African Americans and Police Killings: Investigating the link between socio-economic status and Black mortality at the hands of police.

Abstract

Police killings remain a controversial societal issue in the United States of America. African Americans are overrepresented in annual statistics documenting fatal encounters with law enforcement officers, despite making up only 13% of the total population. What then is the most prominent driver of this phenomenon? In this paper, we investigated the apparent link between socio-economic status amongst African Americans and the likelihood of being killed by law enforcement officers. We made three inferences by applying ANOVA and exploratory data analyses on a 2015 dataset from FiveThirtyEight. First, African Americans are disproportionately affected by police killings. Second, African Americans of higher socioeconomic status are significantly less likely to experience a fatal encounter with the police. And lastly, there is a statistically significant difference between mean household income among African Americans and White people killed by police. Thus, we propose that a broader conversation on federal socio-economic policy needs to happen to alleviate this societal injustice.

Background

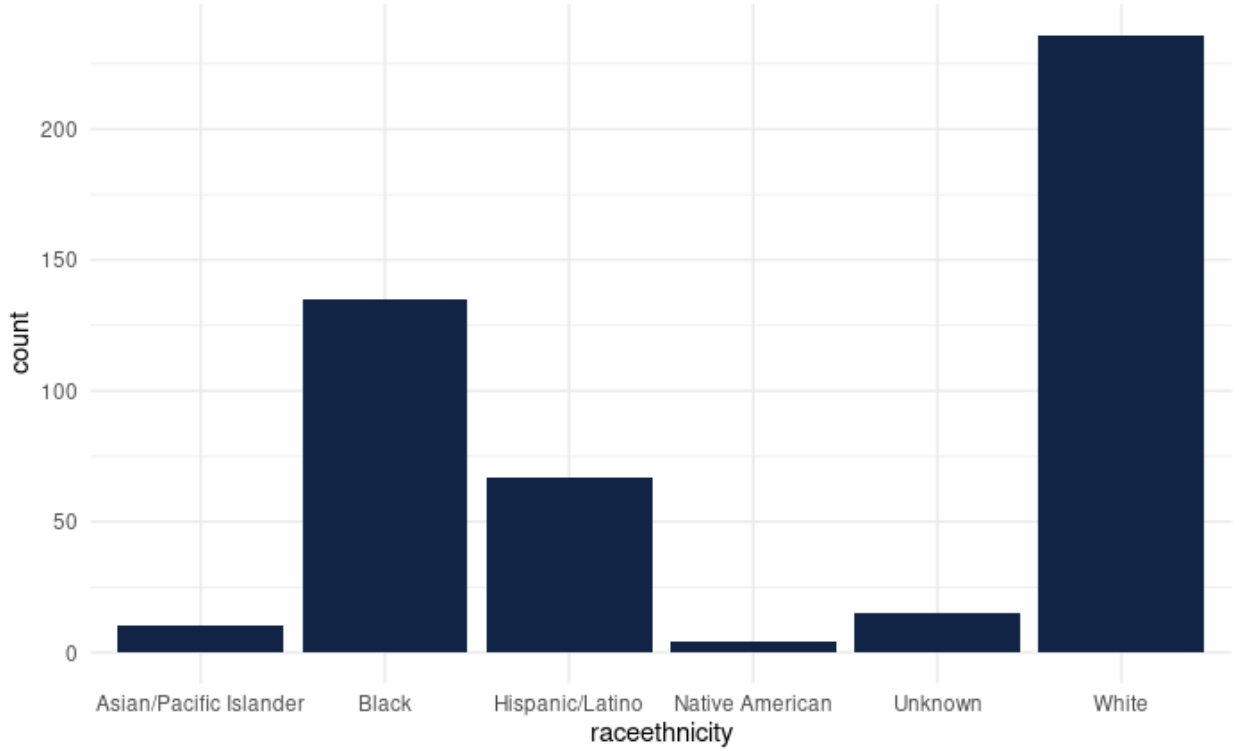
Why are African Americans more susceptible than other races to police killings? Is socio-economic status a factor? How do Black victims compare with other racial groups in terms of status? Answering these questions may help researchers, activists, and policymakers understand the problem and conceive feasible solutions. We skimmed through numerous articles and sources, eventually coming across an intriguing article by The Guardian titled "The Counted." This article contained a link to a dataset with all documented police killings in the US from January 2015 to June 2015. We analyzed this dataset using R.

