American Crime and Incarceration

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Overview

In this project, we set out to understand the extent of the issue of mass incarceration in the United States by finding sub-statistics that could potentially explain the issue as it exists today, such as how incarceration rates connect to US policy. We also used basic predictive modeling to paint a picture of what mass incarceration might look like in the future.

Why Choose a Dataset on Crime?

- The United States currently has the largest prison population in the world at approximately 2,094,000 inmates
- The US has only 5% of the world's population, and yet it houses 25% of the world's incarcerated persons.
- US crime rates are comparable to countries with similar economies and systems of government, yet the rate of incarceration is significantly higher

Total US Prisoners
2001 to 2016

Total Crime in the US
2001 to 2016
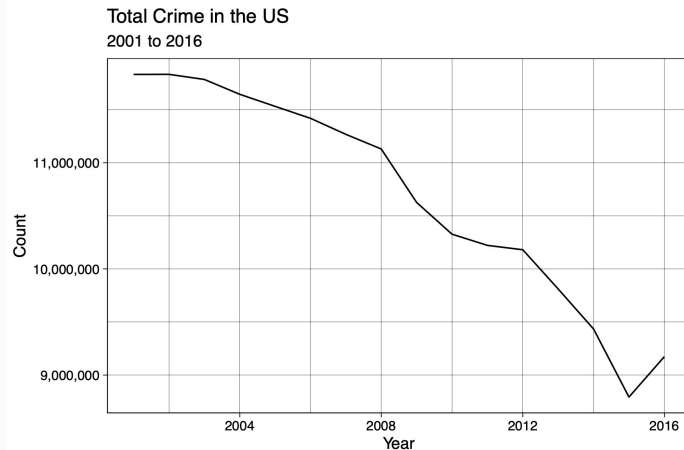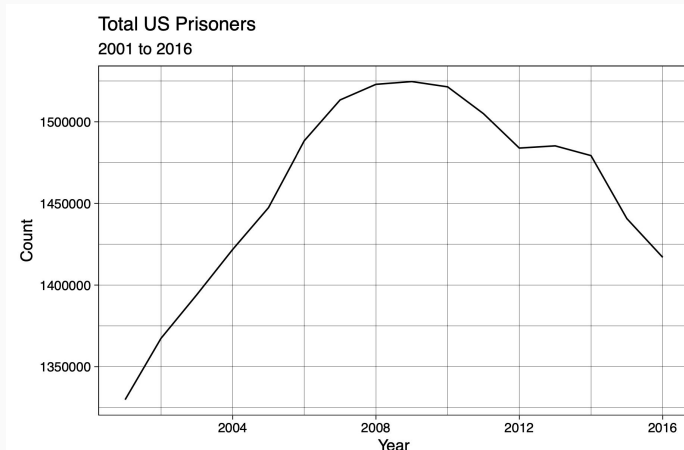
Glimpse of Dataset

Our dataset is constructed using an annual data collection effort from the FBI where they gather information regarding criminal identification, crime, and other records voluntarily submitted by local, state, and federal

The dataset contains 816 rows and 17 variables.

Screenshot of dataset

⚠ jurisdiction	✓ includes_jails	# year	# prisoner_count	✓ crime_reporting_c...
State / federal jurisdiction	Indicates if prisoner totals include jails	Year	Year-end count of prisoners in custody	Indicates whether state changed reporting systems affecting comparisons with previous years
51 unique values	true 96 12% / false 720 88% (88.2%)	2001 — 2016	1088 — 217k	true 4 0% / false 795 97% / [null] 17 2% (97.4%)
FEDERAL	False	2001	149852	
ALABAMA	False	2001	24741	False
ALASKA	True	2001	4570	False
ARIZONA	False	2001	27710	False
ARKANSAS	False	2001	11489	False
CALIFORNIA	False	2001	157142	False

Background Data

- The box plot shows that though the median percent of the population that is incarcerated does not change significantly from year to year, certain years have a larger spread and greater outliers.

- The map shows the proportion of each state's population that was imprisoned in 2016 to get a clearer idea of which states contribute most the issue of mass incarceration.

