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Author(s): Michael Siegel, M.D., M.P.H.

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TITLE PAGE

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The Impact of State-Level Firearms Laws on Homicide Rates by Race/Ethnicity

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CONTACT INFORMATION FOR PRINCIPAL INVESTIGATOR:

Michael Siegel, MD, MPH
Boston University School of Public Health
Department of Community Health Sciences
801 Massachusetts Avenue, CT4
Boston, MA 02118
(617) 358-1347
mbsiegel@bu.edu

CONTACT INFORMATION FOR APPLICANT ORGANIZATION:

Diane Baldwin
Associate Vice President, Office of Sponsored Programs
Trustees of Boston University, BUMC
25 Buick Street, Suite 200
Boston, MA 02215-1301
(617) 353-4365
bumc-era@bu.edu

A. PURPOSE OF THE PROJECT

In 2017, there were 14,542 firearm-related homicide deaths in the United States.¹ Despite constituting only 13% of the U.S. population, Black persons made up 59% of these victims.¹ Many states have addressed the problem of firearm-related homicide by enacting stronger firearm laws. While many studies have already been conducted on the effectiveness of various firearm laws in reducing overall population homicide rates, the vast majority of these studies do not distinguish between victims of different races/ethnicity. In failing to do so, these studies assume that state-level firearm laws produce homogeneous effects, even while Black communities continue to bear the undue burden of firearm violence. The purpose of this research was to fill this critical gap by rigorously evaluating the differential impact of state-level firearm laws on homicide rates among White, Black, and Hispanic populations.

This project sought to answer two major research questions:

- (1) Is there heterogeneity in the effect of different state firearm laws on homicide rates by race/ethnicity?
- (2) To what extent are any differences in the impact of firearm laws by race/ethnicity explained by contextual differences in homicide victimization across urban vs. non-urban settings, as opposed to differences among racial groups per se?

A summary statement of the problem is as follows:

Despite the striking disparity in homicide victimization rates between White and Black Americans, there is virtually no research on the impact of firearm policies on homicide rates among Blacks. The U.S. urgently needs an evaluation of state-level firearm laws over time that explores potential heterogeneity in impact of these laws on homicide rates among the White and Black populations. Given the similarity in predictors of homicide rates among Blacks and Hispanics, it is also critical to determine whether state gun laws have a differential effect on the Hispanic population. The proposed methodologically rigorous, quasi-experimental study will address this critical gap in the field by being the first study to comprehensively examine the relationship between state firearm laws and homicide rates, stratified by race/ethnicity. The results will have important implications for the development of effective criminal justice strategies to reduce the disparity in firearms violence by race and to decrease firearm-related mortality among the entire population.

For both of the major research questions, we analyzed the relationship between a set of state firearm laws and homicide rates disaggregated by race/ethnicity, urbanicity, or both across the period 1991-2017.

We compiled a novel database of state firearm laws that covered 134 provisions across 14 categories for all 50 states during the period 1991-2017 (the database has now been updated so that it is current through 2019).

B. DESIGN AND METHODS

B.1. Design overview

This study used a quasi-experimental, panel design. The design took advantage of differences between states in the enactment of firearm-related laws over time in order to explore the relationship between state firearm laws and homicide rates among the White, Black, and Hispanic populations over a 27-year period, 1991-2017. Using a negative binomial regression with year and state fixed effects and a range of state-level control variables, we examined the association between state gun laws and homicide rates, stratified by race/ethnicity, thus producing the first ever estimates of the specific impact of state firearm laws on homicide among Blacks and Hispanics and providing the first investigation of possible differential effects of firearm laws on the White, Black, and Hispanic populations. We also analyzed the data stratified by place (urban vs. non-urban) in order to explore the extent to which contextual differences in homicide victimization associated with urban crime explain observed racial disparities in firearm homicide victimization and in the impact of state firearm laws.

B.2. Variables and data sources

B.2a. Outcome variables

1. Annual state-specific, age-adjusted firearm, non-firearm, and total homicide rates, stratified by race/ethnicity. Age-adjusted homicide rates were obtained from the Centers for Disease Control and Prevention's Web-Based Injury Statistics Query and Reporting Systems database for three population subgroups: (a) White persons; (b) Black persons; and (c) Hispanic persons.¹

2. Annual state-specific, age-adjusted firearm, non-firearm, and total homicide rates, stratified by urban vs. non-urban location. Homicide rates for urban and non-urban locations were obtained from the FBI Supplemental Homicide Report (SHR). Based on the SHR's coding of the place of each homicide, we

dichotomized the location into either urban or non-urban. Urban locations were defined as all cities with a population greater than 100,000 in 1990 (just prior to the beginning of the study period). All other locations were considered to be nonurban. There were a total of 197 cities that made up the urban locations in the study.