Method

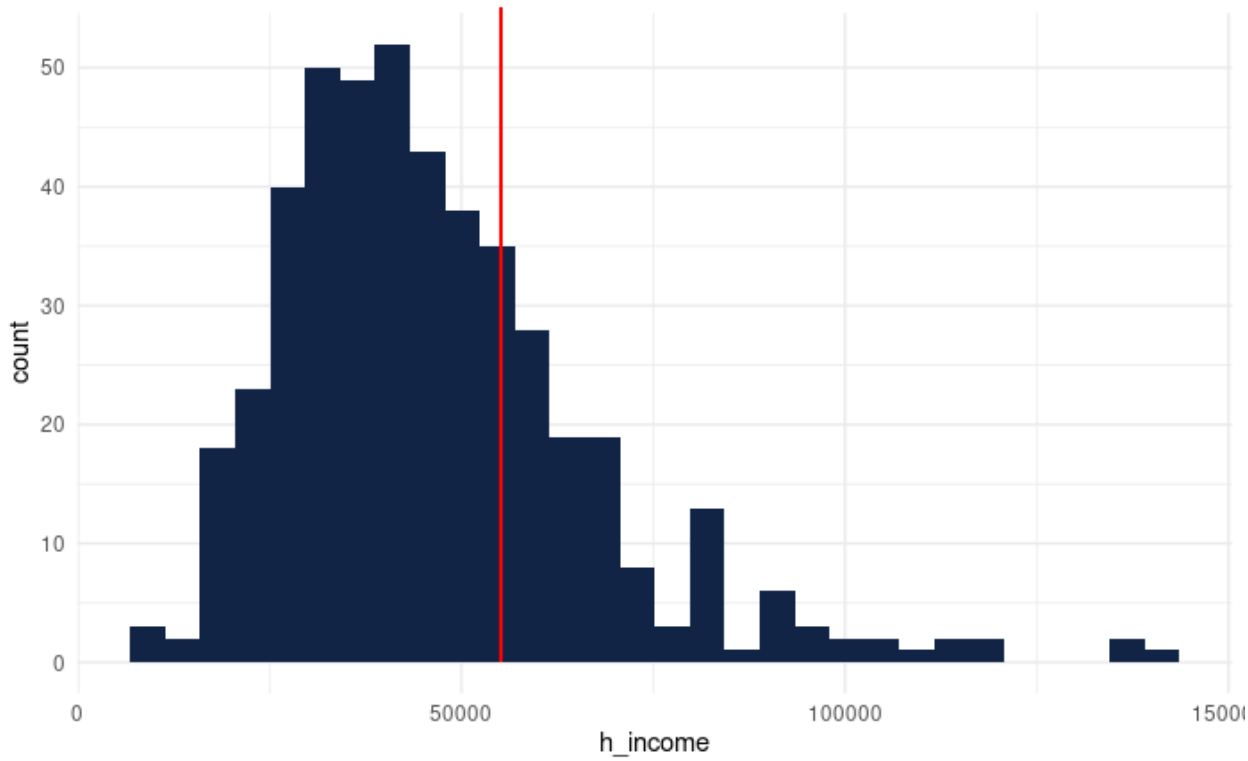
We obtained the dataset from the Guardian, which contains 467 records of fatal police encounters which occurred from January 2015 to June 2015. The dataset comprises detailed information about each death, with variables including median household income of the census tracts where the killings took place, unemployment rate, and personal income. As our analyses progressed, we eventually filtered the dataset only to include African Americans. We also made use of Census Information for the US population in 2015.

Results

1. In our first analysis, we performed a one variable E.D.A on the variable race _ethnicity to determine the proportion of each race in the dataset. Consistent with pervasive societal sentiments, Black people are disproportionately affected by police killings.
   15 of the records had missing ethnicities, so we obtained 452 records in total. Of these, 135, or approximately 30 percent, were Black. This result highlights the racial discrepancies, as Black people account for only 13 percent of the population.



2. For our second analysis, we filtered the dataset to obtain only the records of African Americans (135 in total). Of these, we performed a one variable EDA of tract-level median household income for the neighborhoods where Black individuals were killed:



Median household income($56,516).

