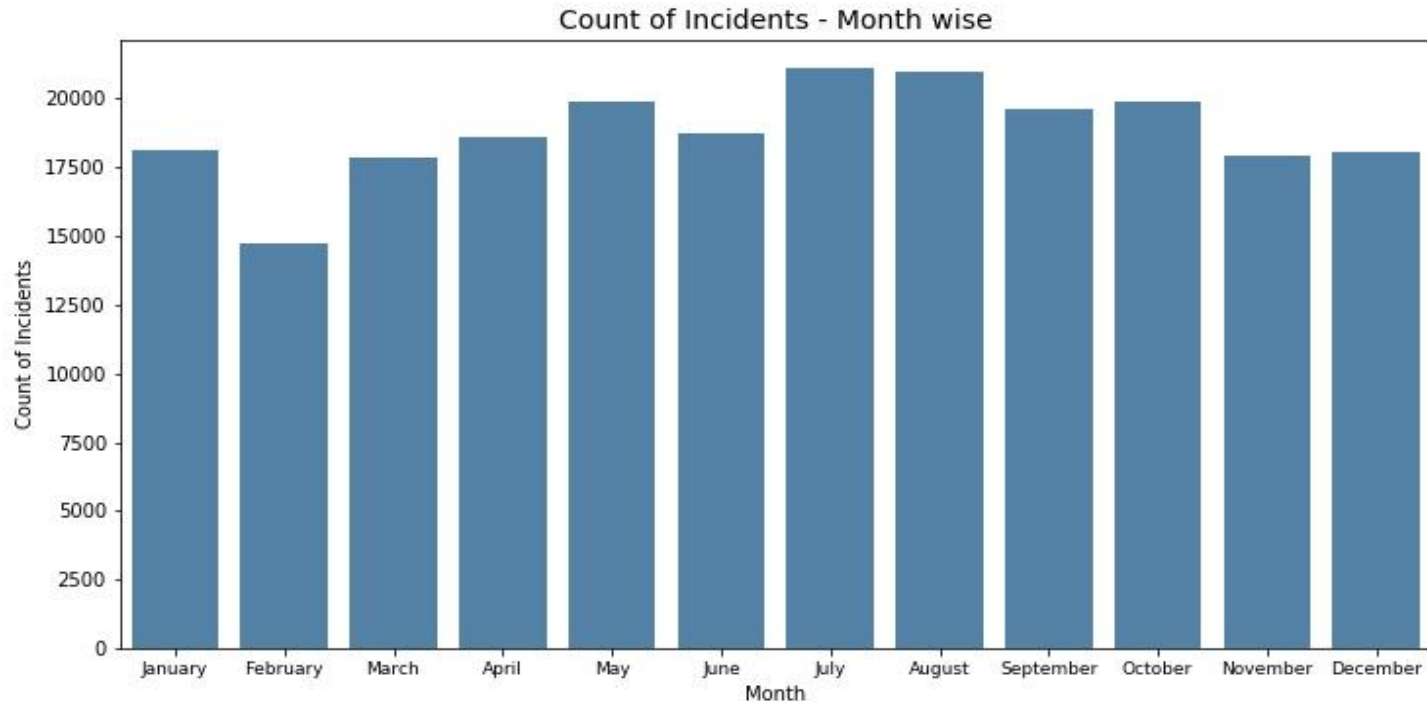


Incident Count - Year wise

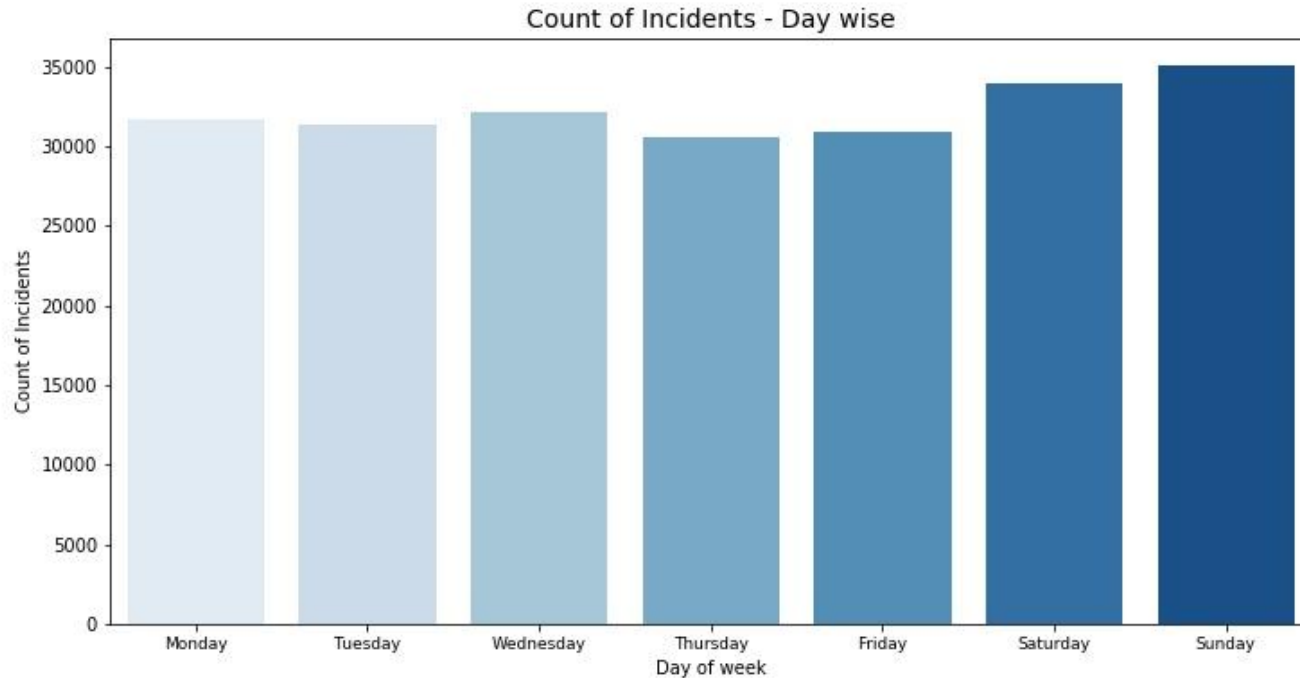


- Data for 2013 & 2018 has been excluded, for being incomplete
- 2014 - 2017 shows a steady increase

