Fatal Police Shootings 2015-2016

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```
knitr::opts_chunk$set(echo=TRUE, warning=FALSE, message=FALSE)
library(dplyr)
library(ggplot2)
library(forcats)
library(sjPlot)
library(RColorBrewer)
library(colorspace)
library(tidyverse)
```

Introduction

The data frame used for this analysis consists of on civilians shot and killed by police has been collected consistently since January 2015, but this project will focus the data specific to the time period of January 2015 - September 2016. It has 3960 observations and 14 variables. However, this analysis will be exploring the relationships between gender, race, and age.

```
library(readxl)
fatal <- readxl::read_excel("/Users/leeahschultz/Desktop/math130/data/fatal-police-shootings-data.xlsx"
        sheet=1, col_names=TRUE)
head(fatal)
```

```
## # A tibble: 6 x 14
##      id name  date                manner_of_death armed   age gender race  city
##   <dbl> <chr> <dttm>              <chr>           <chr> <dbl> <chr>  <chr> <chr>
## 1     3 Tim ~ 2015-01-02 00:00:00 shot            gun      53 M      A     Shel~
## 2     4 Lewi~ 2015-01-02 00:00:00 shot            gun      47 M      W     Aloha
## 3     5 John~ 2015-01-03 00:00:00 shot and Taser~ unar~    23 M      H     Wich~
## 4     8 Matt~ 2015-01-04 00:00:00 shot            toy ~    32 M      W     San ~
## 5     9 Mich~ 2015-01-04 00:00:00 shot            nail~    39 M      H     Evans
## 6    11 Kenn~ 2015-01-04 00:00:00 shot            gun      18 M      W     Guth~
## # ... with 5 more variables: state <chr>, signs_of_mental_illness <lgl>,
## #   threat_level <chr>, flee <chr>, body_camera <lgl>
```

Research Questions:

- What is the average age of the victims of fatal police shootings?
- What kind of relationship do fatal police shootings have with ethnicity?
- Are fatal police shootings positively correlated with certain races more than others, such as people of black or white ethnicity?

- If fatal police shootings are more common with some ethnicity than others, how do they relate to genders of that ethnicity?

Univariate Exploration

Using the `fatal` data set, the variables `age`, `race`, and `gender` will be explored.

```
select(fatal, age, race, gender) %>% str()
```

```
## tibble [3,960 x 3] (S3: tbl_df/tbl/data.frame)
##  $ age   : num [1:3960] 53 47 23 32 39 18 22 35 34 47 ...
##  $ race  : chr [1:3960] "A" "W" "H" "W" ...
##  $ gender: chr [1:3960] "M" "M" "M" "M" ...
```

```
ggplot(fatal, aes(x=age)) + geom_histogram(col="black", fill="darkcyan", binwidth=4) +
  theme_linedraw() +
  ggtitle("Ages of People Fatally Shot by Police from 2015-2016") + xlab("Age") +
  ylab("Number of People") +
  theme(plot.title=element_text(hjust=0.5))
```

Of 3,960 observations, the average age of people fatally shot by police is about 37 years old. 25% of people were 27 years old or under, and 75% of people were 45 years old or younger. The youngest was 6 years old and the oldest was 91 years old.

It is important to note that there are 152 reports where there is no data collected on the victim's age.

