Gun Violence in the US: How it's changed over time

Names of team members:

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Name of GitHub repository:

Project2_Shih_Kavlakoglu_Beckerman

Project Background/Overview:

Background:

As we hear more reports of gun violence within the news, such as the recent shootings in Boulder and Atlanta over the past month, we will look to investigate the history of gun violence within the United States over the last couple of decades. Using Periscopic Gun Violence Dataset as our primary dataset, we'll seek to identify US gun violence trends from 1985 - 2018, including:

Objectives:

The objective of our project is determining the trend of gun violence in the US over time, and understanding the circumstances and potential variables that can contribute to an increased or decreased trend. This includes evaluating factors such as offender and victim characteristics, weapon used, seasonal and geographical trends, as well as gun regulations compared with the number of gun incidents. The following lists the specific questions we worked to answer through data exploration:

1. **Offender, Victim, and Weapon Characteristics:**
   a. Has the distribution of the victim characteristics changed over time?
   b. Which victim age group has more gun violence? How does it differ by state?
   c. What type of guns are more prevalent within shooting events?
   d. Has the distribution of the offender characteristics changed over time?
2. **Seasonal and Geographical Trends:**
   a. Do certain months/seasons have a higher prevalence of gun violence?
   b. What is the distribution of gun violence across regions/states over time?
3. **Relationships Between Gun Violence and Other Variables:**
   a. Under which circumstances did gun violence incidents occur the most?
   b. What type of relationships do offenders and victims have? How does this change over time?

c. Which states have the most gun regulations and which states have the least number of gun regulations? Are domestic violence cases more likely to occur in cases with less number of domestic violence regulations?

Primary datasets:

Table 1: Primary Dataset Description and Fields

Name	Description	Fields
Periscopic Gun Violence Dataset	Includes information on over 389K gun incidents within the United States between 1985 -2018. All incidents are self-reported by police. Original data source: Crime Data Explorer.	a. additional_victim (bool) b. circumstance (string) c. circumstance_grouping (string) d. extra_circumstance_info (string) e. incident_id (int) f. month (int) g. multiple_victim_count (int) h. offender_sex (string) i. offenders_relationship_to_victim (string) j. region (string) k. state (string) l. victim_age (string) m. victim_ethnicity (string) n. victim_offender_split (string) o. victim_race (string) p. victim_race_plus_hispanic (string) q. victim_sex (string) r. weapon_used (string) s. year (int)

Supplemental datasets:

Table 2: Supplemental Dataset Descriptions*

| Name	Description
State Firearm Laws Dataset	Contains the types of firearm laws that each state has from 1991 - 2020. Primary data sources: Thomson Reuters Westlaw database, and the Everytown for Gun Safety database. Secondary data sources: Bureau of Alcohol, Tobacco, Firearms, and Explosives' State Laws and Published Ordinances, and the Law Center to Prevent Gun Violence
Gun Violence Dataset	260k incidents from Jan 2013 - March 2018. Original Source: Gun Violence Archive. Data collected from gun violence incidents collected from over 7,500 law enforcement, media, government and commercial sources.
State Abbreviations Dataset	Contains Mapping of State Full Name, Abbreviation, and Two-Letter Code
US Census Data (1980-1990) US Census Data (2000-2010)	Contains US Census Population Data from 1980-2010

*Supplemental dataset fields provided in Table A1 in the Appendix.

Dataset Assumptions

- Since the US census only collects population data every 10 years, we used the same population value to represent each year in a decade (ie. all 1980 years we're given the same population value)
- Assumed the blank data points for gun incidents in South Dakota in 1994 and North Dakota in 1994 and 2008 are 0. This seemed plausible because there are many years where each state has 3 or less gun incidents.
- Primary dataset only includes reported datasets from police departments, therefore we are assuming the reporting is complete for the majority of states.
- The primary dataset does not define the distinction between the weapon_used field. In particular, the definition of firearm may differ depending on the context. As a result, we are assuming that any case where the weapon_used is listed as a firearm defines it as any firearm that does not fall in the category of handguns, rifles, or shotguns.

Data Cleaning/Sanity Checks

- Since the primary dataset uses state abbreviations to refer to US States and the US Census uses proper state names we had to map the proper state names to state abbreviations
- Delete random row "Unnamed: 35" from US Census population csv file upload
- Convert columns from US Census population file from type "object" to type "float"
- In the primary dataset which contains the reporting period of 1985 - 2018, Florida is missing values for all years other than 1985 - 1987 and 1991 - 1997. Therefore, for any analysis where we are aggregating the number of incidents across multiple states across the reporting period, we have excluded Florida to prevent inaccurate interpretation of the data. See Figure 1a below demonstrating Florida's missing values.
- In the primary dataset, Nebraska is missing values for the entire reporting period from 1985 - 2018. See Figure 1b below demonstrating Nebraska's missing values.
- Age data includes NA and string values. This dataset needed to be cleaned up to represent numeric values. Children less than one year old were set to the value 0.5 and adults over 99 were set to 99. Please note that 99 is representative of 99 years old or greater.
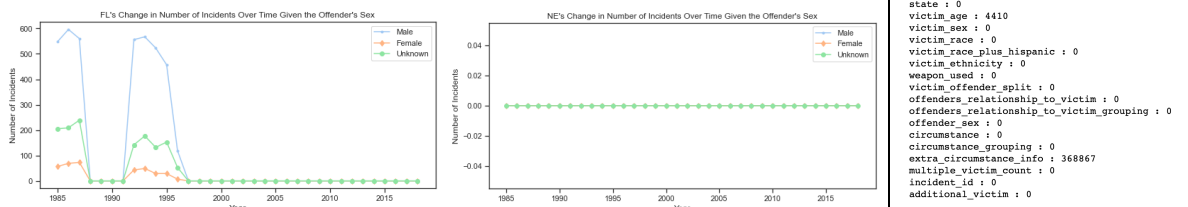
Figure 1: Dataset Missing Values (from left to right)
Figure 1a: Florida's Missing Data in Primary Dataset;
Figure 1b: Nebraska's Missing Data in Primary Dataset;
Figure 1c: Missing or Empty Age Values in Primary Dataset

Data Analysis

Offender, Victim, and Weapon Characteristics

1a) Has the distribution of the victim characteristics changed over time?

We started this analysis by investigating general characteristics about the offenders, victims, and weapons.

Total Gun Deaths by Race: Black victims are consistently the largest victim race from 1985-2018. This trend is pronounced in New York where Blacks victims accounted for over 58% of total victims. Interestingly in CA, Hispanics had the most victims, accounting for 42% of all victims while Blacks made up 32%. Asians had the least victims making up only 1.5% of all victims across the United States from 1985 - 2018. Overall, deaths have decreased in the 2000s compared to the 1990s, but gun incidents have been trending up post 2015.
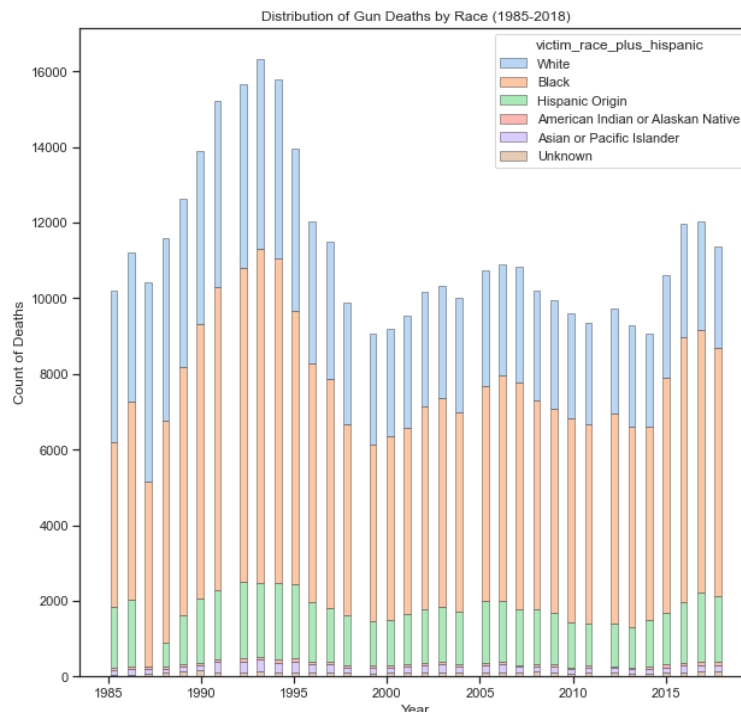
Figure 2: Distribution of Gun Deaths By Race (1985 - 2018)