- Delaware, Oklahoma, and Arizona have the greatest proportion of prisoners relative to the rest of the country. These are likely the outliers in the boxplot from Figure 3.2
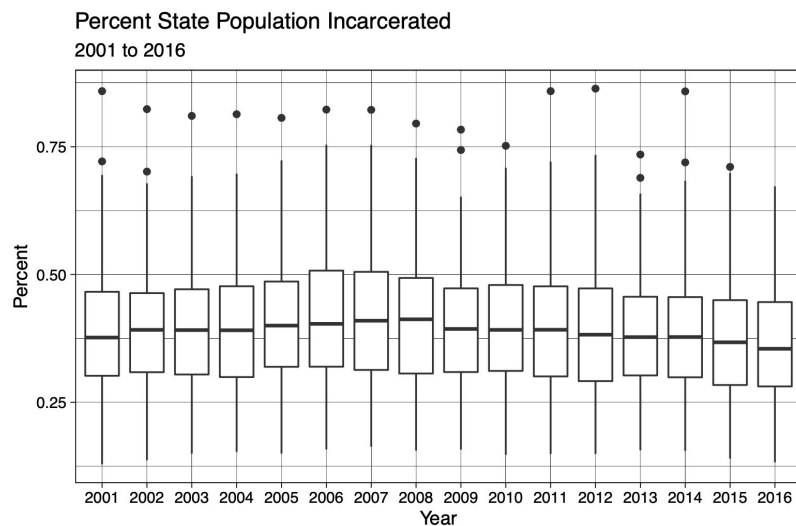

Percent State Population Incarcerated
2001 to 2016

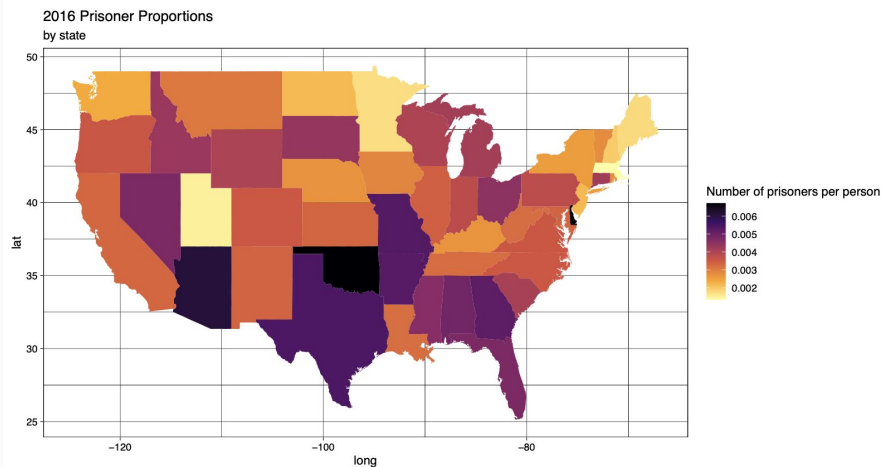Figure 3.2

2016 Prisoner Proportions
by state

Figure 4

How Does Crime Differ by Region?

- The south overwhelmingly has the total highest property crime, total burglary, and total larceny counts
- Outliers: Northeast graph. In 2015 there was sharp decrease with larceny and burglary, likely due to policy changes
- No matter the region, highest to lowest counts in each crime was ordered larceny, burglary, then vehicle theft.

