

Fatal Police Shootings

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Dataset Recap

| id | name | date | manner_of_death | armed | age | gender | race | city | state | signs_of_mental_illness | threat_level | flee | body_camera | longitude | latitude | is_geocoding_exact |
|----|---------------|--------|------------------|------------|-----|--------|------|---------------|-------|-------------------------|--------------|-------------|-------------|-----------|----------|--------------------|
| 3 | Tim Elliot | 1/2/15 | shot | gun | 53 | M | A | Shelton | WA | TRUE | attack | Not fleeing | FALSE | -123.122 | 47.247 | TRUE |
| 4 | Lewis Lee Le | 1/2/15 | shot | gun | 47 | M | W | Aloha | OR | FALSE | attack | Not fleeing | FALSE | -122.892 | 45.487 | TRUE |
| 5 | John Paul Qu | 1/3/15 | shot and Tasered | unarmed | 23 | M | H | Wichita | KS | FALSE | other | Not fleeing | FALSE | -97.281 | 37.695 | TRUE |
| 8 | Matthew Ho | 1/4/15 | shot | toy weapon | 32 | M | W | San Francisco | CA | TRUE | attack | Not fleeing | FALSE | -122.422 | 37.763 | TRUE |
| 9 | Michael Rod | 1/4/15 | shot | nail gun | 39 | M | H | Evans | CO | FALSE | attack | Not fleeing | FALSE | -104.692 | 40.384 | TRUE |
| 11 | Kenneth Joe | 1/4/15 | shot | gun | 18 | M | W | Guthrie | OK | FALSE | attack | Not fleeing | FALSE | -97.423 | 35.877 | TRUE |
| 13 | Kenneth Arne | 1/5/15 | shot | gun | 22 | M | H | Chandler | AZ | FALSE | attack | Car | FALSE | -111.841 | 33.328 | TRUE |
| 15 | Brock Nichol | 1/6/15 | shot | gun | 35 | M | W | Assaria | KS | FALSE | attack | Not fleeing | FALSE | -97.564 | 38.704 | TRUE |
| 16 | Autumn Stee | 1/6/15 | shot | unarmed | 34 | F | W | Burlington | IA | FALSE | other | Not fleeing | TRUE | -91.119 | 40.809 | TRUE |
| 17 | Leslie Sapp I | 1/6/15 | shot | toy weapon | 47 | M | B | Knoxville | PA | FALSE | attack | Not fleeing | FALSE | -79.991 | 40.413 | TRUE |
| 19 | Patrick Wett | 1/6/15 | shot and Tasered | knife | 25 | M | W | Stockton | CA | FALSE | attack | Not fleeing | FALSE | -121.299 | 37.93 | TRUE |

The Data was gathered by Washington post, and the data set contains records of every fatal police shooting in the United States since Jan. 1, 2015.

Source (Licensed): <https://github.com/washingtonpost/data-police-shootings>

Other Supplementary Datasets

- **State Population** (year 2010 to 2019): Because it does not contain the state population in year 2020 and 2021, we would use year 2019 state population for 2020 and 2021 state population.

https://www.census.gov/data/datasets/time-series/demo/popest/2010s-state-total.html#par_textimage_500989927

- **State id:** <https://gist.github.com/dantonnoriega/bf1acd2290e15b91e6710b6fd3be0a53>

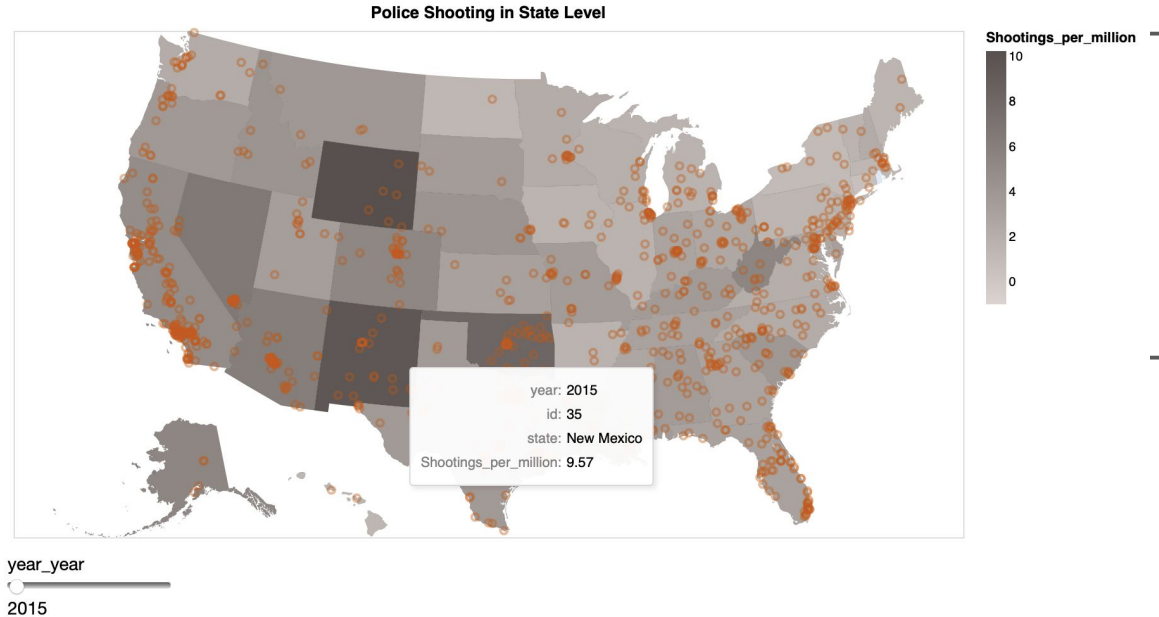
- **US Population by Race:**

https://archive.ph/20200213004951/https://factfinder.census.gov/bkmk/table/1.0/en/ACS/15_5YR/DP05/0100000US#

Visualization Objectives:

- What is the fatal police shooting trend over the Years?
 - Geospatial: Choropleth Map + Dot Map
 - Shooting Trend over Years: Line Chart + Bar Chart
- Detailed Analysis
 - Stacked Bar Chart Armed Type By Race
 - Explore the Correlations between attributes (Bar charts)

