

# Final Figures Report

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

```
## -- Attaching packages -----
## 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 ----- tidyverse
## 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))
```

```

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

# transform 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_race)
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

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)

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')

```

```

final <- final %>%
  select(zip, WHITE, BLACK, HISPANIC, OTHER, TOTAL, Total.Population.Over18, proportionWhite, proportionNonWhite) %>%
  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))

kableExtra::kable(final, format = 'latex', booktabs = T, caption = "Drug Arrests by Zip Code",
  col.names = c("Zip", "White", "Black", "Hispanic", "Other", "Total", "NonWhite Majority", "Arrest Rate"),
  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

	<i>Dependent variable:</i>		
	Drug Arrests (2013-2018) Aggregated (1)	Drug Arrests (2014-2017) (2)	Drug Arrests (2013-2018) Aggregated (3)
EMS Calls 2013-2018	0.0001 (0.0001)		0.0005 (0.0003)
EMS Calls 2014-2017		0.001** (0.0003)	
Proportion Non-White	2.070*** (0.467)	2.126*** (0.297)	1.320* (0.563)
Naloxone Saves (2016-2018)			-0.007 (0.006)
Drug Overdose Deaths (2016-2018)			-0.005 (0.012)
Constant	-4.369*** (0.251)	-6.073*** (0.160)	-3.680*** (0.447)
Observations	12	48	12

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01