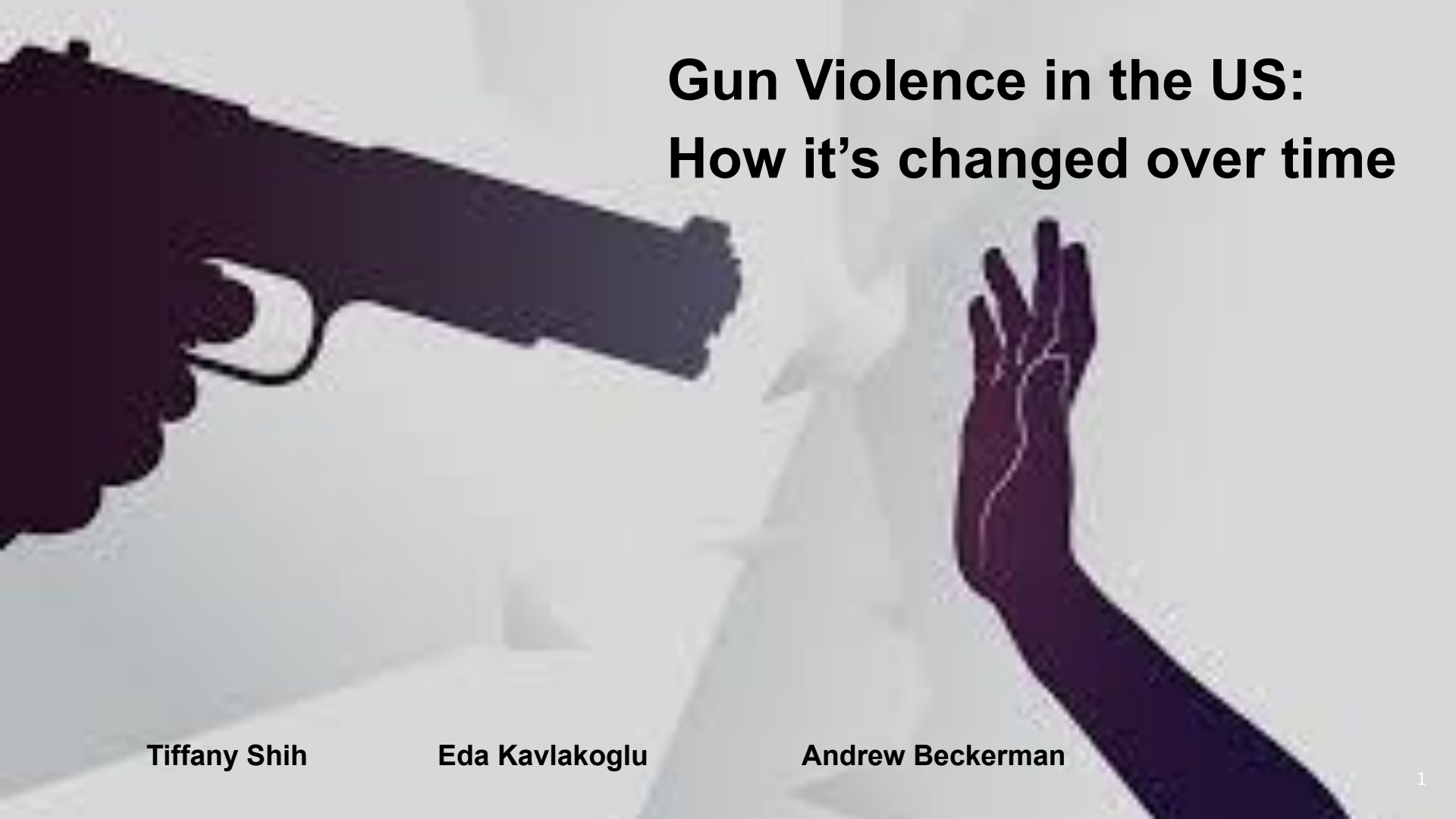# Gun Violence in the US:
How it's changed over time

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How has gun violence changed in America since 1985?

