# Final Figures Report

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```
library(plyr)
library(tidyverse)
```

```
## -- Attaching packages ---------------------------------------------------------------------------- t
## v ggplot2 2.2.1.9000     v purrr   0.3.1
## v tibble  2.0.1          v dplyr   0.8.0.1
## v tidyr   0.8.3          v stringr 1.4.0.9000
## v readr   1.3.1          v forcats 0.3.0
## Warning: package 'tibble' was built under R version 3.5.2
## Warning: package 'tidyr' was built under R version 3.5.2
## Warning: package 'dplyr' was built under R version 3.5.2
## -- Conflicts ------------------------------------------------------------------------------------ tidyver
## x dplyr::arrange()   masks plyr::arrange()
## x purrr::compact()   masks plyr::compact()
## x dplyr::count()     masks plyr::count()
## x dplyr::failwith()  masks plyr::failwith()
## x dplyr::filter()    masks stats::filter()
## x dplyr::id()        masks plyr::id()
## x dplyr::lag()       masks stats::lag()
## x dplyr::mutate()    masks plyr::mutate()
## x dplyr::rename()    masks plyr::rename()
## x dplyr::summarise() masks plyr::summarise()
## x dplyr::summarize() masks plyr::summarize()
```

```
library(ggplot2)
library(sf) # for shapefiles
```

```
## Warning: package 'sf' was built under R version 3.5.2
## Linking to GEOS 3.6.1, GDAL 2.1.3, PROJ 4.9.3
```

```
library(maptools)
```

```
## Warning: package 'maptools' was built under R version 3.5.2
## Loading required package: sp
## Checking rgeos availability: TRUE
```

```
library(rgdal)
```

```
## Warning: package 'rgdal' was built under R version 3.5.2
## rgdal: version: 1.3-9, (SVN revision 794)
##  Geospatial Data Abstraction Library extensions to R successfully loaded
##  Loaded GDAL runtime: GDAL 2.1.3, released 2017/20/01
##  Path to GDAL shared files: /Users/madisonvolpe/Library/R/3.5/library/rgdal/gdal
##  GDAL binary built with GEOS: FALSE
##  Loaded PROJ.4 runtime: Rel. 4.9.3, 15 August 2016, [PJ_VERSION: 493]
```

```
##  Path to PROJ.4 shared files: /Users/madisonvolpe/Library/R/3.5/library/rgdal/proj
##  Linking to sp version: 1.3-1
```

```
library(rgeos)
```

```
## rgeos version: 0.4-2, (SVN revision 581)
##  GEOS runtime version: 3.6.1-CAPI-1.10.1
##  Linking to sp version: 1.3-1
##  Polygon checking: TRUE
```

```
library(reshape2)
```

```
##
## Attaching package: 'reshape2'
```

```
## The following object is masked from 'package:tidyr':
##
##     smiths
```

```
library(scales)
```

```
##
## Attaching package: 'scales'
```

```
## The following object is masked from 'package:purrr':
##
##     discard
```

```
## The following object is masked from 'package:readr':
##
##     col_factor
```

```
library(kableExtra)
```

```
##
## Attaching package: 'kableExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```
# read in drug arrests
drugs <- read.csv("./data/si_drugs_mod_arrests.csv")

# read in zip shapefile
zip   <-readOGR(dsn = "./shapefiles/ZipCode")
```

```
## OGR data source with driver: ESRI Shapefile
## Source: "/Users/madisonvolpe/Documents/Grad_School/Spring_2019/DACJS/CJA/shapefiles/ZipCode", layer:
## with 214 features
## It has 3 fields
```

```
# convert zip to sf
zip <- st_as_sf(zip)
zip <- zip[,c(1,4)]

# filter for SI zip codes only
zip <- filter(zip, zcta %in% c(10302, 10303, 10310, 10306, 10307, 10308, 10309,
                               10312, 10301, 10304, 10305, 10314, 10311, 10313))
```

```r
colnames(zip) <- c("zip", "geometry")

# transfom zip to 4326
zip <- st_transform(zip, 4326)

# get points from drugs dataset
points <- data.frame(x = drugs$longitude,  y = drugs$latitude, id = 1:nrow(drugs), race = drugs$perp_ra
points <- st_as_sf(points, coords = c("x", "y"), crs = 4326)

# Intersection between polygon and points -
intersection <- st_intersection(x = zip, y = points)
```

```
## although coordinates are longitude/latitude, st_intersection assumes that they are planar
```

```
## Warning: attribute variables are assumed to be spatially constant
## throughout all geometries
```

