

POLICY BRIEF

Police Shootings of Residents Across the United States, 2015–20

A Comparison of States

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DATA AND METHODS

State-level rates of police shootings of residents were calculated using data from *The Washington Post's* Fatal Force catalog, the Gun Violence Archive (GVA), and the US Census Bureau. Those rates are then compared to a number of state-based proxy measures of firearm access, including the proportion of suicides with a firearm (FS/S) and an index that combines the FS/S ratio with per capita state hunting license data from the US Fish and Wildlife Service. State-based firearms laws were drawn from the Giffords Laws Center, the Brady Center to Prevent Gun Violence, and Everytown for Gun Safety that rate each state according to the presence or absence of laws and policies regarding firearms. Six years' worth of fatal police shootings (2015–20) from *The Washington Post's* collection were converted into standardized rates of deaths per 100,000 residents using the five-year population estimates (2015–19) from the American Community Survey (ACS). Next, six years' worth (2015–20) of both fatal and non-fatal, injurious police shootings of residents were converted into similar per capita rates using the same ACS estimates. The measures of fatal and nonfatal injurious shootings at the state level were derived from Dr. Julie Ward's (2023) dissertation, which relied on the GVA's collection but performed a lengthy—July 2021 through April 2022—and rigorous data cleaning and coding process with a team of 14 students from the Johns Hopkins Bloomberg School of Public Health.

DISCLAIMER

Throughout this brief, the term "resident" is used to describe any person who is shot by a police officer. It should be viewed synonymously with citizen or civilian (i.e., non-police officers).

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POLICE SHOOTINGS OF RESIDENTS ACROSS THE UNITED STATES, 2015–20

Broader public, media, and scholarly interest in police shootings of residents in the United States has been a constant since 2014. This interest followed a number of high-profile deadly force incidents, including those leading to the deaths of Michael Brown in Ferguson, MO, and Tamir Rice in Cleveland, OH. In the decade since, researchers from a variety of academic disciplines have learned much about the scope and nature of police shootings. While US police as a whole use their firearms more than most other countries, rates of police shootings of residents vary across states.

The purpose of this report is to examine police shootings of residents—including both fatal and nonfatal, injurious incidents—using a comparative lens. More specifically, it explores rates of police shootings in the states comprising the Regional Gun Violence Research Consortium (RGVRC)—Connecticut, Delaware, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island—with the rest of the country. These comparisons suggest an association between levels of firearm prevalence/availability in the general population, as well as related laws and rates of police shootings per capita. The majority of RGVRC states possess the lowest rates of police shootings of residents, which appears to at least partially be a function of low levels of firearm prevalence/availability among residents and strong laws and legislation related to guns.

Background

Since 2014, gun violence researchers have been aware that “official” data on police shootings—such as the Federal Bureau of Investigation’s Supplemental Homicide Reporting system, the Bureau of Justice Statistics’ Arrest-Related Deaths program, and the Center for Disease Control’s National Center for Health Statistics—underestimate the number of people killed by law enforcement by roughly 50 percent due to both the voluntary nature of reporting and nonparticipation as well as the lack of standardized modes of data collection and definitions across coroners offices and medical examiners.¹ Since around 2015, the most accurate national representations of residents who died at the hands of law enforcement—particularly from gunfire—are media-based and crowdsourced datasets that include *The Washington Post’s* Fatal Force, Mapping Police Violence, and Fatal Encounters. Their methods include a combination of web scraping news articles and databases, public records, and civilian reports to arrive at the more accurate figures of people fatally shot and who die in police custody more broadly. For example, in 2014 some of the most high-profile police killings—including Eric Garner and Tamir Rice—were missing from the FBI’s data along with zero reported deaths from police agencies in Florida.² These independent data collections suggest that approximately 1,000 people are fatally shot by American police each year, in addition to another roughly 800 who are shot and

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survive their injuries.³ In fact, fatal police shootings of residents represent 5 percent of all gun homicides in any given year.⁴

Firearms represent both the biggest threat to the safety of US law enforcement officers and account for the largest share of weapons encountered in fatal police shootings of residents. Guns are the weapon used for more than 95 percent of all homicides of police officers.⁵ This statistic helps to partially explain why US police may use their firearms at higher rates compared to other democracies with similar economies and wealth.^{6, 7} The presence of a firearm is one of the strongest, most consistent factors associated with police shootings at the individual and situational/encounter levels of analysis.^{8, 9, 10} Using national data from *The Washington Post's* Fatal Force catalog¹¹ from 2015 through mid-August of 2021, for example, the presence and threat of guns were identified in 59 percent of all fatal police shootings, with toy/replica guns (i.e., perceived as real by officers) accounting for an additional 4 percent (63 percent total). While the broader presence of firearms is the focus of this piece, other factors that may contribute to police shootings of residents include (but are not limited to) training and policies about when and how to deploy their weapons, and the frequency of police themselves carrying firearms.