Background:

As of April 12, 2021, there have been 126* mass shootings in the United States. While the media reports keeps the topic of gun violence salient in our minds, how does gun violence today compare across time?

Data:

In this analysis, we use the [Periscopic Gun Violence Dataset](#) to understand if our perceptions about gun violence and existing gun policies are true. We focus on three key areas:

- Offender, victim, and weapon characteristics
- Seasonal and geographical trends
- Relationships between gun violence and variables, like gun policies and domestic violence

2021 Snapshot of Gun Violence in America

CNN

Sixth victim dies days after mass shooting in South Carolina, coroner says

The sixth victim of a shooting in Rock Hill, South Carolina, earlier this week has died, the York County coroner announced Saturday.
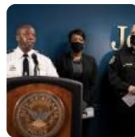
2 days ago

The New York Times

8 Dead in Atlanta Spa Shootings, With Fears of Anti-Asian Bias

The man who police say went on a rampage at three spas in the Atlanta area has been charged with eight counts of murder in connection with ...

2 weeks ago

CNN

Here's what we know about the Boulder, Colorado, mass shooting suspect

(CNN) Ahmad Al Aliwi Alissa was identified by authorities Tuesday as the gunman who opened fire at a King Soopers grocery store in ...

3 weeks ago

Source: https://en.wikipedia.org/wiki/List_of_mass_shootings_in_the_United_States_in_2021

Steps to Analyze Question

1. Data Research: Database Exploration

2. Data Cleaning: Transform Data to Usable Format

3. Data Assumptions: Assumptions or limitations when using the datasets

4. Data Exploration and Analysis: Data characteristics & trends

5. Conclusions & Future Work

Assumptions Made in Analysis

- **Data Completeness:** Our primary dataset is sourced from US police departments, so we are assuming that the reporting is complete for the majority of states.

- **Definitions:** The primary dataset does not specify distinctions between the values in the weapon_used field. In particular, the definition of firearm may differ depending on the context. As a result, we assume that any case where the weapon_used is listed as "firearm" defines it as any firearm that does not fall in the category of handguns, rifles, or shotguns.`

- **Data Gaps:** We assumed that the blank data points for gun incidents in South Dakota in 1994 and North Dakota in 1994 and 2008 were 0. Given that there are many years, where each states has 3 or less gun incidents, this seemed plausible.

- **US Population Data:** 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).

Data Cleaning - Issues with Datasets

- Proper State names --> State Abbreviations
- Delete random row "Unnamed: 35" in US Census dataset
- Convert numeric columns from type "object" to type "float"
- Excluded Florida from analysis (missing values for majority of years)
- Cleaned Age data to only represent numeric values
- Children less than one year old were set to the value of 0.5, adults over 99 were set to the value of 99

Offender, Victim, and Weapon Characteristics

Tracking Victim Characteristics over Time

Black ethnicity, Males, Adults Aged 25-36 are the highest targeted victim groups
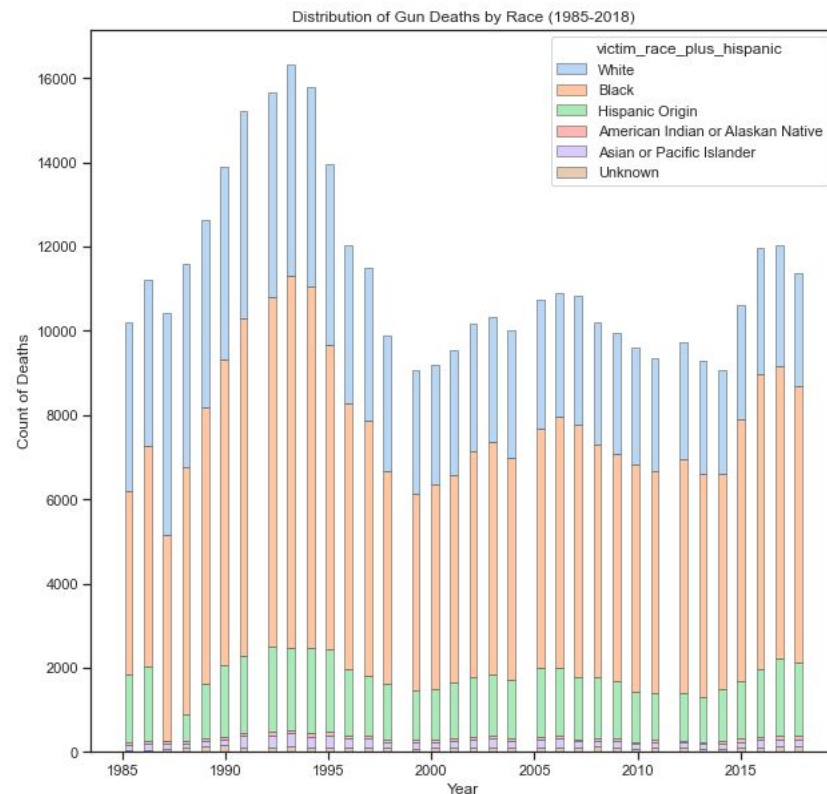
Victim Race/Ethnicity