1) Choropleth Map + Dot Map

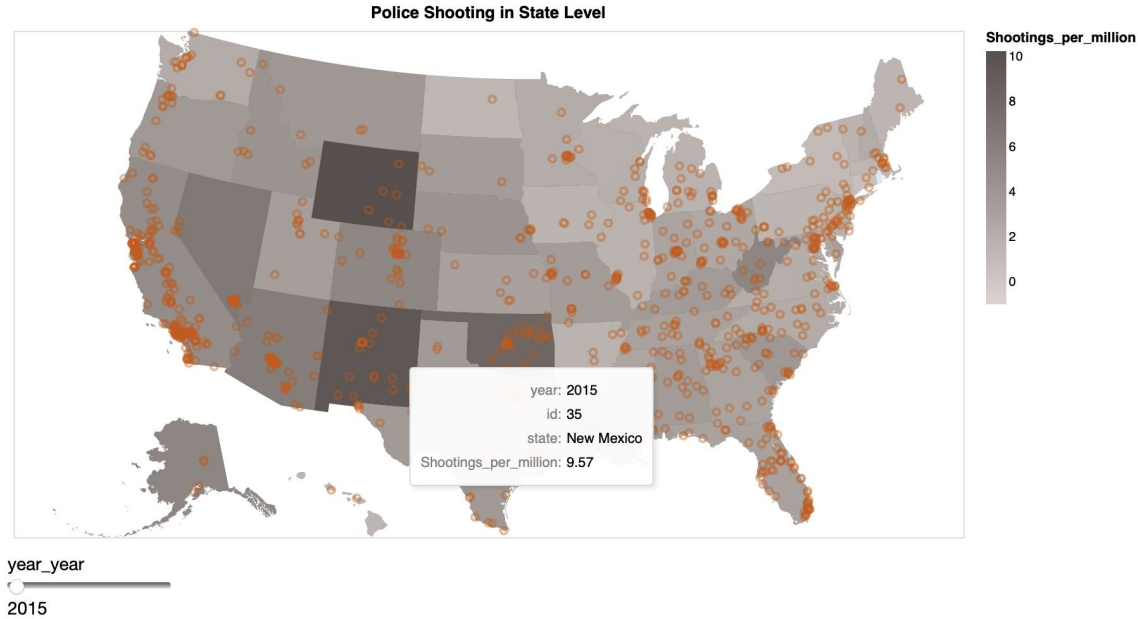


Choropleth Map:

- Continuous and Sequential Single-Hue Scale
- Darker color indicates a higher shooting per million in that state in the given year.

- Dot Map

- Each year's shooting instances are represented by orange circles on the map.



Channel:

- Color
- Position

Marks:

- Area
- Circle

Preattentive Features:

- Hue (color)
- Intensity

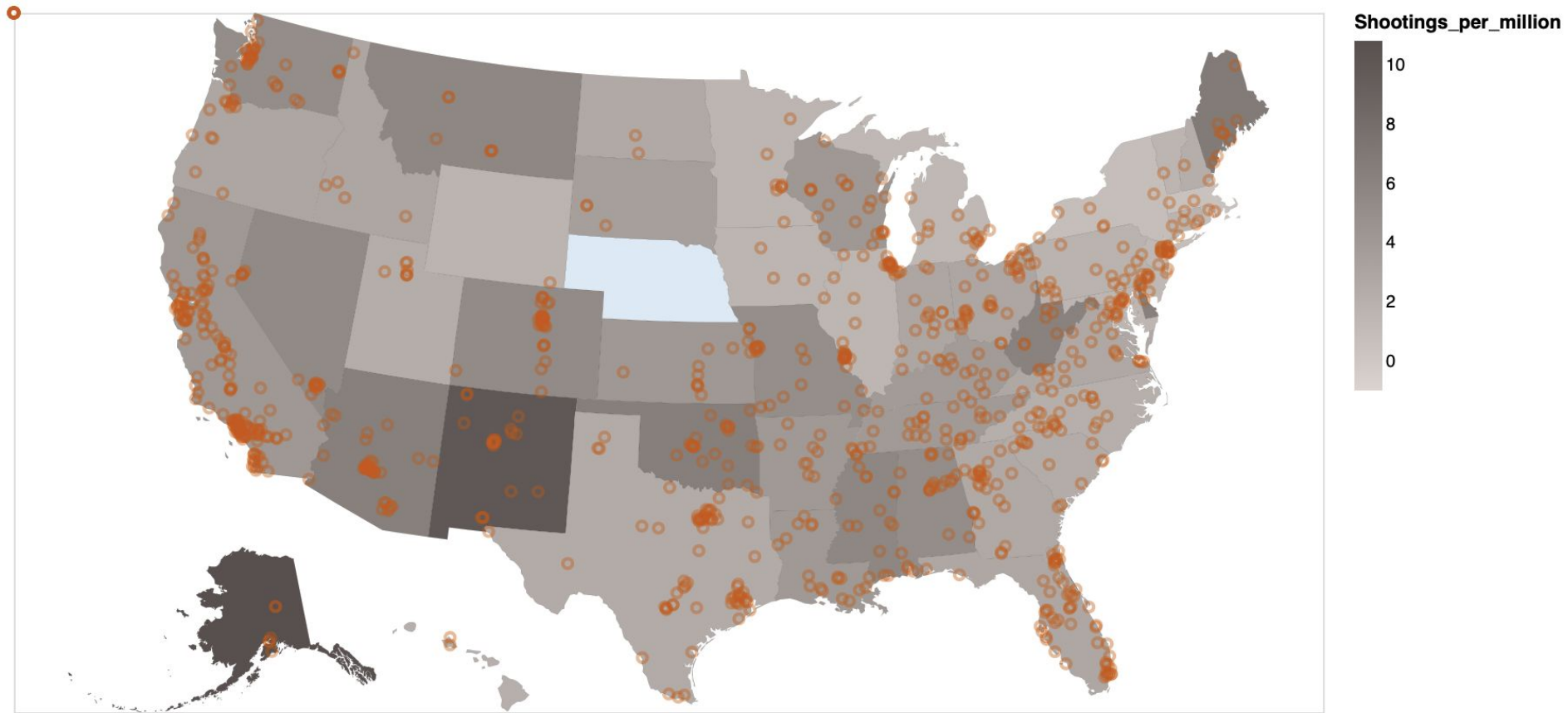
Gestalt Principle:

- Similarity
- Proximity: Dots

Interaction:

- Year slider
- Tooltip

Police Shooting in State Level



year_year



2017

Police Shooting in State Level

Shootings_per_million

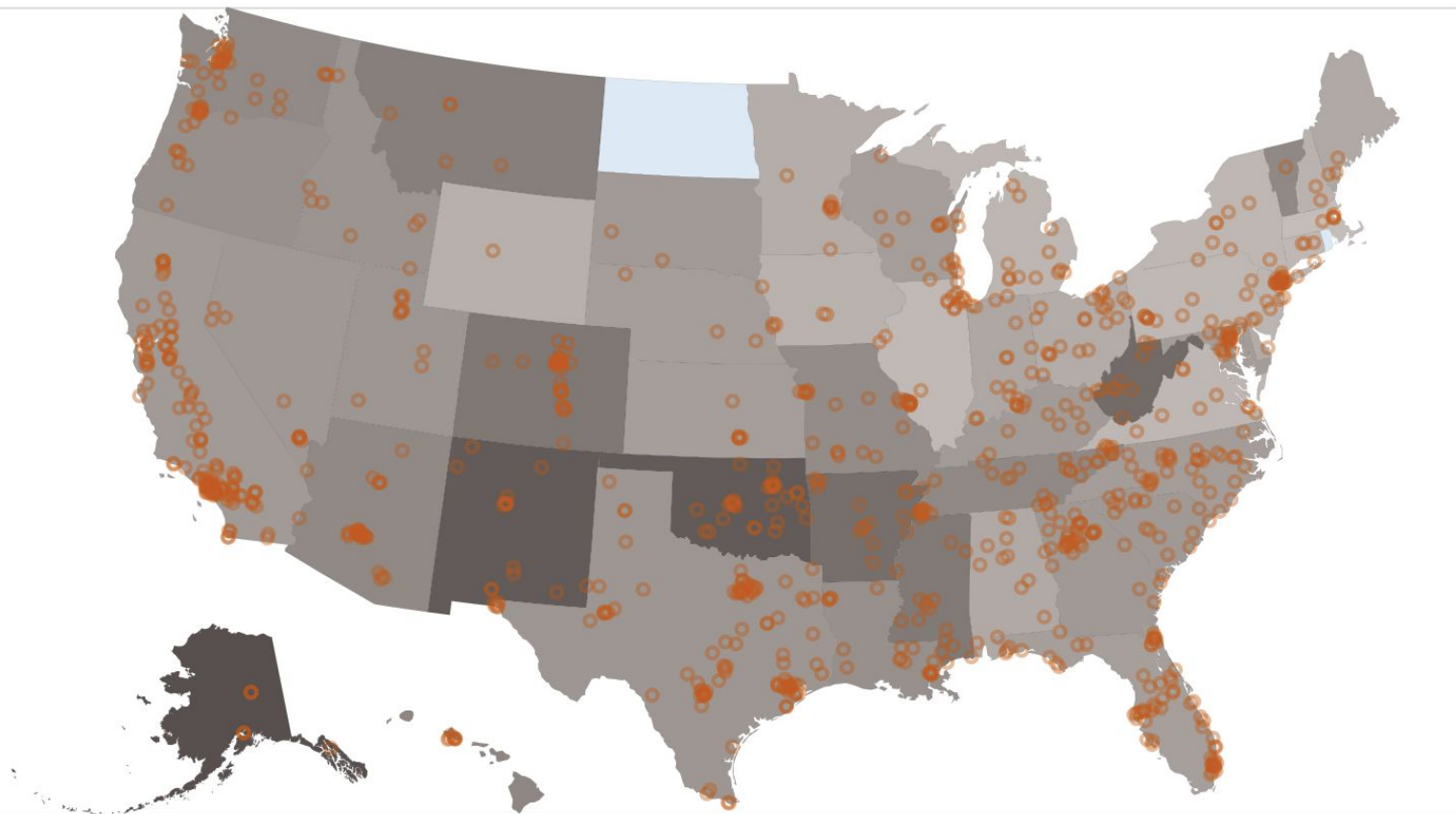
8

6

4

2

0



year_year

2019

Police Shooting in State Level

Shootings_per_million

10

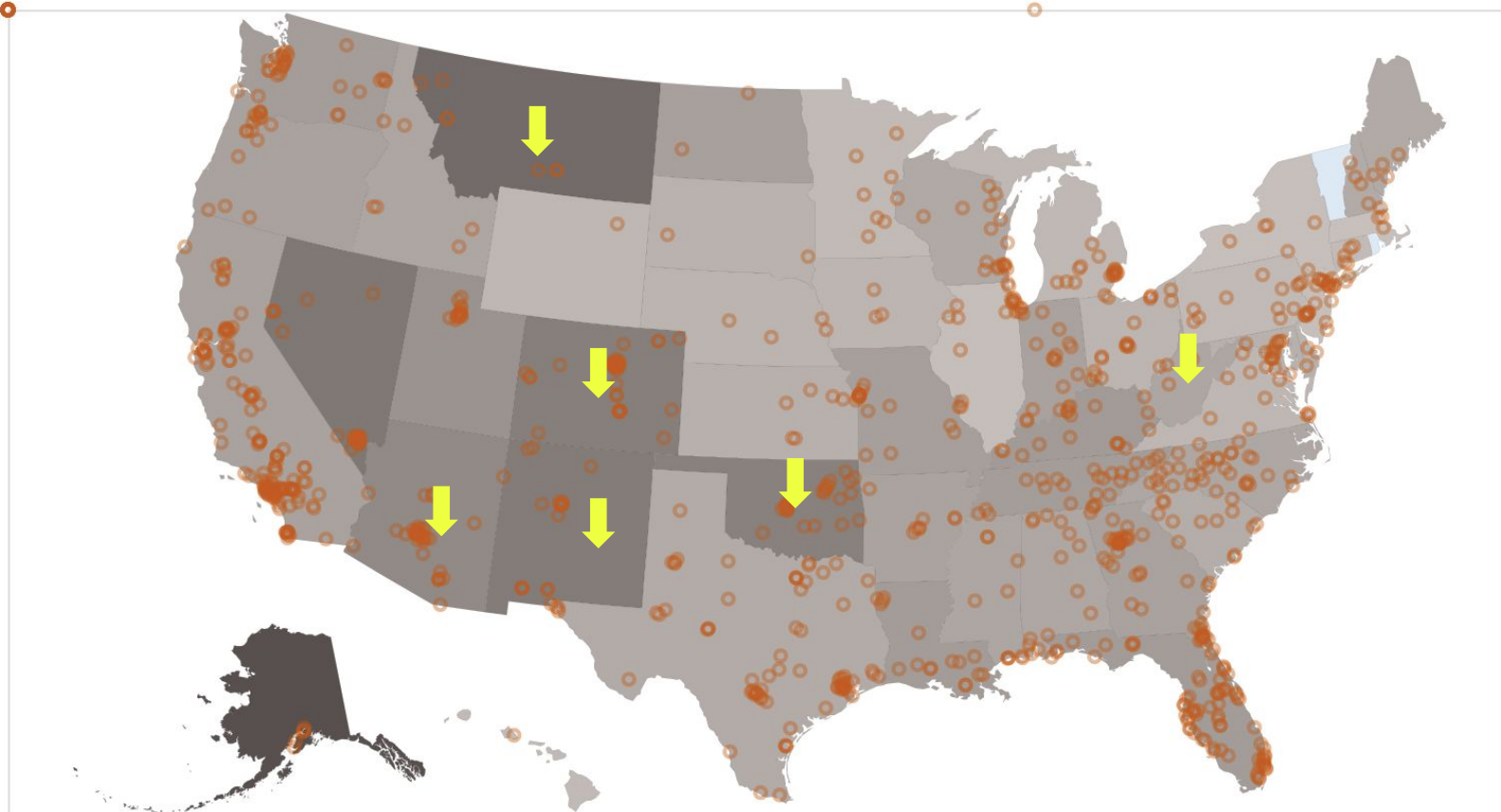
5

0

year_year

States: New Mexico , Colorado, Arizona, Oklahoma, Montana, West Virginia

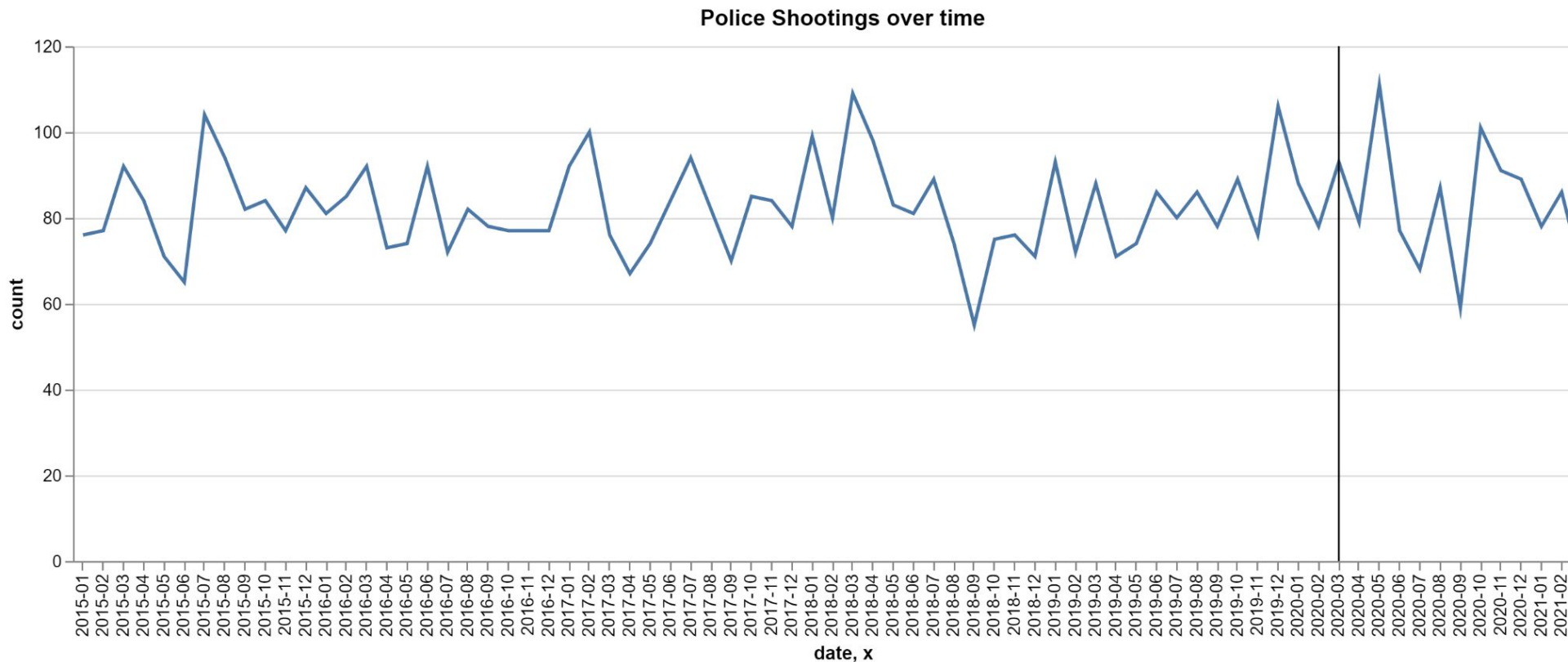
2020



Trend Analysis

- The Question to be investigated: Does the outbreak of Covid-19 increase the number of shootings happened in United states?
- Plausible because
 - Economic aspects for increasing violent behaviors :
 - Unemployment rate has been surged after the outbreak of the pandemic
 - Disastrous stock market/ Many people lose money in their investment.
 - Social aspects
 - People are not happy or angry with how the government is handling the pandemic
 - Escalating tension among groups of people
 - Election year and social movement
- All factors listed above suggest that the shooting number should spike after covid started to spread !