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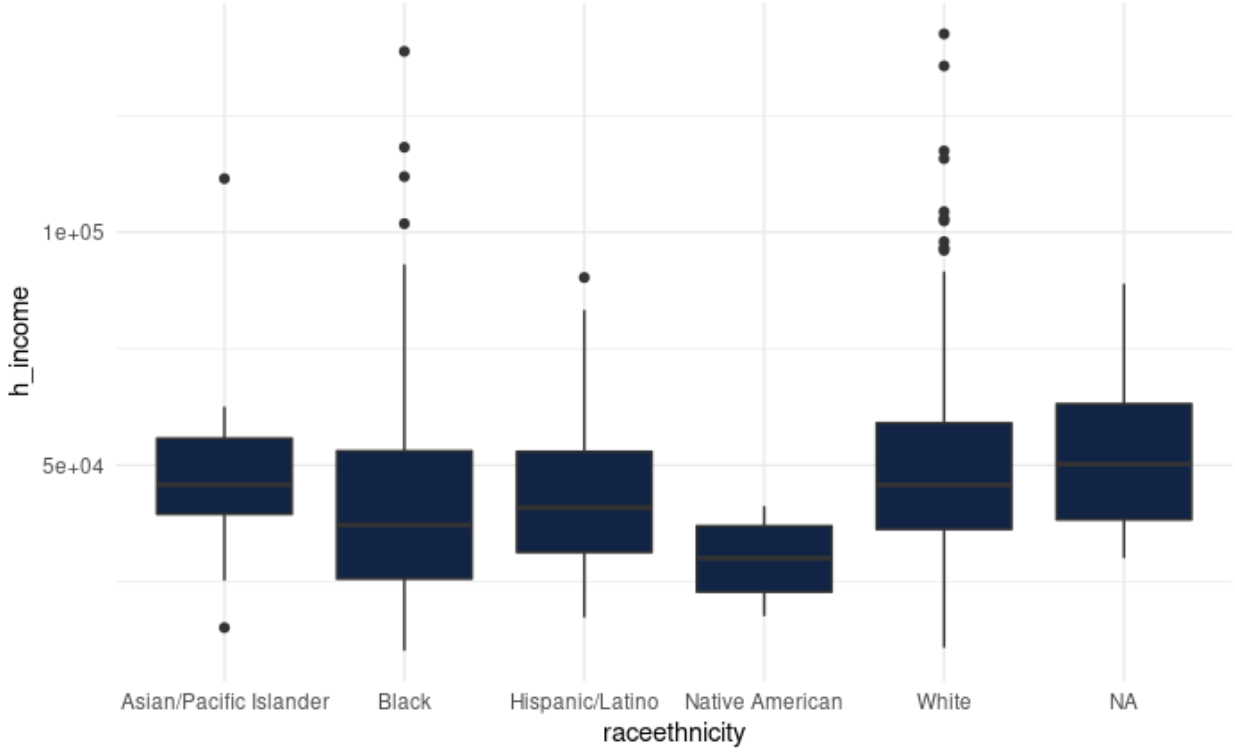
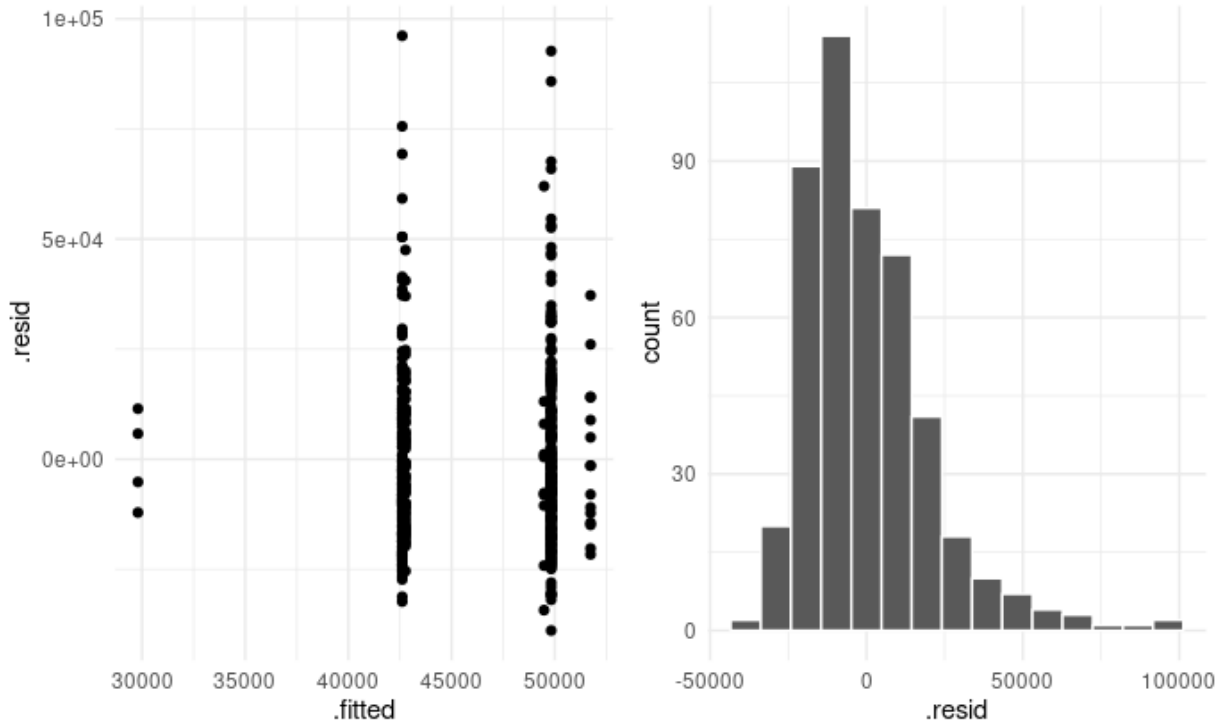
The result shows a skew to the right with a few outliers. It is evident that most of the victims were killed in poor neighborhoods. Using income data from the 2015 Census, we found that police killed 108 of the 135 Black victims (80%) in census tracts with median household income below the national average($56,516).

