Are Body Cameras Being Sufficiently Used To Prevent Fatal Police Shootings?

Chibuike Odibeli

The Issues

This report explores the use of body cameras by law enforcement departments in the United States and how frequently they are utilized in scenarios that lead to fatal shootings by the police. In recent years, the use of body cameras has been widely promoted as a way to enhance accountability and transparency in police departments. The basic idea is that by recording interactions between officers and the public, body cameras could deter excessive use of force, provide evidence in disputes, and ultimately reduce the number of fatal encounters. However, despite their growing presence in police departments across the United States, fatal police shootings continue to occur, raising questions about their effectiveness or if they are even being utilized at all.

This report focuses on several key issues. First, it looks at the usage of body cameras by police departments with a particularly high number of shootings. Second, it looks at the general usage of body cameras by all the departments in the dataset and how it has changed over the 10 years covered by the dataset. Lastly, it looks at the general non-usage of body cameras by all the departments in the dataset and which departments are the largest culprits of this.

By analyzing data from the Washington Post's dataset on shootings in the United States, this report aims to provide insight into whether body cameras are fulfilling their intended purpose or if there are gaps in their use that need to be addressed. The goal is to assess whether body cameras are being used sufficiently and effectively as a preventive measure against fatal police shootings.

Findings

Our analysis of body camera usage and non-usage sheds light on the stark contrast in practices among police departments involved in fatal shootings. Among the 72 outlier police departments, **77% of fatal shootings** occurred without body cameras, illustrating a significant gap in body camera adoption. These departments were responsible for **2680 shootings**, which accounted for **25.8%** of the total shootings in the dataset. Conversely, the use of body cameras in the same departments during the remaining 23% of the shootings was a positive, though far less frequent, occurrence. This finding underscores a key issue: **body cameras are either not being used or are underutilized in high-risk situations**, leaving critical incidents without video evidence that could serve as a tool for accountability.

Discussion

The overwhelming absence of body cameras in the high-risk departments with the most fatal shootings raises serious concerns about transparency and accountability. The 77% of incidents where officers did not wear body cameras point to a systemic gap in the technology's usage, which is problematic, especially in cases where the potential for misconduct is highest. In contrast, the presence of body cameras in the remaining 23% of shootings provides a valuable tool for maintaining transparency and enhancing accountability, but it remains underutilized in key situations.

The evidence strongly suggests that body cameras should be universally adopted, especially in departments with a history of high fatal shooting rates, to ensure that all incidents are documented and scrutinized. The implementation of body cameras could offer a safeguard against both police misconduct and false accusations, benefiting both officers and the communities they serve. This issue should be prioritized in policy reforms aimed at increasing transparency and restoring trust between law enforcement and the public.

Going forward, further investigations should focus on how consistent use of body cameras might reduce instances of police violence and enhance the ability to investigate these incidents. The key takeaway is that while body cameras are an

important tool for accountability, they are still not being used consistently where they are needed most. Closing the gap in usage is essential for building public trust and ensuring police practices align with community expectations.

Appendix A: Method

Data Collection

The data used in this analysis was obtained from *The Washington Post's* publicly available dataset on police shootings in the United States. This dataset tracks fatal police shootings across the country and includes details about each incident, such as the location, circumstances, and whether the officer involved was wearing a body camera.

Variable Creation

Several key variables were created for this analysis:

agencyNames - This is a data frame containing a list of all of the unique police departments that appear in the dataset

agencyCounts - A data frame containing how many times each police department came up in the *Washington Post* dataset.

Outliers - A data frame containing each police department that had a number of shootings that were greater than 3 standard deviations away from the mean, along with the number of shootings for each department

Outliers_dept - A data frame that consists of the outliers data frame joined with the entire *Washington Post* dataset so that we can see all the features for each instance in the outliers dataset.

shootingDates - A data frame that consists of the dates of all the shootings in the *Washington Post* dataset.

shootingDates$DaysElapsed - A vector containing the number of days that have elapsed since the first shooting was recorded in the *Washington Post* dataset

shootingDates$WeekNumber - A vector containing the number of weeks since the first shooting was recorded in the *Washington Post* dataset

shootingDates_merged - A data frame that consists of the *Washington Post* dataset joined with the shootingDates data frame

Body_cam_usage - A data frame that shows the proportion of shootings each week where a body camera was used by the officer(s) involved.