- Black victims are the largest victim race accounting for **53%** of all victims from 1985-2018
- Asian make up only **1.5%** of all victims from 1985-2018

Victim Sex

- From 1985-2018 **84%** of gun victims are males
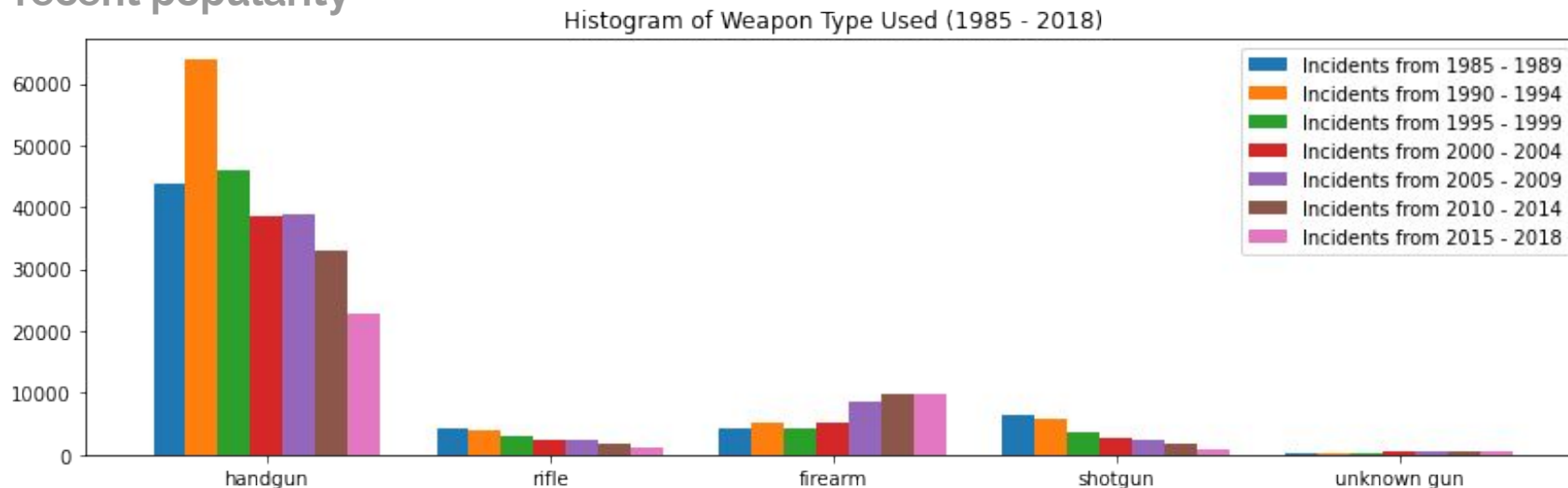- Over **80%** of the victims are male every year from 1985-2018

Victim Age

- Median victim age for each state ranged from **25 to 36.5** years old
- States in the NorthEast (such as Maine, Vermont, and New Hampshire) reported higher median victim ages

