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The Impact of State Laws on Officer-Involved Deaths (OIDs)

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ABSTRACT AND ARTICLE INFORMATION

While the public debates whether law enforcement has a problem with mis- or over-using force, the field lacks critical information concerning how often officers use force when interacting with citizens. Moreover, researchers have not examined how differences in how states restrict officers' ability to use force affect the frequency of force used. Consequently, the various reforms proposed have little evidence supporting them. Using data from Mapping Police Violence combined with census data, we examined the impact of the incorporation of U.S. Supreme Court jurisprudence and the overall restrictiveness each state placed on law enforcement's ability to use force when making an arrest and what constituted reasonable force within each state. We found that while the state's population size and violent crime rate were strong predictors of the number and rate of officer-involved deaths (OIDs), state statutory restrictions on use of force had negligible effects. This has important implications for reforming state and national discussions around reforming use of force.

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Uses of force, particularly those resulting in death, are a high-profile issue in the discourse surrounding policing in the U.S. (Mourtgos & Adams, 2020), with protests and calls for reform frequently following controversial uses of force, particularly those leading to deaths. The term "officer-involved death" (OID) refers to any instance where an individual's death directly results from the actions or intentional omissions of a law enforcement officer (Illinois Police and Community Relations Act, 2015). In the current research, OID indicates fatalities caused by law enforcement officers' intervention while on duty or simply "legal intervention deaths" (DeGue et al., 2016, p.174). OIDs can have sociopolitical, legal, cultural, and economic impacts on individuals who were directly involved and their families, communities, and society. For instance, there has been increased mistrust and tension between law enforcement and communities, particularly in communities of color (Alang et al., 2017; Bedi, 2022; Bottoms & Tankebe, 2012) leading to calls for change. These reforms range from the adoption of training and tools like de-escalation, body-worn cameras, and conducted energy weapons, to the widespread restrictions on when and how officers can use force and the potential consequences that they face for mistakes (Alpert & Dunham, 2010; Ariel et al., 2015; Bedi, 2022; Engel et al., 2022; Schwartz, 2017). Each of these merits consideration and study; however, the fact that there are few comprehensive means by which to achieve these goals raises significant impediments to any widespread reform short of a U.S. Supreme Court decision that upends precedent.

The current study explores how differences in the adoption of Supreme Court decisions and state laws regarding law enforcement's use of force affect the number and rate of officer-involved deaths (OIDs) per 100,000 residents. By examining the impact of these state laws, the research sheds light on the connection between legal frameworks, policy, and law enforcement practices. The focus is on whether the implementation of key Supreme Court rulings—*Tennessee v. Garner* and *Graham v. Connor*—and the restrictiveness of state laws on the use of force influence the yearly occurrence and frequency of OIDs, considering other influencing factors. The findings aim to pinpoint areas where state laws could be revised to help reduce civilian fatalities at the hands of law enforcement.

Literature Review

The State of the Research on Officer Use-of-Force

Numerous factors have been analyzed in efforts to understand the incidence of officer-involved deaths (OIDs). However, this study will concentrate exclusively on examining the influence of state laws and Supreme Court rulings on the occurrence of OIDs. While researchers have explored how law enforcement uses force to respond to threats and resistance to lawful directives, it is crucial to recognize that the U.S. lacks any systematic tracking of how often officers use force, or even what constitutes a use of force. Given that deadly force is predominantly exercised using firearms, Fyfe (1981) proposed that a more suitable quantitative metric for assessing its frequency is the number of instances in which the police discharge their firearms at individuals, rather than solely focusing on the number of individuals killed. This approach is justified because not all police bullets result in fatalities, and instances of missed shots, injuries, and deaths often stem from equally serious decisions (Fyfe, 1981). Moreover, the real or perceived misuse of force, especially lethal force, has the potential to spark protest, reform, and reprisal (Fyfe, 1988; Maguire et al., 2017; Skolnick & Fyfe, 1993). This often does not require the use of a firearm, as the cases of Eric Garner and George Floyd demonstrate. Consequently, the decision to define force in a certain way will likely lead to instances being miscounted. This raises a larger point concerning the lack of systematic data available on the subject (Oramas Mora et al., 2023).

Several factors contribute to the challenges in accurately quantifying police-involved deaths in the United States. The U.S. lacks a federal mandate requiring law enforcement agencies to record and report such incidents (Doucett et al., 2022; Fyfe, 2002). Those that are reported often contain inconsistent or incomplete information, complicating data comparisons across various jurisdictions (Güss et al., 2020). Consequently, the field is left with data collected by the media, which might be prone to errors or differing definitions (Oramas Mora et al., 2023). The lack of a universally agreed-upon definition and operationalization, such as the differentiation between officer-involved shootings resulting in death and officer-involved shootings regardless of death (i.e., including woundings and misses), plays a critical role in determining the criteria for classifying a police-related death (Craig & Reid, 2022; Oramas Mora et al., 2023). This absence contributes to disparities in how

incidents are classified and reported (Averdijk & Elffers, 2012; Tsui et al., 2009).

Potential biases in OIDs' reporting and investigation processes can further influence the data's accuracy and comprehensiveness (Matusiak et al., 2022). One possible explanation for the absence of requirements to report OIDs to a centralized federal database is rooted in the Tenth Amendment, which states that powers not granted to the United States by the Constitution or prohibited to the states are reserved for the states or the people (*Garcia v. San Antonio Metropolitan Transit* Authority, 1985). Nationwide, only a fraction of law enforcement agencies voluntarily report data on the use-of deadly force to the federal government, and the reporting requirements are inconsistent from state to state (O'Leary, 2015). This may be due to the prohibition against the federal government employing state agencies in carrying out a federal mandate under the Tenth Amendment (Jensen & Entin, 1998). The lack of mandatory reporting adds additional barriers to monitoring deadly force usage trends, compromising initiatives to increase law enforcement accountability and transparency. The absence of this crucial data presents difficulties in pinpointing and addressing systemic problems linked to using deadly force. Law enforcement agencies are often reluctant to release information about incidents resulting in OIDs, leaving researchers and the public without access to thorough and accurate data (Jennings & Rubado, 2017). Despite these challenges, mapping officer-involved deaths in the United States can shed light on fatal incidents' overall frequency and distribution.