Total Gun Incidents by Victim Sex: Male victims accounted for the majority of incidents accounting for ~80% victims with females accounting for ~20%. This ratio remained remarkably consistent throughout 1985-2018.
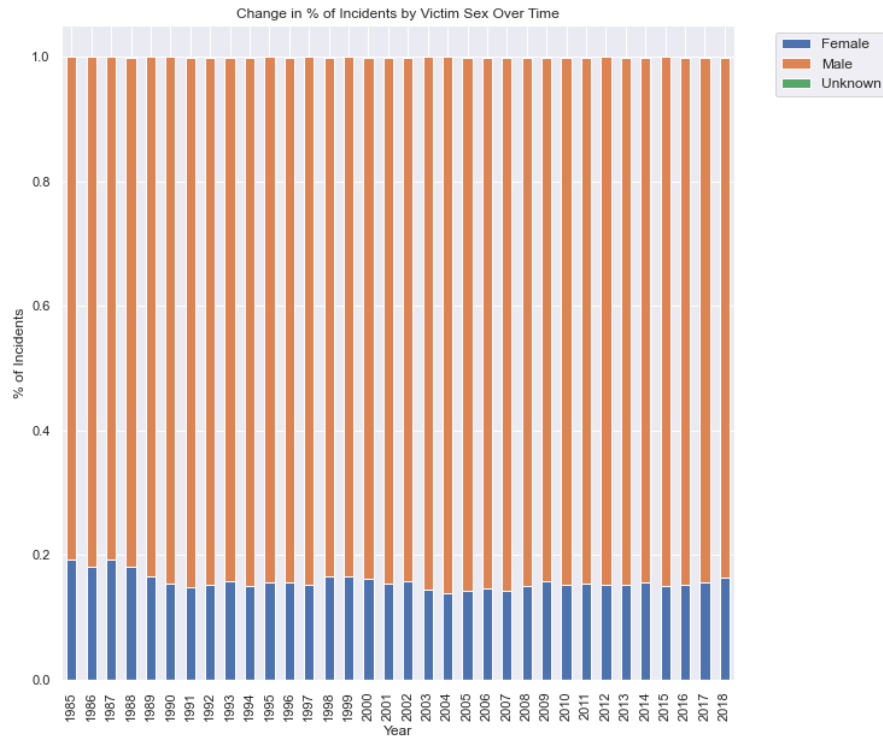
Figure 3: Change in % of Incidents by Victim Sex Over Time

1b) Which victim age group has more gun violence? How does it differ by state?

We then proceeded to investigate median victim ages across the country, shown in Figure 4.
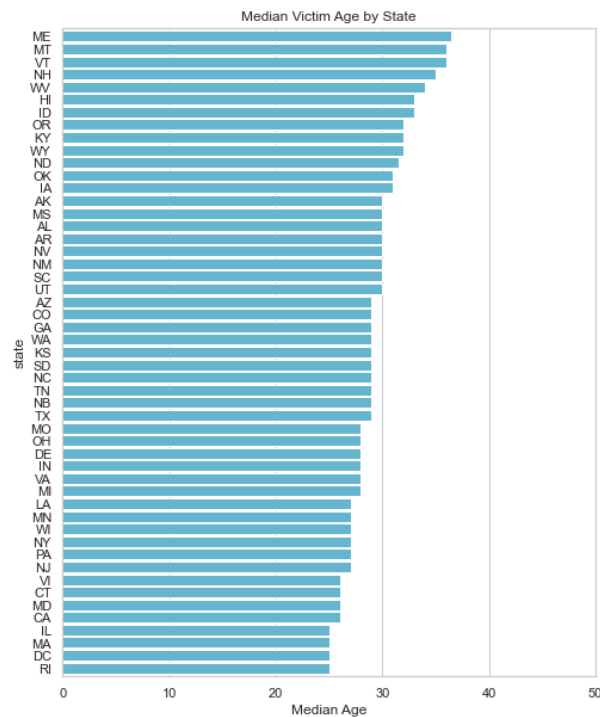
Figure 4: Median Victim Age by State

Median Victim Age by State: We found that states in the northeast, such as Maine, Vermont, and New Hampshire, reported higher median victim ages. Despite close proximity of Massachusetts to these states, it had one of the lowest median ages among reported victims. We hypothesized that the high density of college students in Massachusetts may account for the lower median age here, but it was difficult to find any supporting data for this theory. Based on Census data by age between 2010-2019, population numbers by state and age can only account for minor differences in median age as the overall age makeup doesn't differ greatly between the states. Earlier census data has been difficult to obtain, but this data from the early 1990s is also consistent in demonstrating that median age does not differ greatly across these states.

Overall, the median age of victims ranged from 25 years to 36.5 years old.

1c) What type of guns are more prevalent within shooting events?

Histogram of Weapon Type Used: Using the "weapon_type" attribute from the primary dataset (Periscopic Gun Violence Dataset), the handgun is consistently the primary weapon type used in incidents occurring from 1985 - 2018. This histogram also shows a significantly higher number of incidents occurring in 1990-1994 compared to the other years. The firearm is the only weapon type with a trend of increasing number of incidents from 1994 to 2018 compared to the other weapon types.
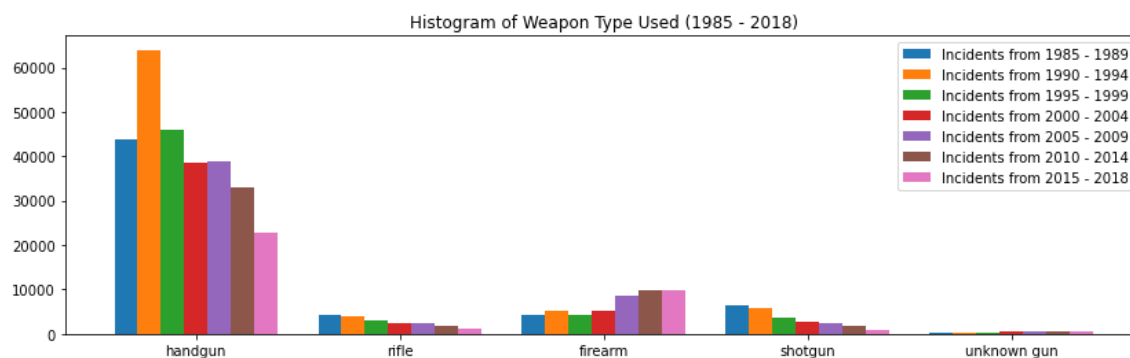

Figure 5: Histogram of Weapon Type Used in Reported Gun Incidents from 1985 - 2018

1d) Has the distribution of the offender characteristics changed over time?

