Analyzing Racial Disparities in Policing: Crime and Incident Data in Dallas, Texas (2016)

Introduction

The dataset provided was created by the Centre of Policing Equity and includes information on crime statistics, police demographics, incident data, incident time and location information, and crime locations across Dallas, Texas in 2016. I utilised a number of graphs in this work to extract useful information from the data. I'll analyse the data to see if I can identify any differences in the patterns of criminals who were apprehended by the police in terms of their race, as well as any instances of racism. The primary goal of this analysis is to inform the police department of areas where racial disparities exist that cannot be explained by crime or poverty levels.

```
## Warning: package 'dplyr' was built under R version 4.2.3
```

```
## ── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ─
─
## ✔ dplyr     1.1.4     ✔ readr     2.1.4
## ✔ forcats   1.0.0     ✔ stringr   1.5.0
## ✔ lubridate 1.9.2     ✔ tibble    3.2.1
## ✔ purrr     1.0.1     ✔ tidyr     1.3.0
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ─
─
## ✖ dplyr::filter() masks stats::filter()
## ✖ dplyr::lag()    masks stats::lag()
## ℹ Use the ]8;;http://conflicted.r-lib.org/conflicted package]8;; to force a
ll conflicts to become errors
##
## Attaching package: 'plotly'
##
##
## The following object is masked from 'package:ggplot2':
##
##     last_plot
##
##
## The following object is masked from 'package:stats':
##
##     filter
##
##
## The following object is masked from 'package:graphics':
##
##     layout
```

Including Plots

You can also embed plots, for example:

```
## Warning in .parse_hms(..., order = "HMS", quiet = quiet): Some strings failed
## to parse, or all strings are NAs
```

Visualisation

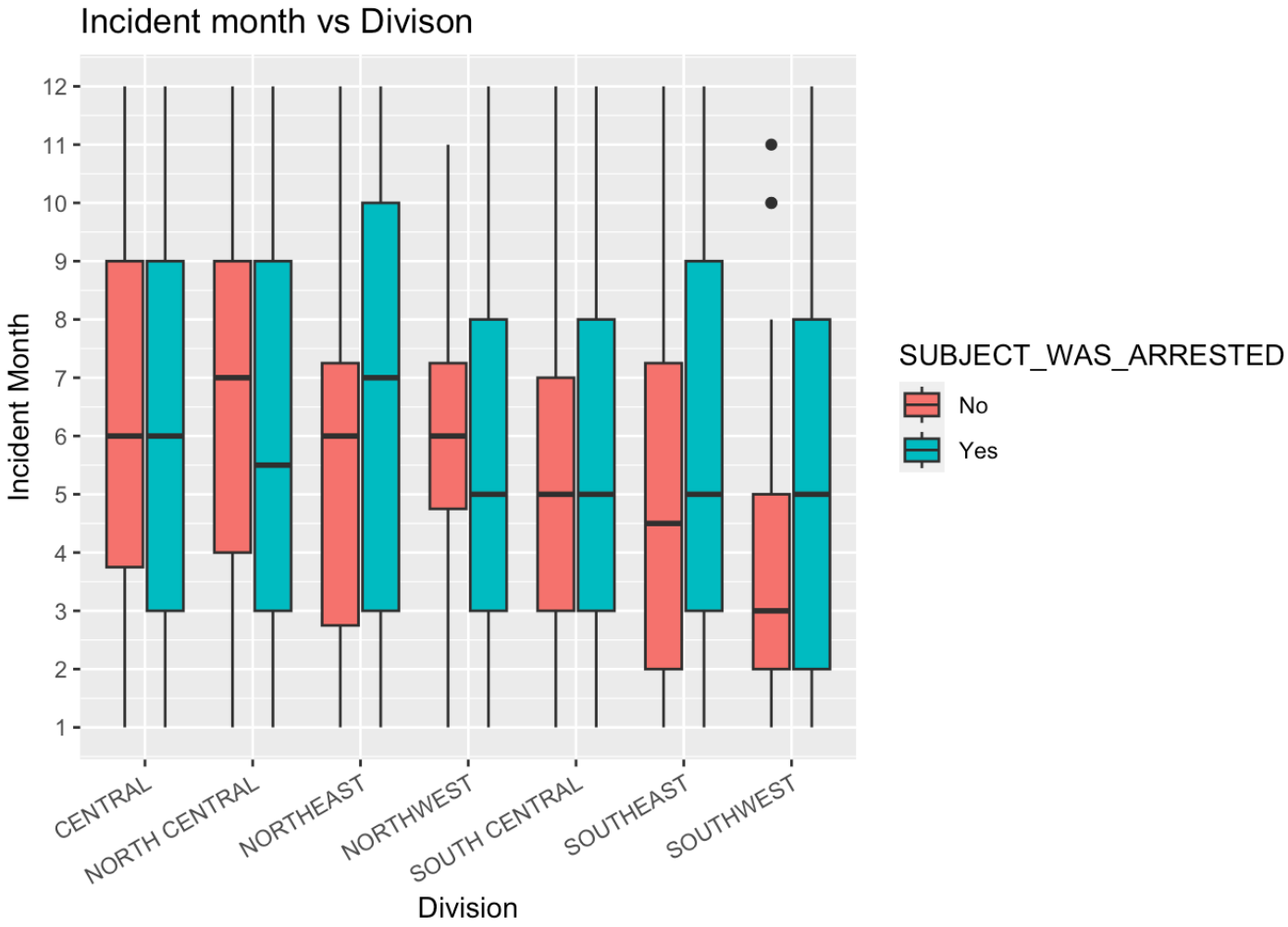
```