Exploring OIDs through geographic mapping can efficiently spotlight patterns and trends linked to these events concerning the locations, victim demographics, and the specific circumstances of each incident (Feldman et al., 2017). Various groups and programs are currently gathering and critiquing data related to OIDs in the United States. One example is Mapping Police Violence, which diligently assembles and visualizes nationwide police violence data, building a comprehensive repository of law enforcement-related deaths (De Angelis, 2024). Similarly, The *Washington Post*'s Fatal Force Database offers accessible and trackable data on deadly police shootings, detailing the context of each case (Conner et al., 2019). Fatal Encounters, another initiative, illustrates data on all deaths following interactions with law enforcement across the United States (Comer & Ingram, 2022). These datasets are valuable in tracking fatalities involving officers and recommending policies aimed at reducing their incidence.

Prevalence of Officer-Involved Deaths

As it stands, officers' use of force overall, and deaths as a result, are very rare occurrences (Mclean et al., 2022; Stoughton et al., 2021). However, research indicates that individuals from racial minority groups, particularly the Black community, are subject to disproportionate fatalities in police shootings compared to their white counterparts. Additionally, these incidents frequently involve unarmed Black men (DeGue et al., 2016; Fyfe, 1988), leading to widespread perceptions of law enforcement's bias against African Americans (Nix et al., 2017).

Consequently, OIDs also result in lawsuits, criminal charges, and political turmoil, which have negatively impacted the reputation and funding of law enforcement agencies (Cobbina-Dungy et al., 2022; Mazerolle et al., 2013; Sierra- Arévalo, 2021; Smith et al., 2007). Using force can also affect officer safety as even comparatively minor uses of force like OC Spray carry some risk for the wielder (Pinizzotto et al., 2012). This can contribute to a feedback loop where community members distrust the police, which leads to their resisting officer instructions, leading to more use of force incidents. Moreover, OID has increased fear of law enforcement, potentially inciting further violence and creating instability within communities (Gill, 2015; Smith Lee & Robinson, 2019). This has led to public outcry concerning police legitimacy along with a growing demand for increased transparency, monitoring, and legal accountability (Archbold, 2021). Furthermore, using force also affects officer safety, particularly in precarious and unpredictable situations that could jeopardize their lives (Pinizzotto et al., 2012). Thus, it is crucial to systematically examine what affects the likelihood of using deadly force by law enforcement.

Additionally, community criminology and sociology have long held that socioeconomic disadvantage, race, and violence are interrelated (McCall et al., 2010; Sampson & Wilson, 2013). Other factors contribute to the use of deadly force by police, which Friedrich (1980) categorized into three main characteristics: officer, organizational, and situational. These include systemic racism, implicit biases, high-stress environments, and officer demographics, all of which can influence decision-making processes and lead to the excessive use of force. For instance, research consistently shows that racial and ethnic minorities, particularly African Americans, face a disproportionate risk of escalated and deadly force, with stress and implicit biases further intensifying these outcomes (James, 2018). Additionally, demographic factors such as gender, education level, and experience impact the frequency and severity of the force used, with studies indicating that female

officers and those with higher education or more experience generally use less force (Rydberg & Terrill, 2010).

While these factors may influence officer involved deaths, many remain unconfirmed and require further investigation. For instance, no studies have directly linked implicit bias measures to actual use of force behavior in police. To date, only explicit bias has been shown to predict use of force. Implicit bias measures do not predict use of force and, therefore, do not provide additional insights beyond what explicit bias measurements offer. The focus on implicit bias may inadvertently reinforce an 'us versus them' mentality between police and the community.

Given the fact that police are often called to intervene in violent situations, it is logical that these incidents would occur more often in areas with high levels of concentrated disadvantage. Relatedly, research has shown that disadvantage was not race-blind – meaning that racial and ethnic minority areas were more likely to experience concentrated disadvantage (McCall et al., 2010), which also increased the likelihood of violence and, thus, police intervention (Fridel et al., 2020). Although the aftermath of the shooting of Michael Brown in Ferguson, MO, did not lead to a significant increase in the number of officers ambushed (White, 2020) or killed (Maguire et al., 2017), there was a significant spike in nonfatal shootings of officers following the murder of George Floyd by police (Sierra-Arevalo et al., 2023).

Legal Restrictions on Officers' Use of Lethal Force

The U.S. Supreme Court established the precedents in which police officers might justify using deadly force if they have probable cause to believe that the suspect poses a significant threat of death or serious physical injury to themselves or others (*Graham v. Connor*, 1989). The Supreme Court has also ruled that force must align with the situation's circumstances, considering factors like the severity of the crime and the imminent threat to safety (*Tennessee v. Garner*, 1985). Nonetheless, the use of deadly force by police has been widely scrutinized, particularly when it might not have been required or where the public deems that alternative, less lethal methods were more reasonable (Fyfe, 1988; Lyle & Esmail, 2016; Oramas Mora et al., 2023; Skolnick & Fyfe, 1993). In fact, Skolnick and Fyfe (1993) described these instances as "lawful but awful," in the sense that these officers' use of force was legal, but still provoked significant public scrutiny.