We analyzed the primary dataset containing the offender and victim genders mapped for every state other than Florida and Nebraska for the years 1991 and 2018. Figure 5 contains a percentage plot of the victim gender vs. state where the offender gender is male, while Figure 6 contains a similar percentage plot where the offender gender is female. All plots show that the predominant victim gender is male. The additional plots for unknown offender gender and 2018 data are included in the Appendix (Figure A1, A2, A3, and A4). There are a few exceptions to the general trend of higher percentage of male victims compared to female victims:
- Hawaii in 1991: All victims reported were female in cases where offender gender is unknown
- Vermont in 2018: All victims reported were female regardless of offender gender. Note that there were only 3 reported incidents in Vermont in 2018 in the primary dataset.
- Utah in 2018: All victims reported were female in cases where offender gender is unknown
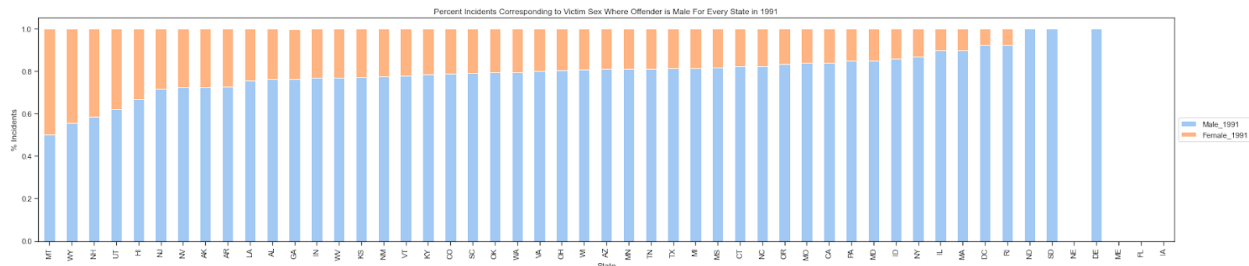
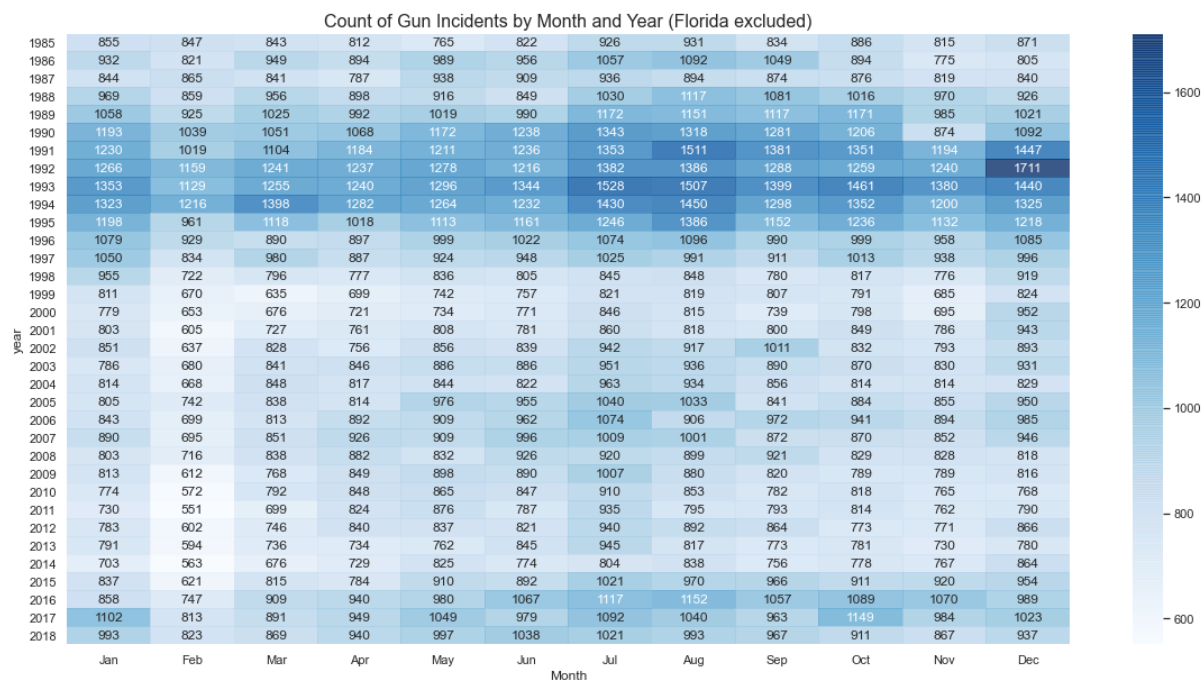**Figure 6: Percent Incidents Corresponding to Victim Sex where Offender is Male for Every State in 1991**
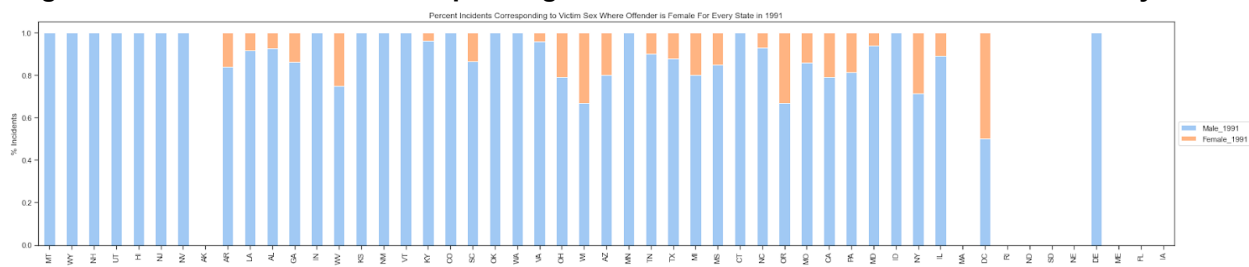
Figure 7: Percent Incidents Corresponding to Victim Sex where Offender is Female for Every State in 1991

Seasonal and Geographical Trends

2a) Do certain months/seasons have a higher prevalence of gun violence?

Heatmap of Gun Incidents by Year and Month: While we already know that there was a spike in gun violence in the 1990s, it also seems that there's some seasonality as it relates to gun violence. Summer months and holiday months (January and December) report higher numbers of gun incidents. This data is consistent with findings from this research which focused on shootings in Chicago between 2012-2016.

Count of Gun Incidents by Month and Year (Florida excluded)

| year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1985	855	847	843	812	765	822	926	931	834	886	815	871
1986	932	821	949	894	989	956	1057	1092	1049	894	775	805
1987	844	865	841	787	938	909	936	894	874	876	819	840
1988	969	859	956	898	916	849	1030	1117	1081	1016	970	926
1989	1058	925	1025	992	1019	990	1172	1151	1117	1171	985	1021
1990	1193	1039	1051	1068	1172	1238	1343	1318	1281	1206	874	1092
1991	1230	1019	1104	1184	1211	1236	1353	1511	1381	1351	1194	1447
1992	1266	1159	1241	1237	1278	1216	1382	1386	1288	1259	1240	1711
1993	1353	1129	1255	1240	1296	1344	1528	1507	1399	1461	1380	1440
1994	1323	1216	1398	1282	1264	1232	1430	1450	1298	1352	1200	1325
1995	1198	961	1118	1018	1113	1161	1246	1386	1152	1236	1132	1218
1996	1079	929	890	897	999	1022	1074	1096	990	999	958	1085
1997	1050	834	980	887	924	948	1025	991	911	1013	938	996
1998	955	722	796	777	836	805	845	848	780	817	776	919
1999	811	670	635	699	742	757	821	819	807	791	685	824
2000	779	653	676	721	734	771	846	815	739	798	695	952
2001	803	605	727	761	808	781	860	818	800	849	786	943
2002	851	637	828	756	856	839	942	917	1011	832	793	893
2003	786	680	841	846	886	886	951	936	890	870	830	931
2004	814	668	848	817	844	822	963	934	856	814	814	829
2005	805	742	838	814	976	955	1040	1033	841	884	855	950
2006	843	699	813	892	909	962	1074	906	972	941	894	985
2007	890	695	851	926	909	996	1009	1001	872	870	852	946
2008	803	716	838	882	832	926	920	899	921	829	828	818
2009	813	612	768	849	898	890	1007	880	820	789	789	816
2010	774	572	792	848	865	847	910	853	782	818	765	768
2011	730	551	699	824	876	787	935	795	793	814	762	790
2012	783	602	746	840	837	821	940	892	864	773	771	866
2013	791	594	736	734	762	845	945	817	773	781	730	780
2014	703	563	676	729	825	774	804	838	756	778	767	864
2015	837	621	815	784	910	892	1021	970	966	911	920	954
2016	858	747	909	940	980	1067	1117	1152	1057	1089	1070	989
2017	1102	813	891	949	1049	979	1092	1040	963	1149	984	1023
2018	993	823	869	940	997	1038	1021	993	967	911	867	937

Figure 8: Count of Gun Incidents by Month and Year (Florida Excluded)

The heatmap also shows that between the years 1990 - 1996, there are an increased number of incidents. We performed additional research on why there is a peak in incidents between 1990s - 1996, and found the following potential factors:

- Percentage of households owning guns has increased from the 1970s to the early 1990s, but has dropped from early 1990s to 2010s (NORC)
- Aging post World War II baby boom population, declining market for crack cocaine, and increased availability of jobs in the 1990s (Pew Research).