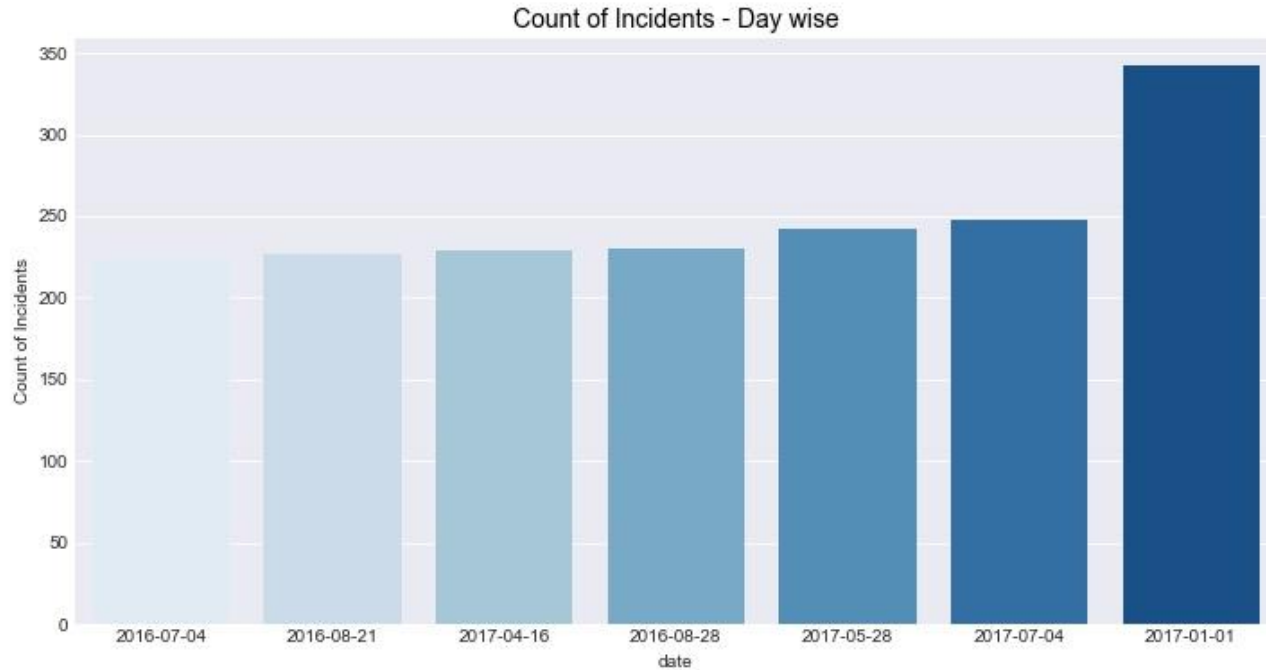
Incident Count - Month wise



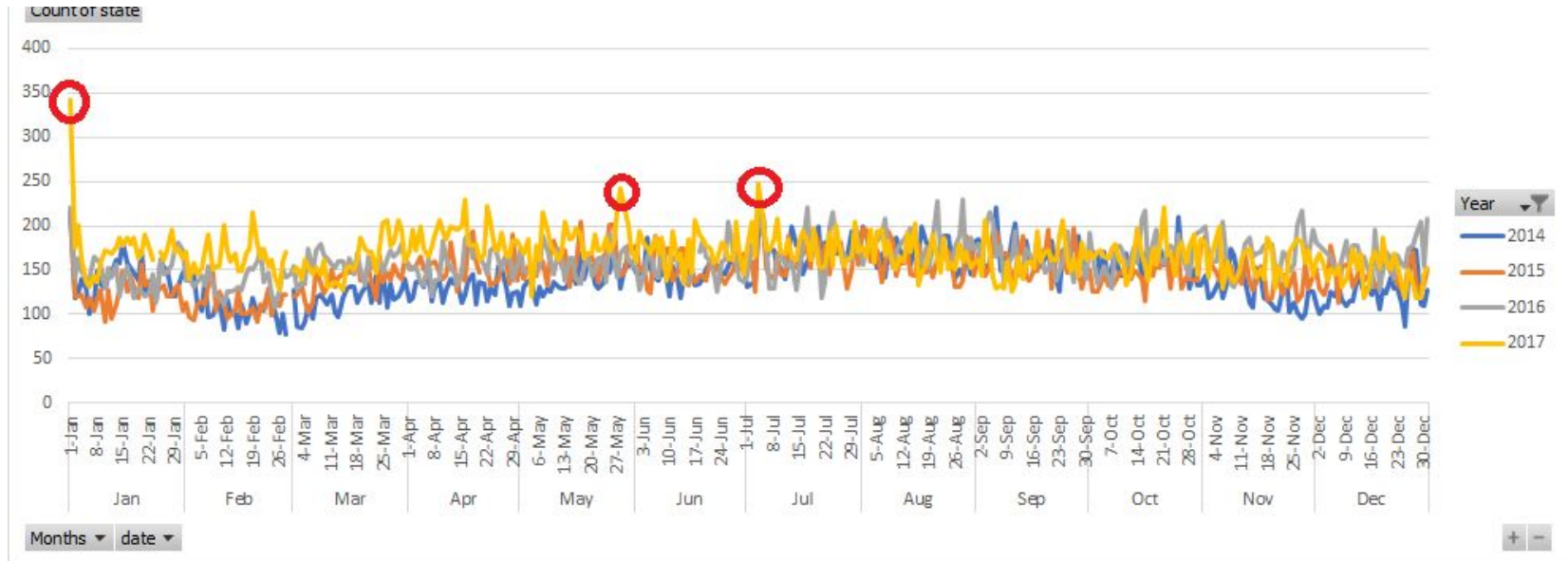
Incident Count - Day wise



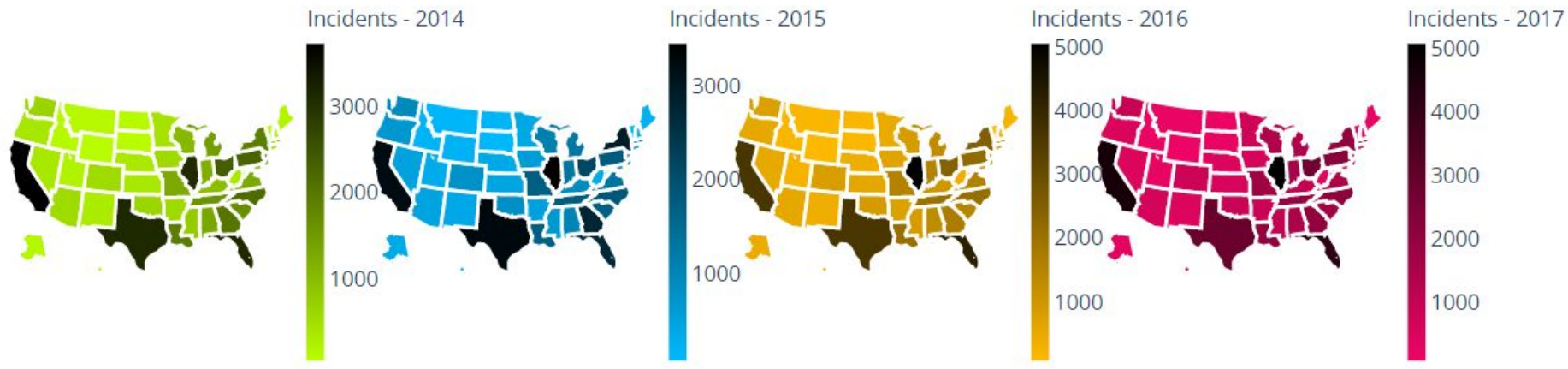
Incident Count - a few unfortunate days



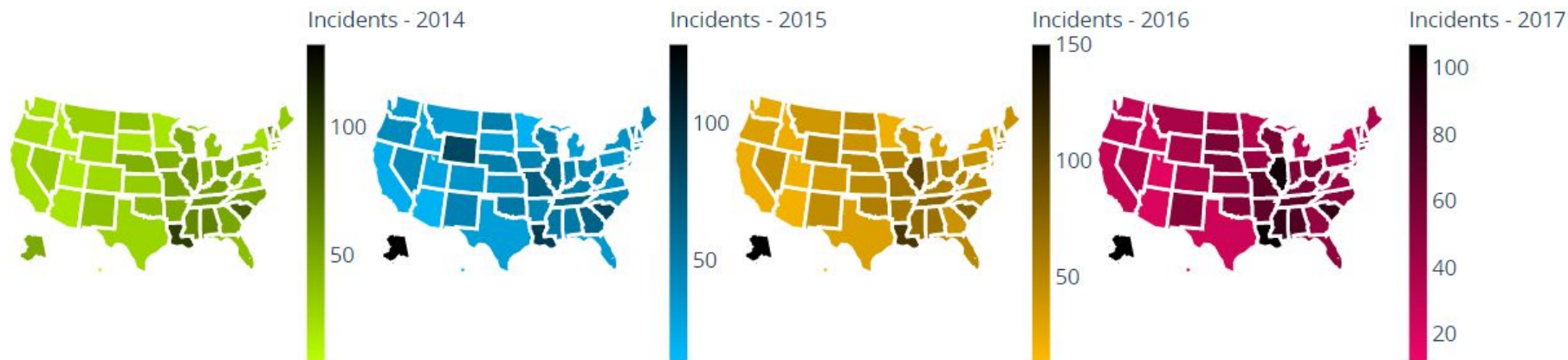
Incident Count - an overview of unfortunate days



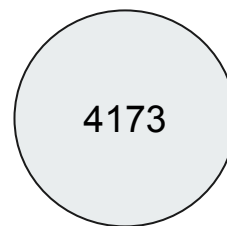
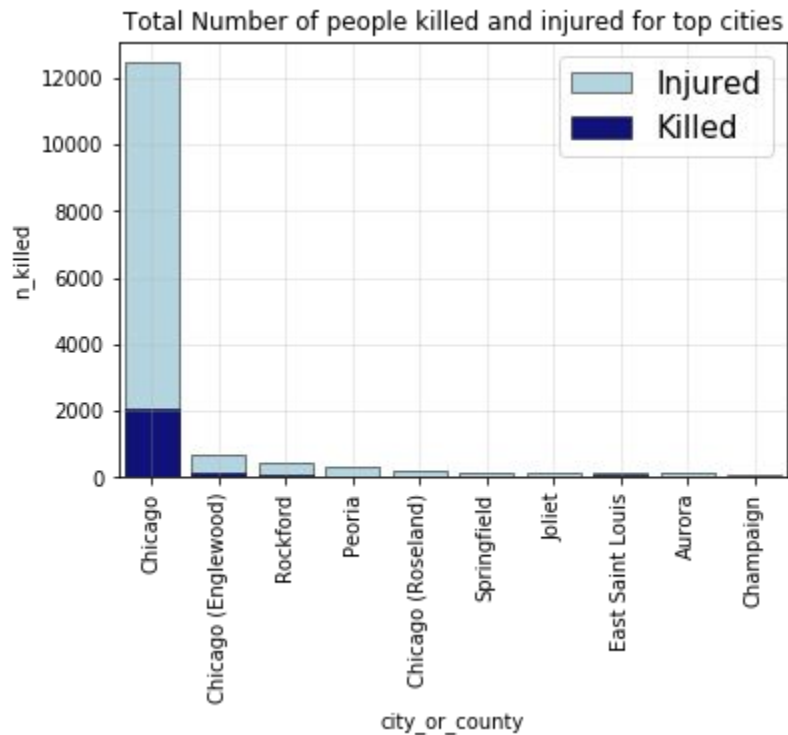
Total Incidents by State



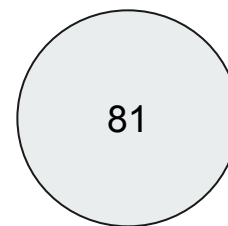
Per capita Incidents by State*



Illinois



Total Incidents



Incidents per Million

