Exploratory Analysis Depression

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```
knitr::opts_chunk$set(fig.width=7, fig.height=4)
library(sjPlot)
library(ggplot2)
library(forcats)

library(readxl)
police <- read_excel("../data/fatal-police-shootings-data.xlsx", sheet=1, col_names=TRUE)
```

Introduction

Fatal police shootings of civilians are a matter of great concern since police officers are expected to be keepers of the peace. The Washington Post compiled data starting in 2015, of police shootings in the line of duty with circumstances similar to the killing of Michael Brown. This was a death that led to the Black Lives Matter movement. Data collected consists of race, shooting circumstances, if armed, among other information totaling 14 variables with 3960 observations.

This analysis seeks to identify what factors have a relationship in the fatal shootings of individuals by police officers. As such, data variables that will be used are manner of death, armed, race, threat_level, and flee.

Univariate Exploration

Manner of death

This categorical, binary variable contains information on the way that the civilian was killed by a police officer.

```
table(police$manner_of_death)
```

```
##
##            shot shot and Tasered
##            3750              210
```

```
table(police$manner_of_death) |> proportions() |> round(2)
```

```
##
##            shot shot and Tasered
##            0.95              0.05
```

95% (n=3750) of the people were shot by a police officer based on this sample.

Armed

This categorical variable contains information on the type of weapon, if any, that the civilian carried that police believed could cause harm.

```r
police$armed_mod <- fct_collapse(police$armed,
               misc_weapon = c("air conditioner", "ax","baseball bat and bottle",
                               "baseball bat","baseball bat and fireplace poker",
                               "baton", "bayonet", "BB gun", "bean-bag gun",
                               "beer bottle", "box cutter","blunt object",
                               "bow and arrow", "brick", "carjack", "chain",
                               "chain saw", "chainsaw", "chair","contractor's level",
                               "cordless drill", "crossbow","crowbar", "fireworks",
                               "flagpole", "flashlight", "garden tool", "glass shard",
                               "gun and car", "gun and knife","gun and sword",
                               "gun and vehicle", "guns and explosives", "hammer",
                               "hand torch", "hatchet","hatchet and gun",
                               "incendiary device", "lawn mower blade", "machete",
                               "machete and gun", "meat cleaver", "metal hand tool",
                               "metal object", "metal pipe","metal pole", "metal rake",
                               "metal stick", "motorcycle", "nail gun", "oar",
                               "pellet gun", "pen", "pepper spray", "pick-axe",
                               "piece of wood", "pipe","pitchfork", "pole",
                               "pole and knife", "rock", "samurai sword", "screwdriver",
                               "scissors", "sharp object", "shovel", "spear",
                               "sword","stapler", "straight edge razor",
                               "Taser","tire iron", "vehicle","vehicle and gun"),
            unknown = c("claimed to be armed","undetermined", "unknown weapon"))