Body_cam_non_usage - A data frame that shows the proportion of shootings each week where a body camera was used by the officer(s) involved.

Body_cam_used - A subset of the original *Washington Post* data only containing shootings where body cameras were used by the officer(s) involved.

No_cam_used - A subset of the original *Washington Post* data only containing shootings where body cameras were not used by the officer(s) involved.

Analytical Methods

Fatal Shootings by Outlier Police Departments not wearing body cameras

Data containing the unique names of each police department represented in the *Washington Post* dataset was put into a data frame called agencyNames. From this dataset, another dataset called agencyCounts was generated by the table() function in order to show how many times each police department was represented in the Washington Post dataset. From the agencyCounts dataset, a dataset called outliers is generated. Outliers is formed by singling out all the police departments that had fatal shootings that were more than 3 standard deviations above the mean. Outliers is then joined with the original *Washington Post* dataset to create a data frame called outliers_dept. This allows us to see all the features of the outliers, including whether or not they were wearing a body camera. We can then make a subset of outliers_dept called outliers_no_cam that shows the instances in outliers_dept where the police officers involved were not wearing body cameras.

Body Camera Usage During Fatal Shootings

Data containing the dates of each shooting represented in the *Washington Post* dataset was put into a data frame called shootingDates. shootingDates consists of attributes like shootingDates$Date, which contains the dates of each of the shootings in year-month-day format. Then, using the earliest date as a reference, another attribute called shootingDates$DaysElapsed is created, containing the

number of days that has passed from the date of the first shooting to the date of each shooting instance in the dataset. Using this, we can create an attribute called shootingDates$WeekNumber to show the number of weeks that has passed from the date of the first shooting to the date of each shooting instance in the dataset. The Washington Post dataset is then joined with shootingDates into a data frame called shootingDates_merged to see all the features for each Week, including whether a not a body camera was utilized. Using this dataset, we can find the proportion of shootings where a body camera was used for each week and put it into a data frame called body_cam_usage. Then another data frame can be created called body_cam_non_usage that has an inverse of all the proportions in body_cam_usage to show the proportion of shootings where a body camera was not used.

Age Distribution of People Shot by the Police Using Body Cameras Versus Those Not Using Body Cameras

The age distribution of people shot by the police using body cameras versus those not using body cameras can be calculated via a t-test. In order for the t-test to produce the most accurate results, the data has to be normally distributed. In order to test for normality, the Shapiro-Wilk test was used on the age attribute of the body_cam_used data frame and the Anderson-Darling test for the age

attribute of the no_cam_used data frame (because it has over 5000 data points). After testing for normality, a t-test was then conducted on both data frames.

Non-Body Cam Usage by Race

To investigate potential disparities in non-body camera usage across racial groups, a frequency analysis was conducted using the no_cam_used dataset, which includes records where no body camera was used during law enforcement interactions. We generated a summary table of non-body camera usage by race using the table function in R, which was subsequently converted into a data frame for ease of manipulation. This yielded a count of non-body camera incidents for each racial group represented in the dataset. To assess the proportional representation of each race in the context of non-body cam usage, percentages were also calculated by dividing each count by the total number of non-body camera incidents.

Appendix B: Results

Fatal Shootings by Outlier Police Departments not wearing body cameras

There are 72 police departments that have a number of shootings that were 3 standard deviations higher than the mean.