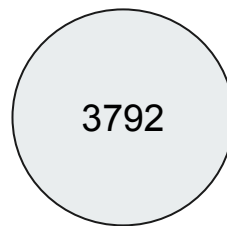
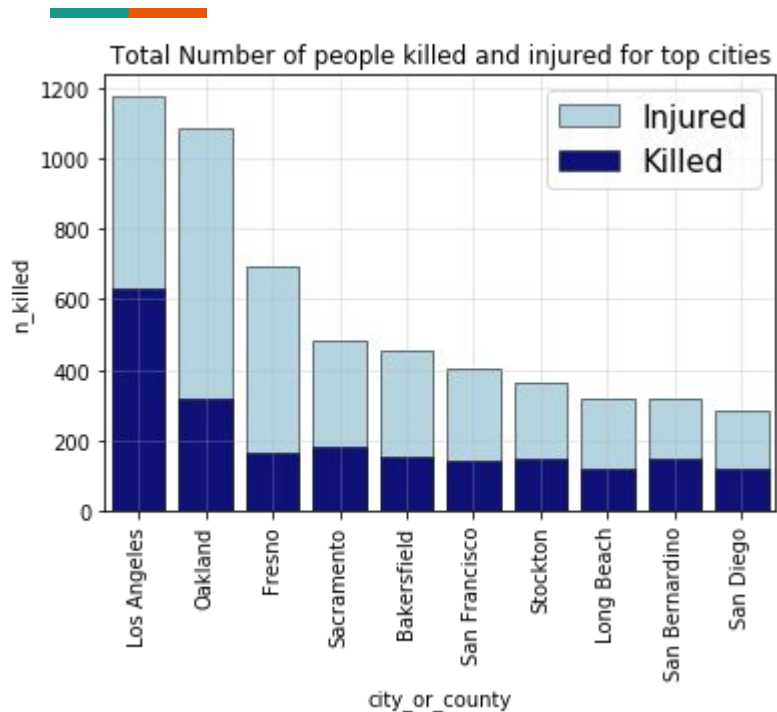
Year	Rank by #Incidents	Rank - # Incidents per Mil
2014	4	9
2015	1	9
2016	1	4
2017	1	5

Illinois

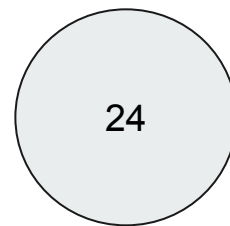


- Illinois has the highest number of incidents across US for 3 years straight
- They have a high number of Gang Related incidents and Armed Robberies
- In Illinois, the capital city Chicago has the highest number of gun violence victims
- Chicago is the city with the highest number of 'Gang Related' incidents for all 4 years