B.2b. Main predictor variable

State firearms laws. We developed the most extensive database of state firearm laws over time, in terms of both the number of law provisions and the number of years included. We coded a total of 134 law provisions over the 27-year period 1991-2017. These provisions cover 14 aspects of state laws. We used the *Westlaw Next* database of historical state statutes and session laws to code all firearm statute provisions. In our analysis, we evaluated the impact of nine firearm laws, as described in Table 1.

B.2c. Control variables

In our analyses of the impact of state firearm laws by race/ethnicity, we controlled for the following state-level factors, which have been identified in previous literature as being related to homicide rates: proportion of young adults (aged 15–29 years), proportion of young males (aged 15–29 years), proportion of Blacks, proportion of Hispanics, level of urbanization, poverty status, unemployment, per capita alcohol consumption, non-homicide violent crime rate (aggravated assault, robbery, and forcible rape), nonviolent (property) crime rate (burglary, larceny–theft, and motor vehicle theft), household gun ownership, and the per capita number of licensed gun dealers. We lagged the state laws by one year.

In our analyses of the impact of state firearm laws by urbanicity, we controlled for the following city- or nonurban location-level factors: proportion of Blacks, proportion of Hispanics, overall population, population density, non-homicide violent crime rate (aggravated assault, robbery, and forcible rape), nonviolent (property) crime rate (burglary, larceny–theft, and motor vehicle theft), poverty, unemployment, educational attainment, and per capita licensed gun dealers.

Table 1. Description of State Firearm Laws Analyzed		
Law	Detailed Description of Provision	States with Law in Effect in 2017
Laws regulating WHO may purchase or possess a firearm		
Universal background checks at point-of-purchase	Both licensed dealers and private sellers must conduct background checks at point of purchase for all firearms. This may or may not include exemptions for buyers who have already undergone a background check for a concealed carry permit or other licensing requirements. Background checks must be explicitly required.	CA, CO, CT, DE, NV, NY, OR, RI, WA
Permit requirements	All firearms may only be sold to and possessed by individuals with a valid license or permit to possess or carry firearms. This may include requiring a firearm safety certificate and must apply to both licensed dealers and private sellers.	CA, CT, HI, IL, MA, NJ, RI
“May issue” laws	Law provides authorities with discretion in deciding whether to grant a concealed carry permit, or the law bans all concealed weapons.	CA, CT, DE, HI, MD, MA, NJ, NY, RI
Violent misdemeanor laws	Law prohibits gun possession by people who have committed violent misdemeanors punishable by less than one year of imprisonment or prohibits gun possession by people subject to a domestic violence restraining order and requires surrender of their weapons. Must cover possession of guns, not just purchase.	CA, CO, CT, HI, IL, IA, MD, MA, MN, NH, NJ, NY, NC, RI, TN, WA, WI
Laws regulating WHAT types of firearms and ammunition are allowed and HOW MANY guns may be purchased		
Assault weapons bans	Law bans the sale of both assault pistols and other assault weapons.	CA, CT, MD, MA, NJ, NY
Large capacity ammunition magazine bans	Law bans the sale of both assault pistol ammunition and other large capacity magazines.	CA, CO, CT, MD, MA, NJ, NY
One gun per month laws	Buyers can purchase no more than one handgun per month, even if they have a concealed carry permit. In order to bypass this restriction, the buyer must be able to demonstrate an extraordinary need for the additional handgun. This may or may not apply to purchases from private sellers.	CA, MD, NJ
Laws regulating WHEN firearms may be used		
No Stand Your Ground law	Use of deadly force is not allowed to be a first resort in public. There is a duty to retreat. Does not count as stand your ground law if it only applies when person is in a vehicle.	AR, CA, CO, CT, DE, HI, ID, IL, ME, MD, MA, MN, NE, NJ, NM, NY, OH, OR, RI, VA, WA, WI, WY
Laws regulating WHY firearms may be purchased		
Ban on gun trafficking	The law prohibits the trafficking of firearms; that is, the purchase of firearm with the intent to re-sell the firearm, but without going through a background check process (or without the buyer already having gone through a background check.	CA, CO, CT, DE, FL, IL, MA, MN, NY, ND, OH, UT, VA

C. DATA ANALYSIS

We used a difference-in-differences analysis. This is a panel regression method that evaluates the change in the outcome variable across states (or across cities) in relation to changes in the presence of a state law. The regression included fixed effects for each year and state (in the race/ethnicity analysis) or for each year and city (in the urbanicity analysis). Including year fixed effects allows us to account for

national secular changes in homicide rates that were occurring throughout the nation. Including state or city fixed effects allows us to account for time-constant differences between states or cities that could otherwise explain differences in homicide rates. Because the per capita number of gun dealers was only available starting in 1997, our analyses encompass the period 1997-2017.