2b) What is the distribution of gun violence across regions/states over time?

Count of Multiple Gun Victims by Year: During the early 1990s, the number of gun incidents which had multiple victims exceeded 1300 in a given year. As time progressed, the total number of incidents with multiple victims declined, only to rise to similar levels again between the years of 2015 and 2018. Overall, states in the Midwest, Southeast, and Southwest have driven the vast majority of gun incidents with multiple victims. However, it's interesting to note that the Midwest and Southeast saw particularly higher rates of incidents with multiple victims towards the latter half of the 2010s.
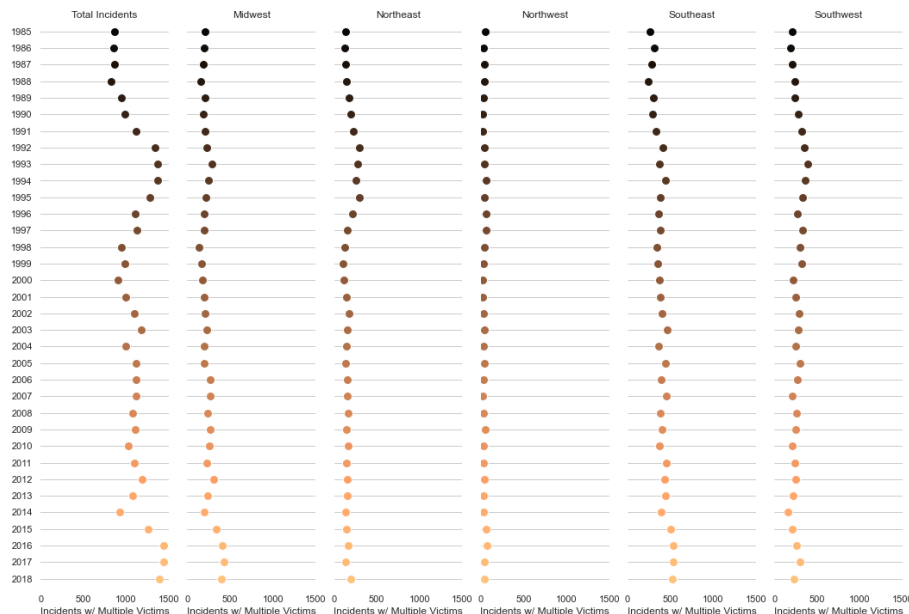
Figure 9: Number of Incidents with Multiple Victims Across US Regions from 1985 - 2018

Table 3: Region and State Mapping

Region	States
Midwest	IA, IL, IN, KS, KY, MI, MN, MO, NB, ND, OH, SD, WI
Northeast	CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT
Northwest	AK, ID, MT, OR, WA, WY
Southeast	AL, AR, GA, LA, MS, NC, OK, SC, TN, TX, VA, VI, WV
Southwest	AZ, CA, CO, HI, NM, NV, UT

Total Gun Incidents by State:

Our first method we was look at the top 5 states each year from 1985-2018 with the most # of Incidents (chart below). California, New York, and Texas consistently ranked in the top 5 states across the years.
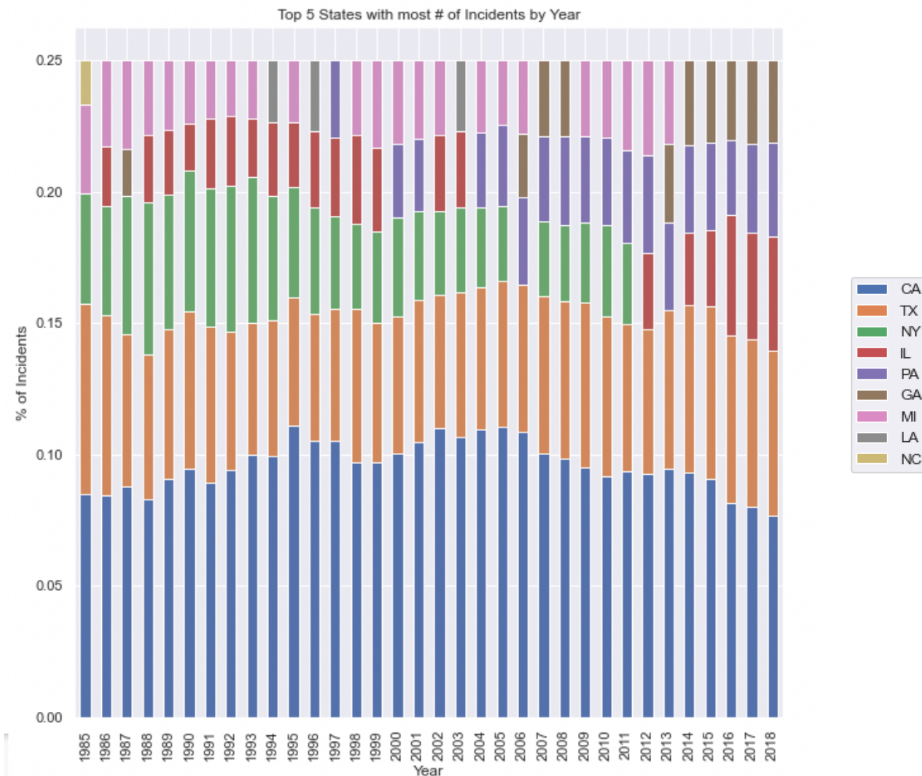
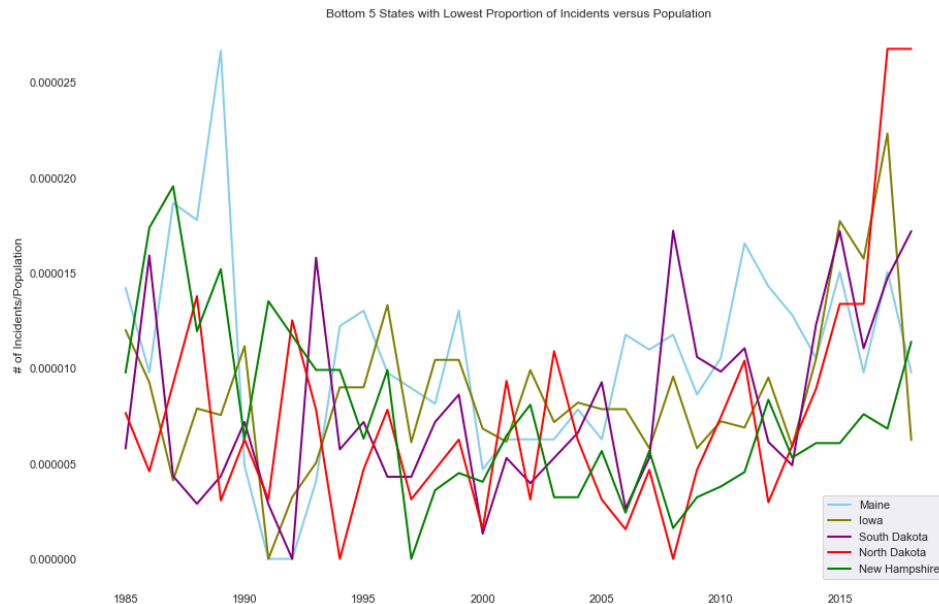**Figure 10: Top 5 States with Most Number of Incidents By Year**

We quickly realized that this method was biased towards states that had larger populations, so we scaled this view by adding in population data. We joined the US Census Population dataset with our primary dataset, merging on "Year". We then sorted for the top 5 states with the highest and lowest proportion of Incidents/Population.