California



Total Incidents



Incidents per Million

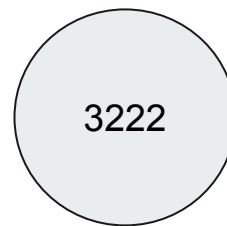
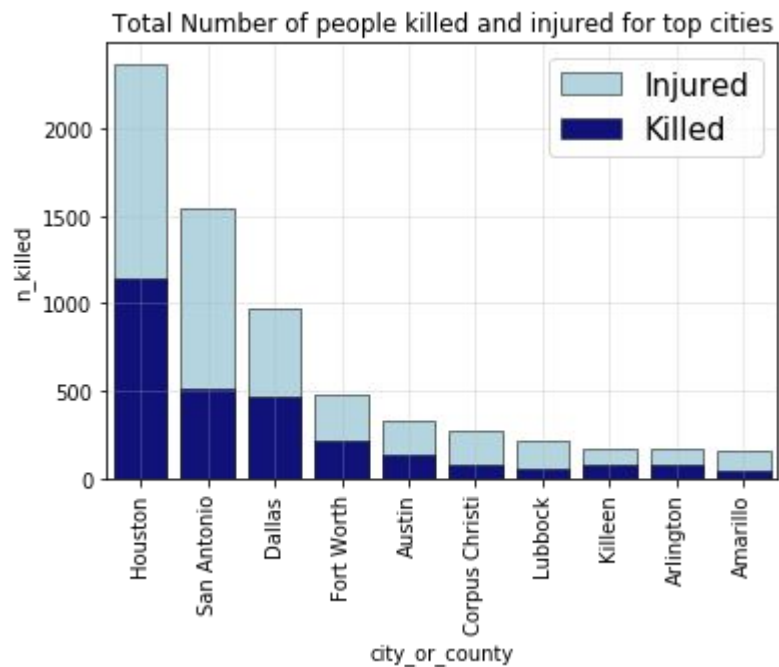
Year	Rank by #Incidents	Rank - # Incidents per Mil
2014	1	44
2015	3	48
2016	3	46
2017	2	44

California

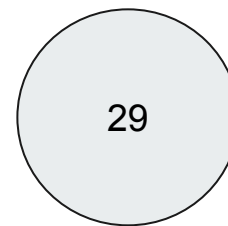


- In terms of incidents California is in the top 3 for all years
- But the per capita rank suggests that the in California the high incident numbers is because of its dense population
- In California, Los Angeles has the highest number of gun violence victims
- Los Angeles is in the top 5 cities with 'Gang Related' incidents for all 4 years

Texas



Total Incidents



Incidents per Million

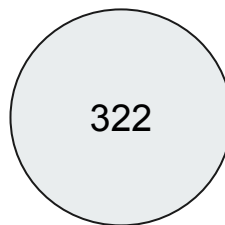
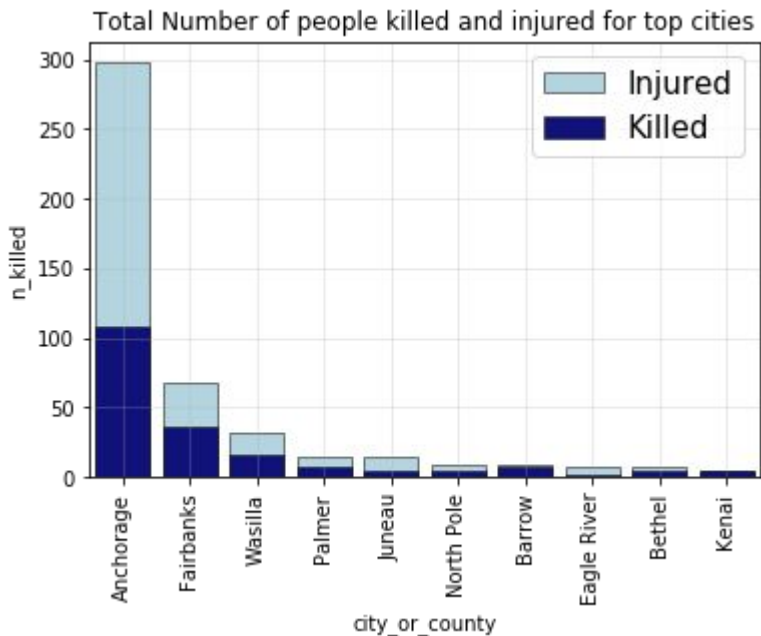
Year	Rank by #Incidents	Rank - # Incidents per Mil
2014	3	39
2015	2	45
2016	4	43
2017	4	47

Texas

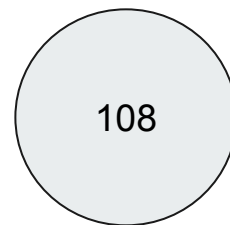


- Texas is consistently present in the Top 5 list for number of incidents. But when we look at incidents per capita, Texas comes down the list
- Most incidents in Texas are Armed Robberies
- Within Texas, Houston has the highest number of victims and Austin stands fifth
- Within all cities of US, Houston ranks 1st with highest number of Defensive Use incidents for all 4 years

Alaska



Total Incidents



Incidents per Million

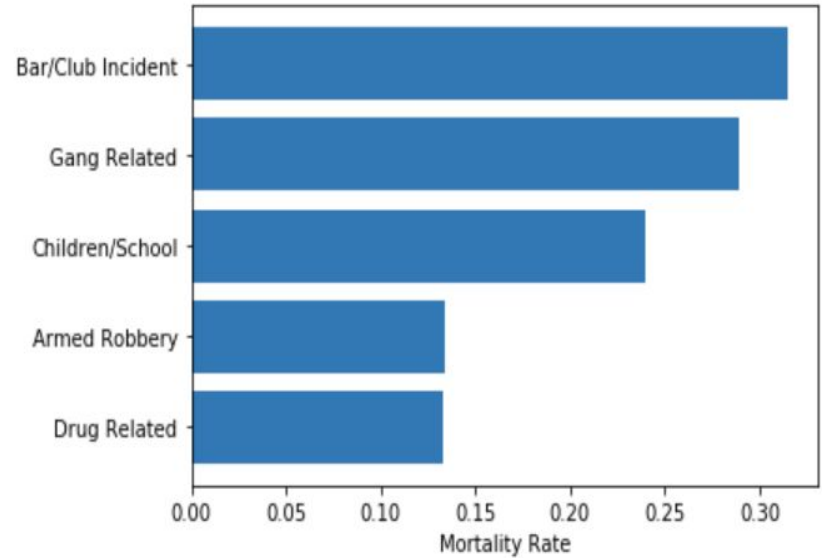
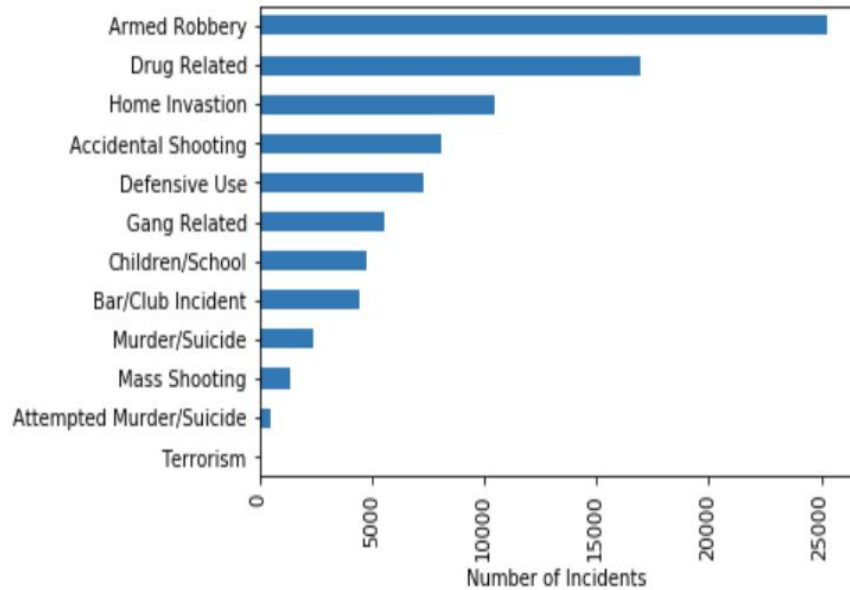
Year	Rank by #Incidents	Rank - # Incidents per Mil
2014	45	16
2015	37	2
2016	36	2
2017	40	2