```
fatal$gender <- fct_recode(fatal$gender, "Male" = "M", "Female" = "F")
fatal %>% select(gender) %>% na.omit() %>% ggplot(aes(x=gender, fill=gender)) +
  geom_bar() + theme_linedraw() +
  ggtitle("Gender of People Fatally Shot by Police") +
  scale_fill_discrete(name="Gender") + scale_fill_brewer(palette = "Accent") +
  geom_text(stat='count', aes(y=..count.. + 130, label =..count..), size = 3.5) +
  xlab("Gender") + ylab("Number of People") + theme(plot.title=element_text(hjust=0.5))
```

Of 3,960 people fatally shot by police from January 2015 to September 2016, 180 of them were female and 3,777 of them were male.

There appears to be 3 reports where data on gender was not collected.

The `race` variable is broken down into these categories:

- A: Asian
- B: Black, non-Hispanic
- H: Hispanic
- N: Native American
- O: Other
- W: White, non-Hispanic

It is important to note that there are 389 reports where data on race is missing.

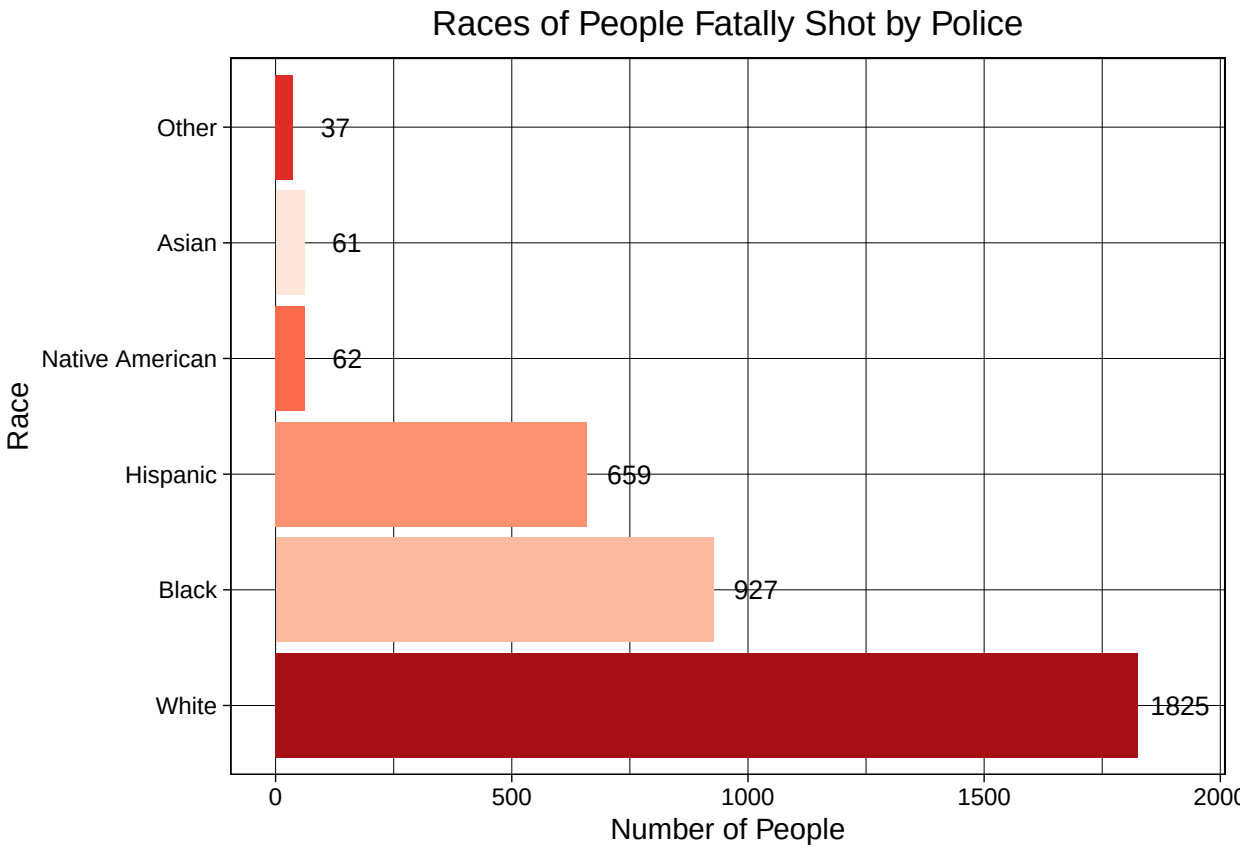
The `race` variable is recoded such that each capital letter is replaced by the full name of the race.

```
fatal$race <- fct_recode(fatal$race, "White" = "W",
                         "Black" = "B",
                         "Hispanic" = "H",
                         "Native American" = "N",
                         "Asian" = "A",
                         "Other" = "O")

table(fatal$race, useNA="always")
```

```
##
##            Asian            Black         Hispanic Native American            Other
##               61              927              659               62               37
##            White             <NA>
##             1825              389
```