Differences in firearm accessibility and prevalence—as measured by proxies such as the proportion of suicides with a firearm—as well as legislation (or the lack thereof) across states are correlated with the rates at which residents are fatally shot by police. Rates of police shooting deaths of residents are higher in states where a greater prevalence of households own at least one firearm,^{12, 13} and those same states tend to have higher rates of felonious homicides of police officers.¹⁴ Rates of police shootings are also higher in states with more relaxed gun laws, such as those that don't require permits or have “constitutional” concealed carry rights for residents.^{15, 16} On the other hand, states with laws designed to strengthen background checks (e.g., permit-to-purchase laws) and those that seek to promote safe storage and reduce gun trafficking have lower rates of police shootings of residents.^{17, 18} This growing body of literature, taken as a whole, has established a correlation between firearm access at the state level and the likelihood of police fatally shooting residents. Policing is territorially based, and research suggests officers' firearm use is influenced by the broader social context of their working conditions related to encountering firearm threats from the general public, including during interpersonal disputes and when a person is experiencing mental or emotional distress.

Such fatal police shootings, however, represent a subset of all incidents in which officers discharge their firearms. The near-exclusive focus on police shootings of residents that result in death represents a significant limitation of prior research on the topic. According to the late James Fyfe, one of the leading authorities on police use of force:

Deadly force is physical force capable of or likely to kill; it does not always kill. The true frequency of police decisions to employ firearms as a means of deadly force, therefore, can best be determined by considering woundings and off-target shots as only fortuitous variations of fatal shootings. All are of a kind.¹⁹

Off-target shootings, when bullets do not strike individuals, are unlikely to be accurately measured at the state level, let alone nationally, due to a lack of uniform measurement and reporting standards across departments. While many departments have rigorous reporting standards for all firearms discharges, not all do and the measurement may be inconsistent with some including unintentional or accidental discharges as well as those done to kill or euthanize animals. Yet, a few studies have cataloged both fatal *and* nonfatal, injurious police shootings of residents where people are struck by police gunfire. One study using two years' worth of data (2016–17) in Texas found that 49 percent of people shot by police died and 51 percent survived their gunshot wounds.²⁰ An additional study using data from four states—California, Texas, Florida, and Colorado—over multiple years found that 55 percent of those shot by police were killed and 45 percent survived; mortality ranged from 53 percent in Texas to 54 percent in Florida, 56 percent in California, and 63 percent in Colorado.²¹ Most comprehensively, a national analysis of fatal and injurious police shootings from 2015–20—using the Gun Violence Archive (GVA)²²—found similar trends: 55 percent of residents struck by police gunfire died with 45 percent surviving.²³ The ratios suggest that in addition to the approximately 1,000 people who are fatally shot by US police in a given year, there are likely more than 800 who were injured but do not die. It is imperative to examine all instances where people are struck by police gunfire rather than only fatalities.

Data and Methods

State-level rates of police shootings of residents were calculated using data from *The Washington Post's* Fatal Force catalog, the Gun Violence Archive (GVA), and the US Census Bureau. Those rates are then compared to a number of state-based proxy measures of firearm access, including the proportion of suicides with a firearm (FS/S) and an index that combines the FS/S ratio with per capita state hunting license data from the US Fish and Wildlife Service. State-based firearms laws were drawn from the Giffords Laws Center, the Brady Center to Prevent Gun Violence, and Everytown for Gun Safety that rate each state according to the presence or absence of laws and policies regarding firearms. Six years' worth of fatal police shootings (2015–20) from *The Washington Post's* collection were converted into standardized rates of deaths per 100,000 residents using the five-year population estimates (2015–19) from the American Community Survey (ACS). Next, six years' worth (2015–20) of both fatal and nonfatal injurious police shootings of residents were converted into similar per capita rates using the same ACS estimates. The measures of fatal and nonfatal injurious shootings at the state level were derived from Dr. Julie Ward's (2023) dissertation,²⁴ which relied on the GVA's collection but performed a lengthy—July 2021 through April 2022—and rigorous data cleaning and coding process with a team of 14 students from the Johns Hopkins Bloomberg School of Public Health.