Alaska

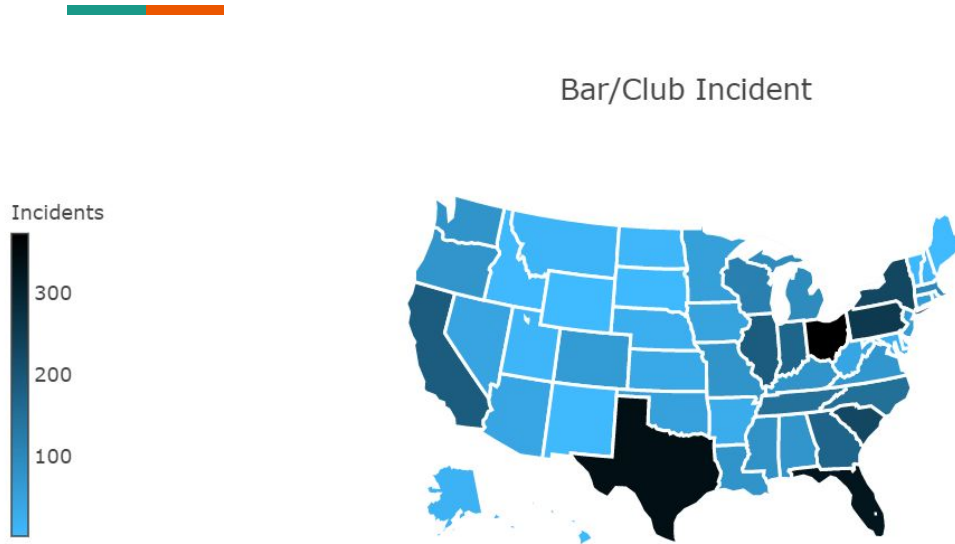


- Alaska has a lower number of incidents but when looked at numbers per capita, Alaska stands second for 3 years straight. The 1st being District of Columbia
- Alaska's biggest city Anchorage has the highest number of gun violence victims
- Between 2014 and 2015, we saw a spike in the number of Drug Related Incidents and Defensive Use incidents

Analysis by Incident Type



Bar/Club Incidents



Rank	State	Number of Incidents
1	Ohio	372
2	Texas	342
3	Florida	328
4	Pennsylvania	259
5	South Carolina	232

- On average, Bar/Club incidents have higher number of people killed per incident
- **Cleveland & Columbus(Ohio), Houston(Texas),Philadelphia(Pennsylvania)** have the highest number of incidents at the city or county level

Gang Related Incidents



Rank	State	Number of Incidents
1	Illinois	1663
2	California	1339
3	Oregon	301
4	New York	229
5	Washington	177

- Illinois and California stand out with a very high incidence of gun violence among the states
- Many state legislatures have enacted laws, like California's law on Gang Affiliation Enhancement, that are designed to discourage gang affiliation.
- According to the STEP Act ("California Street Terrorism Enforcement and Prevention Act"), a defendant can receive an additional sentence if they are affiliated with a gang or helped one.

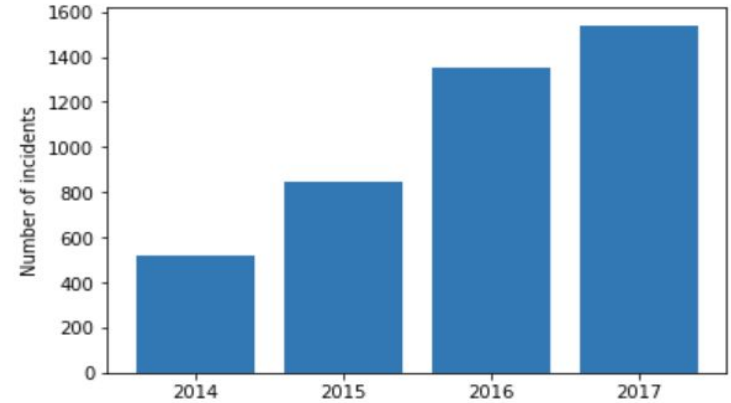
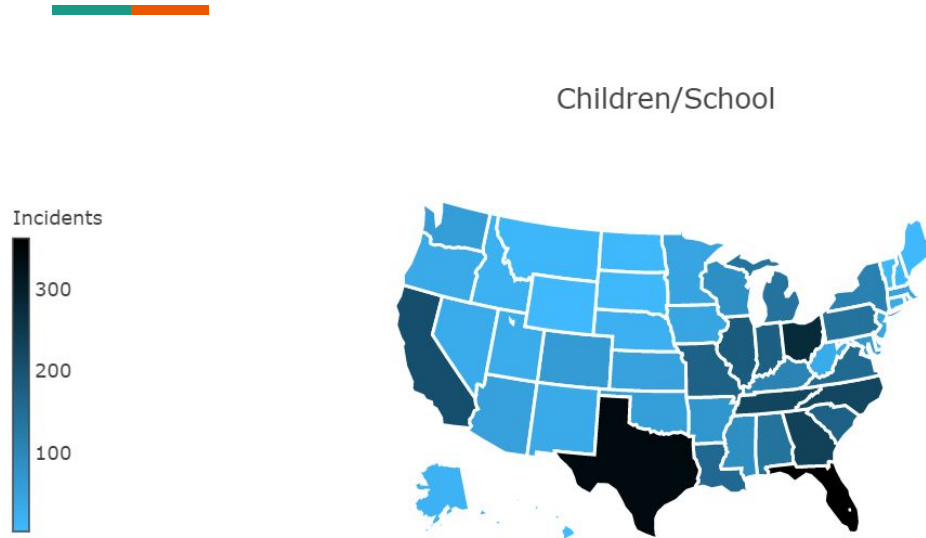
Drug Related Incidents



Rank	State	Number of Incidents
1	New York	1056
2	California	1023
3	Florida	1002
4	Massachusetts	975
5	Texas	828

- Incidents associated with drug trade/use
- According to the Department of Justice's National Gang Center, particularly in urban areas, significant percentages of gun-related homicides (15 percent to 33 percent) are linked with gang and drug activity
- Top 5 cities or counties for these incidents are **Baltimore, Boston, Springfield, Hartford** and **Indianapolis** are in the North Eastern region of the US