Distribution of Gun Deaths by Race (1985-2018)

victim_race_plus_hispanic
- White
- Black
- Hispanic Origin
- American Indian or Alaskan Native
- Asian or Pacific Islander
- Unknown

Tracking Gun Type Used Over Time

**Handgun has been the weapon of choice by offendenders with the firearm growing in recent popularity**

Histogram of Weapon Type Used (1985 - 2018)

Legend:
- Incidents from 1985 - 1989
- Incidents from 1990 - 1994
- Incidents from 1995 - 1999
- Incidents from 2000 - 2004
- Incidents from 2005 - 2009
- Incidents from 2010 - 2014
- Incidents from 2015 - 2018

x-axis: handgun, rifle, firearm, shotgun, unknown gun

- The Handgun has been the most popular gun by offenders, accounting for **75%** of all guns used from 1985-2018 but has become less popular recently

- Rifle/Shotgun is decreasing in popularity, only making up **6%** of all guns used in 2015-2018

8

Seasonal and Geographical Trends

Gun incidents rise during the summer and holiday seasons

Early 1990s gun violence peak

Dots indicate peak months of violence

Count of Gun Incidents by Month and Year (Florida excluded)
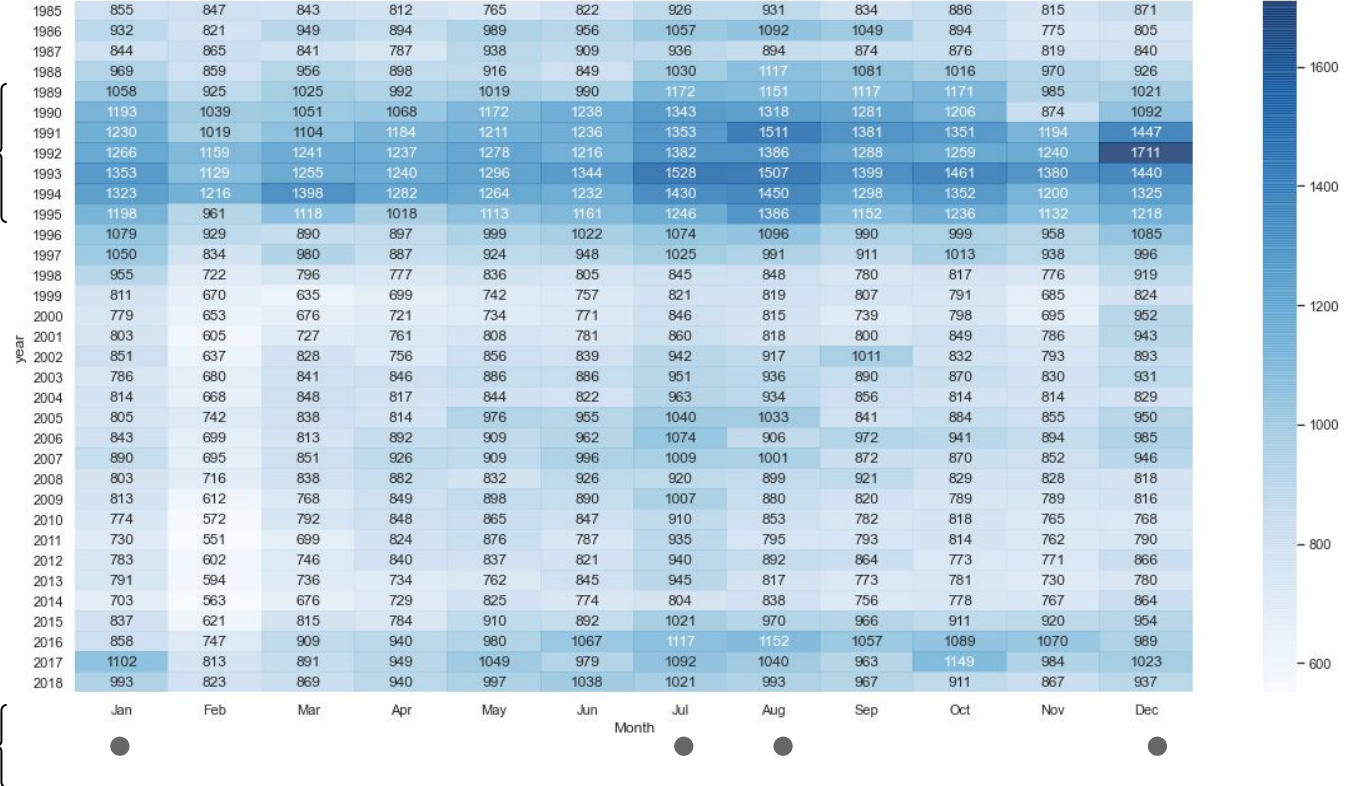
Gun violence is concentrated in the Midwest, SE, and SW regions of the US