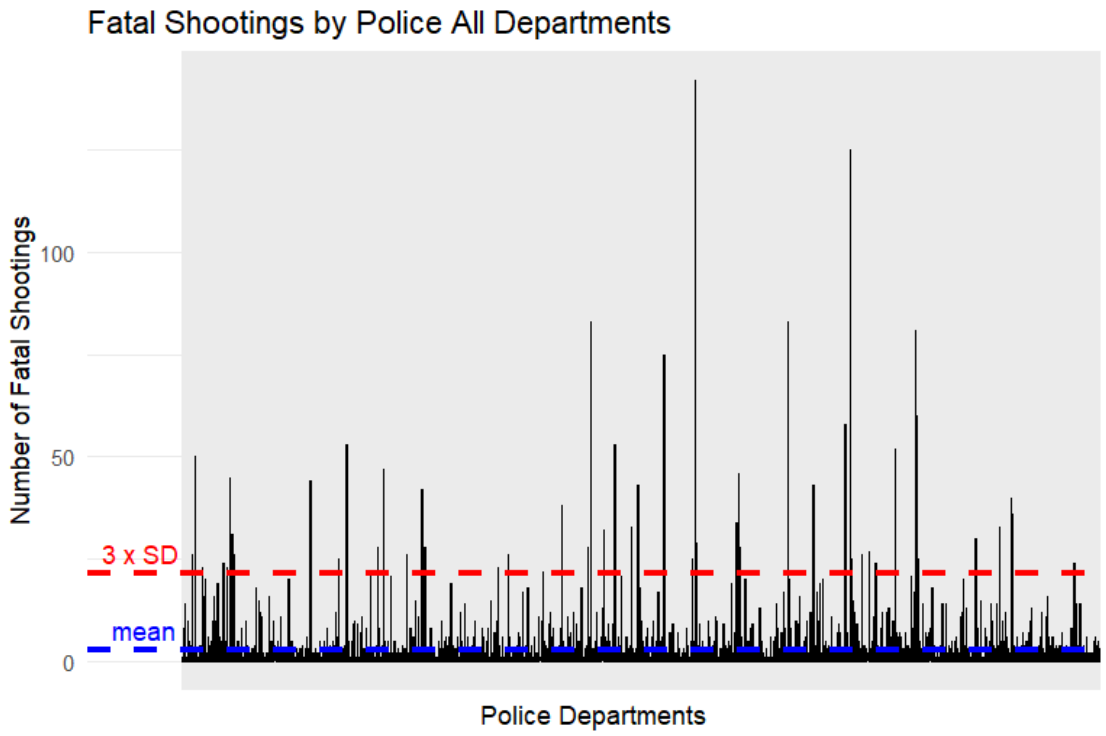

Figure 1: Bar plot showing the number of fatal shootings by all the departments represented in the dataset

As seen in the figure above, the 72 outlier police departments were responsible for a disproportionately high percentage of fatal shootings in the dataset. Specifically, these 72 departments accounted for 2,680 shootings, which represent 25.8% of all fatal shootings recorded.

A deeper look into the data reveals an even more concerning pattern: of these 2,680 shootings, 77% (or 2,066 incidents) involved officers who were not wearing body cameras.