ggplot(data=subset (police, !is.na(armed_mod)), aes(x=armed_mod)) + geom_bar() +
  xlab("armed type")
```
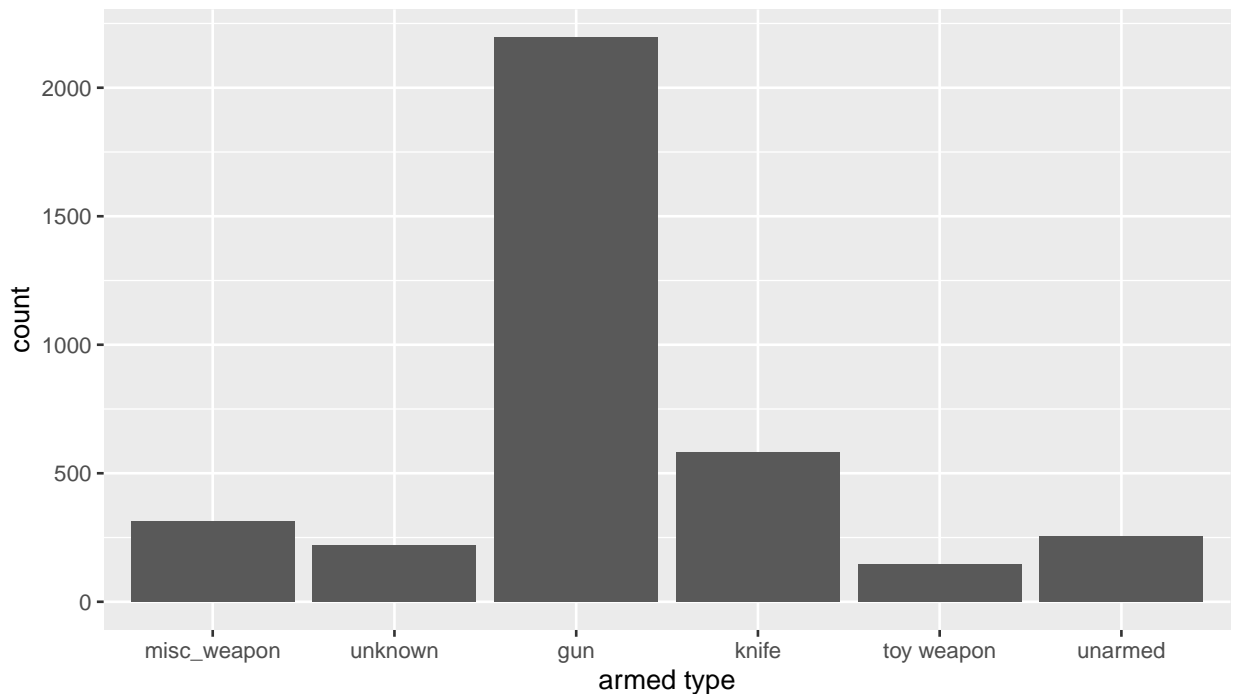
Weapons lower or equal to 40 occurrences were collapsed into a miscellaneous variable based on the low number these weapons were identified to be used. Variables with unknown values were collapsed together as well.

```
table(police$armed_mod)
```

```
##
## misc_weapon     unknown         gun       knife  toy weapon     unarmed
##         314         220        2195         581         145         256
```

```
table(police$armed_mod) |> proportions() |> round(2)
```

```
##
## misc_weapon     unknown         gun       knife  toy weapon     unarmed
##        0.08        0.06        0.59        0.16        0.04        0.07
```

The majority of individuals were armed with a gun at 59% (n=2195) followed by being armed with a knife at 16% (n=581). A toy weapon was the lowest item individuals were armed with at 4% (n=145).

Race

This is a categorical variable listing the race of the civilians with the acronyms meaning: W = White (non-Hispanic), B = Black, non-Hispanic, A = Asian, N = Native American, H = Hispanic, O = Other, None = unknown.