Peaks in gun violence are concentrated in the early 1990s and late 2010s, seeing over 1300 incidents in each period

- States in the Midwest, Southeast, and Southwest drove the majority of gun incidents with multiple victims
- The Midwest and Southeast saw higher rates of incidents with multiple victims towards the latter half of the 2010s

Gun incidents with single and multiple victims are biased towards states that have larger populations but California and Texas still make the Top 5 states when adjusted for population

- **Top 5 states by gun incidents per capita:** Louisiana, Maryland, Nevada, California, and Texas
- **Bottom 5 states by gun incidents per capita:** New Hampshire, North Dakota, South Dakota, Indiana, and Maine
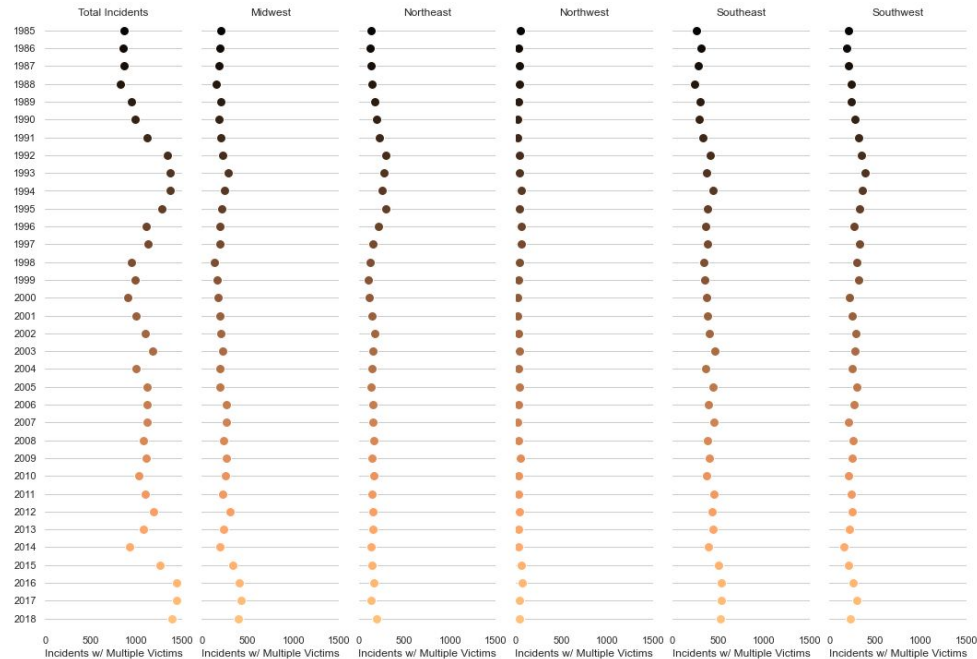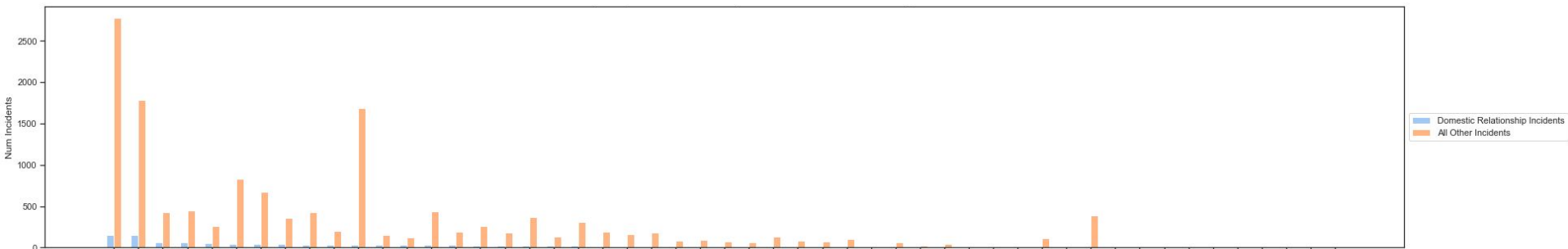
Relationships Between Gun Violence and Other Variables

