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NATIONAL TRENDS IN PEDIATRIC FIREARM AND AUTOMOBILE FATALITIES

Jenny L. Stevens, MD, MPH, Marina L. Reppucci, MD, Kaci Pickett, MS, Margo M. Nolan, BA, Steven L. Moulton, MD

Children's Hospital Colorado, Aurora, CO, USA

Background: Successful public health policies and injury prevention efforts have significantly reduced pediatric automobile fatalities across the United States (US). A recent review of our state's injury fatality data found that in 2019, firearm injuries exceeded motor vehicle crashes (MVC) as the leading cause of childhood death. We hypothesized that similar trends exist nationally and that state gun laws impact pediatric firearm injury case fatality rates.

Methods: Annual pediatric (<19 years-old) case fatality rates for firearm injuries and MVCs were collected from the Centers for Disease Control and Prevention (CDC) Wonder database (1999-2019). Individual state gun law scores were based on the 2014-2019 Gifford's Gun Law Scorecard and strength was categorized by letter grades A-F. Poisson generalized linear mixed models were used to model case fatality rates. Rates were estimated for multiple timepoints and compared between grade levels.

Results: In 1999, the national case fatality rate for MVCs was 2.39 times higher than firearm injuries (95% Confidence Interval (CI): 2.18-2.62, $p < 0.001$). By 2019, however, the national case fatality rate for MVCs was 14% lower than that of firearm injuries (95% CI: 0.78-0.96, $p = 0.009$). For each increase in letter grade for gun law strength there was an 18% reduction in the firearm case fatality rate (95% CI: 0.77-0.88, $p < 0.0001$). States with the strongest gun laws (A) had an estimated 55% lower firearm case fatality rate compared to those with the weakest laws (F).

Conclusion: Firearm injuries have surpassed MVCs as the leading cause of death in pediatric patients across the US. State gun law strength has a significant impact on firearm injury case fatality rates and public health policies are necessary to curb this national crisis.