##
##                Alchohol Alchohol and unknown drugs Animal FD-Animal
##   American Ind        0                         1      0          0
##   Asian               3                         0      0          0
##   Black             125                       118      0          0
##   Hispanic          146                        78      0          0
##   NULL                3                         3      1          1
##   Other               6                         0      0          0
##   White              99                        80      0          0
##
##                FD-Motor Vehicle FD-Suspect Unarmed FD-Suspect w/ Gun
##   American Ind                0                  0                 0
##   Asian                       0                  0                 0
##   Black                       1                 21                15
##   Hispanic                    0                  7                 7
##   NULL                        0                  0                 0
##   Other                       0                  1                 0
##   White                       1                  0                14
##
##                FD-Suspect w/ Other Weapon FD-Unknown if Armed Marijuana
##   American Ind                          0                    0         0
##   Asian                                 0                    0         0
##   Black                                10                   62        34
##   Hispanic                              8                   33        16
##   NULL                                  0                    2         0
##   Other                                 0                    2         0
##   White                                 7                   11         0
##
##                Mentally unstable None detected NULL Unknown Unknown Drugs
##   American Ind                 0             0    0       0             0
##   Asian                        1             0    0       0             1
##   Black                      249           214   31     237           216
##   Hispanic                    46            49   28      66            40
##   NULL                         5             6    8       4             6
##   Other                        0             0    0       2             0
##   White                      111            28    9      55            55
```

