

# Firearm ownership closely tied to suicide rates, study finds

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States with higher estimated levels of gun ownership had higher incidents of gun-related suicides, with firearm ownership alone explaining 71 percent of the variation in state-level gun suicide rates for males and 49 percent for females, a new study by Boston University School of Public Health researchers shows.

The study, published in the *American Journal of Public Health*, covers 33 years, from 1981 to 2013, and is the most comprehensive analysis of the association between gun ownership and gender-specific suicides rates among the 50 U.S. states.

"Our study adds to the consistent finding that among both males and females, increased prevalence of firearms is clearly associated with an increase in the firearm-specific suicide rate," said Michael Siegel, MD, lead author and professor of community health sciences at BUSPH. "The magnitude of this relationship is substantial and warrants attention from policy-makers."

Co-author Emily Rothman, associate professor of community health sciences, added, "Given that suicide is the 10th leading cause of death in the U.S., and firearm-related deaths and injuries are extraordinarily costly, reducing firearm-related self-injury and suicide is a [public health imperative](#)."

The analysis found that firearm ownership was a significant predictor of male firearm suicide rates, which increased 3.3 per 100,000 for each 10

percent increase in gun ownership. For women, firearm suicide rates increased 0.5 per 100,000 for each 10 percent increase in gun ownership. The study also found an association between gun ownership rates and suicides by any means (including non-gun-related acts) among males, but not among females.

Over the 33-year study period, the mean estimated percentage of gun ownership ranged from a low of 12.2 percent in Hawaii to a high of 72.8 percent in Wyoming, with an average for all states of 41 percent. Hawaii had the third-lowest suicide gun suicide rate for males (4.8 per 100,000) among all states, while Wyoming had the highest rate (26.1 per 100,000). Massachusetts, with the lowest gun suicide rate in the country for men (4.2 per 100,000) had the second-lowest gun ownership rate.

The mean adjusted gun suicide rate among women over the study period ranged from a low of 0.40 per 100,000 in New York to a high of 4.2 per 100,000 in Nevada. The average gun suicide rate for both genders declined slightly from 1981 to 2013.

Siegel and Rothman noted that past studies exploring the association between firearm ownership and suicides had produced mixed results, with some failing to find any relationship. They said that by analyzing three decades worth of data, examining gender-specific suicide rates, and accounting for a host of state-specific factors that could potentially confound the association, they had controlled for as many variables as possible. The study controlled for income, education divorce rate and crime, among many other factors.

Siegel noted that because there is no state-level data on firearm ownership, the researchers used a "proxy measure" of firearm ownership that estimates ownership based on the percentage of suicides in which a firearm was used and a state's hunting license rate. The "well-established" proxy has a 95 percent correlation with survey-measured

gun ownership rates, he said.

He said the study suggests that lowering [gun ownership](#) rates could reduce gun-related suicides. For example, if the firearm ownership in Wyoming dropped from 72.8 percent to 41 percent (the average for all states), the male firearm suicide rate could be expected to decline by 38 percent, and the female rate by 56 percent. Overall male [suicide rates](#) in Wyoming, including those by means other than guns, would be expected to fall 16 percent, based on the study's model.

Siegel and Rothman said the key public health implication of their findings is that "reductions in the prevalence of firearms may be an effective strategy for reducing overall and firearm-related suicides among males and for reducing firearm-related suicides among females. "

Approximately 40,000 people die as a result of suicide each year in the U.S., at an estimated cost of \$44 billion a year. While gun homicides are more frequently reported, the number of gun suicides per year is almost twice as high. In 2013, there were 11,208 firearm homicides and 21,175 firearm [suicides](#), according to the Centers for Disease Control and Prevention.

Provided by Boston University Medical Center

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