```
plot_frq(police$race) + xlab("race type")
```
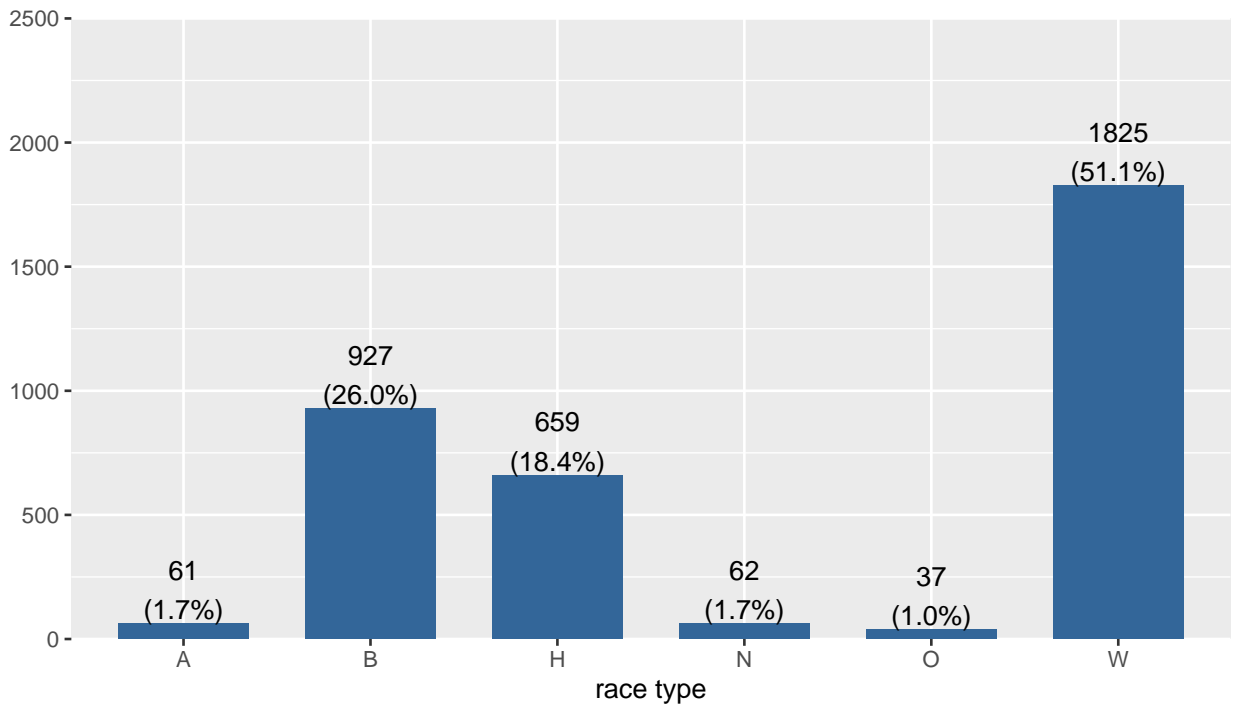

The majority of civilians encounter with an officer were white, non-hispanic at 51% (n=1825) followed by black civilians who were 26% (n=927) of the sample. The lowest race was other at 1% (37).

3

Threat level

This is a categorical variable labeling the highest level of threat, such as officers or others being shot at, and the lowest level of threat, which is not identified.