The table provides information on the number of incidents that occurred involving different racial groups, along with various circumstances such as alcohol and drugs, animal involvement, and suspect behavior. The data suggests that incidents involving black and Hispanic individuals were more likely to involve the use of alcohol or drugs, while incidents involving animals were rare for all racial groups. Incidents involving unarmed or armed suspects with a gun were more frequent among black individuals, while incidents involving suspects with other weapons were more common among black and Hispanic individuals. Moreover, a higher percentage of incidents involving black individuals involved individuals who were either mentally unstable or under the influence of unknown drugs, when compared to incidents involving individuals of other racial groups.

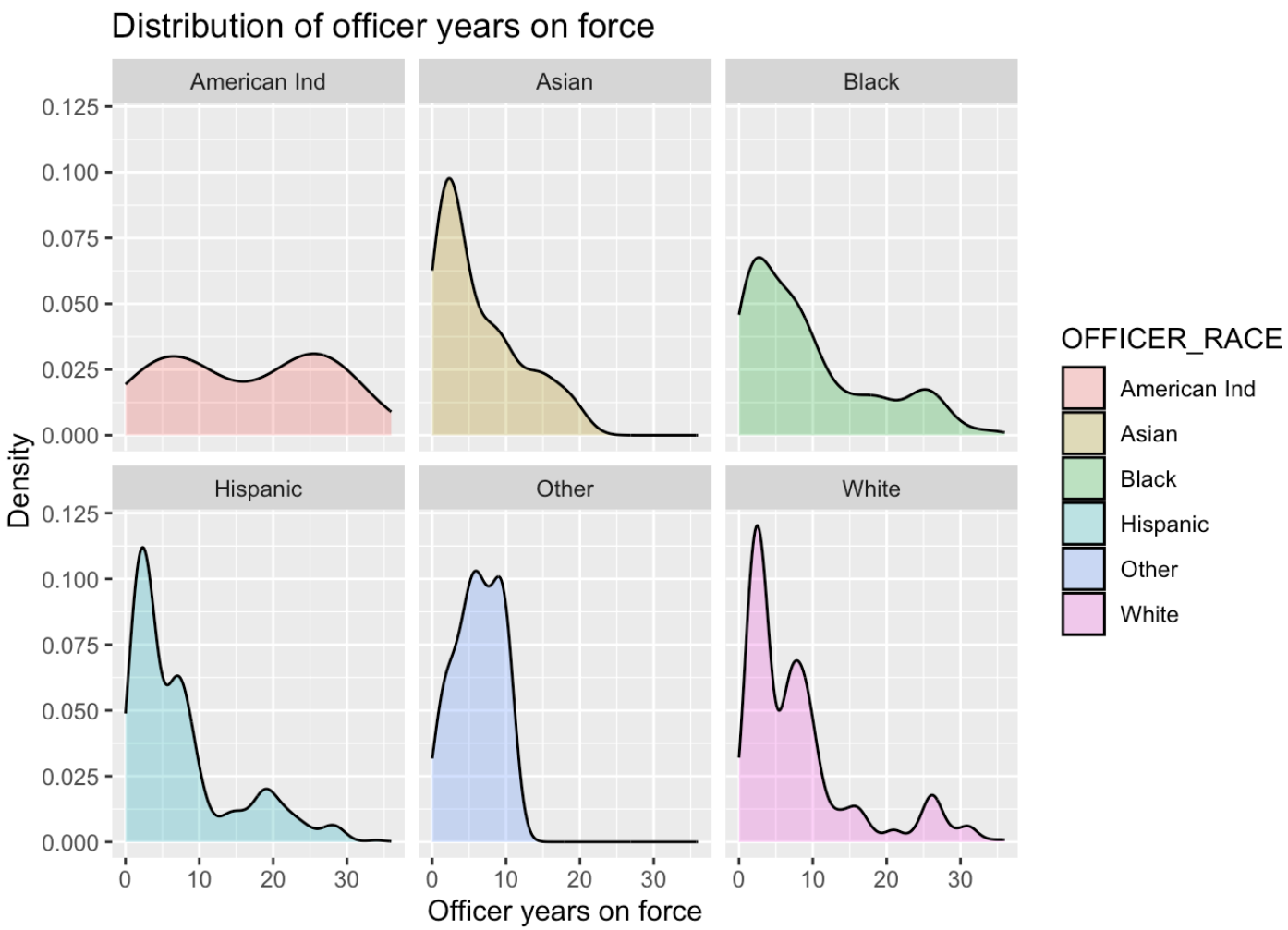
```
##
##           Alchohol Alchohol and unknown drugs Animal FD-Animal FD-Motor Vehicle
##   Female        65                        54      0         0                 0
##   Male         317                       224      0         0                 2
##   NULL           0                         2      1         1                 0
##   Unknown        0                         0      0         0                 0
##
##           FD-Suspect Unarmed FD-Suspect w/ Gun FD-Suspect w/ Other Weapon
##   Female                   6                 4                          4
##   Male                    23                32                         21
##   NULL                     0                 0                          0
##   Unknown                  0                 0                          0
##
##           FD-Unknown if Armed Marijuana Mentally unstable None detected NULL
##   Female                    4         9                133            51    9
##   Male                    106        41                277           246   67
##   NULL                      0         0                  2             0    0
##   Unknown                   0         0                  0             0    0
##
##           Unknown Unknown Drugs
##   Female       66             35
##   Male        298            278
##   NULL          0              4
##   Unknown       0              1
```

The table provides information on the number of incidents involving different circumstances for different genders. It shows that males are involved in more incidents than females for all circumstances, including those involving alcohol and drugs, suspect behavior, and mental state. Incidents involving suspects armed with a gun or other weapon are more common for males. Moreover, incidents involving marijuana are more prevalent among males, while those involving mentally unstable individuals or those under the influence of unknown drugs are more common for both genders. The table also suggests that a greater proportion of incidents involving female individuals have no weapons or other circumstances detected.