```
fatal %>% select(race) %>% na.omit() %>%
  ggplot(aes(x=forcats::fct_infreq(race), fill=race)) + geom_bar(position="dodge") +
  ggtitle("Races of People Fatally Shot by Police") +
  theme_linedraw() +
  xlab("Race") + ylab("Number of People") + scale_fill_brewer(palette="Reds", guide="none") +
  geom_text(aes(y=..count.. + 90, label=..count..),
            stat='count', size = 3.5) +
  theme(plot.title=element_text(hjust=0.5)) +
  coord_flip()
```



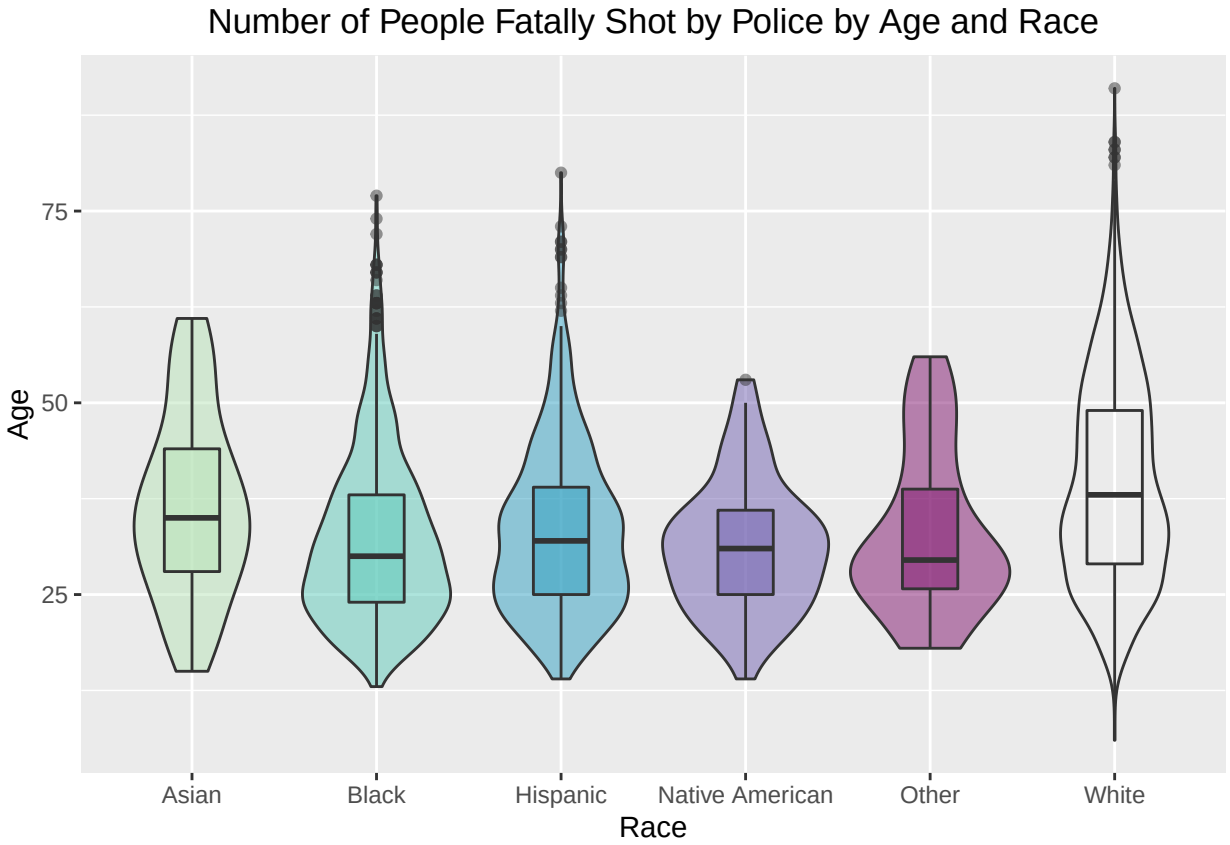
In the 21 month time period between January 2015 and September 2016:

- 1,825 White people were killed by police;
- 927 Black people were killed;
- 659 Hispanic people were killed;
- 62 Native American people were killed;
- 61 Asian people were killed; and
- 37 people of other races were killed.

Bivariate Exploration

Next, the relationships between `age` and `race` and `race` and `gender` are explored.