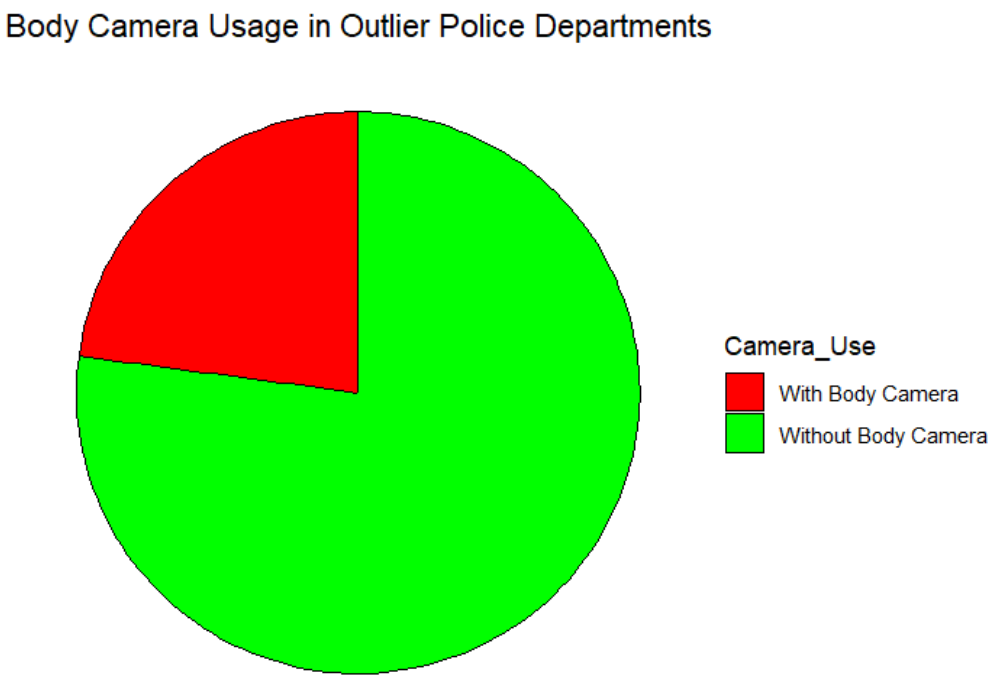

Figure 2: Pie chart showing the percentage of shootings by outlier departments where officers involved did not use body cameras

Body Camera Usage Over Time

The statistics on the body_cam_usage data frame are alarming as it reveals that there was only 1 week out of the 10 years represented in the dataset where a body camera was used up to 60% of the time.

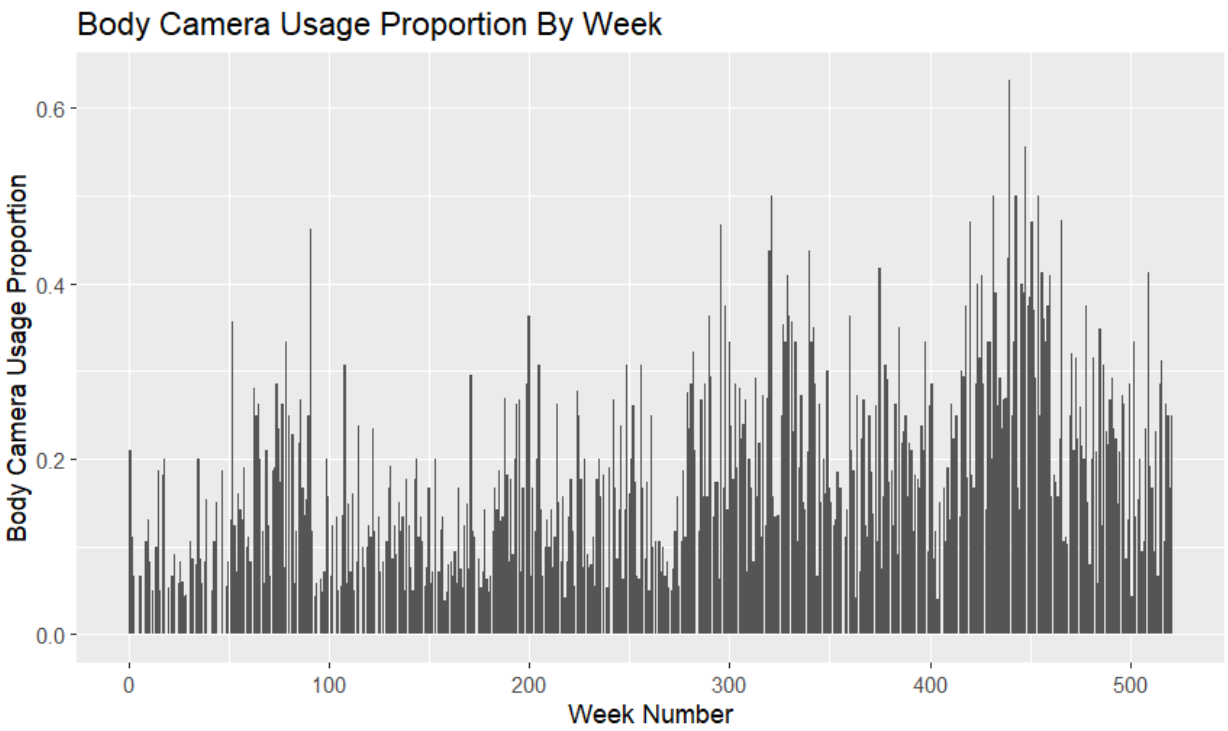

Figure 3: Bar plot showing the proportion of shootings each week where the police officers involved used body cameras