```
plot_frq(police$threat_level) + xlab("threat level")
```
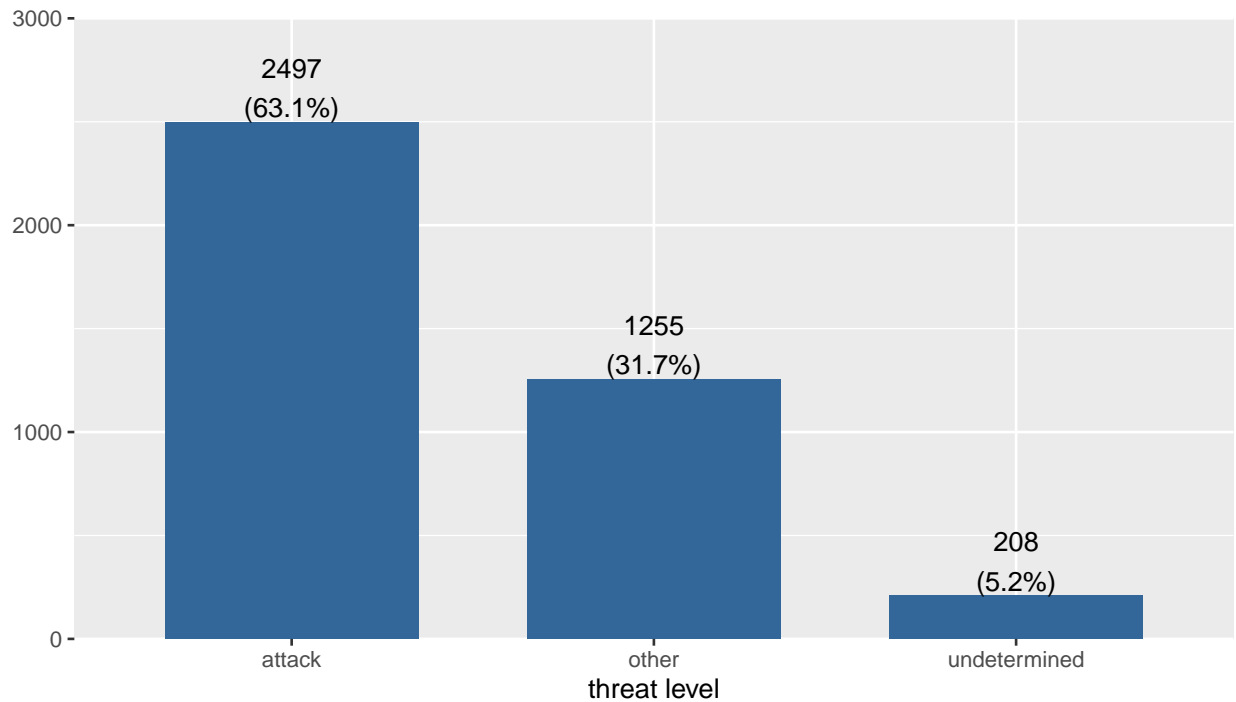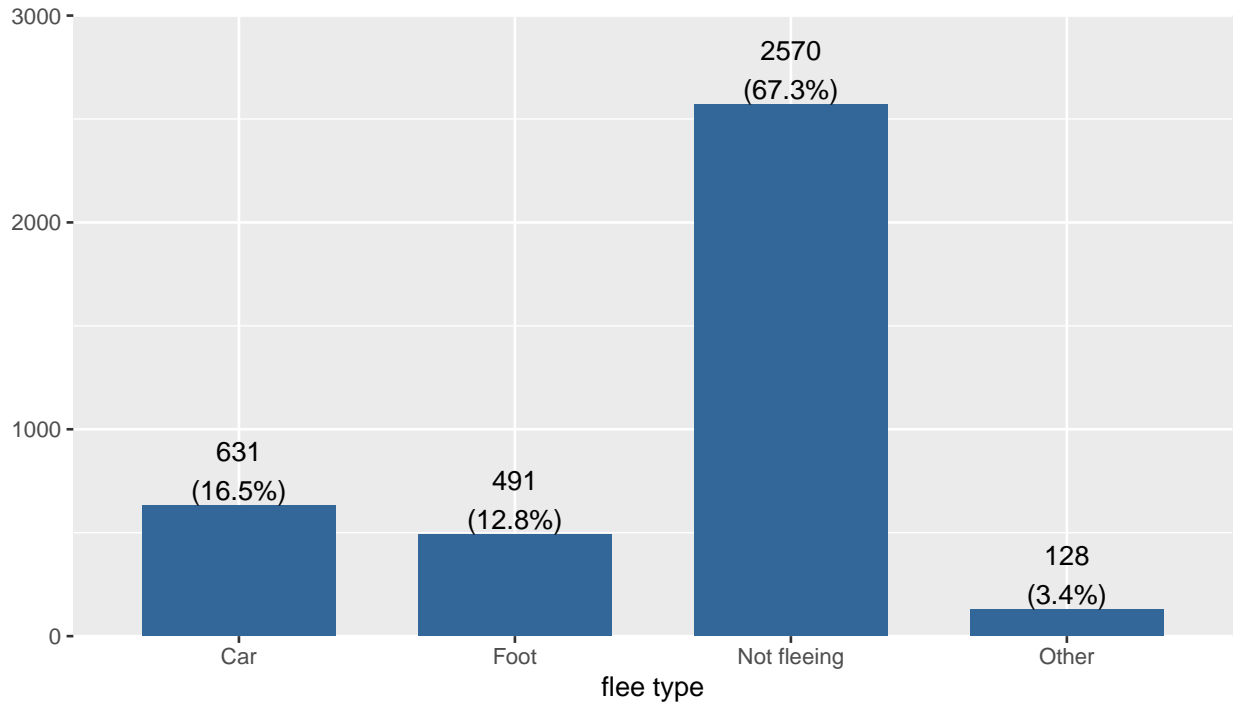

63% (n=2497) of civilians had an attack threat level, putting them at a high threat level. On the other hand, 5% of civilians had an undetermined threat level.

Flee

This categorical variable describes if the individual fled from the officers, based on news report indications.