This attention heightened the demands for increased responsibility and transparency in police use of deadly force and improved training protocols and policies to minimize its usage where feasible (Hine et al., 2018). Earlier studies indicated that the primary responsibility for overseeing police discretion in the use of deadly force has shifted to police administrators, which could have implications for legal oversight and decision-making processes within law enforcement agencies (Fyfe & Walker, 1990). This shift of control towards administrators raises the issue of qualified immunity from civil liability. Officers are directly shielded from civil liability for using force while on duty unless their actions are against established law (Schwartz, 2017). Yet, this approach provides significant discretion to administrators to interpret state laws and relevant jurisprudence to ensure the agency policy does not expose officers or the agency to liability.

Some states have incorporated these rulings more fully into their legal codes, imposing stricter limitations on when and how force can be used (Stoughton et al., 2021). Others have more lenient laws, allowing officers broader discretion in when and how officers can use force to resolve the situation through an arrest or the reasonableness of the force beyond the criteria provided by the Supreme Court decisions. This variability in state laws creates differences in how force is regulated, with some states imposing more conditions and others aligning closely with baseline established by federal precedents. These differences are crucial for understanding the relationship between legal frameworks and the use of force by law enforcement.

Although deadly force is warranted in some situations, it should be considered strictly as the last resort when all other options have been considered and deemed ineffective (Blair et al., 2011; Klinger, 2012; Nix et al., 2017). The Fourth Amendment to the U.S. Constitution protects United States citizens' rights against unreasonable searches and seizures and disproportionate force used by law enforcement (Goode, 2018). Whether the force used was reasonable is based on a range of factors, including the seriousness of the crime, an imminent threat to the officer or others, and circumstances of resisting arrest or attempting to escape (*Tennessee v. Garner*, 1985). If the use of force is considered excessive, it could violate the Fourth Amendment and result in civil rights lawsuits or criminal charges against the officer (Meyn, 2021). However, as Fyfe and Walker (1990) stated, much of the oversight concerning federal jurisprudence devolves to more local authorities.

Impact of State Laws on the Incidence of Officer Involved Deaths

State regulations play significant roles in deaths associated with law enforcement activities. These laws dictate the appropriate use of force and

ensure accountability when officers violate the standards defined in the legal statutes (Garrett & Slobogin, 2020; Stoughton, et al., 2021) and in accordance with the Fourth and Fourteenth Amendments. Beyond the Fourth Amendment, several state and federal legislations also have specific guidelines on the use of force by the police (Mourtgos & Adams, 2020). Some states have more specific laws providing further directions, such as restrictions on chokeholds or mandates requiring de-escalation attempts before resorting to more confrontational tactics (Swanson, 2016). In contrast, other states have minimum regulations on the use of force, permitting officers to employ a broader spectrum of force in a wider set of situations (Terrill & Paoline, 2017). These differences across the states are complicated by the fact that jurisdictions' policies concerning force and accountability also play a role (Lee, 2018; Roiphe, 2017), as do the various mechanisms of oversight available at the local level (Lum et al., 2019).

Higher levels of firearm ownership correlate with an increased risk of law enforcement officers being assaulted with firearms, a risk significantly mitigated in states with universal background check laws (Sivaraman et al., 2020). Additionally, greater legal access to firearms, as indicated by the number of licensed gun stores, is associated with higher rates of both fatal and nonfatal police shootings (Shjarback et al., 2023). However, the availability of illicit firearms does not show a strong connection to these incidents, implying that legally obtained firearms are a more significant factor. Socioeconomic conditions, such as concentrated disadvantage, also contribute to the frequency of police shootings, indicating that broader contextual factors are at play (Shjarback et al., 2023). Stricter firearm legislation, particularly laws that enhance background checks, promote safe storage, and curb gun trafficking, is associated with significantly lower rates of fatal police shootings (Kivisto et al., 2017). These laws not only reduce overall firearm ownership but also directly influence the incidence of police-related fatalities, highlighting the importance of comprehensive firearm regulations. Implementing and enforcing such laws could lead to safer environments for both law enforcement officers and the communities they serve (Kivisto et al., 2017; Rogna & Nguyen, 2022; Shjarback et al., 2023; Sivaraman et al., 2020).

Many factors contribute to the use of force and lethal force, and numerous studies have sought to identify these factors. However, the current study aims to fill a significant gap by examining how these variations in the formal adoption of Supreme Court jurisprudence and state laws impact the incidence of officer-involved deaths (OIDs). By focusing on the restrictiveness of state laws and the degree to which they incorporate these key Supreme Court rulings, our study will utilize novel datasets to explore whether stricter legal frameworks effectively reduce the frequency of OIDs. This gap is relevant to discussions concerning how to reform law enforcement's ability to use force, as identifying effective laws can provide a model for states seeking to reduce OIDs.

Methods

Using the Mapping Police Violence dataset, we incorporated Stoughton and colleagues' (2021) analysis of differences in state laws and jurisprudence restricting use of force across states, as well as socioeconomic and population characteristics from the U.S. Census and aggregate crime data from the Uniform Crime Report (UCR) and Law Enforcement Officers Killed and Assaulted (LEOKA) datasets. Using data from 2013-2019, our goal was to identify whether state-level restrictions on how officers used force had an impact on the number and rate of officer-involved deaths per year, net of other factors.