We can get a clearer look of this by looking at *Figure 4* where we see incredibly high proportions of non-usage throughout every week.

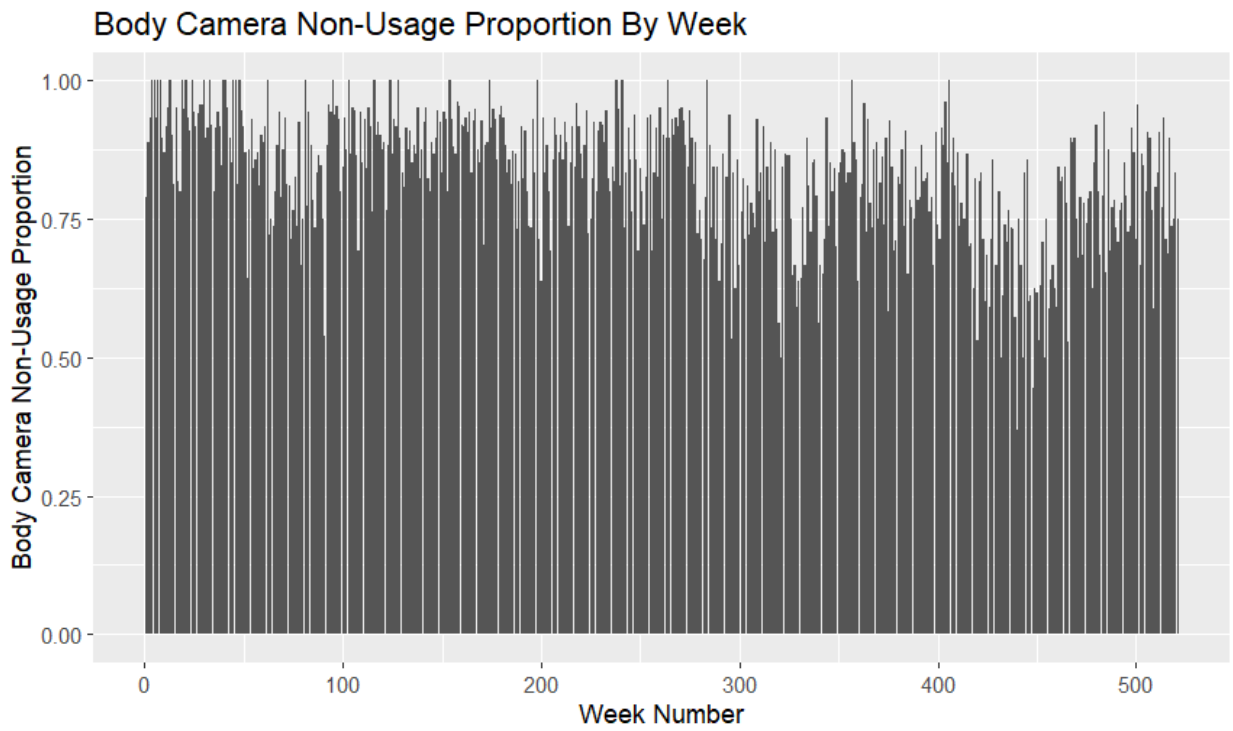

Figure 4: Bar plot showing the proportion of shootings each week where the police officers involved did not use body cameras

Age Distribution Comparison between Body Camera and Non-Body Camera Cases

To assess whether age distributions differed between individuals in body camera and non-body camera incidents, normality tests were first conducted. The Anderson-Darling test for the non-body camera group revealed significant deviation from normality (A = 60.868, $p < 2.2e\text{-}16$). Similarly, the Shapiro-Wilk test for the body camera group indicated non-normal distribution as well (W = 0.96126,

$p < 2.2e-16$). Despite the violation of normality assumptions, a Welch's Two-Sample t-test was used due to its robustness against unequal variances and sample sizes.