Statistical details: The outcome variable was the homicide rate in a given state (or city) in a given year. Because the outcome variable is not normally distributed (it is highly skewed), we used a negative binomial model, which was chosen over a Poisson model because there was overdispersion in the distribution of the outcome variable. Because of the clustering by states (i.e., there were multiple observations for each state) or by cities, we adjusted the standard errors of the regression coefficients to account for these multiple observations. We used cluster robust standard errors. Because we were interested in estimating the independent effect of the state firearm laws, we entered them together in the regression model. Thus, the resulting estimates account for the presence of other firearm laws within the same state. Because of the small number of homicides per observation in the combined race/urbanicity analysis, we used the absolute homicide counts as the outcome variable in these regressions and used the log of the White or Black population as the offset. We did not control for per capita gun dealers in this analysis in order to increase the sample size by including the entire period 1991-2017.

Interpretation of results: The results are reported as incidence rate ratios (IRRs), which indicate the estimated percentage difference in the homicide rate in a state associated with a particular state firearm law. For example, an IRR of 0.80 for a particular law would indicate a 20 percent lower homicide rate associated with the presence of that law. We also report 95 percent confidence intervals on these estimates.

Validity check: For any laws that we found to be associated with homicide rates, we separately examined their relationship with firearm versus non-firearm homicides. Finding that the relationship is specific to firearm-related events would increase confidence that the association is a causal one. If a law were to be associated with both firearm and non-firearm events, then we would be reluctant to conclude

that there is a causal association because conceptually, these laws would be hypothesized to only affect the firearm-related death rates.

D. FINDINGS

D1. Impact of state firearm laws by race/ethnicity

Two laws were significantly associated with lower homicide rates among the White population: permit requirements and may issue laws (Table 2). Neither of these laws was associated with the White non-firearm homicide rate.

Permit requirements and may issue laws were also associated with lower Black homicide rates. In addition, violent misdemeanor laws and trafficking prohibitions were associated with lower Black homicide rates. However, trafficking prohibitions failed the validity check, as they were also found to be associated with lower Black non-firearm homicide rates.

Violent misdemeanor laws and trafficking prohibitions were associated with lower Hispanic homicide rates, but trafficking laws were also associated with lower non-firearm homicide rates as well.

Table 2. Association between state firearm laws and homicide rates by race/ethnicity

Law	Incidence rate ratio (95% confidence interval)		
	White	Black	Hispanic
Universal background checks	0.91 (0.80-1.04)	0.87 (0.74-1.02)	1.04 (0.85-1.28)
Permit requirements	0.84* (0.78-0.91)	0.77* (0.70-0.86)	1.19 (0.94-1.50)
May issue laws	0.95* (0.91-0.99)	0.88* (0.80-0.98)	0.90 (0.78-1.05)
Violent misdemeanor laws	0.97 (0.91-1.03)	0.89* (0.81-0.98)	0.85* (0.76-0.97)
No stand your ground law	1.00 (0.95-1.04)	1.00 (0.90-1.10)	1.07 (0.99-1.16)
Trafficking prohibition	0.95 (0.88-1.03)	0.85* (0.76-0.96)	0.79* (0.68-0.92)
Assault weapons ban	0.99 (0.83-1.16)	1.07 (0.95-1.21)	1.10 (0.88-1.38)
Large capacity magazine ban	1.01 (0.93-1.09)	1.07 (0.99-1.16)	0.93 (0.82-1.04)
One gun per month law	0.98 (0.90-1.05)	1.05 (0.94-1.17)	0.93 (0.82-1.04)

*(bold type indicates $p < 0.05$)

Two major findings emerge from these results. First, there is evidence that permit requirements for the purchase of firearms and stricter permit requirements for concealed firearms are associated with lower homicide rates among the White and Black populations. Second, there is evidence that violent misdemeanor laws are associated with lower homicide rates only among minority populations, but not among the White population.