When sorting on gun incidents per capita there was a shift in the top states. The top five states using this new metric are Louisiana, Maryland, Nevada, California, and Texas. Louisiana, with the highest ratio of gun incidents/population overall, had a large spike in 1994 and then continued to have the highest ratio through 2018. Texas actually had the highest ratio through the 1980s, but then dipped starting in 1991.

The bottom five states were New Hampshire, North Dakota, South Dakota, Indiana, and Maine. Despite these states having a smaller population, the # of gun incidents were so low (an avg of 11 per year across the five states) they made the bottom of the list.
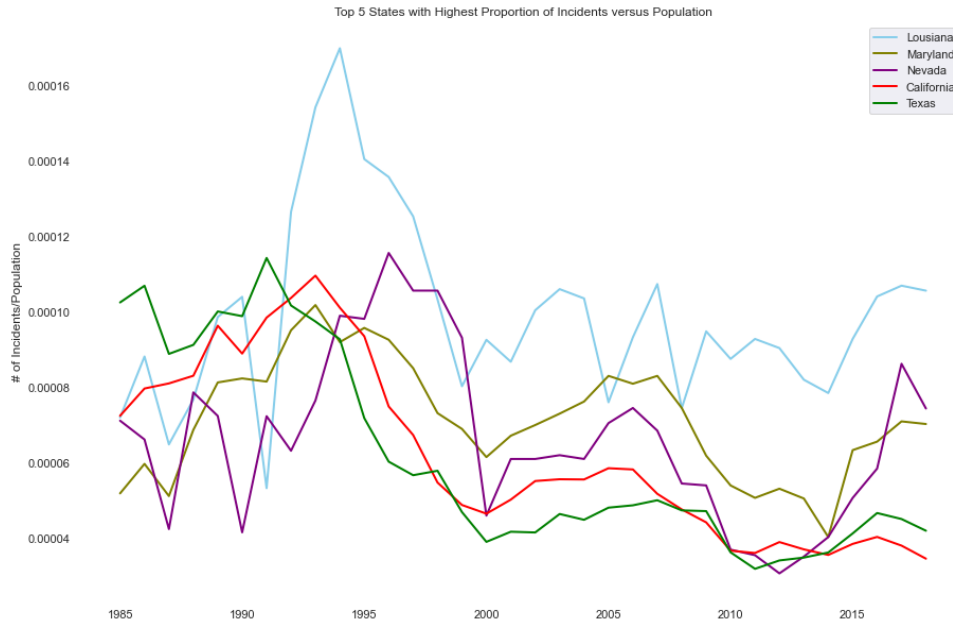
Figure 11: Top 5 States with Highest Proportion of Incidents Scaled by Population

Figure 12: Bottom 5 States with Lowest Proportion of Incidents Scaled by Population

There is a strong correlation between state population and the number of gun incidents. When looking at the top 5 states with the most gun incidents, all 5 of them are ranked in the top 10 states in terms of population with the top 3 worst offender states ranking 1st, 2nd, and 3rd respectively in terms of population. Please see chart below for details:

Table 4: Top 5 States with Highest Number of Gun Incidents vs. Population Rank

Top 5 States	# of Gun Incidents (1985-2018)	Population Rank
CA	65,093	1
TX	38,814	2
NY	26,240	3
MI	18,277	8
IL	17,519	6

Relationships Between Gun Violence and Other Variables (Population, Gun Policies)

3a) Under which circumstances did gun violence incidents occur the most?

Line Graph of Gun Incidents by Circumstance and Year: Overall, there was more crime-related gun violence in the 1990s, which accounts for the overall uptick in gun incidents during that period. For example, there were more reported incidents of robbery, narcotics, felony, and juvenile gang related killings. As overall crime incidents declined, more gun incidents with unknown circumstances rose. This can potentially be attributed to overall declines in crime or poorly documented causes of gun violence.

Pew Research offers a few explanations for the decline in gun violence over time, but there is a lack of consensus among analysts on the main cause of it. The downward trend has been attributed to a number of factors, such as an aging post World War II baby boom population as well as a declining market for crack cocaine. The increased availability of jobs in the 1990s made it less likely for individuals to get involved in crime, which is consistent with our findings in this dataset.
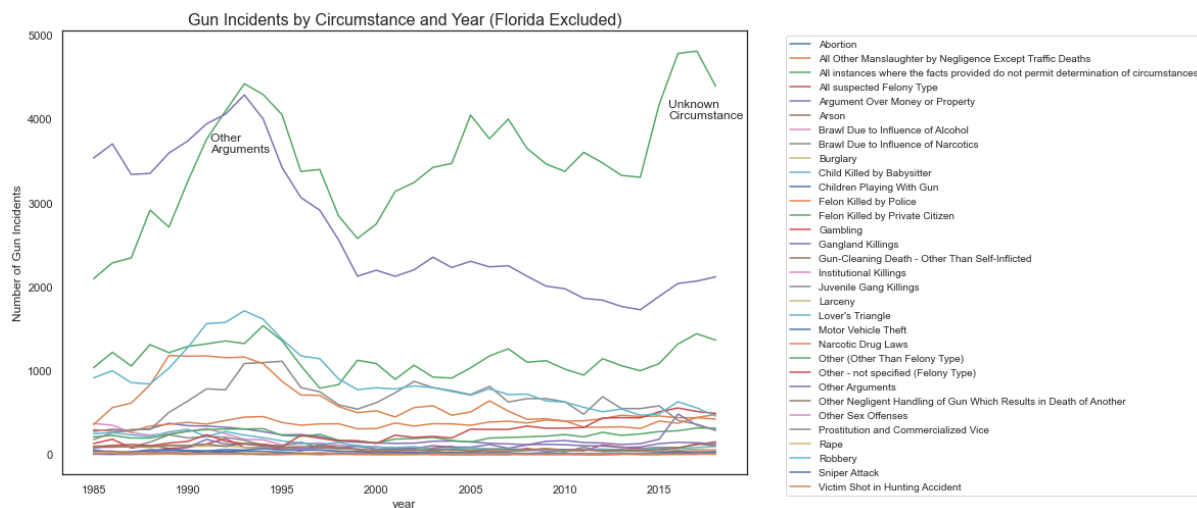
Figure 13: Gun Incidents by Circumstance and Year (Florida Excluded)