Gun Incidents by Circumstance and Year

Gun Incidents by Circumstance and Year (Florida Excluded)
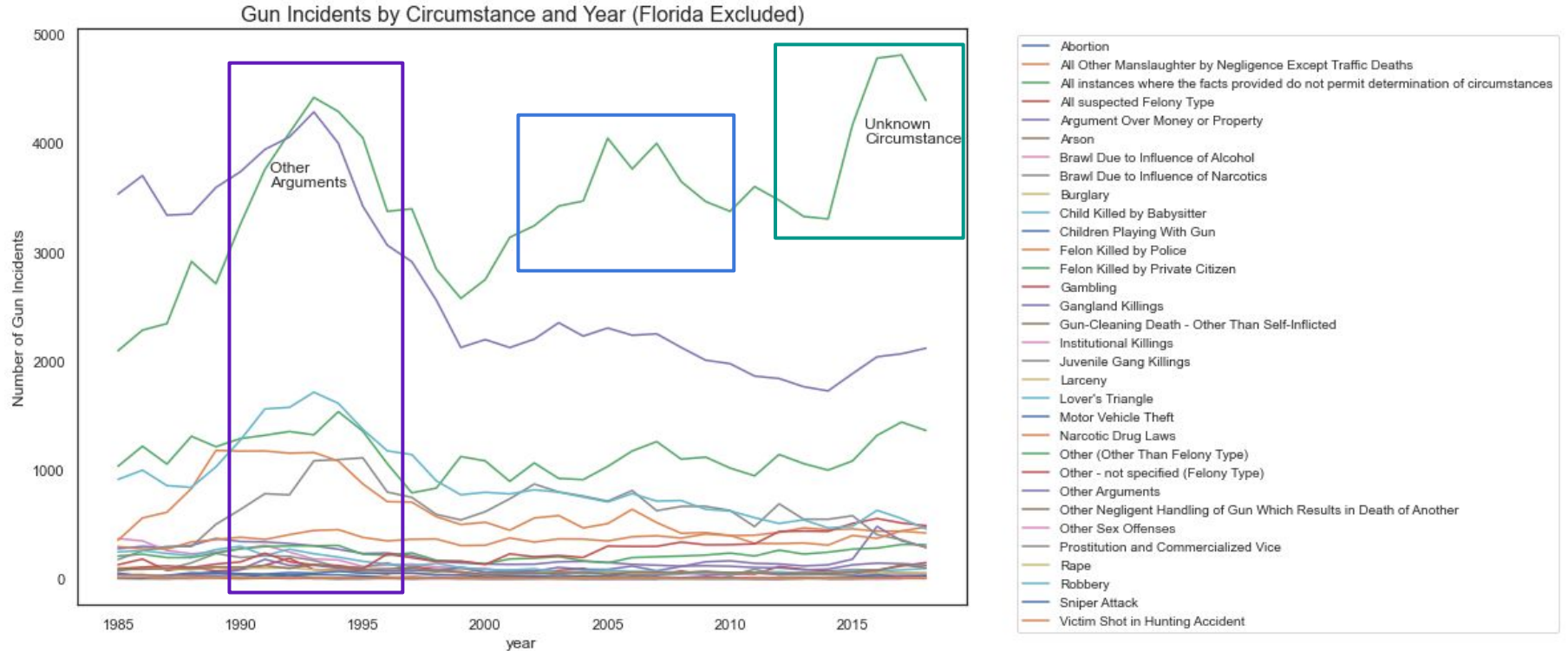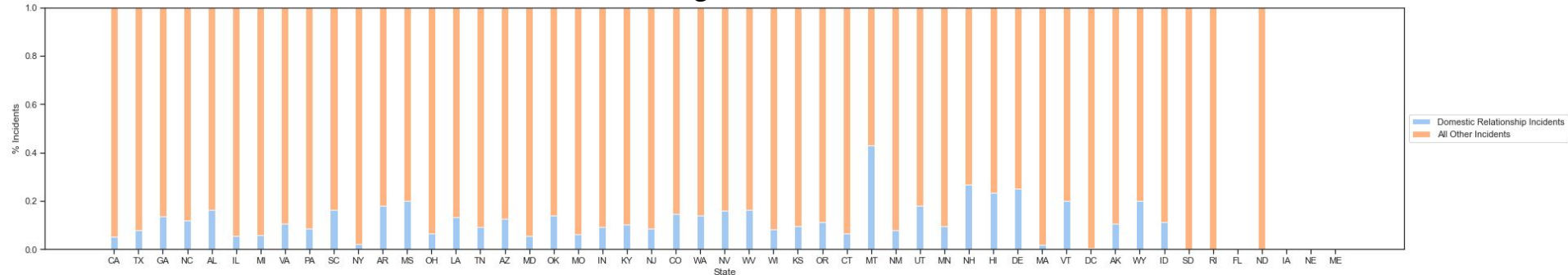
Domestic Relationship Incidents in 1991