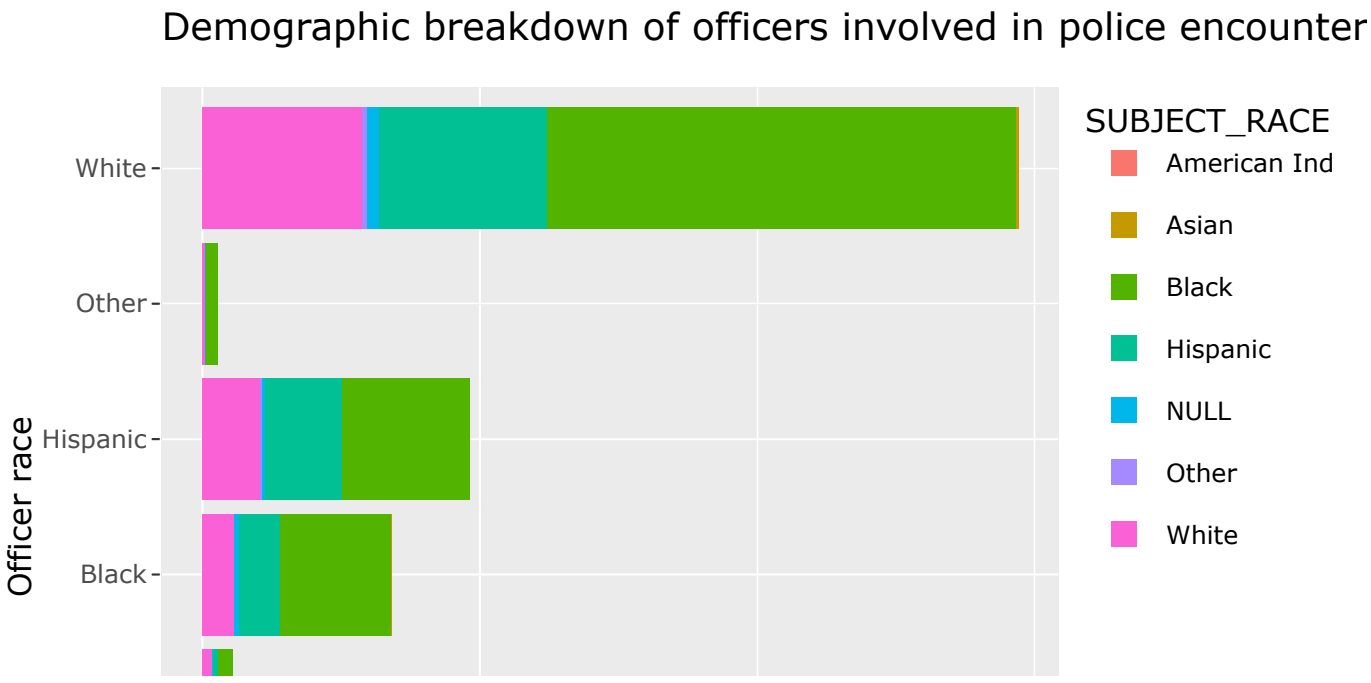
```
## Scale for y is already present.
## Adding another scale for y, which will replace the existing scale.
```

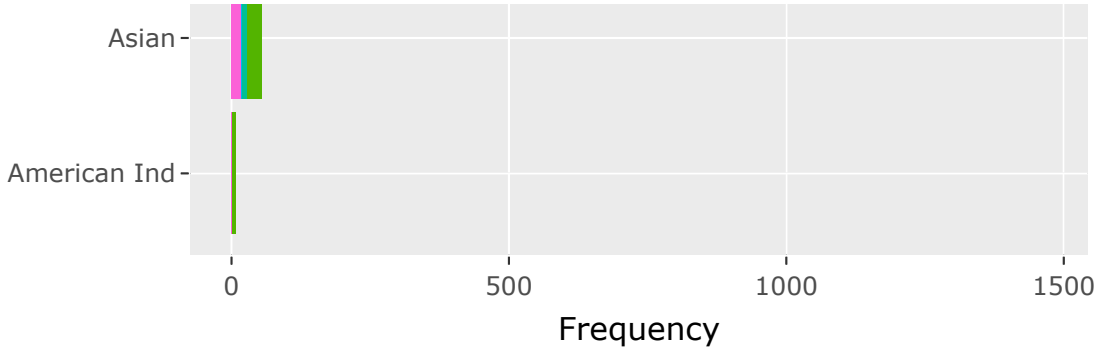


We'll examine which divisions saw the most arrests in this graph for the year 2016. From March to October, the northeast region saw the highest number of arrests, while the central and southeast regions saw the lowest number from February to September. And by examining the graph, we can see that, with the exception of the southwest region, where two persons were detained, no one was arrested in the months of November, December, and January. This reveals that more incidents occur in the northeast region, so police should pay greater attention to this division.



The distribution of officer years on force for each race is seen in this plot. Looking at the plot, we can see that practically every race's officer experience ranges from 0 to 10, with white officers having less experience than other races while black and white. officers have more experience, ranging from 20 to 30 years. American Indians are equally experienced and less experienced than other races. In most races, there are more youthful police officers.