Line Graph of Gun Incidents by Top 10 Circumstances and Year*: This chart has been included to more clearly visualize the circumstances around gun violence over time.
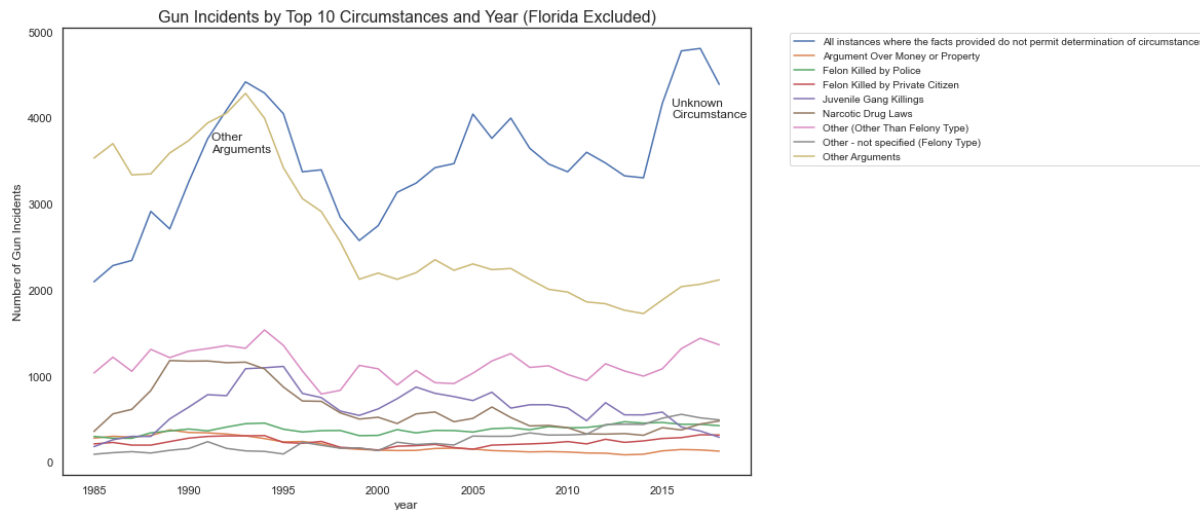

Figure 14: Gun Incidents by Top 10 Circumstances and Year (Florida Excluded)

3b) What type of relationships do offenders and victims have? How does this change over time?

Line Graph of Offender Relationship to Victim: Using the "offenders_relationship_to_victim" attribute from the (Periscopic Gun Violence Dataset), the offender relationship to the victim is typically unknown in most cases. We believe that the vast majority of incidents tend to be categorized as "unknown" because according to this research from 2002, most murder investigations do not result in the identification of the offender.

However, for relationships that are known, gun violence incidents occur more often with acquaintances or total strangers. There is a clear peak in the volume of incidents in the early 1990s, particularly where the offender relationship is unknown, an acquaintance, stranger, or known to the victim in an "other" way. While the volume of gun incidents trends downward in the late 1990s for all of these variables, the number of unknown relationships begins to increase again in the 2000s and late 2010s. This rise in unknown relationships can be attributed to a number of factors, such as lack of resources (e.g. training) for the police force to do their jobs more effectively.
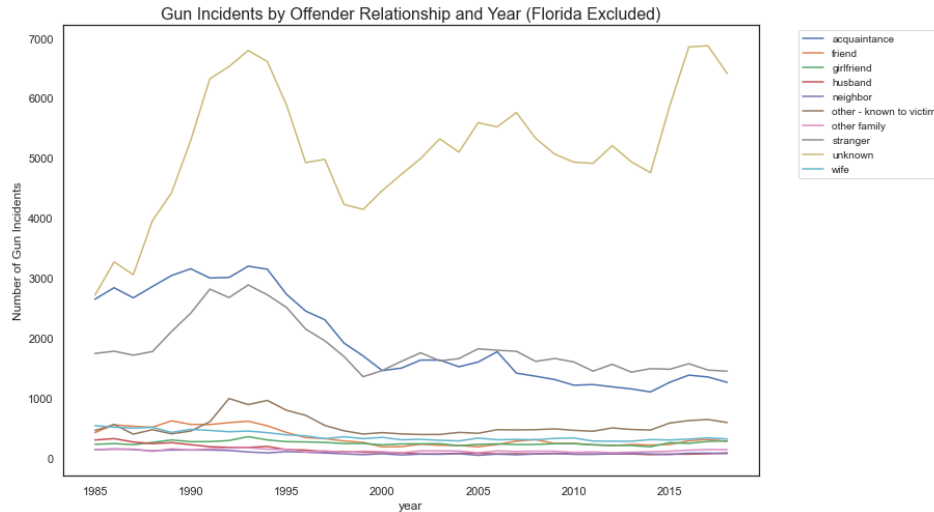
Figure 15: Gun Incidents by Offender Relationship and Year (Florida Excluded)

3c) Which states have the most number of gun regulations, and which states have the least number of gun regulations? Are domestic violence cases more likely to occur in cases with less number of domestic violence regulations?

For the top 10 states ending with the most regulations in 2018, there are trends in the number of regulation increases in the years from 1990 - 2000. Following 2000, there is a relatively flat period where there were not too many regulation increases. There is another inflection point around the years 2012 - 2015 showing an increase in the number of regulations. This increase in the number of regulations since the early 1990s may also have a contributing factor to the decrease in the number of gun incidents since the early 1990s, which was one of the findings observed from question 2(a) previously.
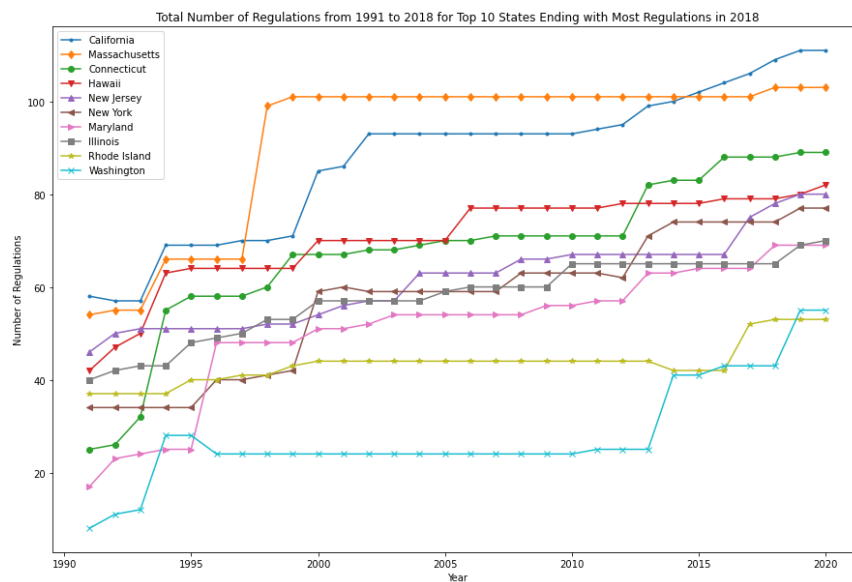
Figure 16: Total Number of Regulations from 1991 to 2018 for Top 10 States Ending with Most Regulations in 2018

In comparison, we also evaluated the bottom 10 states with the least number of gun regulations as of 2018. This chart shows a different behavior than the top 10 states as we actually see a decrease or only a slight increase in the number of regulations from 1991 to 2018. This plot is provided in the Appendix Figure A7.