2) Visualize: total number of cases over years

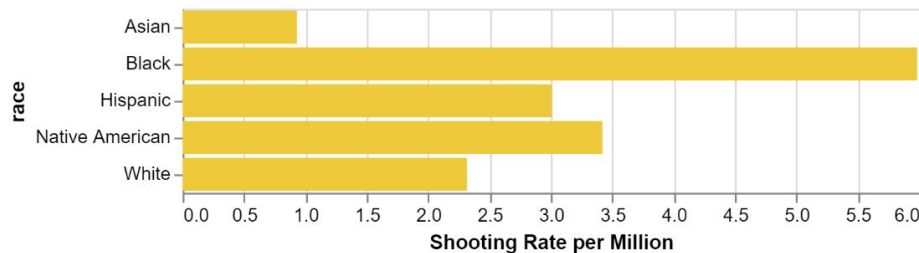
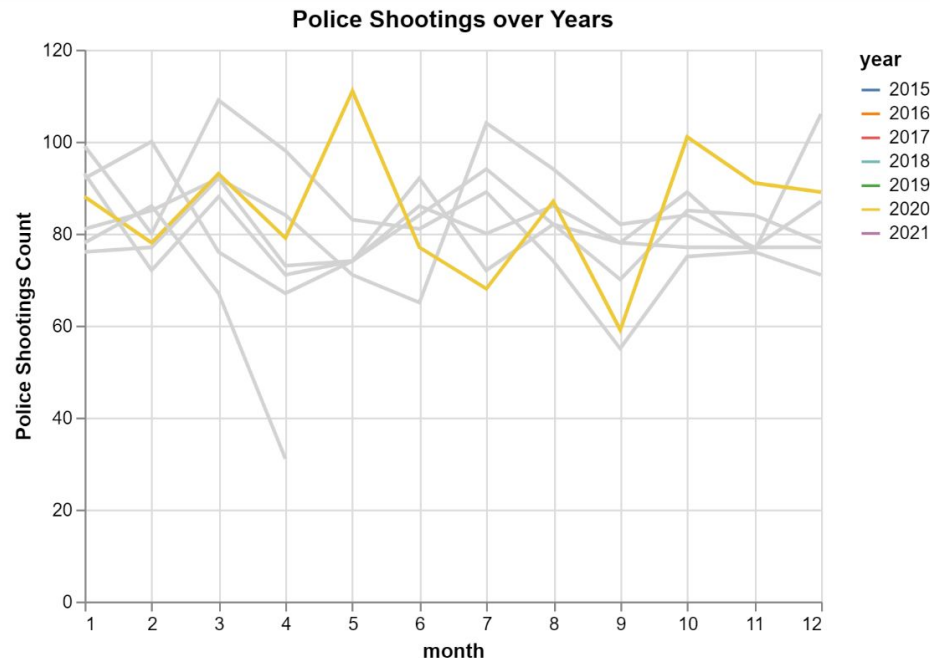


The answer to that question....

- NO
- The fact is the shooting rate is more or less consistent with that of previous year despite the factor we just mentioned.

But We have a interesting finding !

- The shooting rate is normalized
- Average rate over the year is steady but the shooting rate for Black people is much higher than that of other races.
- Whereas the shooting rate for Asian population is the lowest.

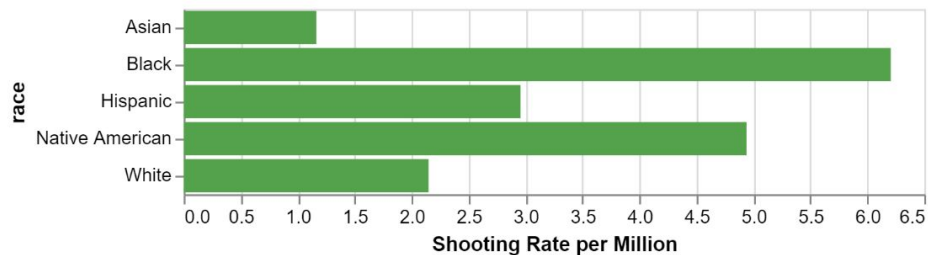
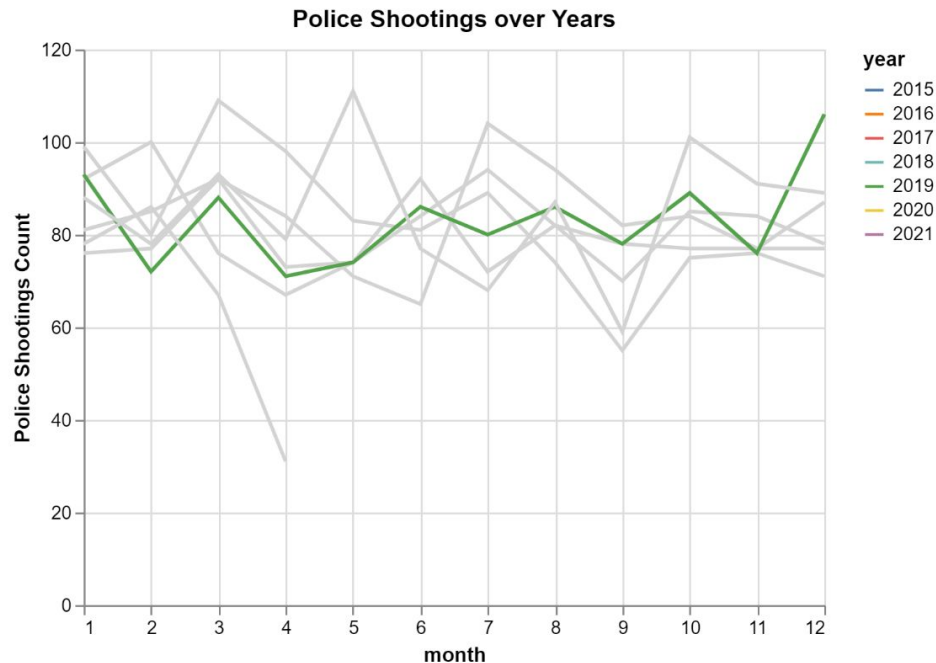


Select_year 2020 ▾

Wait, Did the pattern stay the same for last couple of years?