The Mapping Police Violence (2022) dataset collects media reports concerning officer contacts with the public that lead to the death of a civilian, which includes lawful and unlawful uses of force (i.e., justifiable homicide while on duty versus murder). Each report is then reviewed by at least two researchers, which is then cross-checked with Fatal Encounters, Fatal Force (*Washington Post*), and official sources like the Center for Disease Control and Bureau of Justice Statistics. According to their website, the Mapping Police Violence project appears to identify 92% of all OIDs when compared to Banks and colleagues' (2016) study concerning the arrest-related deaths subset of OIDs, which relied on the Bureau of Justice Statistics's Death in Custody Reporting Program. Similarly, Comer and Ingram found (2022) that there was a strong correlation between the results reported by the *Washington Post's* Fatal Encounters database and Mapping Police Violence – the two open-source datasets that capture the most incidents in the U.S. We selected the Mapping Police Violence dataset as it provides a significant amount of information about the incidents themselves, the location, and the mechanism of death. Our reasoning is that incidents where this information is available were more reliable than those cases where that information may have been missing. Absent a federally-mandated reporting program that goes further than the CDC and BJS voluntary reporting systems, the Mapping Police Violence dataset provides the most reliable picture of the number of officer-involved deaths that occur in the United States. Although the Mapping Police Violence dataset included statistics for Washington D.C., this city was

excluded due to the absence of state laws and the wholly urban population, which would unduly influence the results toward the impact of socioeconomic conditions over state laws.

The two additional datasets from the U.S. Census Bureau's American Communities Survey (ACS) and the Law Enforcement Officers Killed or Assaulted (LEOKA) share similar structures in that they both rely on voluntary participation for accuracy. The socioeconomic factors sourced from the ACS data were created from the aggregated survey responses from residents within each state. The LEOKA dataset was used to create measures concerning violence against law enforcement officers. Due to their voluntary nature, the measures from both datasets are likely undercounts, which would weaken the effects shown in the Results section. Because this study utilizes secondary data from publicly-available datasets, no institutional board approval was required.

Measures

Table 1 provides the mean, standard deviation, and range for the two outcome measures (Number of Officer-Involved Deaths per Year and Rate of Officer-Involved Deaths per Year per 100,000 Residents) and the four state socioeconomic and crime measures that account for state characteristics (State Population Size; State Violent Crime Rate per 100,000 Residents; Concentrated Disadvantage; and the Rate of Law Enforcement Officers Assaulted per 1,000 Officers). We attempted to include the number of officers killed within each state per year, but this measure did not meaningfully contribute to the Bayesian Information Criterion for the negative binomial models or variance explained by the models discussed later. The five measures of state legal restrictions are described in more detail in Table 2 and Table 3.

Officer-Involved Deaths per Year

Because the Mapping Police Violence dataset described the incidents of officer-involved death individually, these cases were then summarized by state and by year. We were able to include all 50 U.S. States in the analysis but elected to exclude OIDs that occurred within Washington D.C. as there are no state laws to incorporate. Summarizing by month and year to account for seasonality was attempted but led to substantial zero inflation and is not displayed in the results below. Based on the MPV dataset, there were an average of 21.37 officer-involved deaths (OIDs) with a standard deviation of 28.09 per year in the U.S. across the seven-year study period. However, this average across the country hides the fact that these deaths were not randomly distributed across the U.S. Table 4 displays the results of one-way analysis of variance tests to determine whether the number and rate of officer-involved deaths varied significantly across states. The number of OIDs per year ranged from zero for North Dakota (2019) and Rhode Island (2015, 2019) to a high of 200 in California (2015). The difference across states was statistically significant ($F = 153.75$, $p < 0.001$). Additionally, we used the following measure to account for the effect of population size on OIDs.

Rate of OID per 100,000 Residents per Year

Rates of OIDs per 100,00 residents were calculated by dividing the number of OIDs per year within each state by the state's total population as provided by the Uniform Crime Report. This was then multiplied by 100,000 to establish a comparable rate of OIDs per year across states. The rate of OIDs per 100,000 residents ranged from 0.00 (identified in North Dakota in 2019 and Rhode Island in 2015 and 2019) to 1.09 in Alaska (2017–2018). The average rate of OID per 100,000 residents was 0.370 (sd =0.220) per state per year, while still varying significantly across states ($F = 13.47$, $p < 0.001$).

Table 1: Descriptive Statistics

Outcome Measures	Mean *(SD)*	Standard Deviation	Range
Number of Officer-Involved Deaths Per Year	21.72	28.295	0 - 200
Rate of Officer-Involved Deaths Per Year Per 100,000 Residents	0.370	0.220	0.000 – 1.088
State Characteristics			
Population Size	6,443,169.59	7,193,582.96	577601 – 39461588
Natural Logarithm – Population Size	15.192	1.014	13.27 – 17.49
Violent Crime Rate per 100k			
Concentrated Disadvantage	-0.065	0.901	-2.19 – 2.74
Rate of Law Enforcement Officers Assaulted per 1000 Officers	118.791	86.228	0.00 – 677.68

State Laws Concerning Officers' Use of Force

Five measures of states' laws concerning law enforcement officers' use of force were collected using the Stoughton and colleagues (2021) content analysis. Table 2 displays the specific restrictions imposed on officer decision-making across different areas, with the specific states listed for each category and the total number of each. Using this information, we created three indices that represented larger concepts. These were "The use of force to make an arrest," "Force may be used to protect self or others," and "The Use of Deadly Force." The last index measure accounts for how officers may use deadly force in various situations or whether officers must make certain actions prior to using deadly force.