```
plot_frq(police$flee) + xlab("flee type")
```

The majority of civilians at 67% (n=2570) were not fleeing from the officers. The minority of civilians were identified as other. This was the lowest percentage at 3% (n=128).

Bivariate Exploration

Armed relationship with race

```
table(police$armed_mod, police$race)
```

```
## 
##                  A    B    H    N    O    W
##   misc_weapon   11   63   64    3    3  129
##   unknown        4   43   44    5    1   83
##   gun           20  528  316   35   15 1058
##   knife         21  103  118   12   10  258
##   toy weapon     1   30   24    1    0   81
##   unarmed        1   94   45    3    5  106
```

```
table(police$armed_mod, police$race) |> prop.table(margin=1) |> round(2)
```

```
## 
##                  A    B    H    N    O    W
##   misc_weapon 0.04 0.23 0.23 0.01 0.01 0.47
##   unknown     0.02 0.24 0.24 0.03 0.01 0.46
##   gun         0.01 0.27 0.16 0.02 0.01 0.54
##   knife       0.04 0.20 0.23 0.02 0.02 0.49
##   toy weapon  0.01 0.22 0.18 0.01 0.00 0.59
##   unarmed     0.00 0.37 0.18 0.01 0.02 0.42
```

```
ggplot(police, aes(x=armed_mod, fill=race)) + geom_bar(position = "dodge")
```
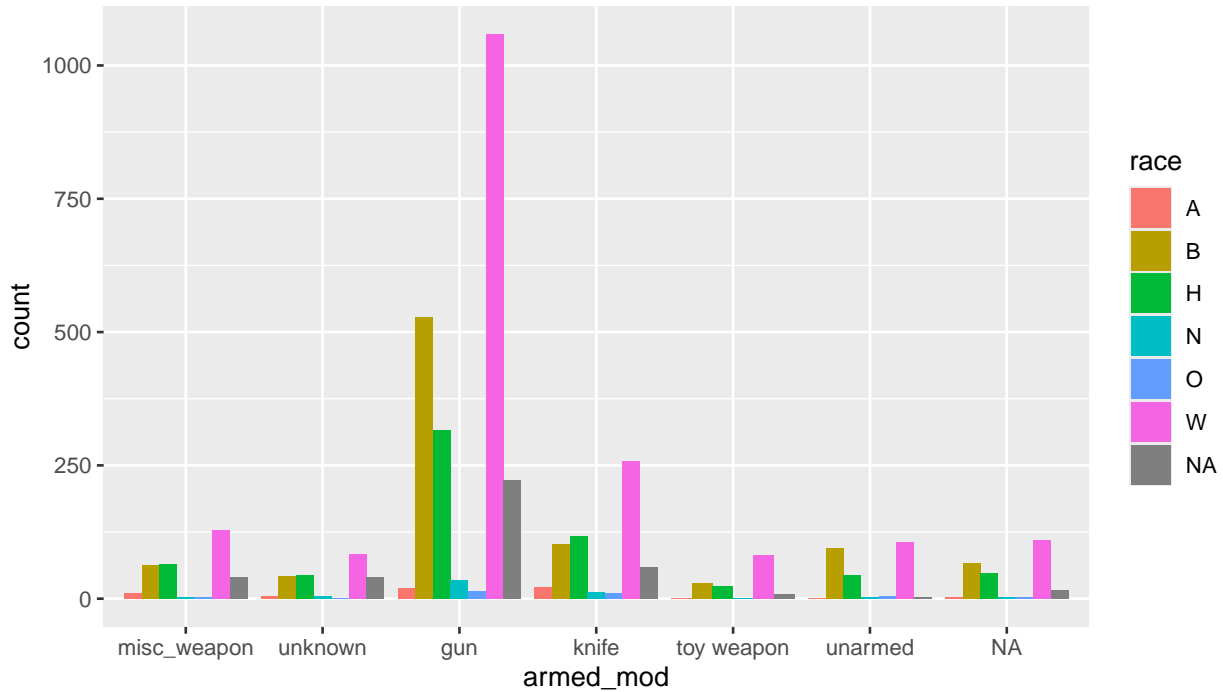

54% (n=1058) of individuals with a gun are White, non-Hispanic, which was followed by 27% (n=528) of people with a gun being Black, non-Hispanic. The lowest value for those armed with a gun were 1% Asian (n=20) and other (n=15). It is also found that 42% (n=106) of unarmed individuals are White, non-Hispanic. Whereas, 0% (n=1) of unarmed individuals are Asian. Another observation is that 49% (n=258) of individuals armed with a knife are White, non-Hispanic followed by 23% (n=118) being Hispanic.

Manner of death relationship with flee

