

Title: Impact Of State Firearm Ownership and State Gun Laws On Firearm Suicide Deaths

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Introduction: This study examines the relationship between state firearm ownership, gun laws, and firearm suicide deaths. It aims to understand how gun ownership and gun laws affect rates of gun-related suicides.

Methods: This study used data from the CDC Wide-Ranging Online Data for Epidemiologic Research on adults (>17) who died by firearm suicide between 2009-2016 in all states and data from the RAND State-Level Estimates of Household Firearm Ownership. Outcomes were the rate of mortalities per 100,000 persons by an injury intent and mechanism of suicide by firearm. The exposure was the percentage of firearms owned per person in each state. D.C. Univariate analyses were performed for adult suicide mortality by firearm laws. Multivariate linear regression analyses were done for handgun/long gun laws that positively impacted the mortality rate and the average number of guns owned per state.

Results: A total of 162,376 adults were killed by firearm-related suicides from 2009-2016. By conducting a univariate analysis, we examined a total of 44 laws. As a result, we found that 18 of these laws significantly reduced rates of adult firearm suicide ($p<0.05$). Also, in univariable analysis, the stand-your-ground law increased the rate of adult firearm suicide ($p<0.05$). Adjusting for gun ownership, multivariate regression analysis found no laws impacting handgun or long gun mortality rates. However, in states with higher gun ownership, the regression showed a 30-fold increase in handgun-related suicides and a 28-fold increase in long gun-related suicides compared to states with fewer weapons (CI 15.45-45.06; 19.02-37.57 respectively).

Conclusion: The number of guns owned by individuals in each state has a bigger impact on adult suicide rates than state-level laws on handguns and long guns. To better understand this, future research should concentrate on finding effective measures, including public health strategies, to reduce firearm suicide deaths.

One liner: Gun ownership by state has a bigger impact on adult suicide rates than state-level firearm laws.