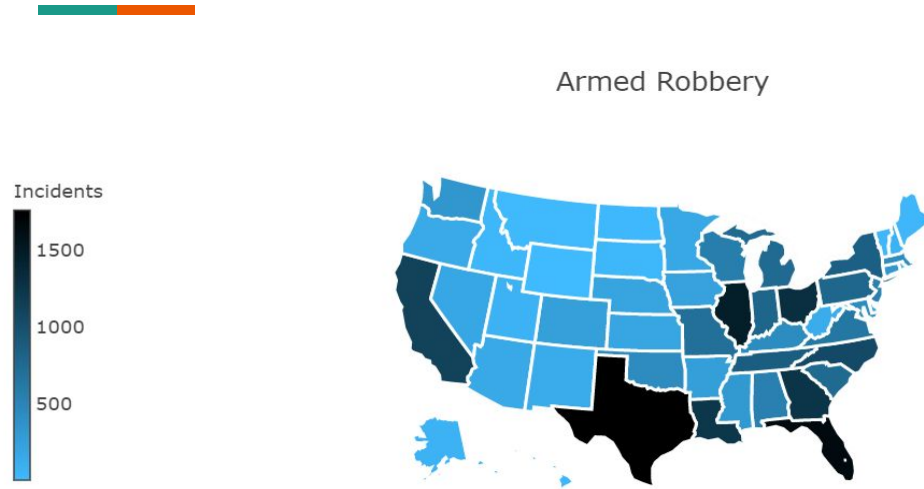
Children/School Incidents



Rank	State	Number of Incidents
1	Florida	362
2	Texas	342
3	Ohio	279
4	Georgia	235
5	Tennessee	228

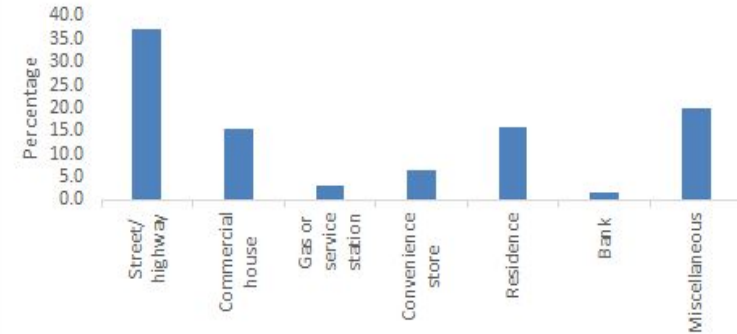
- 4.6 million minors in the US live in homes with at least one loaded, unlocked firearm¹
- Twenty-seven states excluding Ohio have enacted child access prevention laws

Armed Robbery Incidents



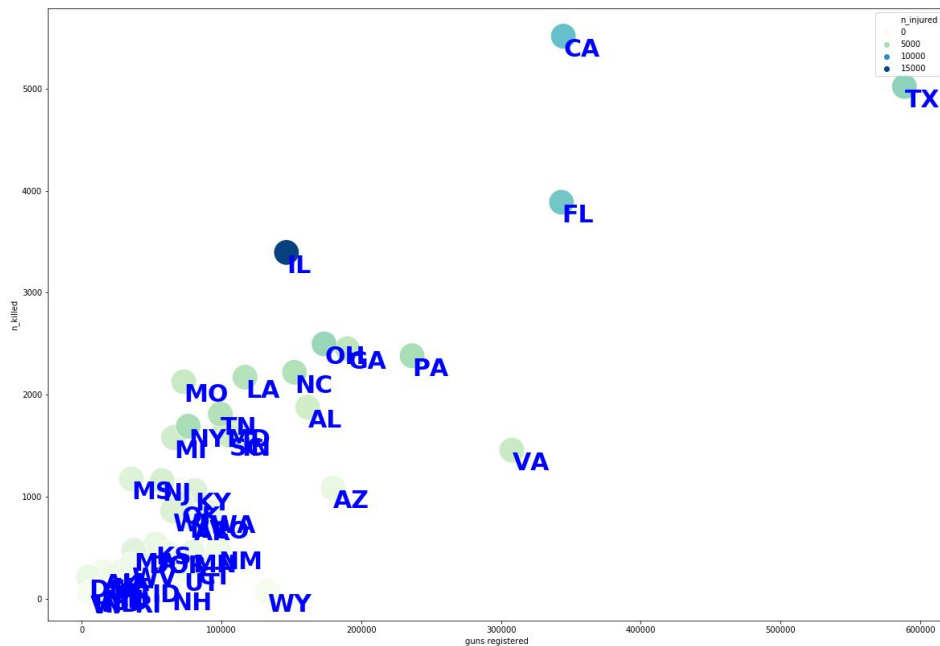
- Armed Robbery has the highest number of incidents among the categories
- New Orleans, Chicago, Washington and Houston are the top 4 cities for armed robbery incidents

Location of Incidents in 2017 - FBI



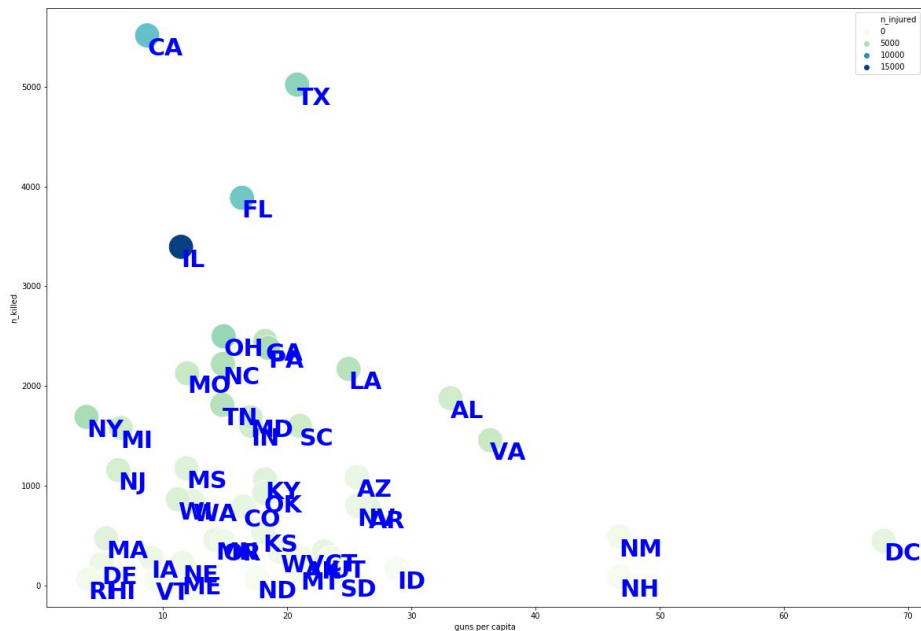
Rank	State	Number of Incidents
1	Texas	1760
2	Florida	1666
3	Illinois	1468
4	Ohio	1318
5	Georgia	1259

Higher gun ownership exhibits higher gun deaths



Rank	State	Number of guns
1	Texas	588k
2	California	344k
3	Florida	343k
4	Virginia	307k
5	Pennsylvania	236k

Guns Ownership per 1000 capita



Rank	State	Number of guns/ 1000 capita
1	Wyoming	588
2	DC	68
3	New Hampshire	47
4	New Mexico	47
5	Virginia	36

More laws translate to lower incidents



At an aggregated yearly level, total no of laws and no of people harmed by gun violence were negatively correlated at **-0.798**

Law Categories	Correlation with gun crimes
Ammunition Regulations	-0.96
Buyer regulations	-0.93
Dealer regulations	-0.95
Possession regulations	-0.96
Stand your ground	+0.71

Which laws are the most impactful?



