Racial Disproportionality of Police Shootings in the United States

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I.   Introduction

During the last year, a lot more attention has been put on the racial disparities of police shootings of American citizens. Way too often we see in the news that yet another innocent black person has been shot by the police. This goal of this project is to extract information from data that proves that black people are being shot and killed by the police at disproportionate rates to white people relative to the fraction of their populations in the United States. Another goal of this project is to also show just how alarming the amount of unarmed people the police are killing amongst all races, and how rarely these officers face criminal charges.

II.   Related Work

A previous study has shown that police killings occur more often in poor neighborhoods and neighborhoods where the proportion of black people living there is high [1]. However, the study does point out the fact that this doesn't say as much about policing in these neighborhoods as it does about racial inequality in the United States. This article states how the shootings that we have been seeing in the news happen anywhere—not just in these poorer neighborhoods.

Another study using the same data uncovered where in the United States there are the highest racial disparities in arrests and killings. They found that in Washington D.C., a black person was thirteen times more likely to be killed by police than a white person [2]. Even more horrific, they found that in Chicago, black people are killed at a per-capita rate twenty-two times higher than the rate for white people. The article says that their findings do not prove that police departments in these cities are corrupt or unlawful, but they do show red flags in certain areas of the United States, and they suggest that the Biden administration open some investigations on these departments.

III.   Datasets

Two data sources were used for this study. The first is the data from the studies mentioned above. This is the Police Killings dataset posted publicly on GitHub, which was created using data from the Guardian's database on police killings, as well as census data from the American Community Survey. This data has 34 columns describing people who were shot by the police. Some of these descriptors include age, gender, race/ethnicity, income, and whether or not they were armed. The data is from only a portion of the year 2015.

The second dataset was extracted from the database from mappingpoliceviolence.org. The information in this database comes from what they claim to be "the three largest, most comprehensive and impartial crowdsourced databases on police killings in the country." These databases are from FatalEncounters.org, the U.S. Police Shootings Database, and KilledbyPolice.net. Only the data from the year 2015 was used from this database. This data provides more details about police killings, such as whether charges were pressed against the officer, if the officer was wearing a body camera, and what the alleged threat level was.
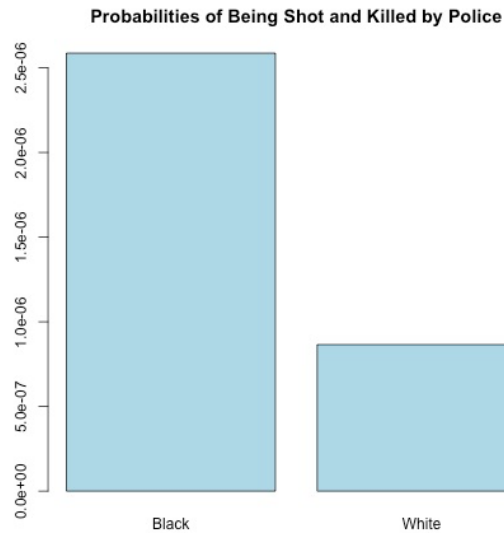
IV.   Methods

Most of the summary statistics were created by filtering the data into subgroups and calculating what percent of the shootings were in that subgroup by dividing it by the total number of shootings. The probabilities of certain groups being shot by the police were calculated by taking the number of shootings for that group and dividing it by that group's population.

