Understanding the Joint Effects of Laws on Firearm Mortality

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Gun violence is a staggering public health problem in the United States. To address gun violence, states have adopted an array of policies focused on regulating access to and use of firearms. Elsewhere in JAMA Network Open, Schell et al1 evaluate 10 of these policies—laws requiring universal background checks, laws regulating child access to guns, laws regulating concealed public carry, and others—to assess the associations between combinations of state gun laws and mortality over a 40-year period. Using bayesian methods, they found that individual policies had relatively small estimated effects on firearm mortality, but when considered jointly, the policies had larger effect sizes. Compared with the most permissive policy combination, the most restrictive policy combination the authors evaluated was associated with a 20% reduction in firearm mortality.1 This is a notable finding, but perhaps the most important contribution of this article is methodological. Schell et al1 addressed a key question in gun policy research: how should researchers study combinations of gun laws?

Although federal laws create an infrastructure for the regulation of guns, most legislative activity occurs at the state level. A snapshot of today’s policy environment reveals the variation in state approaches to gun policy. For example, fewer than half of states require a background check for transfers between private parties (ie, sellers and buyers who are not federally licensed). Similarly, though many states do not require safe storage of guns to limit child access, roughly half of states have adopted laws requiring gun owners to take steps to prevent child access to guns. States also seek to regulate the public carry and use of guns. Historically, most states instituted a permitting system to authorize qualified individuals to carry concealed guns in public, but a recent shift has driven most states to abandon that permit requirement. Most states have also adopted a stand-your-ground law, which allows gun carriers to use deadly force in public without first attempting to retreat. Researchers have evaluated whether these policies affect firearm mortality with mixed success, but among the most consistent findings are that certain background check laws (those requiring permits or licenses to purchase) and child access prevention laws are associated with reductions in firearm mortality, while stand-your-ground laws and laws easing restrictions on concealed carry are associated with increases in firearm violence.2,3

Researchers have used a variety of study designs to analyze state gun laws, and new approaches are gaining momentum, but there are still significant methodological questions about how gun laws should be studied.4 Some key questions are rooted in legal epidemiology, ie, in the way we understand how laws affect public health. In addition to the overarching question of how to choose the best design for drawing causal inferences about a given law, researchers are grappling with important issues related to data availability and covariate selection. However, the first step for policy researchers is to determine how best to measure the laws of interest.5 Schell et al1 focus on a relevant piece of this inquiry: how to measure combinations of laws.

State gun laws do not exist in a vacuum—they interact with each other, and in concert, may affect gun violence differently than each would in isolation. Researchers have observed this but have struggled to find the right measurement approach. Some studies have targeted a specific gun law but have included many other laws in their models.1 These studies are trying to account for the potential effects of these other laws but are not specifically evaluating the associations between these laws and the main law being studied. Other studies seek to create scales or other composite measures of state gun laws. These measures are often simple counts or weighted combinations of restrictive gun laws. These designs are appealing because they (1) claim to address the entire

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spectrum of state gun laws rather than a single law and (2) can easily take advantage of existing compilations of gun laws constructed by researchers or advocacy organizations. Unfortunately, good composite measures are difficult to create. They must be rooted in theory and are usually the product of interdisciplinary collaboration. The studies that use simple counts often erroneously treat all laws as equal and make it difficult to describe the policy implications of the findings.

Schell et al acknowledge this shortcoming of prior work and seek to evaluate “conceptually related policies jointly.” They combine policies into buckets of 2 and 3 related policies and then use bayesian methods to estimate the effects of these combined policy categories on firearm mortality. This approach to the interplay between policies is thoughtful and addresses many of the shortcomings of prior analyses of policy combinations. Schell et al group the policies according to their conceptual similarities and allow that each policy may have a different estimated effect on gun violence-related mortality. The most restrictive combination they identify—private transfer background checks, a 7-day waiting period, minimum ages of 18 years for handgun possession and 20 years for purchase, and a child access prevention law—was associated with a 20% reduction relative to a combination that lacked all of these restrictions.

Studies that seek to measure and model combinations of laws are essential to understanding and preventing gun violence, but more work is needed to translate these findings for policymakers. When studies are designed to grapple with the complexities of broad policy schemes, researchers may find it difficult to articulate the specific implications of the results. If a combination of policies is associated with an increase or decrease in firearm mortality, that is an important finding. However, it may be difficult to translate such a finding for state lawmakers who look to research to inform their legislative agenda. As Schell et al rightly point out, state gun laws are not inherently equal—some are going to have a greater impact than others. But more granular results that help illustrate the outcomes of individual laws in the context of an overall legal scheme may be more helpful to advocates and policymakers seeking to prevent gun violence.

Researchers studying gun policy and gun violence should endeavor to use the same methodological care and thought that Schell and colleagues used in their paper. Gun violence research, as a field, is consistently striving to improve methods, draw more reliable causal inferences, and understand the nuances of state policy. Increasingly, this means designing mixed methods studies that assess both the quantitative effects of a law and the qualitative factors that shape its implementation. As the field grows, it is important for junior scholars and others new to the field to make careful methodological choices, particularly about how laws are measured. It is equally important for the entire field to consider gun violence research more holistically: although some studies of gun laws may carry more weight than others, each contributes to a total body of evidence that is far greater than the sum of its parts.

ARTICLE INFORMATION
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REFERENCES