Law Categories	Correlation with gun crimes
Ammunition Regulations	Licensing, Background Checks
Buyer Regulations	Permission, Training, Restrictions, Theft
Dealer Regulations	Licensing, reporting & junk guns
Possession regulations	Age restrictions, Carrying restrictions
Stand your ground	Right to defend even to the point of application of lethal force

Gun Violence & Mental Illness

Top 10 States with Gun Violence

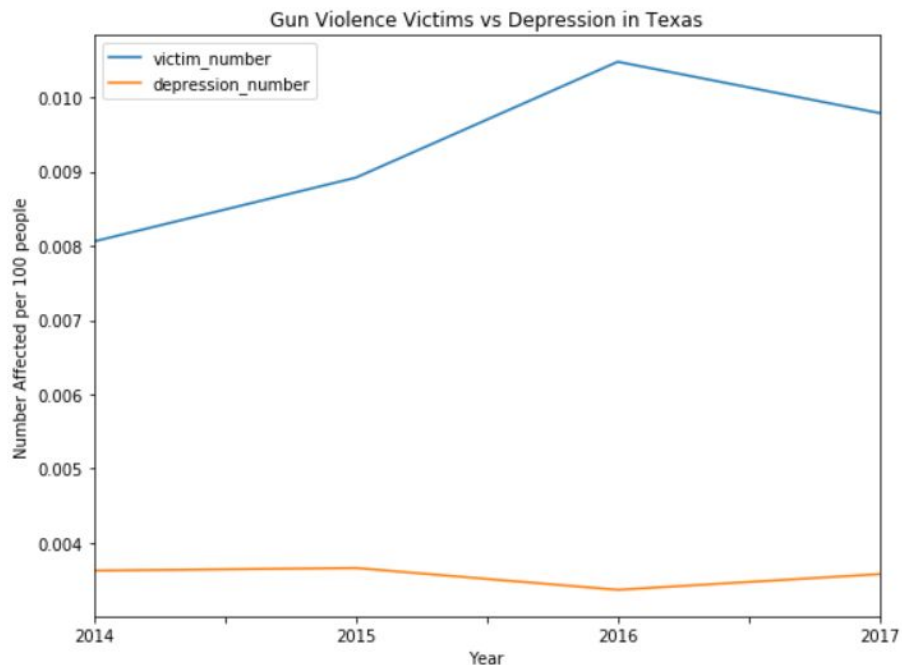
state	2014	2015	2016	2017
Illinois	2913	3510	5083	4588
California	2927	2821	3161	3376
Texas	2251	2491	2927	2734
Florida	2336	2343	2847	2751
Ohio	1614	1841	2083	2217
Pennsylvania	1835	1572	1776	1823
New York	1362	1984	1691	1439
North Carolina	1371	1589	1781	1709
Georgia	1339	1691	1405	1715
Louisiana	1386	1399	1630	1733

Top 10 States with High Depression Numbers

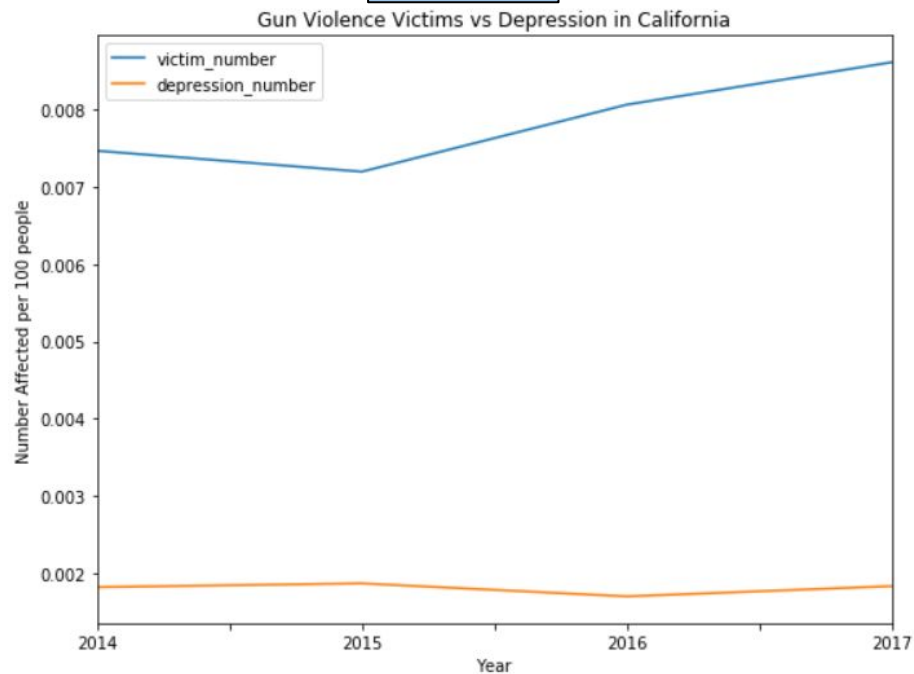
state	2014	2015	2016	2017
Texas	1013	1023	941	1000
California	714	733	667	719
New York	665	687	637	659
Ohio	597	616	568	621
Michigan	501	520	465	492
Florida	479	486	488	471
Indiana	414	437	401	416
Georgia	412	444	408	404
Pennsylvania	411	429	390	408
Missouri	399	425	390	401