Yearly Crime by Region in the United States
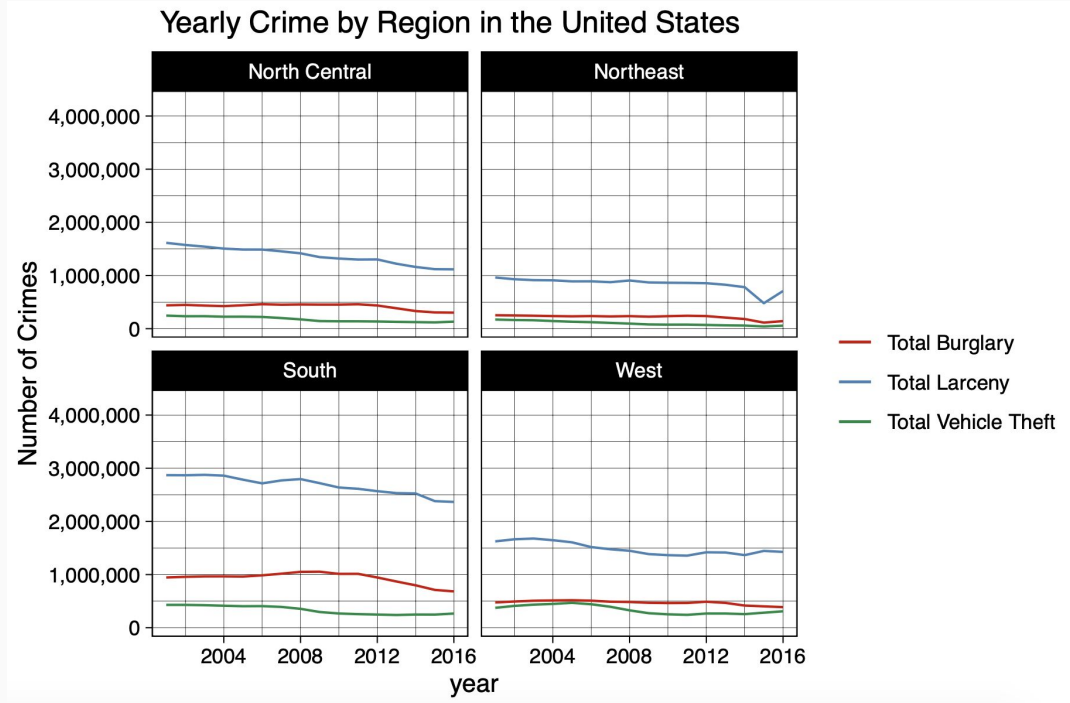
How Does Policy Affect Incarceration?

- In 2012 the FBI changed their definition of rape
- How does the change in definition affect number of prisoners convicted for rape?
- Obvious impact on statistics… While it's a small example, it supports theories on incarceration that emphasize the role of laws and policies on the number of people incarcerated rather than the actual number of crimes committed.

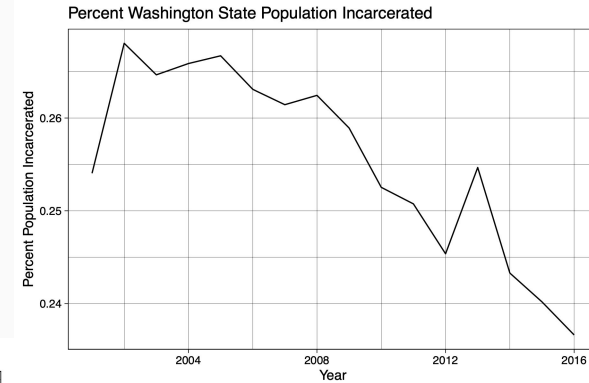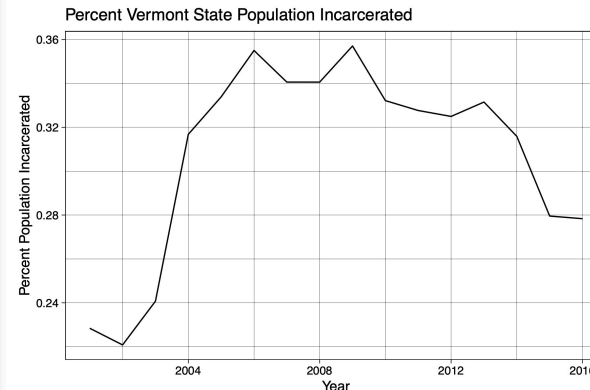Revising definition of rape in 2012 led to more rape convictions
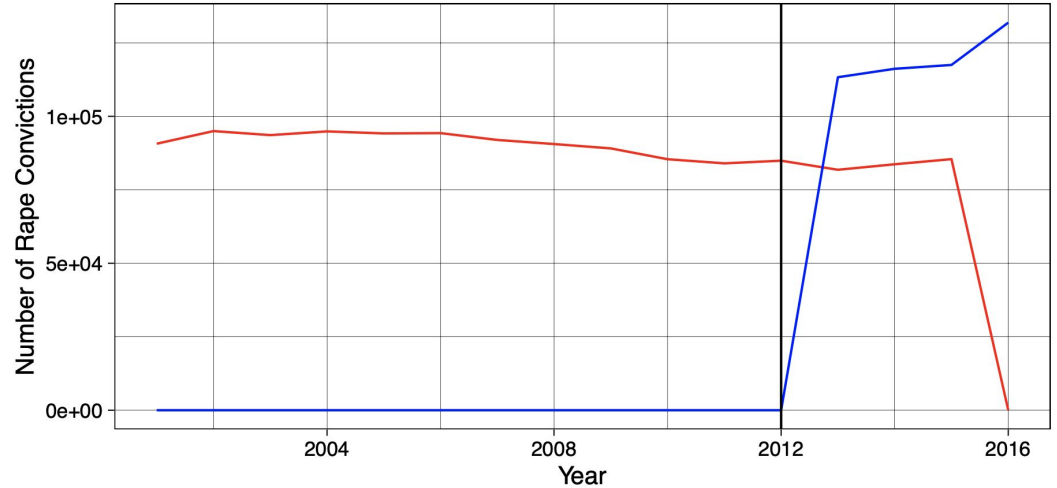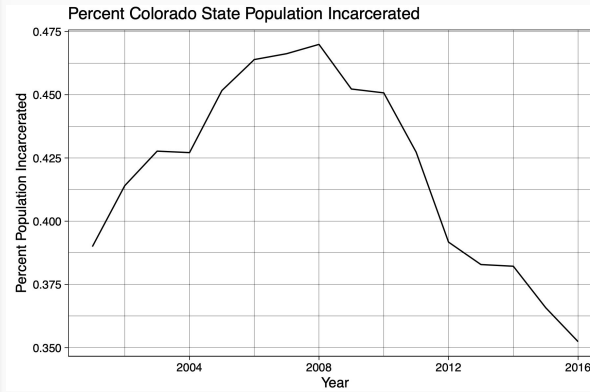
Red = Total Number of Prisoners convicted of rape by the Legacy Definition in state custody