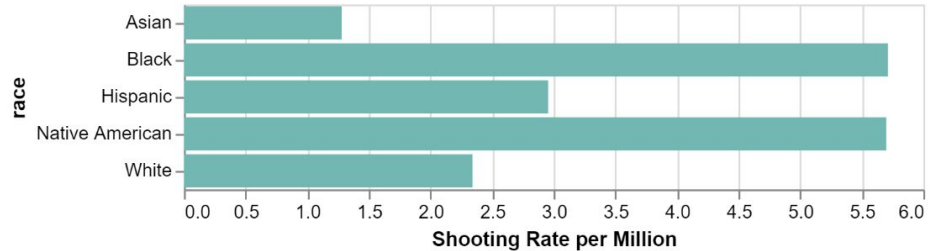
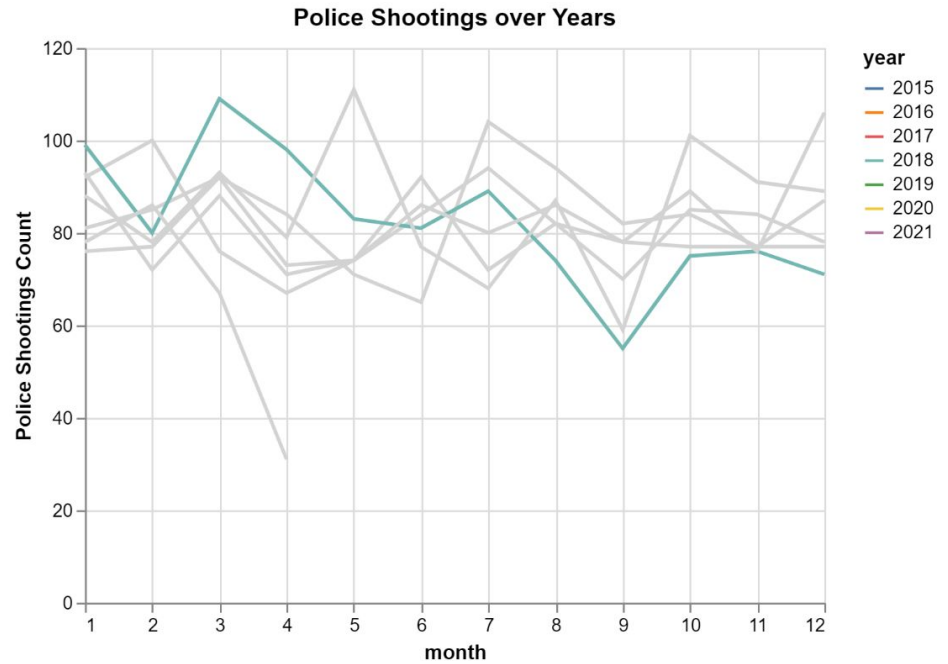
Yes, The huge difference in shooting rates is still there !

But one more interesting finding: the native Americans seems also suffer from a very high shooting rate!



Select_year

- Pattern still persist for 2018
- Preattentive Feature: Hue, length
- Gestalt Principle: Similarity, Proximity
- Channel: Color, position, length
- Marks: Line, bars