After evaluating the number of regulations per state, we then performed an analysis to evaluate whether there is an effect of the number of gun regulations on reducing the number of gun incidents. More specifically, we took a look at domestic violence regulations compared to incidents where the offender and victim were involved in a domestic relationship. The specific regulation descriptions are listed in the Appendix Table A2. Figure 17 contains the percentage of domestic violence incidents over other incidents, compared to the number of gun regulations per state in 2018. The top plot is the percentage of incidents (with blue being the percent of domestic relationship incidents), while the bottom is the number of regulations per state.
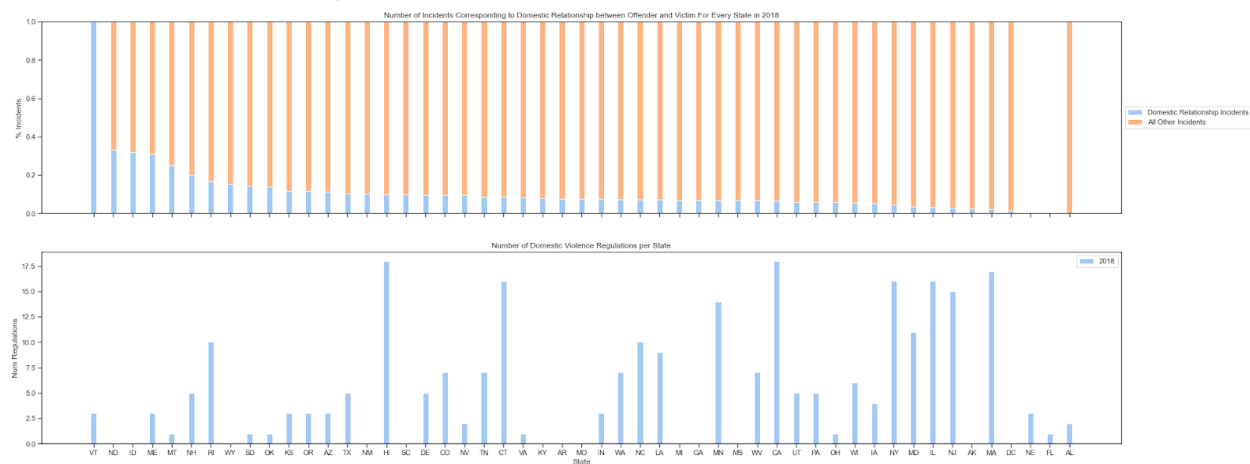
Figure 17: Percent of Domestic Violence Incidents vs. Number of Regulations per State in 2018

As can be seen from this plot, there is no clear trend in a larger number of regulations to a lower percentage of cases. If there was a trend, we should be seeing the number or regulations increasing as we move towards the right of the plot. However, we do not see this to be the case from this dataset. Therefore, it is unclear if current gun regulations are effective at preventing or lowering domestic violence incidents. Note also we see this similar type of inconclusive behavior for other regulations such as ban of assault weapons and large capacity magazines (see Appendix Figure A8).

Conclusions and Future Work

In exploring this data, we came to a few conclusions that were surprising, such as the fact that gun violence incidents were actually higher in the 1900s than they are today. Society's perception around gun violence may be skewed by media reporting. However, it's difficult to make a definitive conclusion since the media dataset was only representative of digital articles, and the data was also much smaller in size, representing years between 2013 and 2018 only. Additionally, most of the data from 2013 and 2018 was incomplete, but the data between 2014 and 2017 followed a similar pattern to our primary dataset.

We also discovered through our analysis that the effectiveness of gun regulations is questionable, particularly when looking at domestic violence regulations and incidents, as well as mass shooting regulations and incidents. One may assume that the higher number of regulations would result in a decreased percentage of incidents related to the restrictions; however, we did not observe this clear trend in the dataset. This calls into question the effectiveness of current gun regulations in preventing or reducing gun violence.

If we were to continue this analysis, it might make sense to explore the relationship between mental health and gun violence to understand if that has contributed to the rise in gun violence incidents in recent years. It might also be interesting to investigate employment trends to understand if that's a higher driver of gun violence given the potential explanations for the decline in incidents in the 1990s. Findings here may help to shape more impactful government regulations that actually deter gun violence.

References

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14. "Family Violence Statistics". US Department of Justice.
https://webarchive.library.unt.edu/eot2008/20080923141406/http://www.ojp.usdoj.gov/bjs/pub/pdf/fvs03.pdf

Appendix

The Appendix contains the following tables and figures:

Table A1: Supplemental Dataset Description and Fields

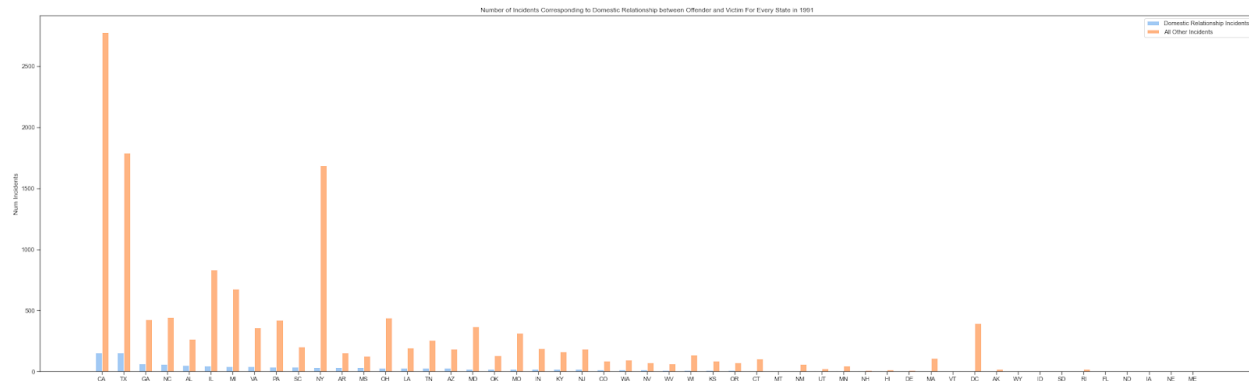| **Name**	**Description**	**Fields**
State Firearm Laws Dataset	Contains the types of firearm laws that each state has from 1991 - 2020. Primary data sources: Thomson Reuters Westlaw database, and the Everytown for Gun Safety database. Secondary data sources: Bureau of Alcohol, Tobacco, Firearms, and Explosives' State Laws and Published Ordinances, and the Law Center to Prevent Gun Violence	a. Dealer regulations b. Buyer regulations c. Prohibitions for high-risk gun possession d. Background checks e. Ammunition regulations f. Possession regulations g. Concealed carry permitting h. Assault weapons and large-capacity magazines i. Child access prevention j. Gun trafficking k. Stand your ground l. Preemption m. Immunity n. Domestic Violence

Gun Violence Dataset	260k incidents from Jan 2013 - March 2018. Original Source: Gun Violence Archive. Data collected from gun violence incidents collected from over 7,500 law enforcement, media, government and commercial sources.	a. incident_id b. date c. state d. city_or_county e. address f. n_killed g. n_injured h. incident_url i. source_url j. incident_url_fields_missing k. congressional_district l. gun_stolen m. gun_type n. incident_characteristics o. latitude p. location_description q. longitude r. n_guns_involved s. notes t. participant_age u. participant_age_group v. participant_gender w. participant_name x. participant_relationship y. participant_status z. participant_type aa. sources bb. state_house_district cc. state_senate_district
State Abbreviations Dataset	Contains Mapping of State Full Name, Abbreviation, and Two-Letter Code	a. State b. Abbreviation c. Code
US Census Data (1980-1990) US Census Data (2000-2010)	Contains US Census Population Data from 1980-2010	a. State b. 1980 Population c. 1990 Population d. 2000 Population e. 2010 Population

**Table A2: Domestic Violence Regulation Descriptions**

Domestic Violence Crime Type	Regulation Description
Misdemeanor crimes (MCDV)	Law prohibits firearm possession by people convicted of a misdemeanor crime of domestic violence if the victim is a spouse, ex-spouse, or cohabiting partner. F10 The law must apply beyond family members, unless family members are defined to include ex-spouses and cohabiting partners.
	Law prohibits firearm possession by people convicted of a misdemeanor crime of domestic violence regardless of the relationship to the victim.