Comparison of Gun Violence & Mental Illness Numbers by State

Texas



California

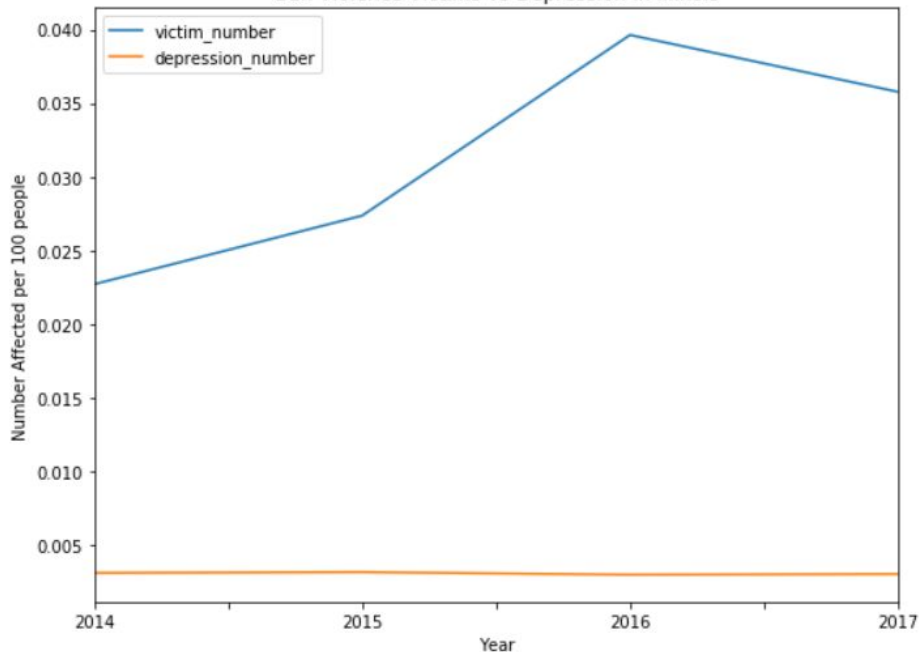


Comparison of Gun Violence & Mental Illness Numbers by State



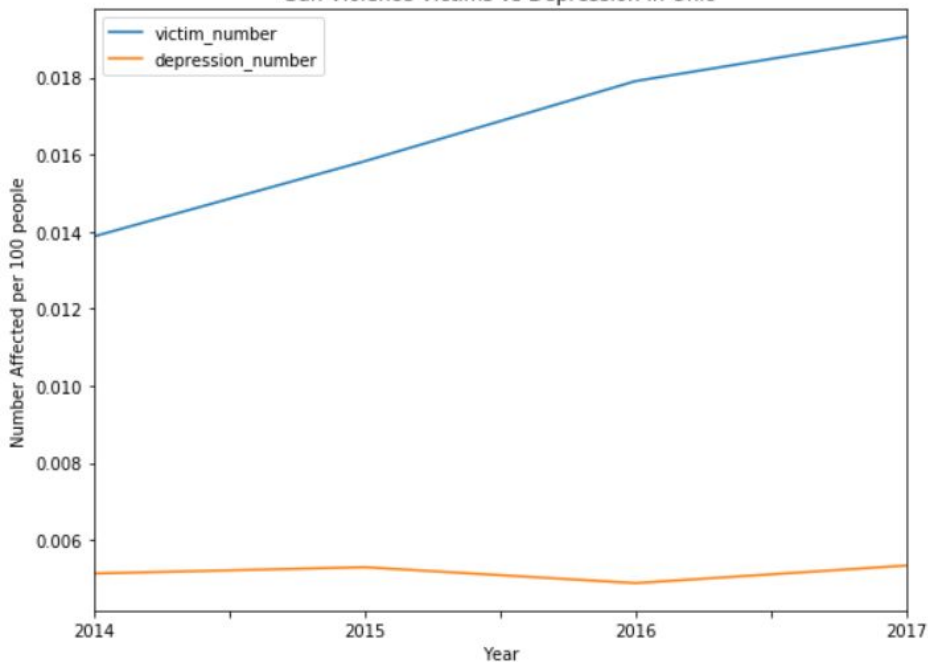
Illinois

Gun Violence Victims vs Depression in Illinois



Ohio

Gun Violence Victims vs Depression in Ohio



Insights



- Based on the analysis by state, Anchorage, Alaska has a large number of gun violence incidents per million people despite being sparsely populated
- Despite the laws against gang related activities, California and Illinois have very high incidence of gang related gun violence
- Laws that aim to regulate gun possession, ownership, and usage are most effective in curbing gun violence while 'stand your ground' law is observed to increase incidents
- More gun ownership per 1000 capita does not necessarily lead to high incidents
- Based on the analysis of mental illness by state, there is no evidence of correlation between gun violence and mental illness



Questions?



References

1. Gun Laws in US : <http://www.statefirearmlaws.org/>
2. Gun ownership by state in US :
<https://www.thoughtco.com/gun-owners-percentage-of-state-populations-3325153>



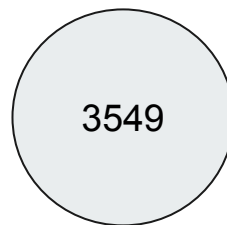
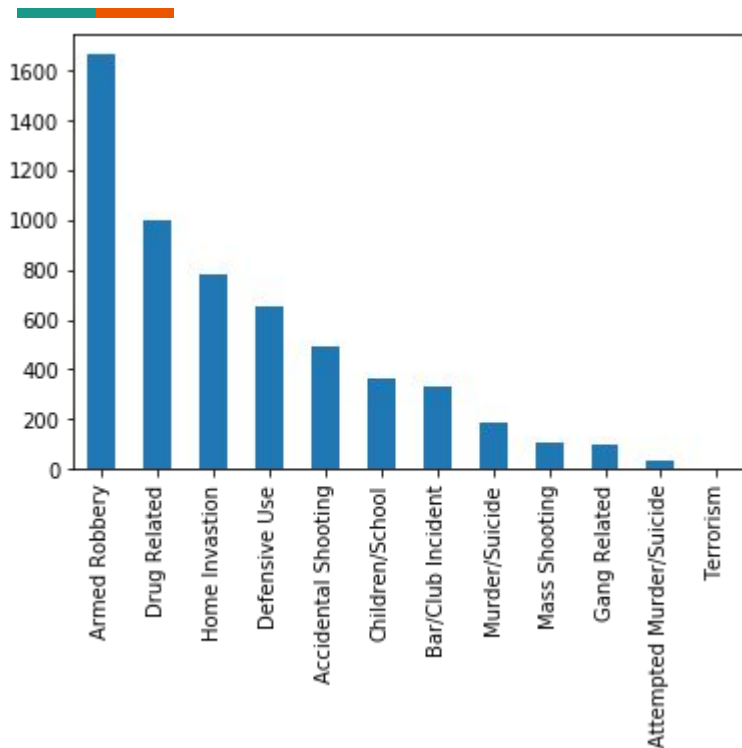
Appendix

Time Series Trends

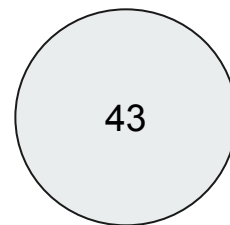


- Analysis done:
 - Year wise
 - Month wise
 - Day of Week wise
 - A few days with high incident count
- Insights gained:
 - Highest in year 2017
 - Highest in July
 - Highest on Weekends (Sunday)
 - Highest on July 4 (two years' July 4)

Florida



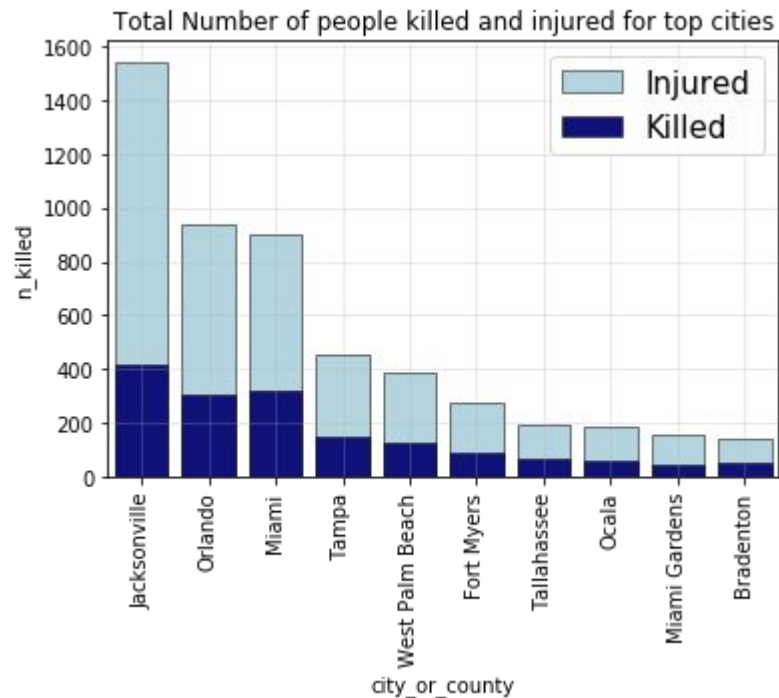
Total Incidents



Incidents per Million

Year	Rank by #Incidents	Rank - # Incidents per Mil
2014	2	29
2015	5	40
2016	2	24
2017	3	26

Florida



- Florida is consistently present in the Top 5 list for number of incidents
- 'Armed Robberies' are more predominant than any other type of incidents
- Jacksonville has the highest number of gun violence victims. This number is almost twice the victims in second highest city Orlando