Select_year 2018 v

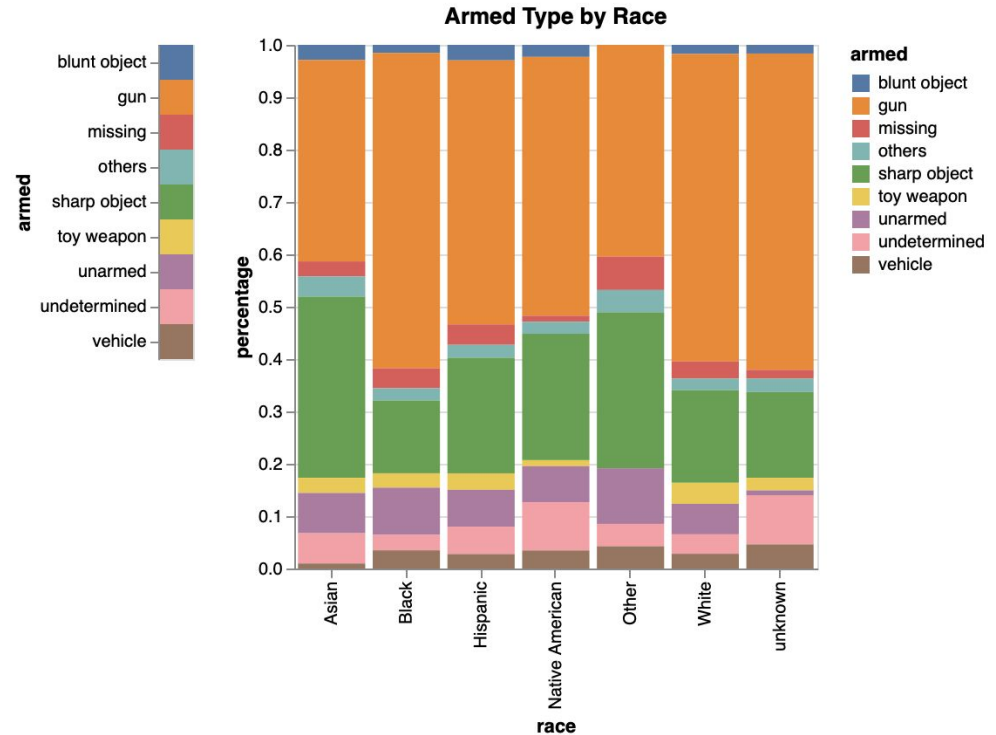
Reflections

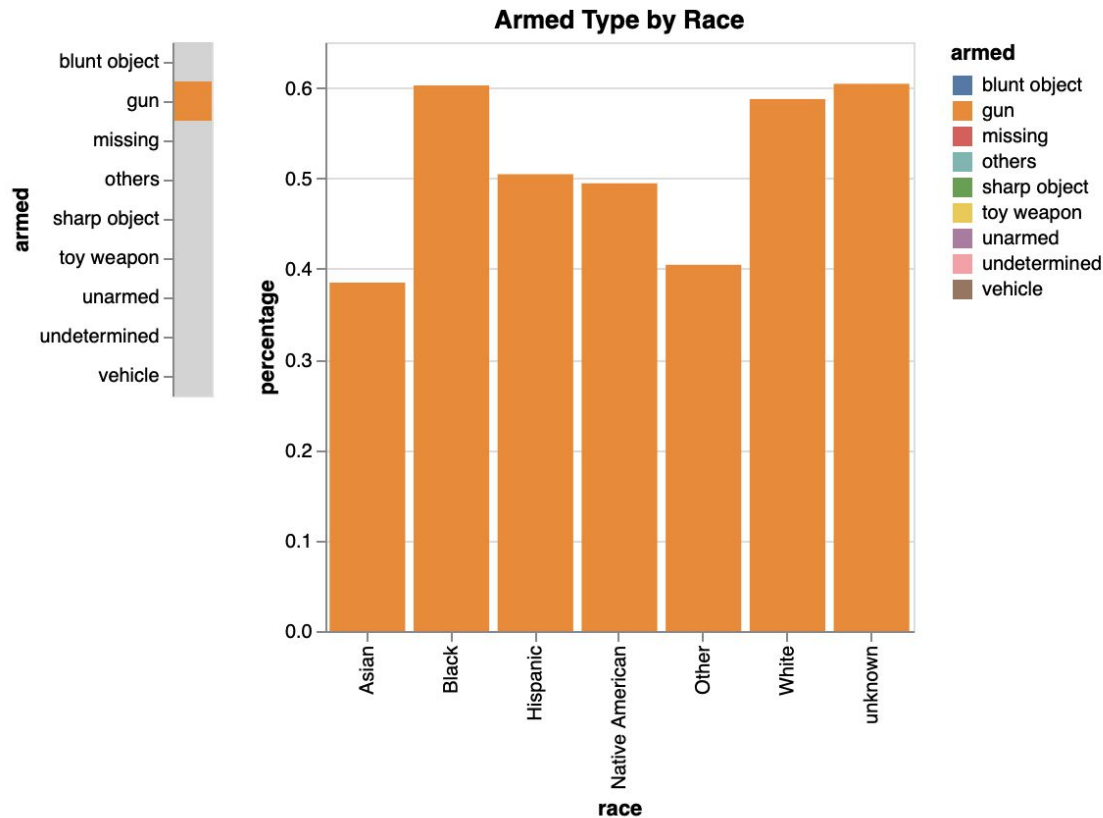
- The interactive features are really useful
 - Drop down menu for selecting years
 - Zoom and pan
 - Linking techniques: link the line chart with barchart

3) Stacked Bar Chart of Armed Type By Race

Demonstrate the distribution of each race's armed type in all police shooting instances from 2015 to now.

Interactive: multi-selection bar



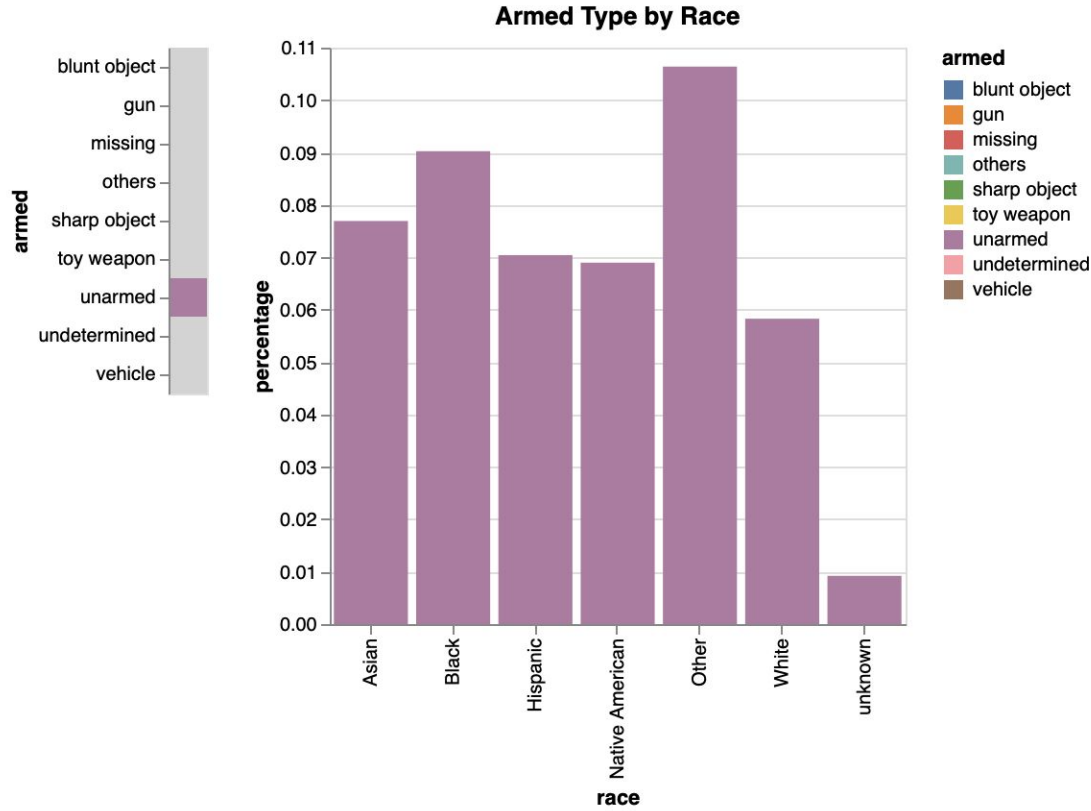


Channel: Length

Mark: Bar

Gestalt Principle: Similarity

Asians are less likely to hold guns compared to other race; while Whites and Blacks are more likely to hold guns.



Among all police shootings since 2015, except the Others, Blacks are the least likely to be armed, while the shooting rate of Blacks is the highest (refer to visualization 2).

