Introduction:

Everyday, 22 children and teens are shot in the United States. Gun violence has increasingly been on the rise in recent years, shooting up as much as 30% during the pandemic and overtaking motor vehicle accidents as the leading cause of death for children and adolescents (ages 1-19) in the United States. Not only do these events cause children and teens significant physiological harm and oftentimes death, they also have a profoundly negative psychological impact. This study will examine the proximity of schools that experienced mass shootings (defined as shootings with 4 or more injured) to the nearest medical center, exposing the reality in which mass shootings happen with the hopes of promoting greater awareness of the epidemic of gun violence in America.

Methods:

Three datasets were used for analysis in this paper. First, data on K-12 shootings was obtained from the [Center for Homeland Defense and Security (CHDS) K12 School Shootings Database](https://www.chds.us/ssdb/) of the addresses of all schools with incidents of gun violence from January 1970 through June 2022. Second, data on the latitudes and longitudes of all level I and II trauma centers in the US was scraped from the [American Trauma Society Trauma Center Map](https://www.amtrauma.org/page/FindTraumaCenter) and finally, a list of all k-12 schools in the US was taken from [HIFLD Open Data](https://hifld-geoplatform.opendata.arcgis.com/).

Using Google Maps API, we obtained the latitudes and longitudes of all addresses in the school shootings dataset. We then calculated the nearest trauma center and for every school in either datasets as well as the distance between them using sklearn.BallTree for k-nearest neighbor lookup (here, k is 1) and the Haversine formula as the distance metric to compute geographic distances. Analysis was restricted to shootings from 1990 onwards and to schools in the continental US (excluding Hawaii and Alaska). All data wrangling, analysis, and visualizations was done in Python and Jupyter Notebook.

Links:

<https://www.bradyunited.org/key-statistics>

<https://www.npr.org/2022/05/28/1101307932/texas-shooting-uvalde-gun-violence-children-teenagers>

<https://jamanetwork.com/journals/jamapediatrics/fullarticle/2769688>