	Law prohibits firearm possession by people convicted of a misdemeanor crime of domestic violence and also requires them to turn in the firearms they already have.
	There are no additional conditions on the requirement that MCDV offenders turn in their firearms. No additional finding is necessary.
	The requirement that MCDV offenders turn in their firearms applies if the victim is a dating partner of the offender.
	Law enforcement officials are authorized to remove firearms from MCDV offenders.
	Law enforcement officials are required to remove firearms from MCDV offenders.
Firearm removal	Law enforcement officials are required to remove at least some firearms from the scene of a domestic violence incident.
	Law enforcement officials must remove all firearms from the scene of a domestic violence incident. Firearms that can be removed cannot be restricted to only firearms used in the incident, firearms threatened in the incident, or firearms brandished in the incident.
Restraining order (DVRO)	Subjects of a domestic-violence related restraining order (DVRO) are not allowed to possess firearms. The law must apply to possession, and not just purchase of firearms. Application to handguns only is acceptable. The law must apply beyond family members, unless family members are defined to include ex-spouses and cohabitating partners.
	Subjects of a DVRO are not allowed to possess firearms and the prohibition applies if the subject is a dating partner of the petitioner.
	Subjects of a temporary (ex parte) restraining order are not allowed to possess firearms.
	The prohibition on firearm possession by subjects of an ex parte restraining order applies if the petitioner is a dating partner of the DVRO subject.
	Subjects of a DVRO are not allowed to possess firearms and are required to surrender the firearms that they already possess.
	There are no additional conditions on the requirement that DVRO subjects turn in their firearms. No additional finding is necessary.
	The requirement that DVRO subjects turn in their firearms applies if the subject is a dating partner of the petitioner.
	Law requires subjects of an ex parte DVRO to turn in their firearms.
	Law requires subjects of an ex parte DVRO to turn in their firearms and there are no additional conditions on this requirement. No additional finding is necessary.
	Law requires subjects of an ex parte DVRO to turn in their firearms and this requirement applies if the subject is a dating partner of the petitioner.
	Law requires law enforcement officials to remove firearms from people subject to a domestic violence-related restraining order.
Stalking	Law prohibits firearm possession by people who have been convicted of a stalking offense.

Figure A1: Percent Incidents Corresponding to Victim Sex where Offender Gender is Unknown for Every State in 1991

Figure A2: Percent Incidents Corresponding to Victim Sex where Offender Gender is Unknown for Every State in 2018

Figure A3: Percent Incidents Corresponding to Victim Sex where Offender is Male for Every State in 2018

Figure A4: Percent Incidents Corresponding to Victim Sex where Offender is Female for Every State in 2018
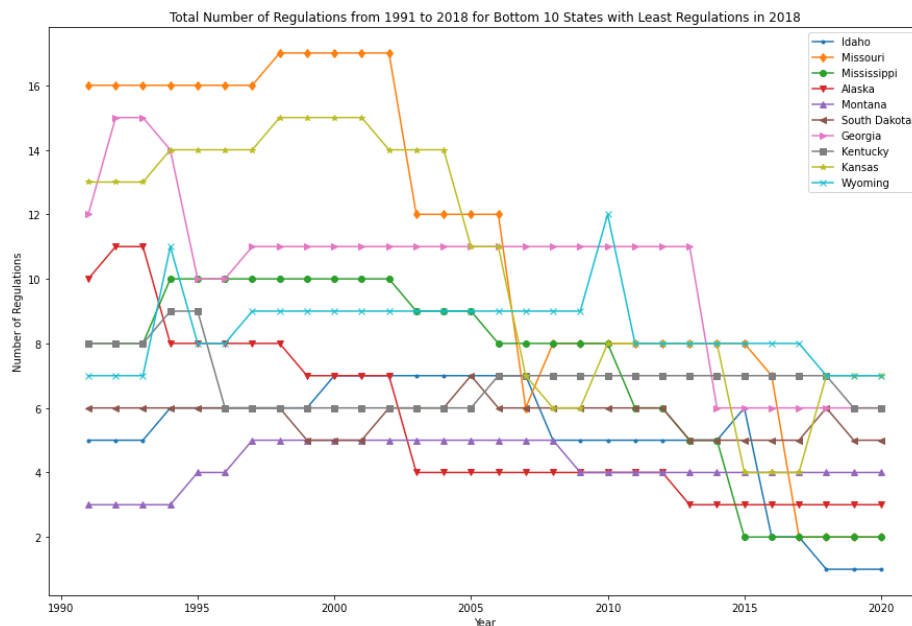
Figure A5: Number of Incidents Corresponding to Domestic Relationship vs. All Other Incidents Between Offender and Victim For Every State in 1991
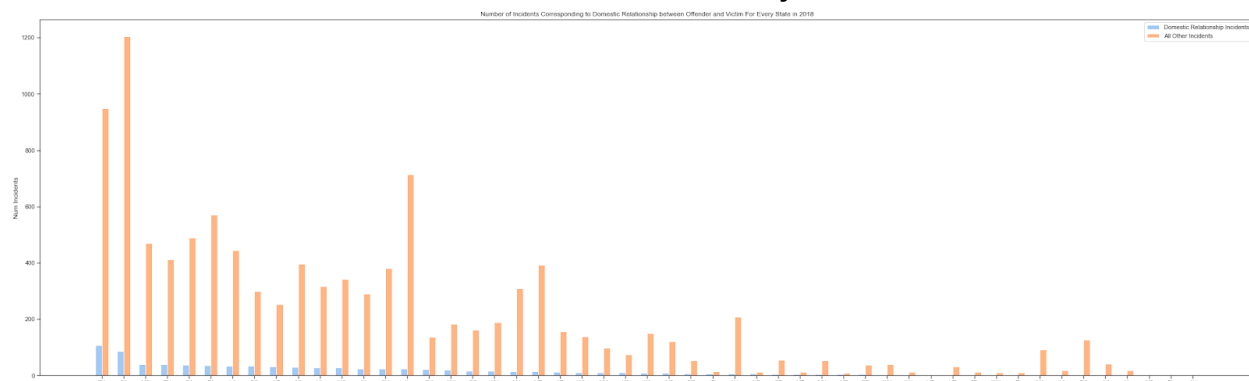
Figure A6: Number of Incidents Corresponding to Domestic Relationship vs. All Other Incidents Between Offender and Victim For Every State in 2018

Figure A7: Total Number of Regulations from 1991 - 2018 for Bottom 10 States with Least Regulations in 2018
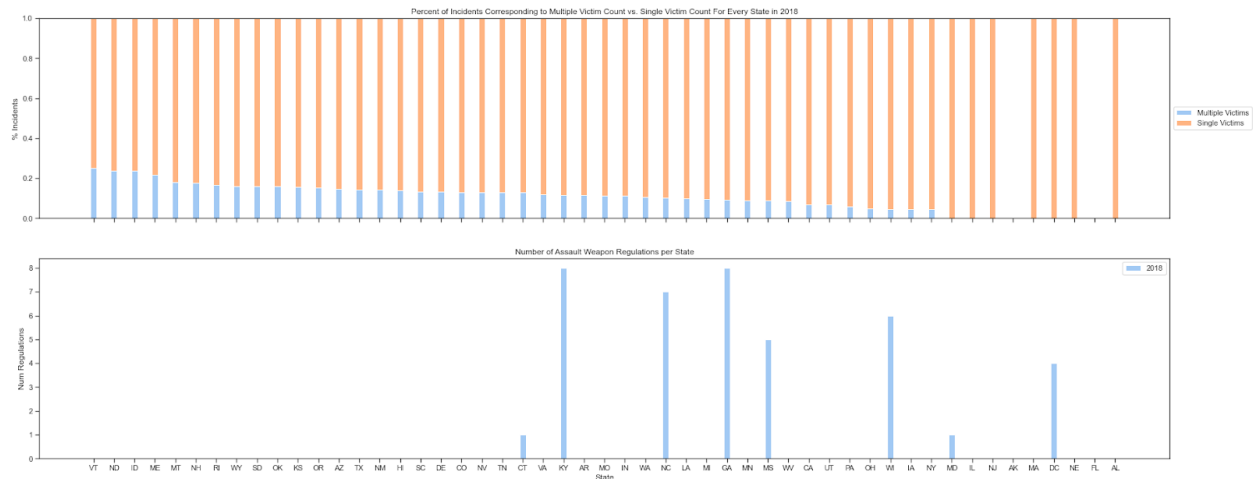
Figure A8: Percent of Multiple Victim Incidents vs. Number of Assault Weapon Regulations per State in 2018