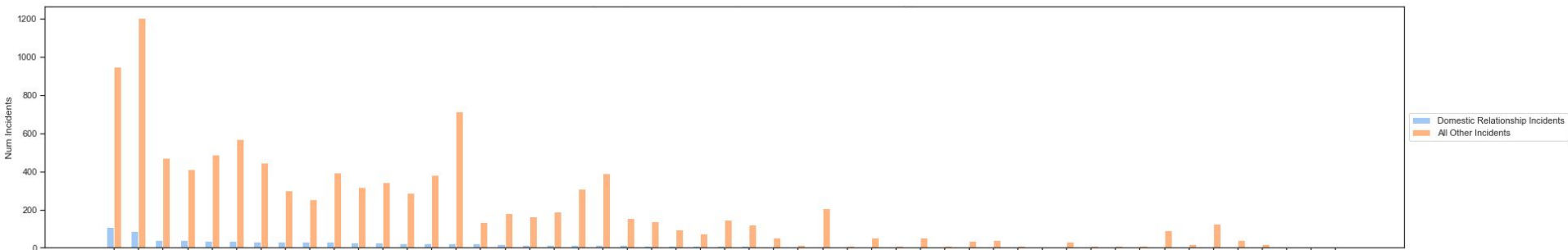Number of Incidents (Domestic Relationship vs. Other Incidents)
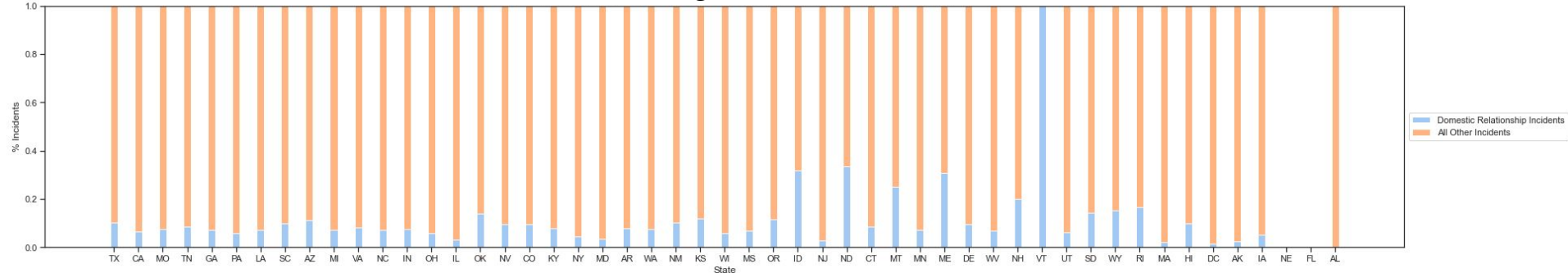
Percentage of Incidents

