

# Spatial Analysis of School Shootings

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```
# gun control laws
# violent video game sales
# music
```

```
perps <- read_csv("ss_perps.csv", na = c("", "null", "N/A"),
                  show_col_types = F)
weapons <- read_csv("ss_weapons.csv", na = c("", "null", "N/A"),
                   show_col_types = F)

incidents <- read_csv("ss_incidents.csv", na = c("", "null", "N/A"),
                     show_col_types = F)
```

## Warning: One or more parsing issues, see 'problems()' for details

```
# incident dataset filtered
incidents_f <- incidents %>%
  dplyr::select(Incident_ID, Reliability, Date, Quarter, School,
               City, State, School_Level, Location, Location_Type,
               During_School, Time_Period, Situation,
               Bullied, Domestic_Violence, Gang_Related,
               Preplanned, Shots_Fired) %>%
  mutate(Date = as.Date(Date)) %>%
  filter(!(Situation %in% c("Accidental", "Escalation of Dispute",
                           "Domestic w/ Targeted Victim", "Suicide/Attempted")))
  ) %>%
  filter(Gang_Related == "No") %>%
  filter(Date > "1990-01-01") %>%
  unite(Full_Location, c(School, City, State), remove = F, sep = " ") %>%
  mutate(Full_Location = as.character(Full_Location))

incidents_f <- incidents_f %>%
  mutate_at(setdiff(names(incidents_f), c("Incident_ID", "Full_Location", "Date")),
            .funs = as.factor)

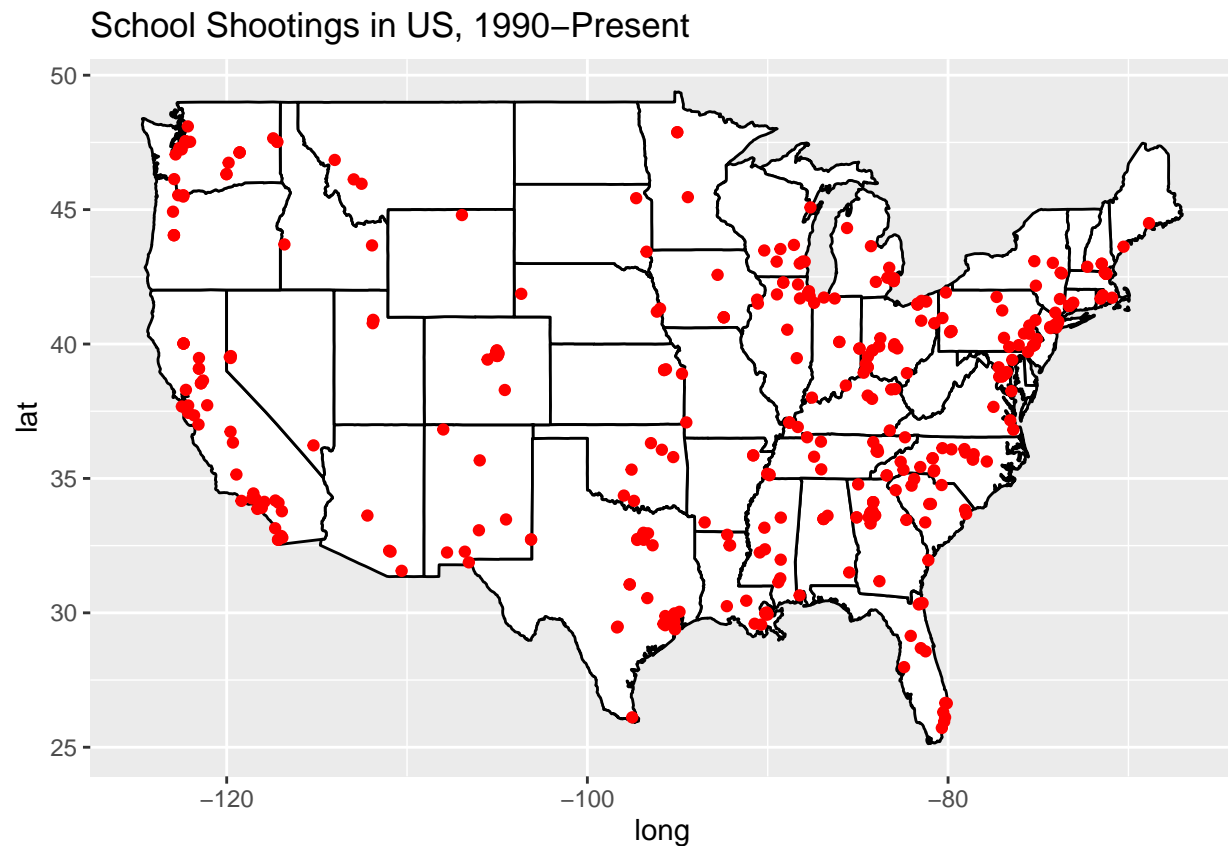
# perpetrator dataset filtered
perps_f <- perps %>%
  dplyr::select(incidentid, age, gender, race, schoolaffiliation) %>%
  rename(Incident_ID = incidentid, Age = age, Gender = gender,
         Race = race, School_Affiliation = schoolaffiliation)
```

```
# weapon dataset filtered
weapons_f <- weapons %>%
  dplyr::select(incidentid, weapontype) %>%
  rename(Incident_ID = incidentid, Weapon_Type = weapontype)

# from tigris
states_shp <- states()
```

## Retrieving data for the year 2020

```
# maps is loaded
states <- map_data("state")
ggplot(data = states, aes(x = long, y = lat, group = group)) +
  geom_polygon(fill = 'white', color = 'black') +
  geom_point(data = df,
            aes(x = lon, y = lat, group = NULL), color = "red") +
  ggtitle("School Shootings in US, 1990-Present")
```



```
# sf is loaded
# raster is loaded
# spatstat.geom is loaded
# tigris is loaded
# downloads the shapefile of the US from Tigris
```

```

# states_shp is loaded
# states_shp <- tigris::states()

# parts of the USA to exclude
excludes <- c("Hawaii", "Alaska", "United States Virgin Islands",
              "Commonwealth of the Northern Mariana Islands",
              "Guam", "American Samoa", "Puerto Rico")

# subsetting shapefile to only the mainland United States
mainland_shp <- states_shp[!paste(states_shp$NAME) %in% excludes,]
# converting to flat coordinates
mainland_flat <- st_transform(mainland_shp, crs = 6345)
# creating a window
mainland_owin <- as.owin(as_Spatial(mainland_flat))

# creating ppp object
df_geocoords <- as.matrix(cbind(df$lat, df$lon))
df_ppp <- as.ppp(df_geocoords, mainland_owin)

## Warning: 402 points were rejected as lying outside the specified window

# plot(df_ppp, axes = TRUE)

# Youth Mental Healthcare Rankings
ymhc_2019 <- read_csv("youth_mhc_2019_2.csv",
                     col_names = T, col_types = "ic") %>%
  rename(Youth_MHC_Rank = Rank, State_Name = State)
ymhc_2019$State <- state.abb[match(ymhc_2019$State_Name, state.name)]

```