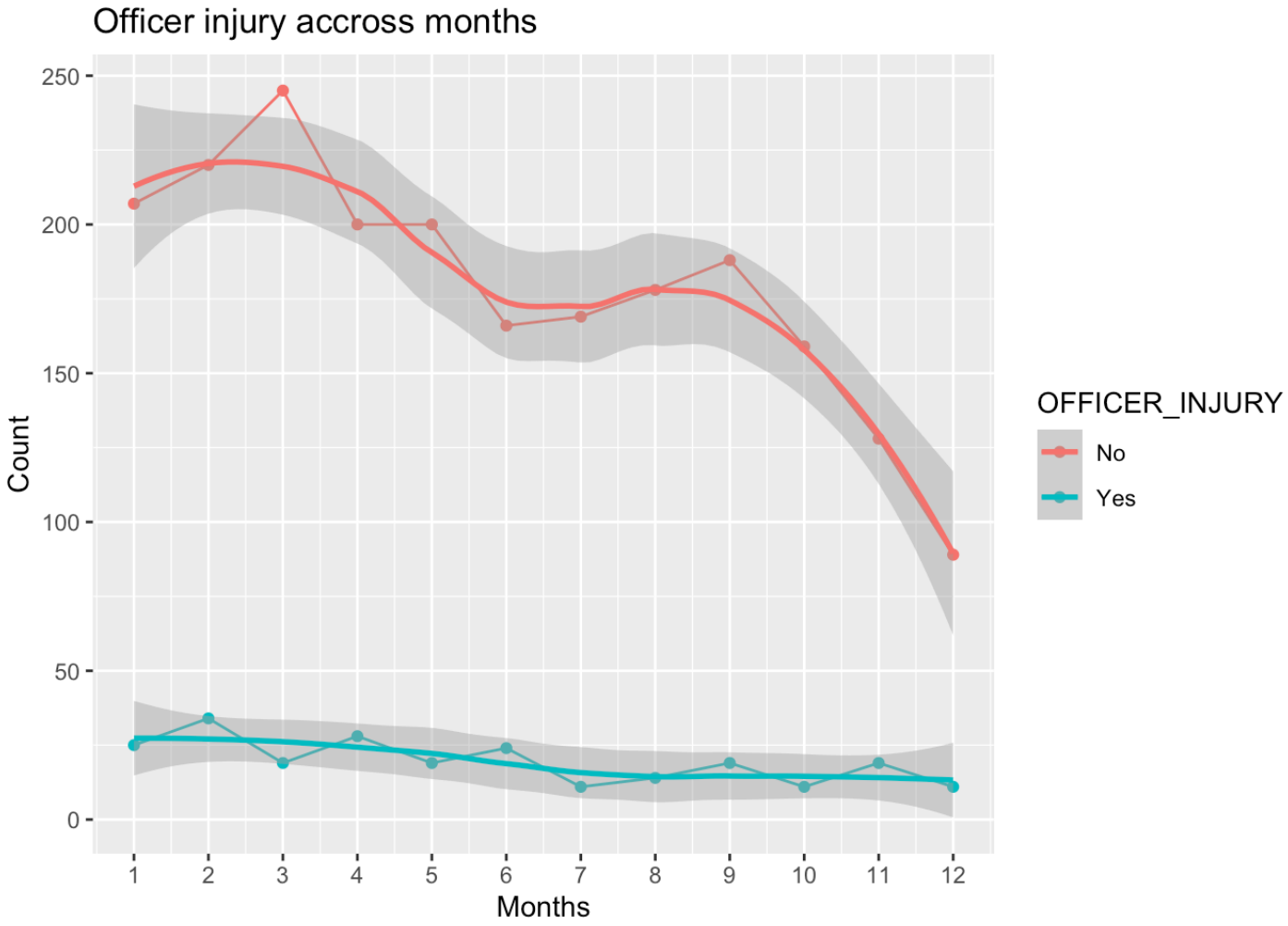


The frequency of the various racial groups among the officers and the subjects they have intervened on is depicted in this graph.The majority of the officers in this are Caucasian, followed by a Hispanic group. The police department's least-represented race is American Indians. Most incidents involving black people and other race officers involve white race officers.