The t-test showed a statistically significant difference in mean ages between the two groups . The mean age for the body camera group was 35.62 years, while the non-body camera group had a higher mean age of 37.60 years. The 95% confidence interval for the difference in means ranged from -2.69 to -1.28, indicating that individuals in the non-body camera group were, on average, significantly older than those in the body camera group. These values should be taken with a grain of salt, given that the data was not normally distributed.

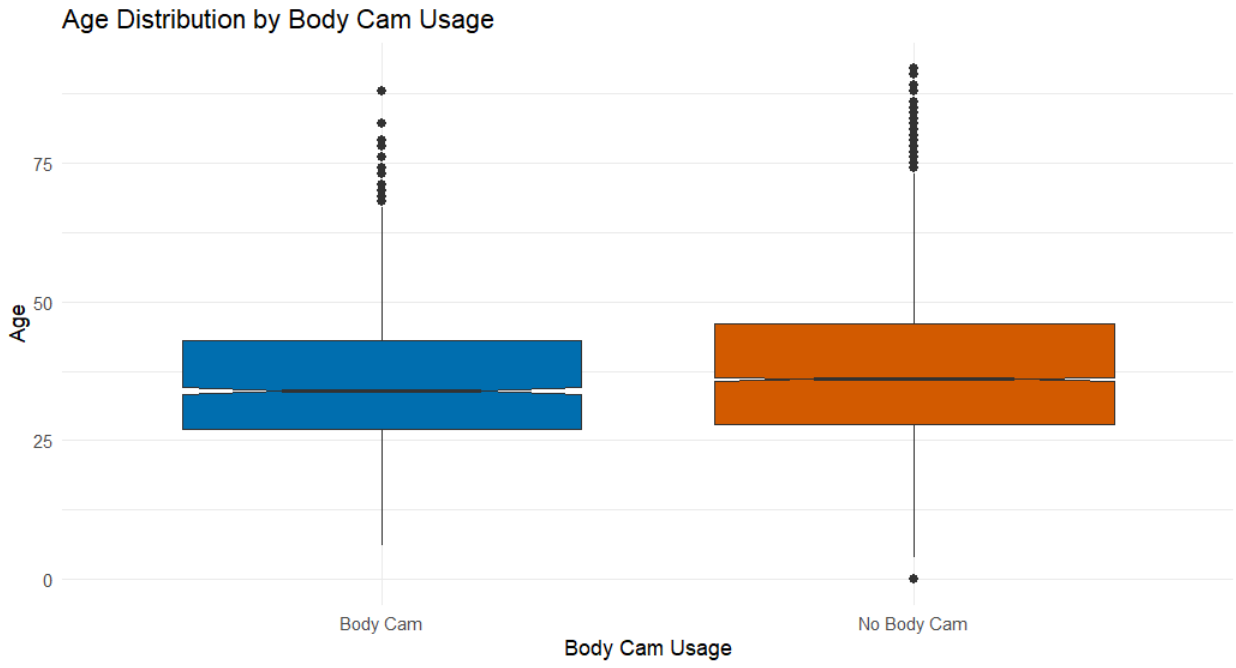

Figure 5: 2 box plots showing the difference in age distributions between body camera cases and non-body camera cases

Body Camera Non-Usage By Race

The analysis revealed disparities in non-body camera usage across racial groups. Out of a total of 6,831 incidents where no body camera was used, the majority involved individuals identified as White, comprising 47.6% of the cases. This was followed by Black individuals at 23.3% and Hispanic individuals at 17.6%. Cases with Unknown race accounted for 8.1% .