Findings

The rate of fatal police shootings of residents in the US for 2015–20 was 1.93 per 100,000. To put this into context, the broader gun homicide rate in the US from 2013–19 was 4.38 per 100,000.²⁵ Rates of fatal police shootings of residents across states, however, ranged from a low of 0.38 per 100,000 in Rhode Island to a high of 5.70 per 100,000 in Alaska. [Figure 1](#) presents a map of those fatal shooting rates broken into quartiles. Six of the seven RGVRC states rank in the first (lowest) quartile, with the remaining state (Delaware) in the second quartile. [Table 1](#) provides information on all seven RGVRC states, including where they rank in terms of rates of fatal police shootings of residents.

FIGURE 1. Rates of Fatal Police Shootings per 100K Population, 2015–20

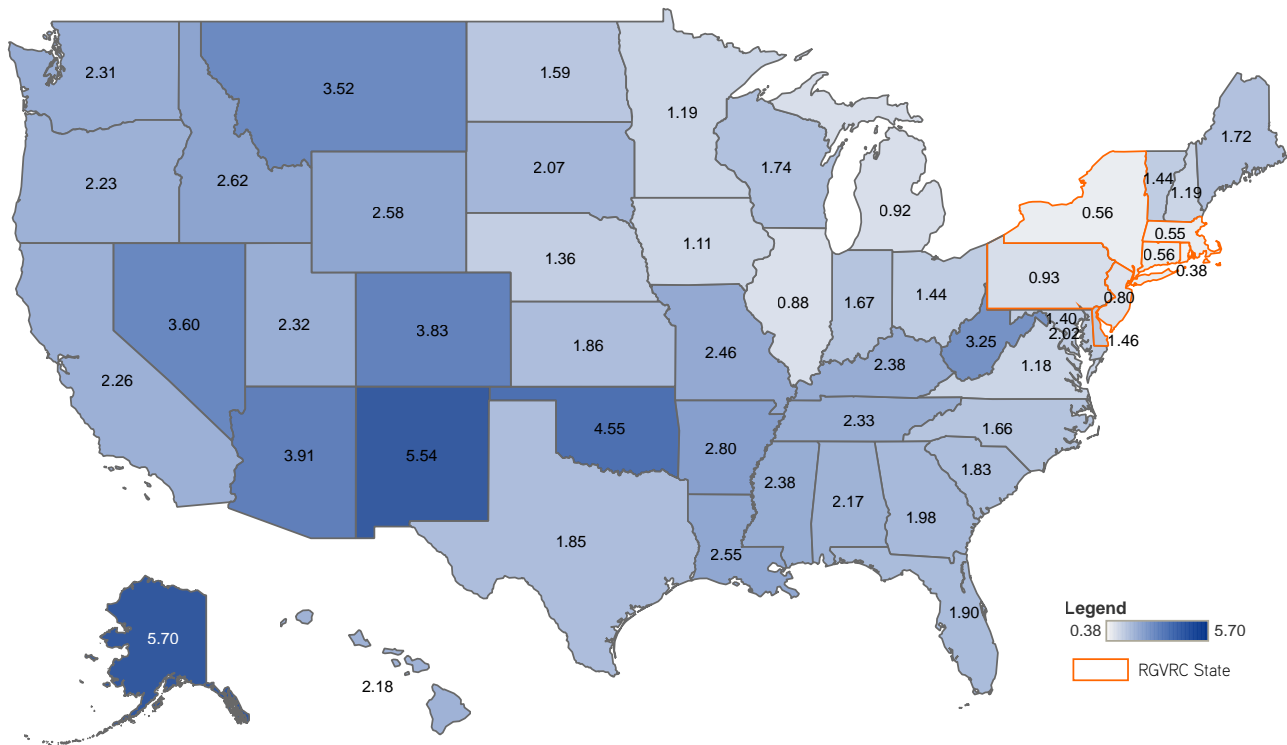


TABLE 1. RGVRC States and Rates of Fatal Police Shootings Per 100,000, 2015–20

Rank (Lowest)	State	Rate
1	Rhode Island	0.38
2	Massachusetts	0.55
3	New York	0.56
4	Connecticut	0.56
5	New Jersey	0.8
—	—	—
8	Pennsylvania	0.93
17	Delaware	1.46