In order to predict whether or not a policeman would be charged for shooting and killing a person, decision tree classification was used. A decision tree falls under the category of supervised machine learning. The data was split into training and testing data, and the training data was used to predict whether or not there were charges for each entry in the testing data. The decision tree will determine what factors are likely to cause a policeman to be charged for a shooting and use that information for prediction.
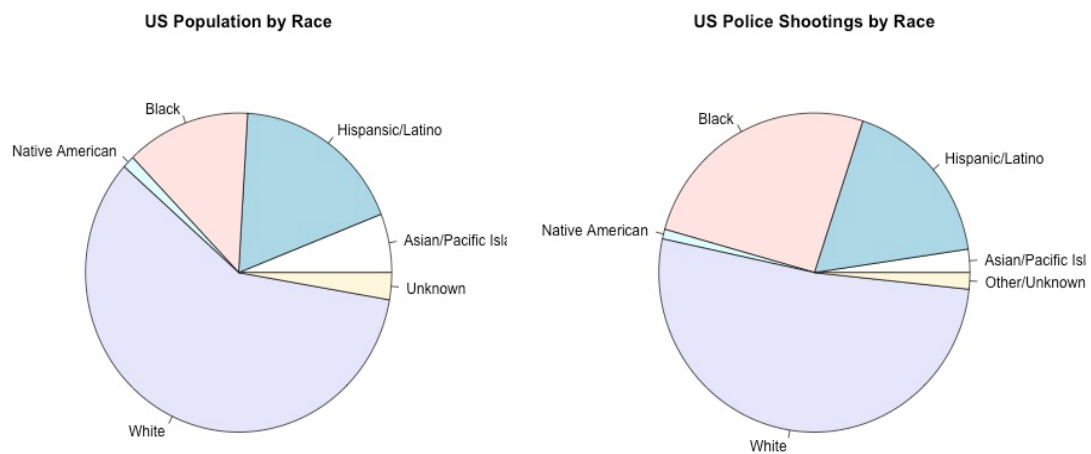
V.   Results and Discussion

The statistics from the FiveThirtyEight articles [1,2] were confirmed, as well as multiple other statistics. As the article from [1] said, 30% of police killings occurred in the tracts that are on the bottom 20% in terms of household income. It was also confirmed that over 40% of black Americans who were killed were killed in these poorest tracks.

After confirming results from previous studies, the data was filtered to create a new dataset for only the police shootings. Other causes of death of people killed by the police include dying in custody, taser, and struck by vehicle. Due to the overwhelming amount of black Americans we have seen being shot by the police in the news, the rest of the project was performed only on data where the cause of death was a gunshot.

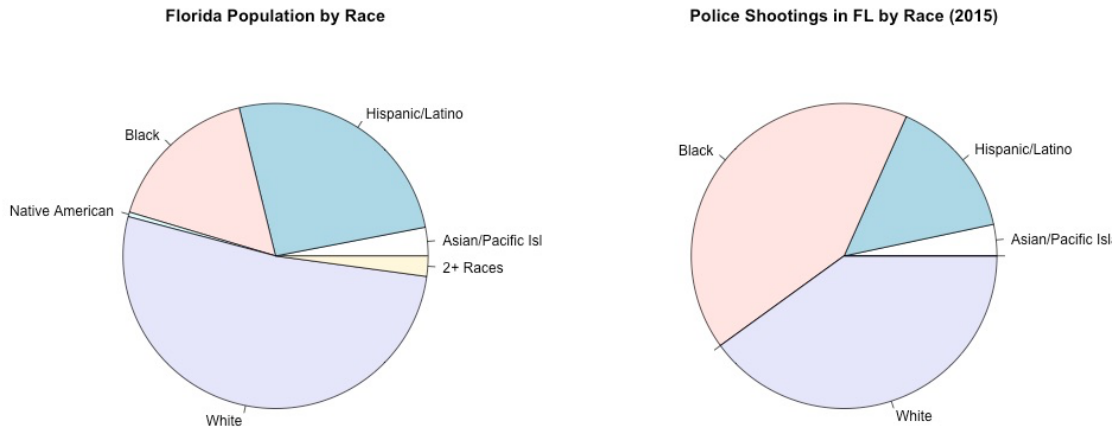**Probabilities of Being Shot and Killed by Police**

When comparing the probability of being black in America to the probability of being shot by the police as a black person, we find that it is almost three times more likely to be shot as a black American than as a white American. Of the 411 people that were shot and killed by police in the first half of 2015, 110, or 26.8% of them were black. Keep in mind that only 13.4 % of the population is black or African American, according to Census data. It was also calculated that black people are arrested at a rate 2.26 times higher than white people, and a black person is 1.27 times more likely to be shot if arrested.