```r
intersection <- as.data.frame(intersection)
intersection <- intersection[1:3]
intersection <- as.data.frame(intersection)
intersection$race <- as.character(intersection$race)

# Counts
race.results <- intersection %>%
                  select(zip,race) %>%
                  group_by(zip,race) %>%
                  count()

names(race.results)[3] <- "Amount"

race.results <- tidyr::spread(data= race.results, key = race, value = Amount)
```

```r
make.zero <- function(x){
  x[is.na(x)] <- 0
  return(x)
}

make.numeric <- function(x){
  x <- as.numeric(as.character(x))
  return(x)
}

race.results <- data.frame(apply(race.results, 2, make.zero))
race.results <- data.frame(apply(race.results, 2, make.numeric))

race.results <- race.results %>%
  mutate(OTHER = AMER.IND + AMERICAN.INDIAN.ALASKAN.NATIVE + ASIAN...PACIFIC.ISLANDER +
           ASIAN.PAC.ISL+ UNKNOWN,
         TOTAL = WHITE + BLACK + HISPANIC + OTHER) %>%
  select(zip, WHITE, BLACK, HISPANIC, OTHER, TOTAL)

zip.results <- read.csv("./data/ModelDatasets/zipcodeModel3.csv")

final <- left_join(race.results, zip.results, by = 'zip')
```

```r
final <- final %>%
  select(zip, WHITE, BLACK, HISPANIC, OTHER, TOTAL, Total.Population.Over18, proportionWhite, proportio
  mutate(MajorityNonWhite = ifelse(proportionNonWhite > .5, "Yes", "No")) %>%
  mutate(DrugArrestRate = (TOTAL/Total.Population.Over18)*100) %>%
  select(zip, WHITE, BLACK, HISPANIC, OTHER, TOTAL, MajorityNonWhite, DrugArrestRate) %>%
  arrange(desc(DrugArrestRate))
```

```r
kableExtra::kable(final, format = 'latex', booktabs = T, caption = "Drug Arrests by Zip Code",
                  col.names = c("Zip","White", "Black", "Hispanic", "Other", "Total", "NonWhite Majorit
    kable_styling(latex_options = c("striped", "hold_position"),
                  full_width = F)
```

Table 1: Drug Arrests by Zip Code

| Zip | White | Black | Hispanic | Other | Total | NonWhite Majority | Arrest Rate |
|---|---|---|---|---|---|---|---|
| 10302 | 473 | 553 | 318 | 43 | 1387 | Yes | 9.664832 |
| 10301 | 928 | 1065 | 563 | 44 | 2600 | Yes | 8.520679 |
| 10303 | 362 | 597 | 242 | 28 | 1229 | Yes | 6.640731 |
| 10304 | 516 | 1111 | 423 | 42 | 2092 | Yes | 6.453006 |
| 10310 | 222 | 424 | 215 | 19 | 880 | Yes | 5.001421 |
| 10309 | 790 | 16 | 90 | 19 | 915 | No | 3.514770 |
| 10305 | 741 | 138 | 171 | 49 | 1099 | No | 3.302184 |
| 10307 | 280 | 9 | 29 | 5 | 323 | No | 2.829610 |
| 10306 | 834 | 78 | 118 | 23 | 1053 | No | 2.435132 |
| 10314 | 1144 | 198 | 232 | 77 | 1651 | No | 2.314075 |
| 10312 | 958 | 25 | 85 | 29 | 1097 | No | 2.294979 |
| 10308 | 287 | 14 | 29 | 7 | 337 | No | 1.397007 |

Table 2: Poisson Regression Results

| | *Dependent variable:* | | |
|---|---|---|---|
| | Drug Arrests (2013-2018) Aggregated | Drug Arrests (2014-2017) | Drug Arrests (2013-2018) Aggregated |
| | (1) | (2) | (3) |
| EMS Calls 2013-2018 | 0.0001 | | 0.0005 |
| | (0.0001) | | (0.0003) |
| EMS Calls 2014-2017 | | 0.001** | |
| | | (0.0003) | |
| Proportion Non-White | 2.070*** | 2.126*** | 1.320* |
| | (0.467) | (0.297) | (0.563) |
| Naloxone Saves | | | −0.007 |
| | | | (0.006) |
| Drug Overdose Deaths | | | −0.005 |
| | | | (0.012) |
| Constant | −4.369*** | −6.073*** | −3.680*** |
| | (0.251) | (0.160) | (0.447) |
| Observations | 12 | 48 | 12 |
| *Note:* | | | *p<0.1; **p<0.05; ***p<0.01 |