A combination of both fatal and nonfatal, injurious police shootings of residents provides an important insight into police use of deadly force, however, because a number of factors influence the likelihood of mortality when an individual is struck by police gunfire; mortality alone presents an incomplete picture. These factors include location of the bullet strike,^{26, 27} officers administration of first aid, whether the officer engages in “scoop and run” practices by driving the individual to the closest hospital themselves rather than waiting for emergency medical services,^{28, 29} and the time to and distance from a trauma care center.^{30, 31} Due to these factors, rates of both fatal and nonfatal, injurious shootings together provide a more accurate measure of the prevalence of police use of deadly force.

FIGURE 2. Rates of Fatal and Nonfatal, Injurious Police Shootings of Residents per 100K Population, 2015–20

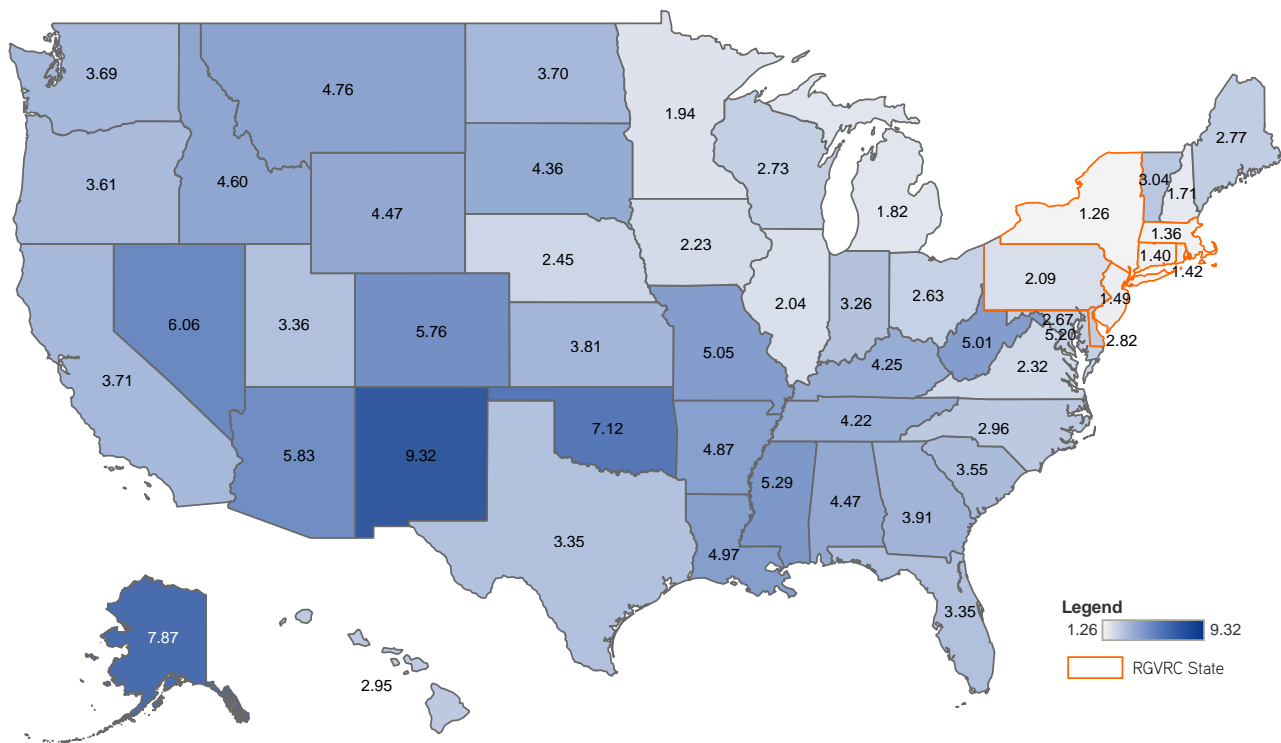


TABLE 2. RGVR States and Rates of Fatal and Injurious Police Shootings Per 100,000, 2015–20