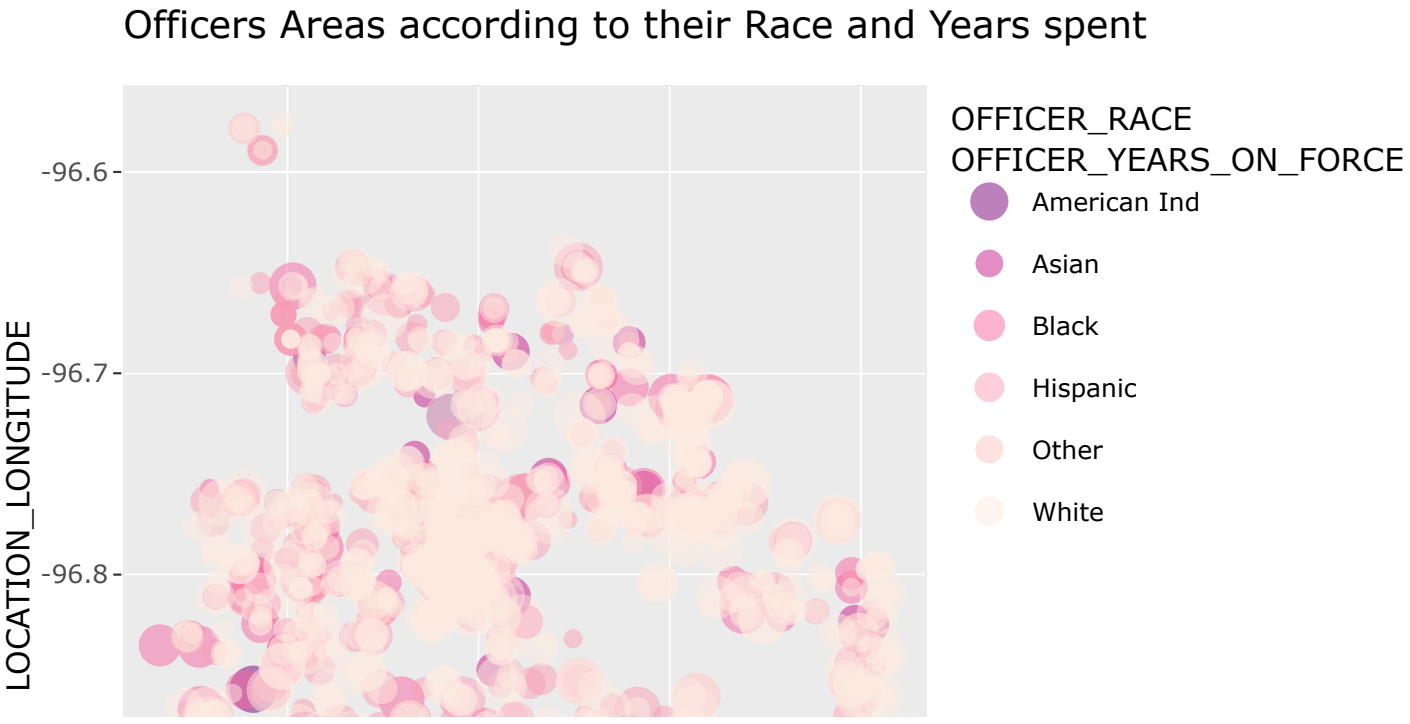
OFFICER_INJURY <chr>	INCIDENT_MONTH <dbl>	n <int>
No	1	207
No	2	220
No	3	245
No	4	200
No	5	200
No	6	166
No	7	169
No	8	178
No	9	188
No	10	159

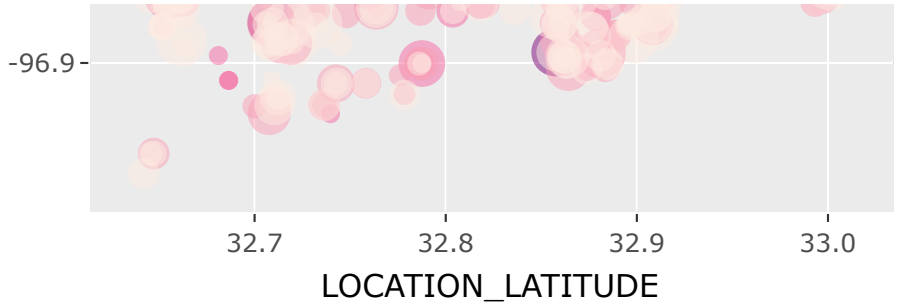
1-10 of 24 rows Previous **1** 2 3 Next

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



The graph provides information on officer injuries in 2016. Less injuries to officers occurred in the month of March, and they fluctuated in subsequent months. In March, the incident left approximately 250 officers unharmed. After September, the officer's "No injury" rate began to decline. With more than 25 injuries, the officer injury rate in February was significant.