Blue = Total Number of Prisoners convicted of rape by the Revised Definition in state custody

Does recreational drug legalization impact incarceration?

- Vermont and Washington state show strong evidence for a sharp decline in incarceration after recreational drug legalization.

- Colorado is less convincing as the incarceration rate leading up to 2012 was already on the decline, however, the incarceration does not increase with recreational legalization

- Not enough to call it a causal relationship, but compelling evidence.

Percent Colorado State Population Incarcerated

Percent Washington State Population Incarcerated

Percent Vermont State Population Incarcerated

Future of Issue Using Predictive Modeling

- We created a linear model to extrapolate and make predictions for after 2016 and compared these predicted numbers to the actual statistics from 2017, 2018, and 2019.
- The top statistic implies that all else held constant with each passing year, the percentage incarcerated in the United States is expected to decrease by about .002%.
- The actual data slightly underestimates the % incarcerated in the United States when extrapolated.

```
## # A tibble: 2 x 2
##   term          estimate
##   <chr>            <dbl>
## 1 (Intercept)   5.03
## 2 year         -0.00230
```

pred. % incarcerated = 5.03374618 - 0.00229865(year)

pred. % incarcerated in 2017 = 5.03374618 - 0.00229865(2017)
pred. % incarcerated in 2017 = 0.3973691
actual % incarcerated in 2017 = 0.4570901

pred. % incarcerated in 2018 = 5.03374618 - 0.00229865(2018)
pred. % incarcerated in 2018 = 0.3950705
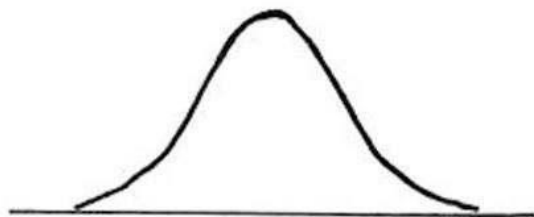actual % incarcerated in 2018 = 0.4496333

pred. % incarcerated in 2019 = 5.03374618 - 0.00229865(2019)
pred. % incarcerated in 2019 = 0.3927718
actual % incarcerated in 2019 = 0.4373857

Potential Issues With Our Project

- Discrepancy of jails vs. prisons in the dataset → we did not factor this into our analysis (no way to separate the two)
- Changes in how crime is reported in many states → would skew the data.
- For Kentucky and Illinois, there are multiple years where the crime totals are estimates rather than exact data → could skew our data and analyses
- For the linear regression models, other regression models (e.g. logistic modeling) may be better suited.

What We'd Do Next

- Research more policy changes that would give further insight as to why incarceration changes the way it does
- Find a dataset which includes drug crimes and explore the relationship between drugs and incarceration further
- Find demographic data among the prison populations in the various states so we can investigate the racial and socioeconomic disparities of mass incarceration

Thank you!