Rank (Lowest)	State	Rate
1	New York	1.26
2	Massachusetts	1.36
3	Connecticut	1.40
4	Rhode Island	1.42
5	New Jersey	1.49
—	—	—
10	Pennsylvania	2.09
18	Delaware	2.82

The rate of fatal and injurious police shootings of residents in the US for 2015–20 is 3.45 per 100,000. It ranges from a low of 1.26 per 100,000 in New York to a high of 9.32 per 100,000 in New Mexico. [Figure 2](#) presents a map of those fatal and injurious shooting rates broken into quartiles. Again, six of the seven RGVRC states rank in the first (lowest) quartile with the remaining state (Delaware) in the second quartile. [Table 2](#) provides information on all seven RGVRC states, including where they rank in terms of rates of fatal and injurious police shootings of residents.

Potential Mechanisms for State-Level Differences in Rates of Police Shootings

Given that the presence of guns at the encounter/situational level is such a crucial factor in police shootings, an effort was made to solely explore the relationship between firearm ownership and availability and the aforementioned rates at the state level. It is important to keep in mind that the relationships between state-level firearm measures and police shootings of residents should be viewed as associations rather than in causal terms. There may be other state-level factors that can be assessed in relation to rates of police shootings, such as per capita spending on mental health programs and economic disadvantages, however, state-level firearms and related legislation are the primary areas of focus. Additionally, police departmental policies governing officers' firearm use and related training may also impact the likelihood and rate of police shootings of residents; however, they cannot be measured at the state level.

Indicators of household firearm ownership and availability are difficult to come by due to the lack of annual survey data. As a result, researchers often employ a number of proxy measures that are believed to be correlated with firearm ownership in order to account for differences in the rate of ownership and availability across states. Two of the most commonly used proxy measures in the literature are the ratio of firearm suicides to total suicides (FS/S),³² as well as a recently developed index that combines the FS/S ratio with per capita state hunting license data from the US Fish and Wildlife Service.³³ Additionally, researchers are beginning to use aggregate measures of firearm availability and legislation as designed by nonprofit organizations. The Giffords Law Center to Prevent Gun Violence,³⁴ Everytown for Gun Safety,³⁵ and the Brady Center to Prevent Gun Violence each have devised grades or scorecards based on the level and scope of firearms legislation and policies in each state ranking

Five of the seven RGVRC states with the lowest rates of police shootings—Connecticut, Massachusetts, New Jersey, New York, and Rhode Island—also consistently possess some of the lowest rates of firearm ownership/availability (via proxy measures) as well as some of the strongest laws and policies surrounding guns.

them from strong to weak. One study,³⁶ for example, incorporated a state-level measure that relies on firearm laws and policies from the Giffords Law Center, while another used a similar grade from the Brady Center.³⁷

TABLE 3. State-Based Measures of Firearms and Related Legislation

Name	Description	Range (Measurement Type)	Source
Proportion of Gun Suicides (i.e., FS/S)	Ratio of firearm suicides divided by total suicides	20–70 percent, with larger values indicating higher household firearm ownership rates (continuous)	Centers for Disease Control and Prevention (CDC) (a)
Gun Suicides + Hunting Licenses	A combination of the proportion of gun suicides with per capita state hunting license data	10.4–68.8 percent, with larger values indicating higher household firearm ownership rates (continuous)	Centers for Disease Control and Prevention (CDC) and US Fish and Wildlife Services (b)
Giffords Strength	Ranked listing by legal experts based on state laws and policies regarding firearms	1–50, with lower values indicating stronger state laws and policies (ordinal)	Giffords Law Center to Prevent Gun Violence (c)
Giffords Grade	A graded score by legal experts based on state laws and policies regarding firearms	A–F, with better grades indicating stronger state laws and policies (ordinal)	Giffords Law Center to Prevent Gun Violence (d)
Everytown Strength	A composite score based on the presence or absence of 50 key policies	3–86.5, with higher scores indicating stronger state laws and policies (continuous)	Everytown for Gun Safety (e)
Everytown Rank	A state rank based on the presence or absence of 50 key policies	1–50, with lower values indicating stronger state laws and policies (ordinal)	Everytown for Gun Safety (f)
Brady Score	A weighted state-level firearm strength score based on laws and policies	4–31, with higher scores indicating stronger state laws and policies (continuous)	Brady Center to Prevent Gun Violence (g)

(a) David Hemenway et al., “Variation in Rates of Fatal Police Shootings Across US States: The Role of Firearm Availability,” *Journal of Urban Health* 96 (2019): 63–73..