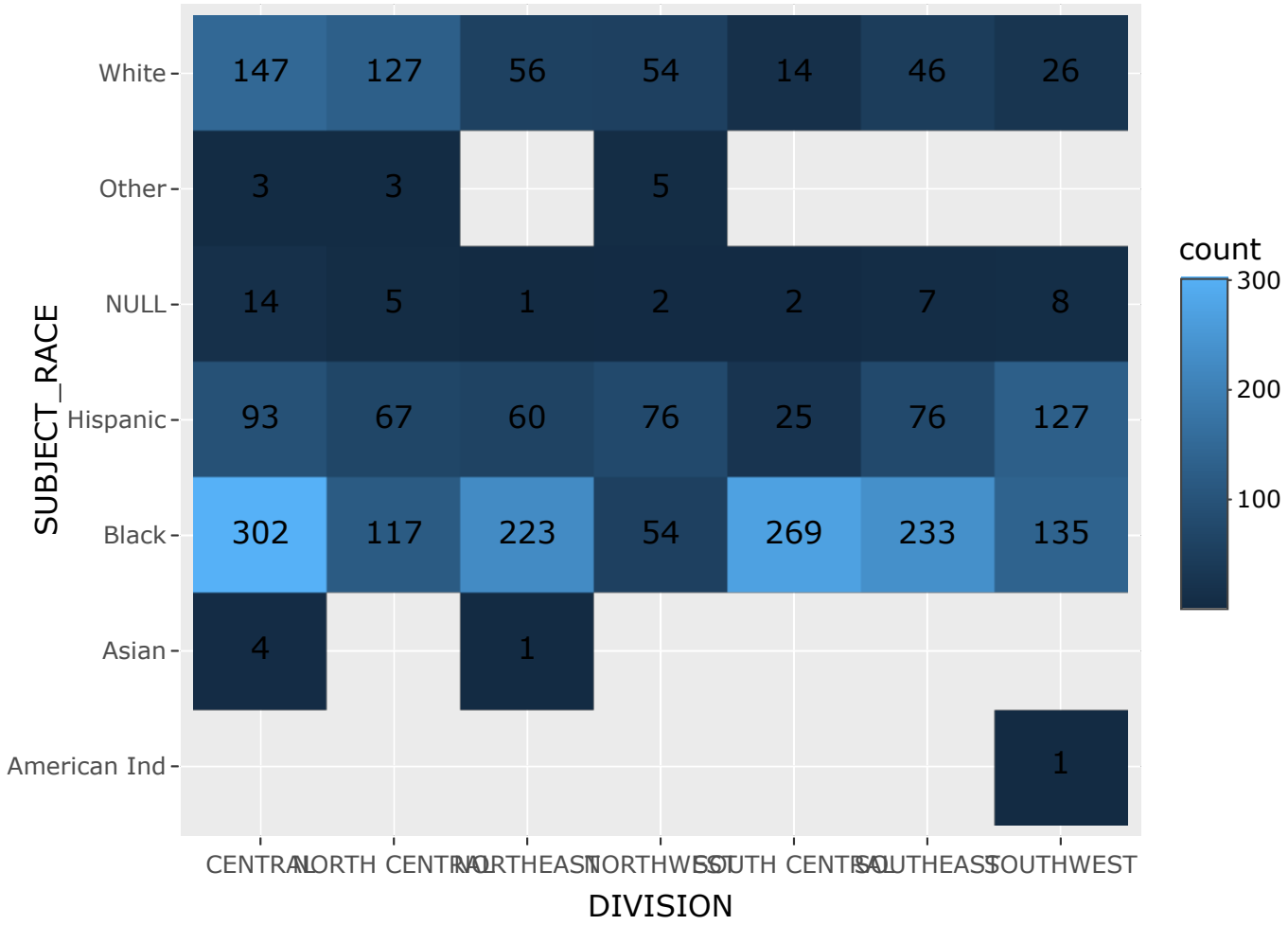




This graph provides data on police officers of different races and the number of years they have served in different locations. It presents information on the behavior of police officers based on their location and determines whether a specific race of police officers tends to stay longer in a particular area. The graph shows that the population of American Indian officers is widely dispersed, which could be attributed to their limited number in the police force. Additionally, the white police officers appear to dominate the central area of the region depicted in the graph.