Table 3 displays how states' jurisprudence differed in their laws concerning uses of force across these five dimensions. These included two measures of the extent to which the states had incorporated the primary Supreme Court decisions concerning law

Table 2: Stoughton et al.'s (2021) Content Analysis of State Laws Concerning When Officers May Use Force

Use force to make arrest or detention	
Reasonable belief that arrest is lawful	AK, AZ, CA, CT, MN, MO, NY, NC, TX, WI (*n* = 10)
Subjective belief that arrest is lawful	AL, AR, CO, DE, KY, ME, NE, NH, OR (*n* = 9)
State makes no distinction on officer's perception of lawfulness of arrest, merely that it is lawful (actual lawfulness)	FL, GA, HI, IA, ID, IL, IN, KS, LA, MA, MI, NE, NJ, PA, SD (*n* = 15)
Force can be used to make an arrest without regard to the lawfulness of the arrest.	MT, TN, UT, WA (*n* = 4)
Force can be used to make an arrest after officers identify themselves.	AZ, DE, KY, NE, NJ (*n* = 5)
Force may be used to protect self or others	
Force may be used to overcome suspect's resistance	ID, MN, WA (*n* = 3)
Force may be used to prevent escape	AL, AK, AR, AZ, CA, CO, CT, DE, FL, HI, ID, IN, KY, ME, MN, MO, MT, NC, ND, NE, NH, NJ, NY, OR, PA, SD (*n* = 24)
Force may be used to protect self or others	AL, AR, CO, CT, DE, FL, IA, IL, KS, ME, NC, NE, NH, NJ, NY, OR, PA, UT (*n* = 18)
Officers may use reasonably necessary force to protect others	AL, AK, AR, AZ, CO, CT, DE, GA, HI, IA, ID, IL, IN, KS, KY, MA, MI, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OH, OR, PA, RI, SC, TN, TX, UT (*n* = 35)
Officers may use reasonable force to protect others	CA, LA, MD, ME, OK, VA, VT, WI, WV (*n* = 9)
Officers may use necessary force	FL, SD, WA, (*n* = 3)
Use of Deadly Force	
Fleeing Felon approach	AL, FL, MS, OR, SD (*n* = 5)
Partially Restrictive	
Violent felony or use or threat of deadly force	AK, AR, AZ, CO, CT, DE, GA, HI, IL, IN, KS, ME, MN, MO, ND, NE, NH, NV, NY, OK, OR, PA, TN, TX, UT (*n* = 25)
Deadly force can be used for certain crimes	NJ, NY, OR (*n* = 3)
Deadly force can be used against future threats	AK, AZ, CO, DE, HI, IA, IL, KS, ME, MN, MO, NE, NH, OK, PA, TN, TX, UT (*n* = 19)
Deadly force can be used against armed, escaping subjects	AK, AR, GA, ME, NY, PA (*n* = 6)
Deadly force can be used against fleeing felon if suspect knows officer is attempting an arrest	RI (*n* = 1)
Deadly force can be used against convicted felon attempting escape	NC (*n* = 1)
"Garner Rule"	
Deadly force can be used when individual presents a threat of death or grievous bodily harm to officer or others.	AL, AR, AZ, CA, CO, CT, FL, GA, ID, IL, IN, KS, ME, MN, NC, ND, NH, NJ, NM, NV, NY, OK, OR, PA, TN, UT, WA (*n* = 27)
No additional risk posed to innocent persons through use of deadly force	DE, HI, MA, NE, NJ, PA (*n* = 6)
No use of deadly force against suicidal subjects	CA, DE, NE, NJ, PA, TN (*n* = 6)
Force can only be used to overcome 'actual resistance'	ID, MS, WA (*n* = 3)
Force can only be used when other reasonable options have been tried.	CA, DE, IA, NH, TN (*n* = 5)
Officers are required to identify self, if feasible.	ME, NH, TN (*n* = 3)
Officers cannot use motor vehicle violations as a predicate for use of deadly force.	CO (*n* = 1)

enforcement officers' use of force into the state legal code (*Graham v. Connor*, *Tennessee v. Garner*, and *Scott v. Harris)*. This separation accounts for the fact that a use of force may be against state law but not violate the existing federal jurisprudence on uses of force and vice versa. Stoughton and colleagues (2021) examined records of state judicial opinions to identify states that examined law enforcement's use of force under state regulations or common law and to what extent the courts incorporated the federal standards. States that had fully incorporated the Supreme Court decisions were scored as -1, while those that had partially incorporated the decision were scored as -0.5. Those states that made no mention of the decision were scored as 0. Stoughton and colleagues arrived at this determination by examining whether and how state jurisprudence concerning state laws has incorporated, or to a lesser extent, referenced, the most recognized cases concerning how officers use force. Including the 31 states that did not incorporate *Tennessee v. Garner* or *Scott v. Harris* or the 19 that did not incorporate *Graham v. Connor* in the models was done to provide a useful counterfactual to the inclusion of SCOTUS jurisprudence in state laws.

We also created bivariate variables to account for specific restrictions that states have placed on officers' decision to use force. Table 2 displays the individual laws that Stoughton and colleagues (2021) identified across the 50 states. These are then summed into three indices to account for the totality of use of force restrictions. The first accounts for the number of restrictions that states have imposed on officers' ability to use force when making an arrest. The second index accounts for the number of restrictions on officers' ability to use force to protect themselves or others. The final index accounts for any restrictions that the state has imposed on officers' ability to use deadly force.

This coding uses a similar basis to previous translations of qualitative research into quantitative methods, notably Muir's (1979) assessment of officer personality schemas transferred to an empirical test (Snipes & Mastrofski, 1990) and Anderson's (2000) Code of the Street concepts examined via survey (Brezina et al., 2004). Although factor analysis was attempted on the state law indices, it did not produce a measure that explained a meaningful fraction of the variance or met the other requirements for exploratory factor analysis (EFA).

Table 1 displays a summary of Stoughton and colleagues' (2021) content analysis of the variation in state laws across the United States. As can be seen in the table below, there is considerable variability in how States control law enforcement's use of force against the public. While there is a paucity of instances where officers are held criminally liable for their actions on duty (Armacost, 2003; Skolnick & Fyfe, 1993), violations of state laws can serve as grounds to fire an officer (Grunwald & Rappaport, 2020) or hold them accountable civilly by invalidating their qualified immunity to lawsuits (Schwartz, 2017).