(b) Aaron J. Kivisto et al., “Firearm Ownership and Domestic Versus Nondomestic Homicide in the US,” *American Journal of Preventive Medicine* 57 (2019): 311–20.

(c) Annual Gun Law Scorecard,” Giffords Law Center to Prevent Gun Violence, accessed October 1, 2023, <https://giffords.org/lawcenter/resources/scorecard/>.

(d) Ibid.

(e) “Gun Safety Policies Save Lives,” Everytown for Gun Safety, accessed October 1, 2023, <https://everytownresearch.org/rankings/>.

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Following these studies, all of the aforementioned state-based measures were employed in the analysis and compared to all 50 states—both those comprising the RGVRC as well as all others.

Table 4 presents all seven RGVRC states (listed in alphabetical order) with their rank of fatal police shootings and fatal plus nonfatal, injurious police shootings as well as all seven measures of firearm ownership/availability and related legislation. Five of the seven RGVRC states with the lowest rates of police shootings—Connecticut, Massachusetts, New Jersey, New York, and Rhode Island—also consistently possess some of the lowest rates of firearm ownership/availability (via proxy measures) as well as some of the strongest laws and policies surrounding guns.

TABLE 4. RGVRC States, Rates of Police Shootings, and State-Based Measures of Firearms and Related Legislation

State (AZ)	Rank (Fatal)	Rank (Total)	Proportion of Gun Suicides (Rank)	Gun Suicides + Hunting Licenses (Rank)	Giffords Strength/ Grade	Everytown Strength* (Rank)	Brady Score* (Rank)
Connecticut	4	3	27 (4)	19.8 (5)	3 / A-	78.5 (5)	28 (4)
Delaware	17	18	50 (18)	26.9 (9)	13 / B	60.0 (11)	18 (10)
Massachusetts	2	2	20 (1)	12.5 (2)	6 / A-	78.0 (6)	25 (7)
New Jersey	5	5	25 (3)	15.2 (4)	2 / A	79.0 (4)	30 (2)
New York	3	1	27 (5)	20.5 (6)	4 / A-	81.5 (2)	26 (5)
Pennsylvania	8	10	49 (17)	37.2 (21)	15 / B-	40.0 (15)	15 (13)
Rhode Island	1	4	30 (6)	15.0 (3)	9 / B+	57.5 (13)	19 (9)

NOTE: Rank indicates lowest among the country.

* Higher value indicate stronger state laws and policies.

Relationships Between State-Based Firearm Measures and Rates of Police Shootings

Next, relationships were assessed between the states' rates of police shootings and the seven state-based measures of firearm ownership/availability and related legislation. A bivariate correlation—often called a Pearson's r —is a statistical technique that is used to determine the existence of a relationship between two different variables. It ranges from -1 through 1 with values at or close to zero meaning no relationship and values closer to either -1 (negative) or 1 (positive) indicating a stronger relationship. The bivariate correlations for each state-based measure and rates of both fatal as well as fatal and injurious police shootings of residents are displayed in Table 5. All seven state-based measures are moderately to strongly correlated with rates of police shootings across the US. For example, states with higher proportions of firearm suicides (FS/S)—again, one of the most valid and reliable indicators of firearm ownership at that unit of analysis—tend to have higher rates of both fatal ($r = .50$; $p < .01$) and fatal and injurious police shootings of

residents ($r = .58$; $p < .01$). For each state-based measure, the bivariate correlation is slightly stronger for the broader measure of rates of the combined fatal and injurious police shootings than just the rates of fatal police shootings. While [Table 5](#) only presents correlations between two variables at a time, it is important to note that state-level measures of firearm ownership/availability and related legislation persist in most studies that examine police shootings when considering multiple measures simultaneously (i.e., statistical controls).^{38, 39, 40, 41, 42}

TABLE 5. Bivariate Correlations for All 50 States

State-Based Measures (a)	Rates of Fatal Police Shootings	Rates of Fatal and Injurious Police Shootings
Proportion of Gun Suicides	.50**	.58**
Gun Suicides + Hunting Licenses	.47**	.52**
Giffords Strength	.44**	.52**
Giffords Grade	.37**	.42**
Everytown Strength (b)	-.38**	-.44**
Everytown Rank	.40**	.46**
Brady Score (b)	-.49**	-.56**

** $p < .01$ (two-tailed test; Pearson’s r correlation coefficient).

(a) All of the state-based measures are very highly correlated with one another, often $r > .8$.