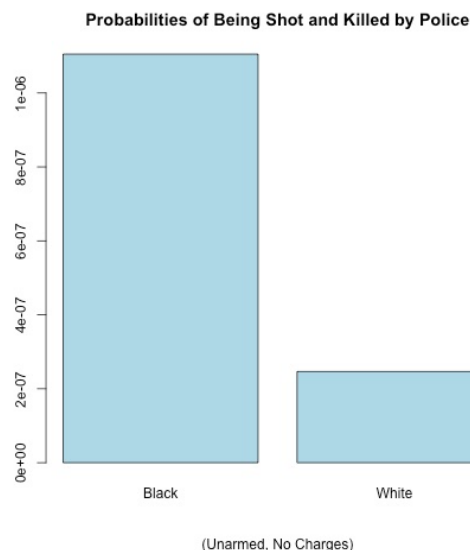**US Population by Race**

US Police Shootings by Race

Next, we examine the racial disparity of police shootings in the state of Florida specifically. Florida is one of the few states where more black people were shot and killed by police than white people. The majority of the population of Florida is white, followed by

Hispanic/Latino, and the black population is fairly similar to that of the US at 16.9%. In 2015, the police in Florida shot and killed 25 black people and 24 white people. This leads us to calculate that in 2015, it was six times more likely to be shot and killed by the police in Florida if you were black compared to if you were white.

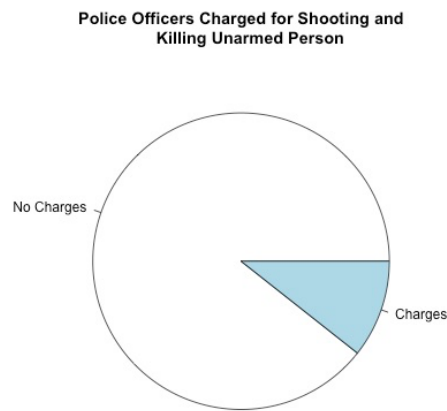Florida Population by Race

Police Shootings in FL by Race (2015)

Another alarming statistic found was that 23.8% of white individuals and 29.1% of black individuals who were shot and killed were not armed. Looking at the data from mappingpoliceviolence.org for all of 2015, 55 white American and 39 black Americans died from a gunshot from a policeman, even though they did not have a weapon. None of the officers were charged with criminal charges. Comparing the numbers of these unarmed individuals who were killed to their populations, we find that it is almost four and a half times more likely for an unarmed black person to be shot and for the officer to receive no criminal charges than it is for a white person.

Probabilities of Being Shot and Killed by Police

(Unarmed, No Charges)

Next, we develop a classification tree to predict whether or not a police officer will be charged for shooting and killing a person based on the other descriptors of the incident. The tree had a training error rate of 2.5% and the variables used in the formation of the tree were race, whether or not the policeman was off duty, whether or not the policeman had a body camera, if the victim was fleeing, if the victim was armed, and if the victim had signs of mental illness.

The testing error rate for the classification tree was only 1.9%. However, when we examine the tree, we understand why the testing error is so low. Every single outcome of the classification tree results in "No known charges." So, even if the police officer is off-duty, doesn't have a body camera, the victim is unarmed and not fleeing, it still predicts that the officer will not be charged with criminal charges. From the data from [4], only 2.3% of the officers had some sort of criminal charges, and 89% of the officers who shot and killed unarmed people did not receive any criminal charges. Some of those officers had the charges dropped, were acquitted, or had a mistrial, so in actuality, 91% of the officers didn't face any criminal charges.

Police Officers Charged for Shooting and Killing Unarmed Person

VI. Conclusions

The purpose of this project is to validate the claims in the news that black people are being shot and killed at a disproportionate rate to their population in the United States. Based on the statistics from the shootings in the US in 2015, it has been confirmed that black people were shot and killed at significantly higher rates than white people. It has also been shown that in 2015, many unarmed people were shot, and the officer almost never faced criminal charges. From the classification tree, we discovered that the tree would predict an officer to face no criminal charges, no matter the circumstances of the deathly shooting.

The aim of this project is not to say that all police departments are corrupt and racist, but that there needs to be a reform in the way that policing is conducted in the United States, and some departments should be investigated.

References

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        Disparities In Arrests And Killings. Retrieved April 17, 2021, from
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[4]   https://mappingpoliceviolence.org

[5]   https://www.census.gov