Domestic Violence Incidents in 2018

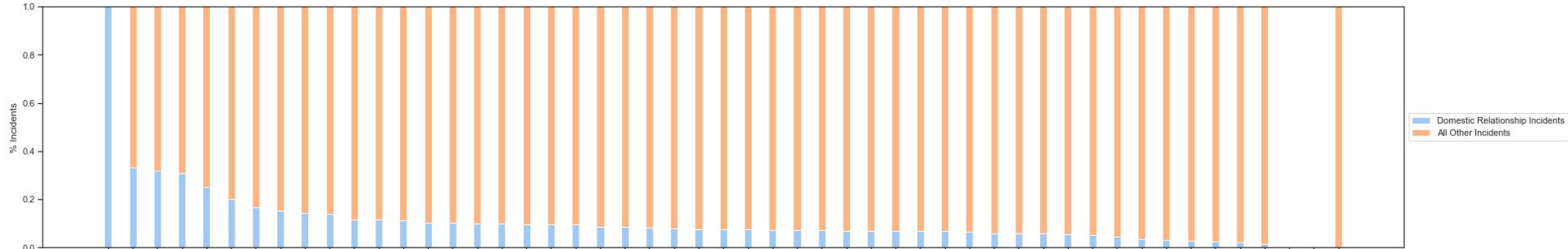Number of Incidents (Domestic Relationship vs. Other Incidents)
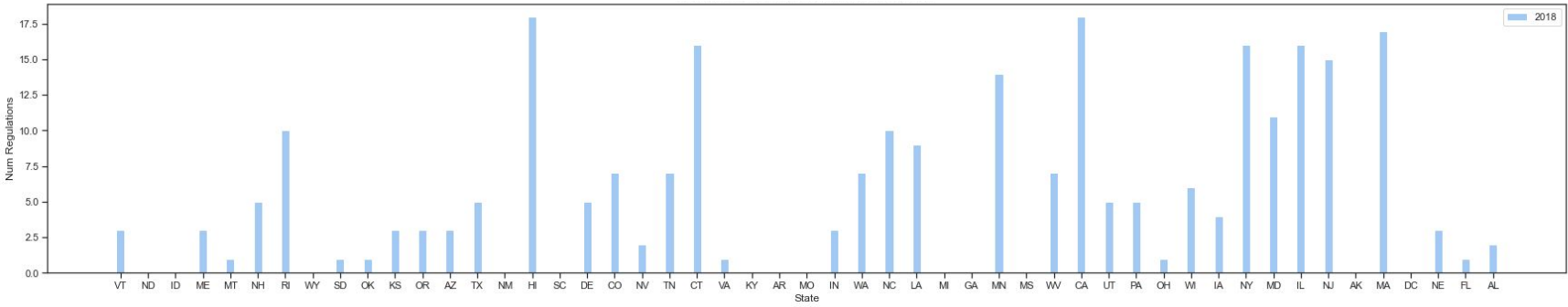

Percentage of Incidents

Percent of Domestic Violence Incidents vs. Regulations per State in 2018

Conclusions & Future Work

Data Characteristics and Trends

- Highest targeted gun victims in the US from 1985 -2018:
    - Black ethnicity (~84%)
    - Males (~80%)
    - Aged 25-36.5 years old (41%)
- Peaks in gun violence concentrated in the early 1990s and late 2010s, particularly states in the Midwest, Southeast, and Southwest
- No clear trend between increased number of regulations and decreased gun violence incidents

Future Work

Evaluate relationships between gun violence and other variables to help identify and create impactful gun violence prevention programs:

- Mental Health
- Employment Rates

Thank You!