State Conditions

We included three measures of the states' conditions to account for differences in socioeconomics and patterns of violence. First, population size was measured using the yearly total population provided by the U.S. Census Bureau. This ranged from 577,601 for Wyoming (2018) to 39,461,588 for California (2018), with the mean state population being 6,330,191.89 (sd = 7,167,295.52). Since this was highly skewed, we calculated the natural logarithm to adjust the population to a more normal distribution (Fox, 2008). This adjusted the mean to 15.16 (sd = 1.03). Second, we included the violent crime rate per 100,000 residents calculated as part of the Uniform Crime Report (UCR). This ranged from 102.59 for Vermont (2014) to 891.67 for Alaska (2018), with the mean state violent crime rate per 100k being 380.48 (sd = 178.41). While the two primary means of statewide crime data (UCR and the National Crime Victimization Survey) often differ (Berg & Lauritsen, 2016), especially in rural areas, these differences do not eliminate the UCR's usefulness. Given that the UCR relies on victims to report to the police, it is conceptually related to how often police use force, given that officers are more likely to use force during violent calls.

Third, we included a single measure of socioeconomic disadvantage due to the wealth of criminological and social science research that has found a relationship between conditions of disadvantage and violent behavior (Sampson & Wilson, 2013; Wilson, 2012). Following Holmes Finch's (2020) process for exploratory factor analysis, we extracted one factor representing socioeconomic disadvantage via promax rotation (kappa = 4) with missing cases excluded pairwise. The following measures were included in the factor: percent residents under the poverty line, percent residents over 25 years old with less than a high school diploma or GED, unemployment rate, percent single-parent households, and percent non-White residents. This measure explained 59.136% of the variation in the included measures of socioeconomic disadvantage, with Bartlett's Test of Sphericity being significant ($X2$ = 806.016, $p < 0.001$). The Kaiser-Meyer-Olkin measure of sampling adequacy was fairly low (KMO = 0.739), which is likely due to the nature of working with 50 states' data. The inclusion of concentrated disadvantage also helps to address the weakness that Berg and Lauritsen (2016) recognized concerning

crime reporting in rural areas: that the more disadvantaged that rural areas are, the more likely they are to have an imbalance between the number of victimizations experienced and reported.

Fourth, we included the rate of officers assaulted per 1,000 officers included in the state's report to the Law Enforcement Officers Killed or Assaulted data. This is a voluntary component of the Uniform Crime Report, of which approximately two-thirds of law enforcement agencies across the U.S. report. However, since it is voluntary and approximately 6,000 agencies do not participate (at least consistently), there is likely to be incidents where officers are assaulted or killed that are missing. To address this issue, any state that did not have yearly data concerning the rate of officers assaulted per 1,000 officers present were assigned a 0 for that measure. While this would weaken the impact that this variable has on the model, this approach minimizes the possibility of overstating the effect through mean substitution or other means of imputing missing data. As noted above, we did not include the number of officers killed within each state per year as this measure did not meaningfully affect the Bayesian Information Criterion values or variance explained within the models.

It is important to note that the measures of state conditions relied upon individuals receiving and responding to census forms and reporting victimizations to the criminal justice system accurately, along with agencies willingly submitting the total number of violent crimes and the number of officers assaulted or killed consistently. For the census measures, this issue was so severe that it necessitated excluding data from 2020 forward, which presents a limitation that will be discussed later in the article.

It is important to note the limitation in using media reports aggregated into open data sources to measure the actions of law enforcement in that there may be an unknown bias in the data collected or reported by the Mapping Police Violence dataset. However, because there is no mandatory reporting of officer-involved deaths in the United States, open-source datasets are filling the gap. While Nix and Shjarback (2021) argue that this is likely an undercount of officers' use of lethal force due to not including incidents that did not result in death (e.g., a missed shot or wounded subject), the framing of

Table 3: State Restrictions on Uses of Force

	No Mention	Referenced	Fully Incorporated				
Incorporation of Tennessee v. Garner* or *Scott v. Harris	AK, AL, AR, CT, HI, ID, IL, IN, KS, LA, MA, ME, MN, MO, MS, MT, NC, ND,NE, NH, NJ, OK, OR, PA, SD, TN, TX, UT, VA, WT, WA, WI *N* =31	AZ, CA, DE, FL, KY, MD, SC, WV *N* =8	CO, GA, IA, MI, NM, NV, NY, OH, RI, WY *N* =10				
Incorporation of Graham v. Connor	AL, HI, KS, MA, MN, MO, MT, NC, ND, NH, NJ, OR, PA, SD, TN, TX, UT, WA, WI *N* =19	ID, KY, MS, NY *N* =4	AK, AR, AZ, CA, CO, CT, DE, FL, GA, IA, IL, IN, LA, MD, ME, MI, NE, NM, NV, OH, OK, RI, SC, VA, VT, WV, WY *N* =27				
Number of State Law Restrictions	0	1	2	3			
Use of Force to make an arrest	MD, MS, ND, NM, NV, OH, OK, RI, SC, VA, VT, WV, WY (*n* = 13)	AK, AL, AR, CA, CO, CT, FL, GA, HI, IA, ID, IL, IN, KS, LA, MA, ME, MI, MN, MO, MT, NC, NH, NY, OR, PA, SD, TN, TX, UT, WA, WI (*n* = 32)	AZ, DE, KY, NJ (*n* = 4)	NE (*n* = 1)			
	0	1	2	3			
Use of Force in Protection of Others	WY (*n* = 1)	GA, LA, MA, MD, MI, MS, ND, NM, NV, OH, OK, RI, SC, TN, TX, UT, VA, VT, WI, WV (*n* = 20)	AK, AZ, CA, HI, IA, IL, IN, KS, KY, MN, MO, MT, SD, WA (*n* = 14)	AL, AR, CO, CT, DE, FL, IL, ME, NC, NE, NH, NJ, NY, OR, PA (*n* = 15)			
	0	1	2	3	4	5	6
Use of Deadly Force	KY, MD, MI, MT, OH, SC, VA, VT, WI, WV, WY (*n* = 12)	MA, NM, RI, SD (*n* = 4)	AL, CT, FL, IA, ID, IN, MO, MS, NC, ND, NV, TX, WA (*n* = 13)	AK, AR, AZ, CA, GA, HI, IL, KS, MN, OK, UT (*n* = 11)	CO, NE, NJ, NY, OR (*n* = 5)	DE, ME, NH (*n* = 3)	PA, TN (*n* = 2)

research around officer-involved death can reduce this issue. Additionally, Comer and Ingram (2022) found that the open-source datasets are highly correlated during this study's time period. Consequently, this represents the best means as of yet to study this topic.