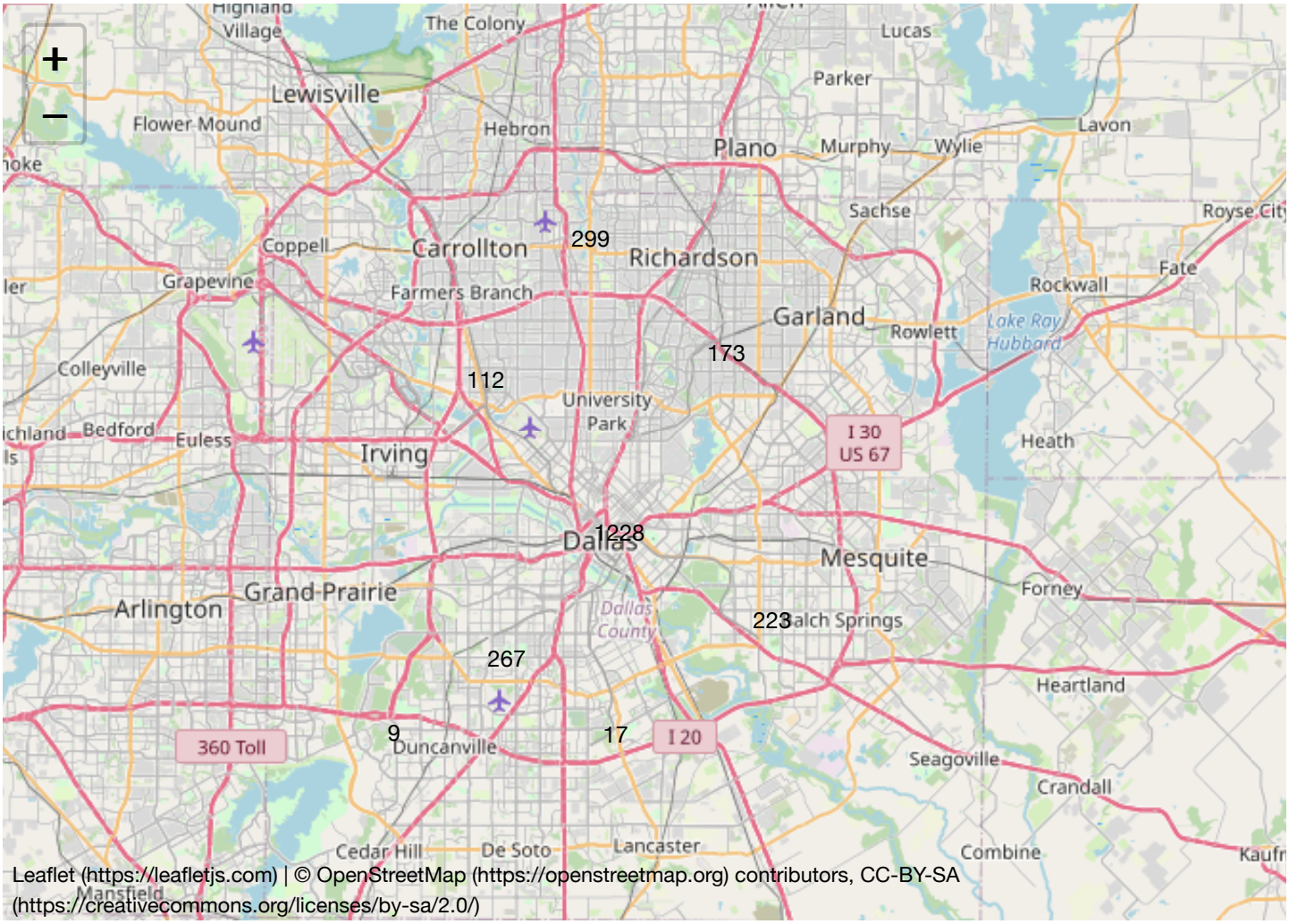
```
## `summarise()` has grouped output by 'DIVISION'. You can override using the
## `.groups` argument.
```

```
ggplotly(p3 , echo=FALSE)
```



The graph shows how subject race is related to the number of incidents in which officers were involved. The data suggests that in the central, northeast, south-central, and southeast regions, incidents involving black individuals were the most frequent. Specifically, there were 302 incidents involving black individuals in the central region. Following black individuals, white and Hispanic individuals were involved in more incidents compared to other racial groups. White individuals had the highest number of incidents in the central region. These findings indicate that the central division has a higher likelihood of experiencing crimes than other regions.

```
## Warning in validateCoords(lng, lat, funcName): Data contains 55 rows with
## either missing or invalid lat/lon values and will be ignored
```



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.