Smaller proportions were observed for other racial groups: Asian individuals made up 1.7% , Native American individuals represented 1.3% (n = 88), and those identified as Other accounted for 0.4% .

A small number of entries were reported with multiple racial identifiers. Each of these multi-race categories individually accounted for less than 0.03% of the total.

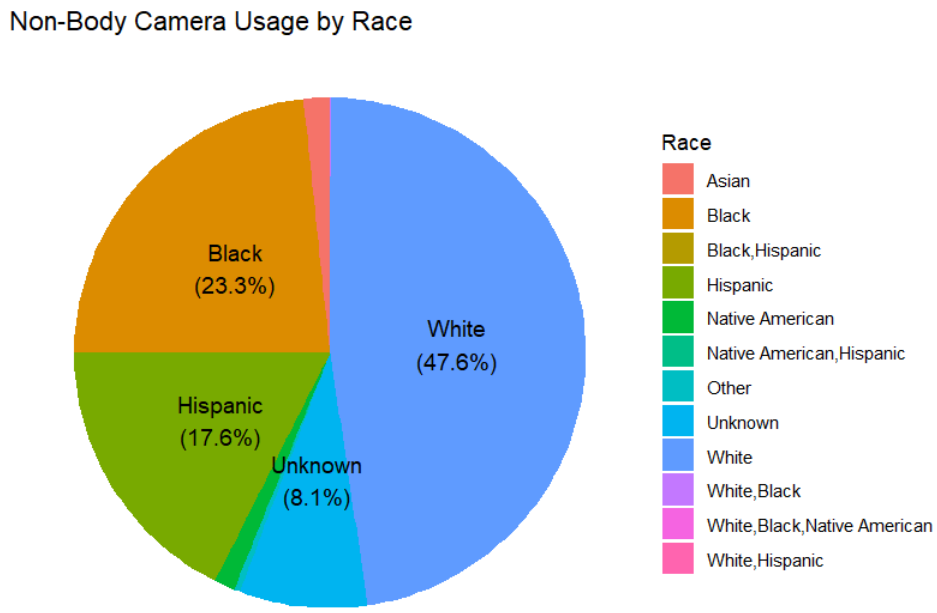

Figure 6: Pie chart showing the proportion of shootings performed without the use of body cameras for each race

Appendix C: Code

Here I list the code to derive each variable.

agencyNames

```
agencyNames <-
data.frame(unique(Washington_Post_police_shootings$police_departments_involved)
```

agencyCounts

```
agencyCounts <- data.frame(table(shootings$police_departments_involved))
```

Outliers

```
> outliers <- agencyCounts[agencyCounts$Freq >= 21.969,]
```

Outliers_dept

```
outliers_dept <- left_join(outliers,
Washington_Post_police_shootings, by = c("police departments" =
"police_departments_involved"))
```

shootingDates

```
shootingDates <-
Washington_Post_police_shootings[Washington_Post_police_shooting
s$date]
```

shootingDates$DaysElapsed

```
reference_date <- ymd("2015-02-01")
 shootingdates$DaysElapsed <-
as.numeric(difftime(shootingdates$Date, reference_date, units =
"days"))
```

shootingDates$WeekNumber

```
shootingdates$WeekNumber <- floor(shootingdates$DaysElapsed / 7)
+ 1
```

shootingDates_merged

```
shootingDates_merged
<- merge(shootings,Washington_Post_police_shooting, by = "Date")
```

Body_cam_usage

```
body_cam_usage <- df %>% group_by(week) %>%
summarise(proportion_body_cam = mean(body_cam))
```

Body_cam_non_usage

```
body_cam_non_usage <- body_cam_usage
body_cam_non_usage$proportion_body_cam <- 1 -
body_cam_usage$proportion_body_cam
```

Body_cam_used

```
body_cam_used <- shootings[shootings$body_camera == TRUE, ]
```

No_cam_used

```
no_cam_used <- shootings[shootings$body_camera == FALSE, ]
```