```
plot_xtab(police$manner_of_death, grp=police$flee, margin= "row", show.total = FALSE)
```
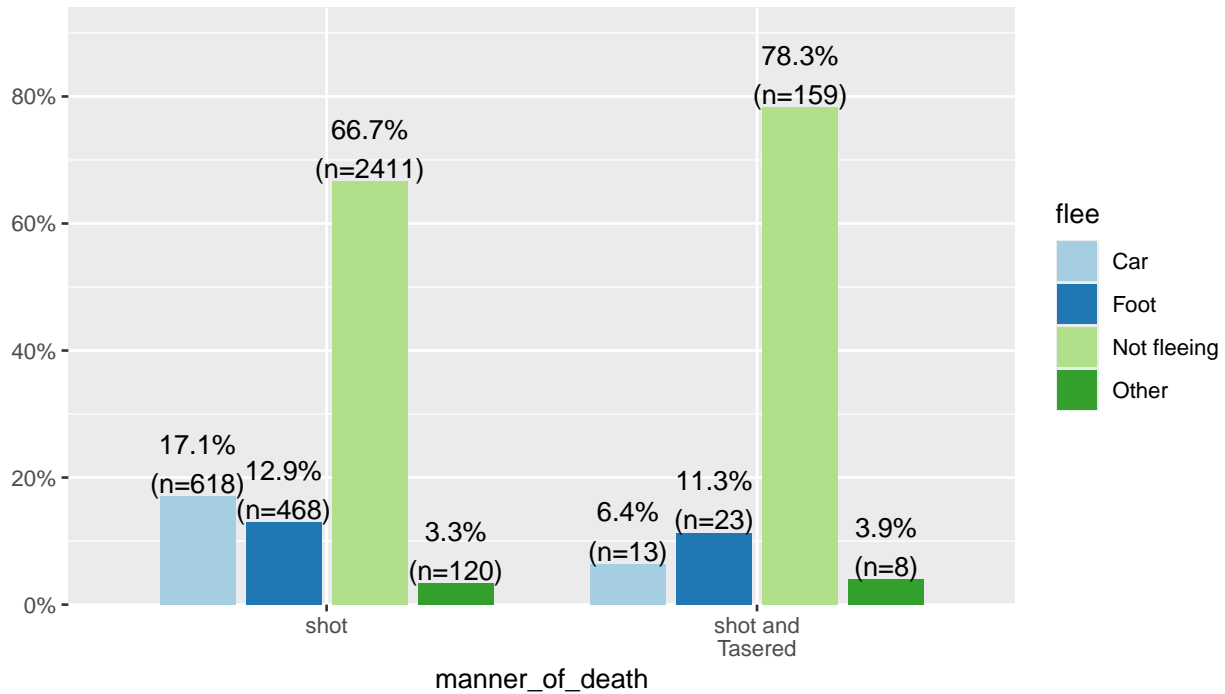
For manner of death, 66.7% (n=2411) of individuals shot were not fleeing from the scene followed by 17.1% (n=618) shot to death fleeing on car. For individuals who died from being shot and tasered, 78.3% (n=159) were not fleeing from the scene while 3.9% (n=8)fled in some other way. 11.3% (n=23) of individuals killed from being shot and tasered were fleeing on foot.

Race relationship with threat level

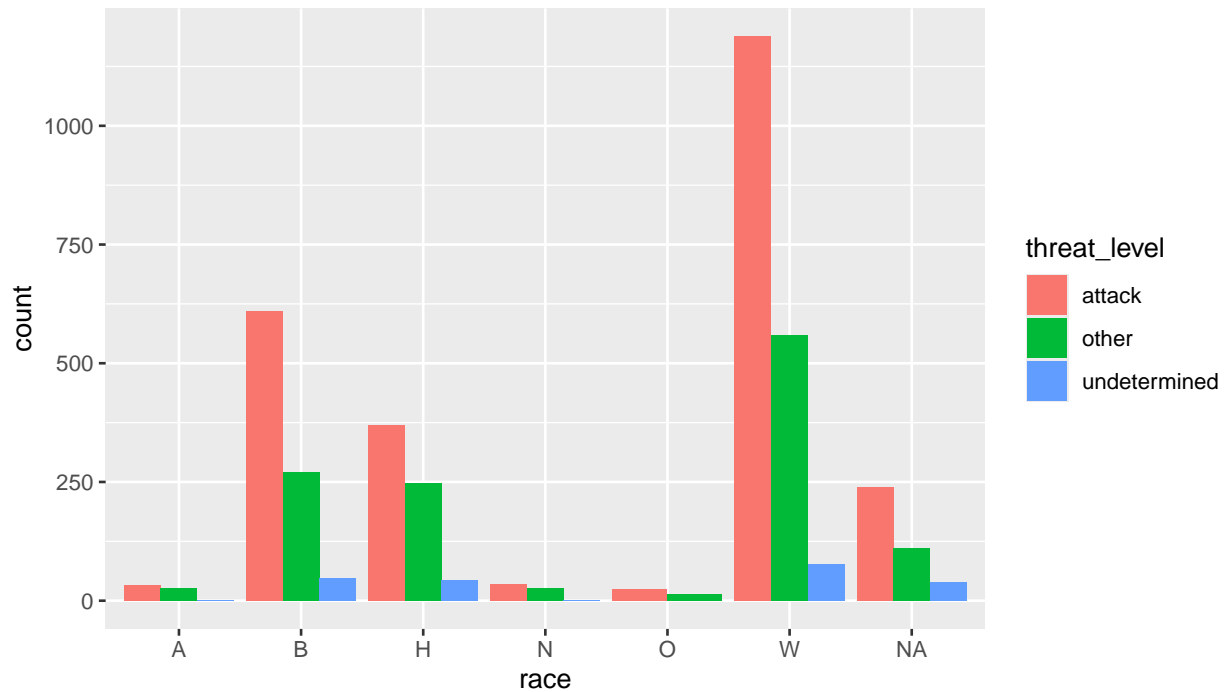```
table(police$race, police$threat_level)
```

```
## 
##     attack other undetermined
##   A     32    27            2
##   B    609   271           47
##   H    369   247           43
##   N     35    26            1
##   O     24    13            0
##   W   1188   560           77
```

```
table(police$race, police$threat_level) |> prop.table(margin=1) |> round(2)
```

```
## 
##     attack other undetermined
##   A   0.52  0.44         0.03
##   B   0.66  0.29         0.05
##   H   0.56  0.37         0.07
##   N   0.56  0.42         0.02
##   O   0.65  0.35         0.00
##   W   0.65  0.31         0.04
```

```r
ggplot(police, aes(x=race, fill=threat_level)) + geom_bar(position = "dodge")
```