```
fatal %>% select(age, race) %>% na.omit() %>% ggplot(aes(x=age, y=race, fill=race)) +
  geom_violin(alpha=.5) +
  geom_boxplot(alpha=.5, width=.3) +
  coord_flip() +
  ggtitle("Number of People Fatally Shot by Police by Age and Race") +
  xlab("Age") + ylab("Race") +
  scale_fill_discrete_sequential(palette = "Purple-Yellow",
                                 nmax = 6, order = 2:6,
                                 guide="none") +
  theme(plot.title=element_text(hjust=0.5))
```



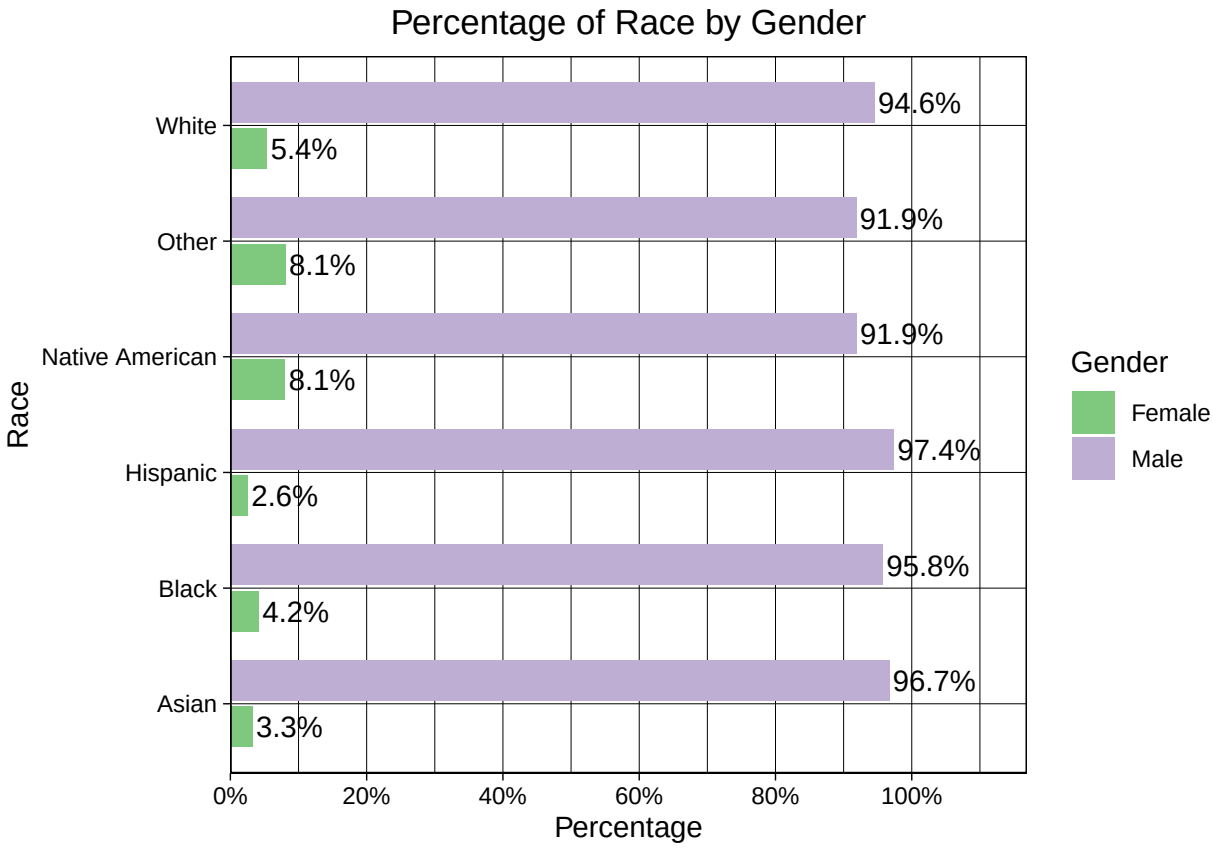

```
fatal %>% filter(!is.na(race)) %>% group_by(race) %>%
  summarise_at(vars(age), list(age = mean), na.rm=TRUE)
```