Analytic Plan

The following analyses were conducted in Stata version 17. Table 4 shows how the number of OIDs per year and the rate of OIDs per 100,000 residents per year varied across the U.S. and across the legal characteristics described above using seven one-way analysis of variance (ANOVA) tests. It also displays the Pearson *r* correlation coefficients for the relationship between the five state characteristics and the number of OIDs per year and the rate of OIDs per 100,000 residents per year. The next step of the analysis is displayed in Table 5. This table displays the results of five negative binomial panel regression models (Models 1-5) to understand the impact of state laws on the number of OIDs per year, net of other factors. It also displays the results of five ordinary least squares panel regression models (Models 6-10) to examine the impact of state laws on the rate of OIDs per 100,000 residents per year, net of other factors. Appendix A: The Effect of State Characteristics on the Number and Rate of Officer-Involved Deaths per Year displays the results of socioeconomic characteristics on the number and rate of officer-involved deaths to show how the models performed without the inclusion of the measures of State Laws.

Results

Bivariate Statistics

As noted above, the number of OIDs per year and rate of OIDs per 100,000 residents per year varied significantly across states during the seven years of the study period. For the incorporation of the two SCOTUS decisions, the number and rate of OIDs varied significantly across the three levels of incorporation that Stoughton and colleagues (2021) identified (not incorporated, partially incorporated, and fully incorporated). However, the laws did not have significant effects on both outcome measures. The incorporation of *Graham v. Connor* had a significant impact on the rate of OIDs per year (F = 5.77, p = 0.003) but not the number of OIDs per year (F = 2.11, p = 0.123). Conversely, the level of

Table 4: Bivariate Statistics

	Difference Across States	*P*		
Outcome Measures				
Number of Officer-Involved Deaths Per Year	F =153.750	0.000		
Rate of Officer-Involved Deaths Per Year Per 1 Million Residents	F =13.473	0.000		
	Differences Across Counts	**p**	**Differences Across Rates**	**p**
Incorporation of SCOTUS Decisions into State Jurisprudence				
Graham v. Connor	F = 2.110	0.123	F = 5.773	0.003
Tennessee v. Garner	F = 20.877	0.000	F = 1.267	0.283
Restrictiveness of State Laws Concerning Law Enforcement				
Use of Force During Arrest Index	F = 4.360	0.005	F = 3.709	0.012
Use of Force to Protect Others Index	F = 2.991	0.031	F = 4.542	0.004
Use of Deadly Force Index	F = 7.250	0.000	F = 4.296	0.000
State Characteristics				
Population Size	R = 0.889	0.000	R = -0.132	0.013
Natural Logarithm – Population Size	R = 0.676	0.000	R = -0.168	0.002
Violent Crime Rate per 100k	R = 0.212	0.000	R = 0.493	0.000
Concentrated Disadvantage	R = 0.351	0.000	R = 0.086	0.110
Rate of Law Enforcement Officers Assaulted per 1000 Officers	R = -0.015	0.785	R = 0.351	0.000

incorporation of *Tennessee v. Garner*'s fleeing felon rule significantly affected the number of OIDs per year ($F = 20.88$, $p < 0.001$) but not the rate ($F = 1.27$, $p = 0.283$).

When examining the number of restrictions that the State legal code imposes on how law enforcement uses force, the three indices corresponded to significant differences in the number of OIDs per year and the rate of OIDs per 100,000 per year. The number of restrictions placed on law enforcement when using force to make an arrest corresponded to a significant variation in the rate of OIDs per 100,000 residents per year ($F = 3.71$, $p < 0.012$) and the number of OIDs per year ($F = 4.360$, $p = 0.005$). Similarly, the Use of Force to Protect Others index showed significant differences across the number of OIDs per year ($F = 2.99$, $p = 0.031$) and the rate of OIDs per 100,000 residents per year ($F = 4.54$, $p = 0.004$). Lastly, the Use of Deadly Force index also corresponded to significant differences across the number of OIDs per year ($F = 7.25$, $p < 0.001$) and the rate of OIDs per 100,000 residents per year ($F = 4.30$, $p < 0.001$).

Using Pearson's r bivariate correlations, most of the measures of the states' characteristics had consistent impacts on the number of OIDs per year and rate of OIDs per 100,000 residents per year. The total number of residents within each state had a very strong positive correlation with the number of OIDs each year ($r = 0.889$, $p < 0.001$). This held true when we calculated the natural logarithm of each state's yearly population to adjust for the positive skew, then calculated the correlation between this and the number of OIDs per year ($r = 0.676$, $p < 0.001$). Similarly, the Violent Crime Rate per 100,000 residents along with the measure of Concentrated Disadvantage had consistent positive effects on the number of OIDs per year (Violent Crime Rate $r = 0.212$, $p < 0.001$; Concentrated Disadvantage $r = 0.351$, $p < 0.001$). The rate of assaults on officers per 1,000 officers was represented by the LEOKA data ($r = -0.015$, $p = 0.785$).

