

Mapping Homicide Trends in Boston, MA

Homework 5 (option 1) | ERHS 535

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# packages
library(readr)
library(dplyr)
library(lubridate)
library(stringr)
library(forcats)
library(tigris)
library(sf)
library(ggplot2)
library(viridis)
library(ggdark)

# get data
homicides <- read_csv("../data/data-homicides-master/homicide-data.csv") %>%
  # create new column called city_name to unite city and state
  tidyr::unite("city_name", c(city, state), sep = ", ")

# filter to Boston, Massachusetts homicides
ma_homicides <- homicides %>%
  filter(city_name == "Boston, MA") %>%
  # create column for unsolved homicides
  mutate(unsolved_hom =
    disposition %in% c("Closed without arrest", "Open/No arrest"),
    # create column for top 3 victim race (lumps other races into "Other")
    victim_race_lump = fct_lump(victim_race, n = 3),
    # create new column with status
    solved_status = if_else(unsolved_hom == TRUE,
                            "Unsolved", "Solved"),
    # change reported_date to date class
    reported_date = ymd(reported_date),
    # extract year and make new column
    reported_year = str_sub(reported_date, 1, 4)) %>%
  # filter missing latitude and/or longitude coordinates
  filter(!is.na(lat), !is.na(lon))

# download boundaries for sub-city geography (tracts) from tigris
# show as a layer underneath the points showing homicides
# county for Boston is Suffolk County 25_025
boston_tracts <- tracts(state = 25,
                        county = 025,
                        cb = TRUE,
                        class = "sf",
                        progress_bar = FALSE)
class(boston_tracts)

## [1] "sf"           "data.frame"
```

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# change to sf object; say which columns are the coordinates and set a CRS
boston_homicides <- st_as_sf(ma_homicides, coords = c("lon", "lat")) %>%
  st_set_crs(4269)

# check range of reported years for graph subtitle
range(ma_homicides$reported_year)

## [1] "2007" "2017"

# map plot of Boston homicides (Suffolk County)
ggplot() +
  geom_sf(data = boston_tracts, color = "black") +
  geom_sf(data = boston_homicides,
          aes(color = victim_race_lump, fill = victim_race_lump)) +
  scale_color_viridis(option = "plasma",
                      discrete = TRUE,
                      name = "Victim Race") +
  scale_fill_viridis(option = "plasma",
                      discrete = TRUE,
                      name = "Victim Race") +
  facet_grid(~ solved_status) +
  labs(title = "Boston Homicides by Victim Race",
       subtitle = "Suffolk County | 2007-2017") +
  dark_theme_linedraw() +
  ggplot2::theme(legend.position = "bottom",
                plot.title = element_text(size = 15, face = "bold"),
                legend.title = element_text(face = "bold"),
                strip.text.x = element_text(size = 10, color = "black",
                                            face = "bold"))

```

Boston Homicides by Victim Race

Suffolk County | 2007–2017