D2. Impact of state firearm laws by urbanicity

Three laws were significantly associated with lower homicide rates among the urban population: permit requirements, may issue laws, and trafficking prohibition laws (Table 3). None of these laws was associated with the urban non-firearm homicide rate.

Permit requirements were also associated with lower homicide rates in nonurban areas, but trafficking prohibitions were associated with higher homicide rates. In addition, violent misdemeanor laws were associated with lower nonurban homicide rates. None of these laws was associated with the urban non-firearm homicide rate.

Table 3. Association between state firearm laws and homicide rates by urbanicity

Law	Incidence rate ratio (95% confidence interval)	
	Urban Localities	Nonurban Localities
Universal background checks	0.91 (0.79-1.04)	1.06 (0.96-1.17)
Permit requirements	0.83* (0.76-0.91)	0.74* (0.56-0.96)
May issue laws	0.86* (0.80-0.93)	1.01 (0.91-1.12)
Violent misdemeanor laws	0.96 (0.89-1.04)	0.85* (0.75-0.96)
No stand your ground law	0.98 (0.92-1.05)	0.98 (0.88-1.09)
Trafficking prohibition	0.88* (0.78-0.98)	1.07* (1.00-1.14)
Assault weapons ban	1.17 (0.98-1.39)	1.00 (0.88-1.13)
Large capacity magazine ban	1.02 (0.92-1.14)	1.07 (0.95-1.20)
One gun per month law	1.03 (0.91-1.16)	0.93 (0.85-1.03)

*(bold type indicates $p < 0.05$)

Three major findings emerge from these results. First, permit requirements appear to be associated with lower homicide rates in both urban and nonurban areas. Second, may issue laws were only associated with lower homicide rates in urban areas. Third, violent misdemeanor laws were only associated with lower homicide rates in nonurban areas.

D3. Impact of state firearm laws by race and urbanicity

Because of the small sample sizes when stratifying by both race and urbanicity, the findings must be interpreted with caution. We did find that violent misdemeanor laws were consistently associated with lower Black homicide rates (both in urban and nonurban areas) and were associated with lower White homicide rates only in nonurban areas (Table 4). Permit requirements were also consistently negatively associated with homicide rates, especially among the Black population. Although trafficking prohibitions

were associated with lower homicide rates among the urban White and nonurban Black populations, they were also associated with non-firearm homicide rates among the Black population.

Table 4. Association between state firearm laws and homicide rates by race and urbanicity

Law	Incidence rate ratio (95% confidence interval)			
	Urban Localities		Nonurban Localities	
	White	Black	White	Black
Universal background checks	0.92 (0.75-1.14)	0.88 (0.73-1.06)	1.00 (0.90-1.12)	1.05 (0.77-1.43)
Permit requirements	0.91 (0.79-1.05)	0.77* (0.69*-0.88)	0.81 (0.65-1.01)	0.68* (0.49-0.93)
May issue laws	0.94 (0.87-1.02)	1.01 (0.94-1.09)	0.98 (0.91-1.06)	1.11 (0.91-1.34)
Violent misdemeanor laws	1.00 (0.91-1.09)	0.90* (0.83-0.99)	0.92* (0.87-0.97)	0.76* (0.63-0.93)
No stand your ground law	0.94 (0.87-1.02)	1.00 (0.93-1.09)	1.01 (0.95-1.08)	0.90 (0.75-1.08)
Trafficking prohibition	0.89* (0.82-0.96)	0.90 (0.83-0.97)	0.99 (0.92-1.05)	0.77* (0.59-1.00)
Assault weapons ban	1.15 (0.98-1.35)	1.17 (0.99-1.37)	1.05 (0.97-1.15)	1.28 (0.92-1.79)
Large capacity magazine ban	1.02 (0.91-1.15)	1.08 (0.94-1.23)	1.00 (0.92-1.09)	1.16 (0.93-1.46)
One gun per month law	0.90 (0.80-1.01)	1.09 (0.97-1.21)	0.99 (0.95-1.04)	1.07 (0.87-1.30)

*(bold type indicates $p < 0.05$)

E. IMPLICATIONS OF FINDINGS FOR CRIMINAL JUSTICE POLICY AND PRACTICE

Our findings lead to four major conclusions regarding our original research questions.

The implications of each of these conclusions is discussed below.