(b) Higher values indicate stronger state laws and policies.

Analysis and Conclusion

This research suggests that there is a clear and compelling association between firearm ownership/availability, related firearm legislation (or lack thereof), and the rates at which police use their firearms across US states. Compared nationally, most RGVRC states—particularly Connecticut, Massachusetts, New Jersey, New York, and Rhode Island—appear to benefit from having among the lowest rates of firearm ownership/availability and more stringent laws regulating purchasing and gun possession in public places, including permit-to-purchase laws as well as restrictions on open and concealed carry. Each of these five RGVRC states consistently ranks among the lowest in the country in terms of rates of police shootings of residents. Pennsylvania and, to a lesser extent, Delaware still rank relatively low in police shootings nationally; however, these rates might be partly indicative of the higher levels of ownership/availability and fewer gun-related pieces of legislation compared to the other five consortium states.

Jurisdictions with both lower rates of firearm ownership/availability and those that more effectively restrict firearm access to certain individuals as well as in public places may have fewer opportunities for police officers to encounter armed residents. The presence of a firearm continues to be one of the strongest, most consistent factors associated with police shootings at the individual and situational/encounter



levels of analysis.^{43, 44, 45} Such variations in firearm ownership/availability and related legislation across states appear to influence the likelihood of officers encountering armed individuals who are suicidal or in a dispute—for which police are dispatched—and either noncompliant or threatening with a gun.^{46, 47} Rates of police shootings are higher in states that do not require permits or have “constitutional” concealed carry rights,^{48, 49} while rates are lower in states with laws designed to strengthen background checks.^{50, 51}

Additionally, studies consistently find that the prevalence and density of federally-licensed gun dealers (FFLs) correspond with higher rates of intimate partner homicides.^{52, 53, 54, 55, 56, 57} A growing body of work is also starting to uncover a relationship between firearm carrying rates with violent crime, more specifically with firearm homicides. Rates of violent crime, in general, are higher in states without permitting requirements for carrying a firearm,⁵⁸ and increases in the number of concealed carry licenses at the county level are statistically associated with increases in gun homicides over time.⁵⁹ Policing is territorially-based, and research suggests officers’ firearm use is influenced by the broader social context of their working conditions related to encountering firearm threats from residents.

It is important to note that the majority of the research on the relationship between firearms and police shootings of residents, especially in larger areas including states, uses proxy measures that attempt to quantify *legal* gun ownership and access.

However, illegal/illicit firearms—either through trafficking, straw purchasing, and other diversions from FFLs or theft—are more pertinent to general homicide rates across place.^{60, 61, 62, 63} The connection between legal and illegal/illicit guns is clear: all firearms, with the exception of some ghost guns, originate from FFLs. And the presence of more legal gun stores may, in part, feed secondary illegal markets via theft.⁶⁴ Still, little is known about the types of firearms possessed by residents—legally obtained versus not—in shootings both by and of police officers due to a lack of systematic data. Future work in this area should examine and differentiate between legally-owned guns from those that are illegally possessed.⁶⁵ Policymakers can aid in this effort by cultivating systematic data collection and reporting requirements to better capture these important missing measures.



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ABOUT THE REGIONAL GUN VIOLENCE RESEARCH CONSORTIUM

The Regional Gun Violence Research Consortium is a coalition of gun violence researchers and practitioners that seeks to inform policymakers and the public by providing evidence-based, data-driven policy recommendations to disrupt the cycle of firearm-involved homicides, suicides, and injuries. The Consortium approaches the study of gun violence with the belief that:

- + Gun violence is a public policy problem.
- + State and local governments are key in the fight to reduce firearm-involved deaths and injuries.
- + We need to better understand the nuances of state law- and policy-making to effectively combat gun violence.

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