

STA 108 Project 1

Noe Velasquez, _____, and _____

2023-01-27

Introduction

1

```
# 1
# a
cdi = read.table("CDI.txt")
colnames(cdi) <- c("id_num", "county",
                  "state", "land_area",
                  "pop_total", "pop_18_34",
                  "pop_65_old", "active_physicians",
                  "hospital_beds", "serious_crimes",
                  "pct_hsgrad", "pct_bachelors",
                  "pct_poverty", "pct_unemp",
                  "income_percap", "income_total",
                  "region")
model_1 = lm(active_physicians ~ pop_total, data = cdi)
model_2 = lm(active_physicians ~ hospital_beds, data = cdi)
model_3 = lm(active_physicians ~ income_total, data = cdi)
```

a

The estimated regression functions are:

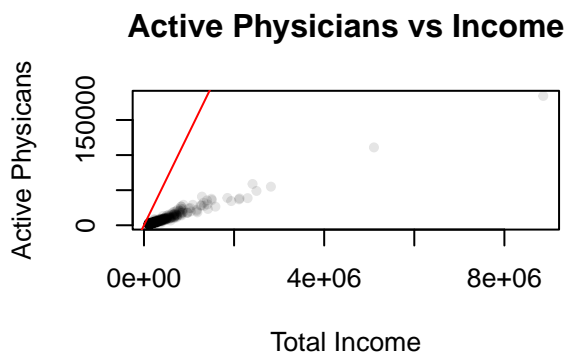
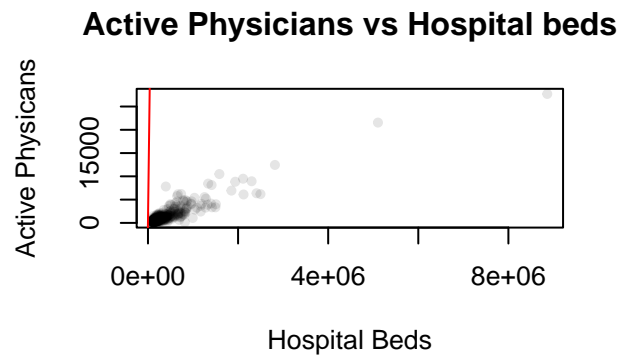
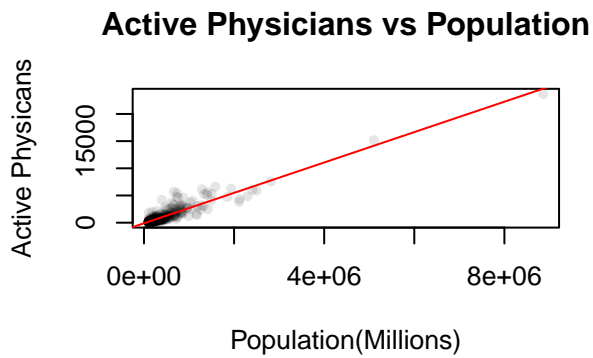
1. The number of active physicians in relation to total population is estimated by $\hat{Y} = -110.63478 + 0.0028X$.
2. The number of active physicians in relation to number of hospital beds is estimated by $\hat{Y} = -95.93218 + 0.74312X$.
3. The number of active physicians in relation to total personal income is estimated by $\hat{Y} = -48.39485 + 0.1317X$.

```
#b
par(mfrow = c(2,2))
plot(cdi$pop_total, cdi$active_physicians,
     main = "Active Physicians vs Population",
     xlab = "Population(Millions)",
     ylab = "Active Physicans",
     pch = 20,
     col = rgb(red=0, green = 0, blue = 0, alpha = 0.1))
```

```
abline(model_1, col="red")

plot(cdi$pop_total, cdi$hospital_beds,
     main = "Active Physicians vs Hospital beds",
     xlab = "Hospital Beds",
     ylab = "Active Physicans",
     pch = 20,
     col = rgb(red=0, green = 0, blue = 0, alpha = 0.1))
abline(model_2, col="red")

plot(cdi$pop_total, cdi$income_total,
     main = "Active Physicians vs Income",
     xlab = "Total Income",
     ylab = "Active Physicans",
     pch = 20,
     col = rgb(red=0, green = 0, blue = 0, alpha = 0.1))
abline(model_3, col="red")
```



b

c

c