1. Laws that regulate who has access to firearms appear to be more effective than those regulating the type of firearms that can be obtained: Our major finding was that permit requirements to purchase or possess firearms and stricter requirements on who can obtain a concealed carry permit were associated with lower homicide rates among both the White and Black populations, while laws prohibiting firearm possession by people convicted of violent misdemeanors were effective in reducing homicide rates among the Black and Hispanic populations. These findings suggest a general conclusion about the impact of state firearm laws. It appears that laws which regulate the “what” (i.e., what guns/products are allowed) do not have much of an impact on overall population homicide. In contrast, laws that regulate the “who” (i.e., who has legal access to firearms) may have an appreciable impact on firearm homicide, especially if access is restricted specifically to those people who are at the greatest risk of violence: namely, people who have a history of violence. Policies that restricted access to weapons among violent offenders through one of three mechanisms—permit requirements for gun purchase and possession, more stringent

permit requirements for concealed carry, or prohibition of gun possession by violent misdemeanants—were consistently associated with lower homicide rates. The major implication of this finding is that criminal justice practitioners should prioritize strict permitting laws and laws to keep guns out of the hands of people convicted of a violent crime over banning select types of weapons.

2. There is evidence for a differential effect of certain state firearm laws on homicide rates by race/ethnicity: We found that violent misdemeanor laws appear to be more effective among the Black and Hispanic populations than among the White population. This is the first documentation of a state law that appears to impact homicide rates differentially by race/ethnicity. One possible explanation for our finding that violent misdemeanor laws are more effective among populations of color is that there is reason to suspect that when a person of color is accused of a violent misdemeanor, there is a greater likelihood of both arrest and conviction than when a person is White.^{2,3} The major implication of this finding is that state firearm laws can only be effective in keeping firearms out of the hands of violent offenders if people are prosecuted for violent offenses. Tightening these prosecutions must go hand-in-hand with strengthening the requirements for firearm possession.

3. The differential effect of violent misdemeanor laws on the Black population does not appear to be mediated by urbanicity: Violent misdemeanor laws were associated with lower homicide rates among the Black population both in urban and nonurban areas. It appears that the effect of this particular firearm law is mediated directly by race/ethnicity, rather than indirectly through urbanicity.

4. Differential impacts of state firearm laws do not appear to contribute to the observed racial disparities in firearm homicide: We found evidence that several firearm laws appear to be effective among both the White and Black populations and that one law was actually preferentially effective among the Black population. There was no evidence to support our hypothesized concern that certain firearm laws are only protecting the White population. The implication of this finding is that policy makers can confidently implement firearm laws without concern about widening the racial disparity in firearm homicide. If anything, the Black population appears to benefit preferentially from certain policies; namely, those which keep weapons out of the hands of people with a history of violence.

F. RECOMMENDATIONS

- 1. To reduce firearm violence generally and especially among the Black and Hispanic populations, policy makers should prioritize the enactment of laws that extend the prohibition on firearm possession from felony offenses to include violent misdemeanors.** As of 2019, only four states (California, Connecticut, Hawaii, and Maryland) have laws that prohibit firearm possession by people who have been convicted of a violent misdemeanor crime. In these states, crimes such as assault and battery preclude an offender from firearm possession. An additional 15 states ban firearm possession by people convicted of misdemeanor crimes or subject to restraining orders in the domestic violence context and require these offenders to turn in firearms already in their possession.
- 2. Violent misdemeanors and domestic violence offenses should be prohibitive for the issuance of concealed carry permits.** This can be accomplished either by giving police discretion to deny concealed carry permits (“may issue” laws) or by adding violent crimes as an explicit prohibitor for concealed carry permits.
- 3. Policy makers should prioritize the enactment of policies that require a permit or license to purchase and possess a firearm.** These laws were found to be broadly associated with firearm homicide rates, both among Black and Whites, and in both urban and nonurban settings.
- 4. Criminal justice practitioners who wish to reduce firearm homicide rates must also develop more effective methods of prosecuting violent crimes at the misdemeanor level, especially among White defendants.**
- 5. Future research on the impact of firearm laws should consider the potential modifying influences of both race/ethnicity and urbanicity.** It is possible that previous studies that failed to find an effect of certain firearm laws may have yielded null findings because they did not disaggregate on race or urbanicity.

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Grant Products

Database: State Firearm Law Database, 1991-2019: Database of 134 firearm law provisions in all 50 states for the period 1991-2019; Submitted to be archived at NACJD.

Publications:

1. Knopov A, Rothman EF, Cronin SW, Xuan Z, Siegel M, Hemenway D. The Impact of State Firearm Laws on Homicide Rates among the Black and White Populations in the United States, 1991-2016. *Health and Social Work*. 2019; 44(4):232-240.
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