

E8 A Temporal and Spatial Analysis of Firearm Deaths in Harris County, Texas: 2009–2020

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Learning Overview: After attending this presentation, attendees will be able to understand the temporal and spatial dimensions of firearm suicides and homicides. This analysis identifies internal and external risk factors and areas to target prevention. Attendees will be able to summarize the findings within this large geographic region and translate to their own jurisdiction.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by serving as a template for the application of temporal and spatial methods to forensic data to identify areas for prevention and to aid in forensic staffing decisions.

The purpose of the retrospective longitudinal study (January 1, 2009–June 2020) was to address the following gaps: (1) understand how firearm suicides and homicides vary over time within a single large geographic region; (2) identify concentrations of firearm suicide and homicide deaths; (3) examine temporal variations in firearm suicides and homicides by year, season, day of week, and time of day; and (4) examine socio-economic and risk correlates for firearm suicides and homicides by small geographical areas (census block groups).

Analyses included bivariate and multivariate statistical analyses to examine firearm death differences over time. Hot spot analysis and multivariate non-linear spatial regression was conducted of the suicide and homicide firearm deaths.

Of the $N=6,979$ firearm events involving death, 646 involved more than one firearm death, of which 226 were homicide-suicide and 420 multiple homicides. Overall, 3,087 were classified as suicide (155 in custody), 3,797 as homicide (198 in custody), 31 as accidental, and 64 were undetermined. The age distribution of firearm-related homicide and suicide deaths was 0–14 years (111), 15–24 years (1,668), 25–64 years (4,468), and 65+ years (637). The total number of male and female decedents was 5,920 and 964, respectively. Race/ethnicity included non-Hispanic White (2,517), Black (2,285), Hispanic (1,815), and other (267); the latter includes Asians, American Indians, multi-ethnic, and unknown.

Correlates of suicidal firearm deaths included non-Hispanic White ethnicity, prior psychiatric history, and veteran status. Correlates of homicide firearm deaths included Black and Hispanic ethnicity and prior history of gunshot wound injury. Circumstances involving multiple firearm deaths, interpersonal violence, and at-work deaths had a higher incidence of homicide than suicide.

The overall trend is a steady increase in both homicide and suicide firearm deaths. June of 2014 had a decline in firearm deaths and an increase in firearm homicide deaths after June of 2019. Firearm-related homicides were higher at nighttime, while suicide firearm deaths were highest in the daytime. Homicide deaths were highest on Friday night, Saturday night, and Sunday early morning, while suicides were highest on Monday. Firearm homicides were generally located closer to downtown Houston, TX, whereas firearm suicides were generally located farther from downtown. There was some overlap in several areas for which future research and prevention efforts can be targeted. The results have implications for practice and prevention.

Forensic Science, Suicide Firearm Deaths, Homicide Firearm Death