Explore some possible correlations !

we will be trying to answer what really makes the police officer to turn the body camera on during the shooting:

--- >Such question should be studied when discuss transparency of the law enforcement.

Look at two pairs of correlations

- 1) Body Camera status and Mental illness
- 2) Body Camera status When the officer is under attack

Chart 1

Body camera vs mental state of person who was shot by the police.

The area of orange on the right is slightly bigger than the area of orange on the left.

Police is more likely to turn the camera on when that person had some mental illness.

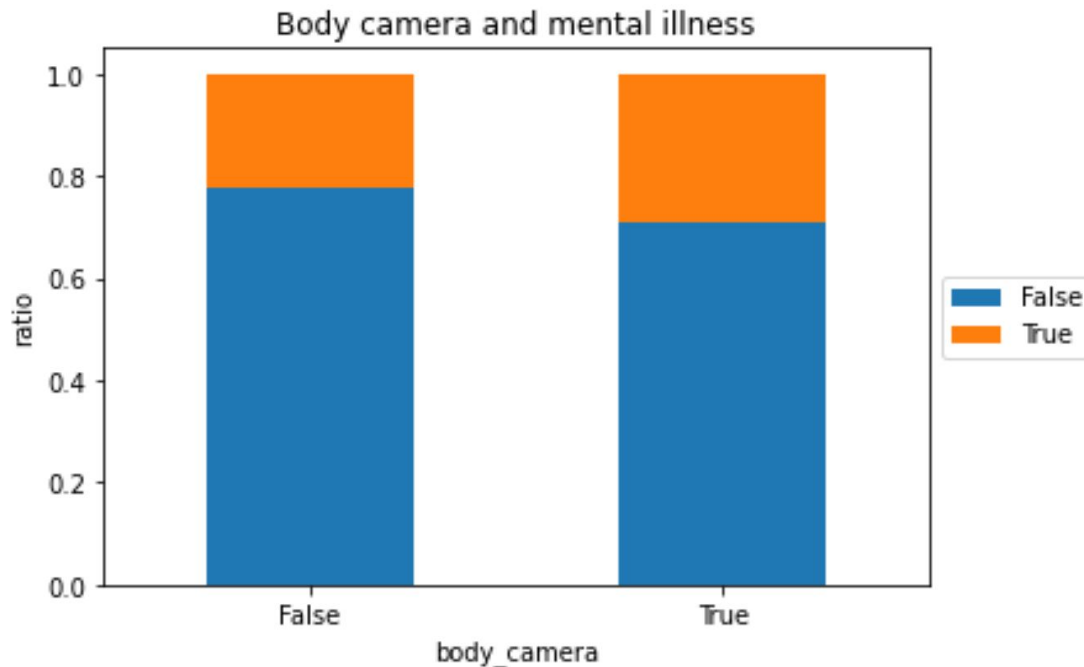
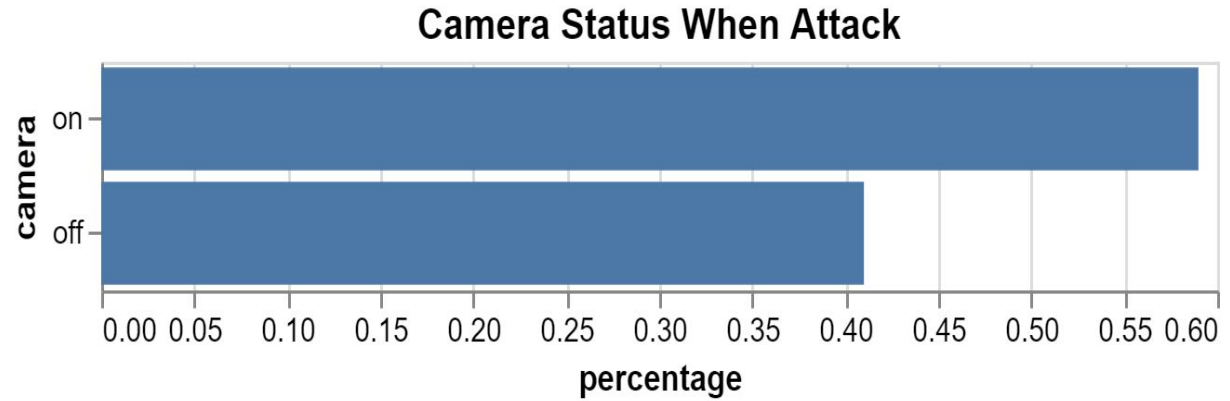


Chart 2

Body Camera status when attack happen

Police will likely to turn the camera on when the suspect is attacking the police.

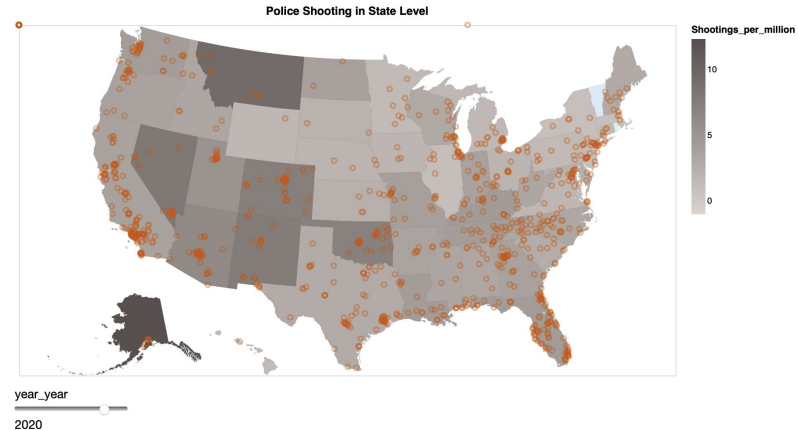


Some things to say...

- Correlation does not mean causality. This applies to the findings that we presented to you
- Other approaches rather than charts to interpret numerical difference: hypothesis/statistical testing. (p-value)
- Form a theory based on the differences in values and verify the theory carefully.

Challenges

- The dataset does not have state population in year 2020 and 2021; so we have to use 2019's state population as an approximation.
- Some geospatial data may not be accurate; a few dots positioned in the sea (out of the US territory map). Hard to debug.



Q&A

Thank you