```
## # A tibble: 6 x 2
##   race              age
##   <fct>           <dbl>
## 1 Asian            36.5
## 2 Black            32.2
## 3 Hispanic         33.3
## 4 Native American  31.2
## 5 Other            32.9
## 6 White            39.7
```

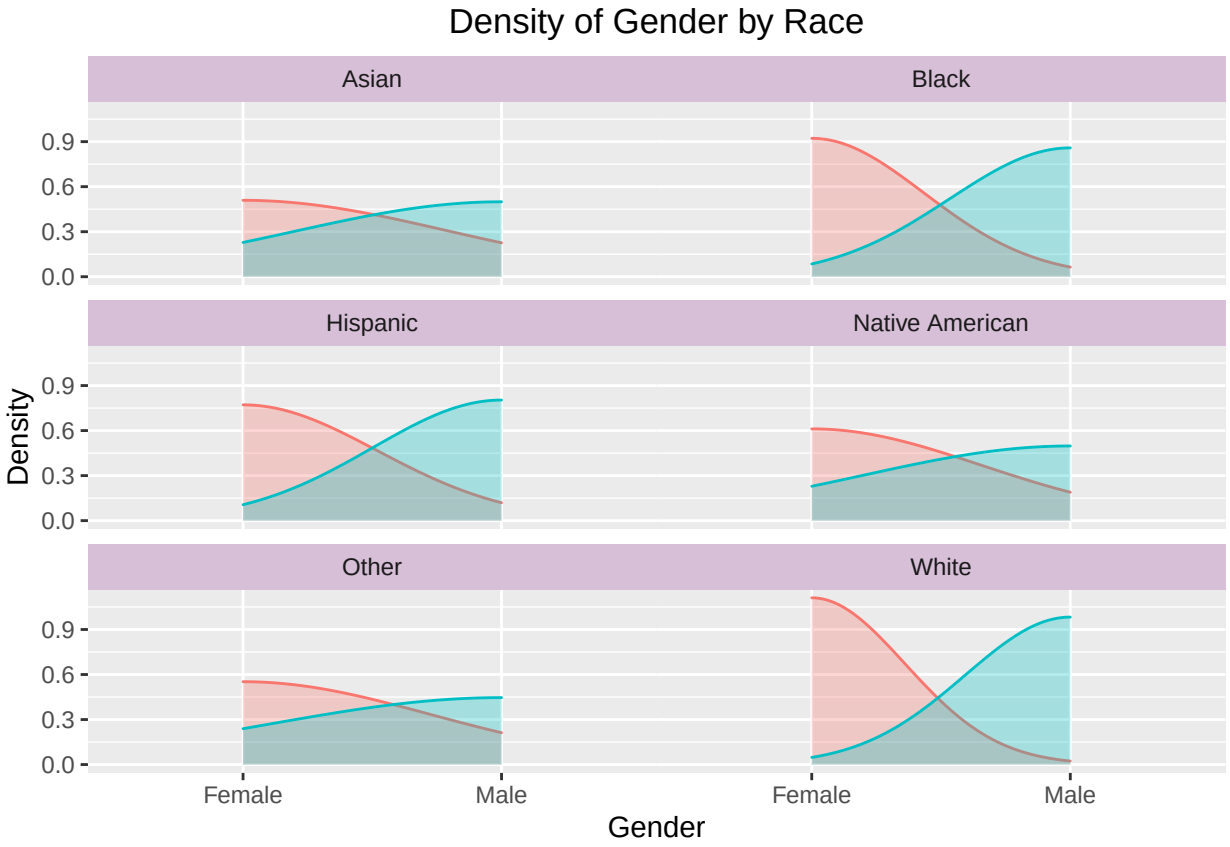
- The average age of Asian people fatally shot by police is 36.5;
- The average age of Black people fatally shot by police is 32;
- The average age of Hispanic people fatally shot by police is 33;
- The average age of Native American people fatally shot by police is 31;
- The average age of White people fatally shot by police is about 40;
- The average age of other races fatally shot by police is about 33.

```
plot_xtab(fatal$race, fatal$gender, margin='row',
          show.total=FALSE, geom.spacing = 0.1, geom.size = 0.7,
          geom.colors = "Accent",
          rev.order=FALSE, show.n=FALSE, coord.flip=TRUE,
          legend.title="Gender") +
```

```
  ylab("Percentage") +
  xlab("Race") +
  theme_linedraw() +
  theme(plot.title=element_text(hjust=0.5)) +
  ggtitle("Percentage of Race by Gender")
```




```
fatal %>% select(gender, race, age) %>% na.omit() %>% ggplot(aes(x=gender, fill=gender, color=gender)) +
  xlab("Gender") + ylab("Density") +
  ggtitle("Density of Gender by Race")
```



Of the 3,960 people who were fatally shot by police from January 2015 - September 2016:

- 94.6% of White people were male and 5.4% were female;
- 91.9% of Native American people were male and 8.1% were female;
- 97.4% of Hispanic people were male and 2.6% were female;
- 95.8% of Black people were male and 4.2% were female;
- 96.7% of Asian people were male and 3.3% were female;
- 91.9% of other races included in this data set were male and 8.1% were female.

Conclusion

Of the data collected, the most common victims of police shooting fatalities in the 21 month period between January 2015 and September 2016 were White men around the age of 40 years old. The lease common were those of "other" races around the age of 33 years old and Asian men around the age 36.5 years old. Overall, the average age of the victims was ~37 years old.

Compared to 3,777 males, there was a total of 180 females shot over that time period.