3. Our next step was an ANOVA analysis to investigate differences in the means of neighborhood median incomes across racial groups within the dataset.



Checking assumptions .



Using the Bonferroni correction, we identified which groups (if any) have statistically significant differences from one another.

$\alpha^* = 0.05/ 15 = 0.0033$

After performing a pairwise comparison using t-tests with pooled SD, we found the following:

Groups with statistically significant differences are Black and White since the p-value = 0.001, which is less than 0.0033

Reject the null hypothesis that tract mean household income for white victims = tract mean household income for black victims.

Conclude that mean household income is significantly different between Black and white people killed by police, and fail to find a significant difference in mean household income among other racial groups.

Conclusions

Our analysis verifies that African Americans are indeed disproportionately affected by police killings. Furthermore, killings of African Americans tend to occur in poorer neighborhoods, showing a link between socio-economic status and police killing rate. Our Anova also highlights the disparity in household income between Black and White victims. This shows an urgent need to address the socio-economic state of African Americans in the country.

Limitations

- The dataset is not a random sample
- Our Anova model does not show equal variance
- Some of the killings may not have taken place in the area of residency of the victim.
- The Guardian(database collector) determined the race/ethnicity of people killed from several sources," including police and coroners' reports, voter registration data, witness testimony, court records, and photographs. However, some of the records may be inaccurate."

Appendix

The Null hypothesis for the relationship between variables race_ethnicity and h_income

H0 = mean Asian/Pacific Islander = mean Black = mean Hispanic Latino = mean Native American = mean White = mean N/A

HA: At least one mean is different.

Checking Assumption for residual vs fitted graph

- Independence. The police records are independent.
- Normal residuals. There is a slight skew to the right, but there is some degree of normality.
- Equal variance. The variance does not appear to be equal as some differences in the spread are visible. This may be the limitation of our analyses attributed to problems with the sample."

Pairwise Comparisons using t-tests with pooled SD

	Asian/Pacific Islander	Black	Hispanic/Latino	Native American
Black	0.303	-	-	-
Hispanic/Latino	0.330	0.958	-	-
Native American	0.102	0.215	0.216	-
White	0.958	0.001	0.0012	-

P-value adjustment method: bonferroni

References

- https://www.census.gov/library/publications/2016/demo/p60-256.html
- http://fivethirtyeight.com/features/where-police-have-killed-americans-in-2015
- https://www.causeweb.org/usproc/usclap