65% (n=1188) of White, non-Hispanic were considered an attack threat whereas 4% (n=77) were considered undetermined. 66% (n=609) of individuals whose race is Black, non-Hispanic were considered an attack threat followed by 29% (n=271) considered as an other type of threat. All the other races had a similar trend where an attack threat was higher in percent compared to the other data points, regardless of sample size.

Manner of death relationship with race

```r
plot_xtab(police$manner_of_death, grp=police$race, margin= "row", show.total = FALSE)
```
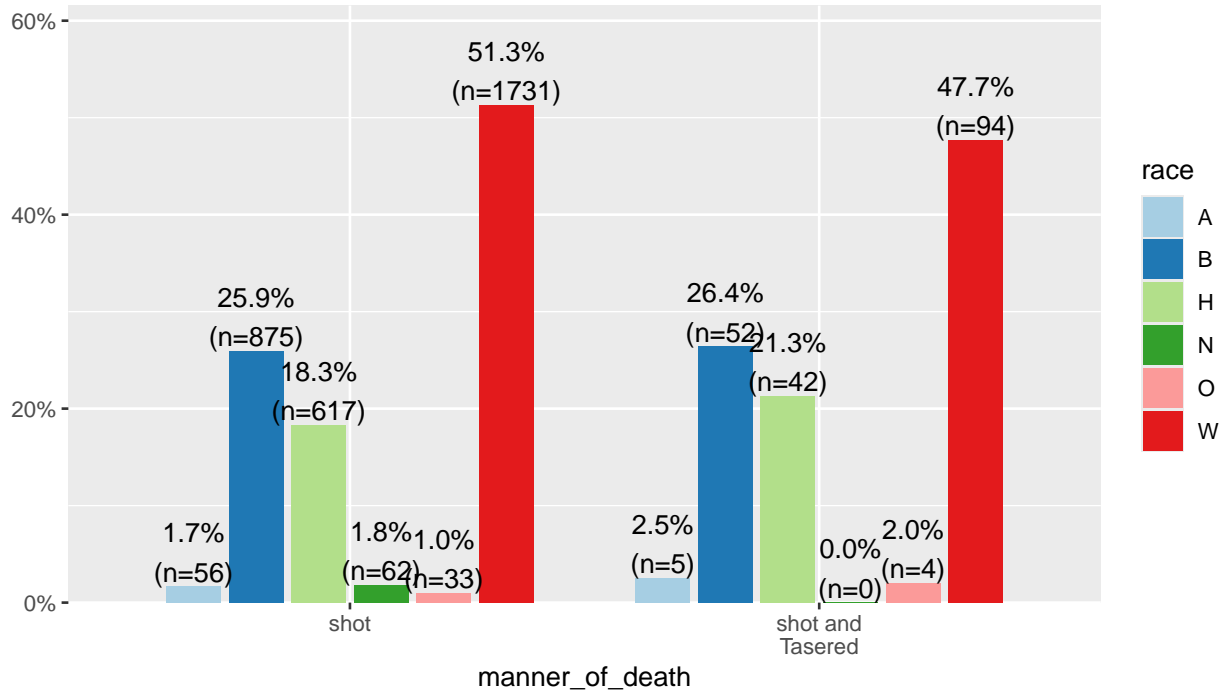
Of the individuals who died by being shot by police, 51.3% (n=1731) were White, non-Hispanic followed by 25.9% (n=875) being Black, non-Hispanic. 18.3% (n=617) of those shot by cops were Hispanic. For individuals who died by being shot and tasered, 47.7% (n=94) were White, non-Hispanic followed by 26.4% (n=52) being Black, non-Hispanic. 21.3% (n=42) of those shot and tasered were Hispanic.

Conclusion

Based on the data analyzed, factors that appear to influence fatal police shootings are primarily threat level and if armed, regardless of race or fleeing. the general trend was White, non-Hispanic being the most armed and as such had a higher percentage of manner of death, whether shot or shot and tasered. They were also the race with the highest threat level. The most common weapon individuals were armed with was a gun, then a knife was the second type of armed weapon used. It is if interest that most individuals who were killed by police were not fleeing from the scene. This could be due to individuals standing their ground in confrontation with the police.

Things of interest to further elucidate fatal police shootings is if the individual was legally conceal carrying their armed item. It would also be of interest to have information on why the person did not flee from the police officer. Were they complying or was there another response to the situation?