However, the states' population size, and its natural logarithm, had negative effects on the rate of OIDs per 100,000 residents per year (Population Size $r = -0.132$, $p = 0.013$; ln Population Size $r = -0.168$, $p = 0.002$). This suggests that less populated states might have more OIDs than their population size would indicate, meaning that there is likely a mediating factor affecting the relationship. The violent crime rate per 100,000 residents had a strong positive relationship with the rate of OIDs per 100,000 residents per year ($r = 0.493$, $p < 0.001$). However, concentrated disadvantage had an inconsistent negligible effect on the rate ($r = 0.086$, $p = 0.110$). The rate of officers assaulted in each state per year had a strong positive correlation with the rate of OIDs per 100,000 residents per year ($r = 0.351$, $p < 0.001$). Taken together, the bivariate statistics indicate that there are multiple predictors that affect the number of OIDs per year, as well as the rate of OIDs per 100,000 residents per year, which supports the use of multivariate techniques.

Negative Binomial Regression Models

Table 5 presents the results of five negative binomial panel regression models with random effects in Models 1-5. Across the five models, the natural logarithm of the state's population size and its violent crime rate per 100k residents were consistently the strongest predictors of the number of officer-involved deaths per year. The effect of the state's (ln)population size ranged from $b = 0.842$ to 0.846, with all effects significant at the 0.001 level. Similarly, the state's violent crime rate had a very consistent positive effect across the six models that included it, with all its effects at or around $b = 0.001$ ($p < 0.001$).

However, the state's level of concentrated disadvantage did not have a consistent effect on the number of officer-involved deaths that occurred each year across the five models. Concentrated disadvantage had a slight positive effect on the number of OIDs per year (0.066-0.067, $p = 0.079 – 0.89$). Similarly, the rate of assaults on officers per 1,000 officers had a positive but inconsistent effect on the number of OIDs per year ($b = 0.001$, $p = 0.092 – 0.102$). Surprisingly, none of the measures of the state's efforts to restrict how officers can use force or their level of incorporation of existing Supreme Court precedent into state jurisprudence affected the number of officer-involved deaths that occurred in each state once the state's socioeconomic and violent crime characteristics were accounted for.

Across the five models, the Bayesian Information Criterion did not substantially change. Taken together, this indicates that there may be other factors that explain this relationship better.

Ordinary Least Squares Panel Regression Models

Table 5 displays the results of ordinary-least squares panel regression models using the generalized least squares estimator in Models 6-10. This analytic model produces the *R*-Squared values for the within-, between, and overall variance explained for each model. Consequently, our model comparisons are evaluated based on the amount of variation between states and overall that each model explains. Similar to Models 1-5 shown in Table 5, the natural logarithm of the state's population size had a positive effect on the rate of OIDs per 100,000 residents ($b = 18.56 – 18.78$, $p = 0.000$) that was highly consistent across the five models. When examining the impact of the other state

Table 5: The Effect of State Laws on the Number and Rate of Officer-Involved Deaths per 100,000 Residents per Year

	Number of OID per Year										Rate of OID per 100,000 Residents per Year									
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9		Model 10	
	B (se)	*P*	B (se)	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*		
Population Size (ln)	0.844 (.059)	0.000	0.842 (.059)	0.000	0.848 (.060)	0.000	0.846 (.059)	0.000	0.845 (.059)	0.000	18.776 (2.847)	0.000	18.559 (2.884)	0.000	18.750 (2.912)	0.000	18.770 (2.889)	0.000	18.605 (2.900)	0.000
Violent Crime Rate per 100k	0.001 (.000)	0.000	0.001 (.000)	0.000	0.001 (.000)	0.000	0.001 (.000)	0.000	0.001 (.000)	0.000	0.018 (.010)	0.063	0.019 (.010)	0.054	0.019 (.010)	0.053	0.019 (.010)	0.056	0.019 (.010)	0.051
Concentrated Disadvantage	0.067 (.039)	0.089	0.068 (.039)	0.079	0.066 (.039)	0.089	0.067 (.039)	0.087	0.067 (.039)	0.086	0.627 (1.163)	0.590	0.721 (1.160)	0.534	0.726 (1.159)	0.531	0.722 (1.158)	0.533	0.750 (1.159)	0.518
Rate of Assaults on Officers per 1000	0.0005 (.000)	0.098	0.0006 (.0003)	0.097	0.0006 (.0003)	0.092	0.0006 (.0003)	0.094	0.0005 (.0003)	0.102	0.005 (.007)	0.452	0.005 (.007)	0.449	0.005 (.007)	0.454	0.005 (.007)	0.450	0.005 (.007)	0.455
Incorporation of Graham v. Connor	-0.044 (.124)	0.720									-5.765 (6.179)	0.351								
Incorporation of Tennessee v. Garner			-0.023 (.148)	0.897									-2.163 (7.345)	0.768						
Justifications for Deadly Force																				
Use of force to make an arrest					-0.051 (.093)	0.584									-1.193 (4.692)	0.799				
Use of Force to Protect Others							-0.040 (.068)	0.556									-1.556 (3.381)	0.645		
Deadly Force Index									-0.015 (.036)	0.684									0.192 (1.766)	0.913
Constant	-9.421 (.942)	0.000	-9.384 (.941)	0.000	-9.433 (.940)	0.000	-9.363 (.937)	0.000	-9.407 (.938)	0.000	-274.128 (43.502)	0.000	-268.334 (43.641)	0.000	-269.647 (43.732)	0.000	-267.995 (43.653)	0.000	-268.922 (43.786)	0.000
Log Likelihood	-1039.860		-1039.912		-1039.774		-1039.751		-1039.841											
BIC	2126.583		2126.687		2126.411		2126.365		2126.544											
R^2 Within											0.024		0.024		0.0239		0.0239		0.024	
Between											0.498		0.489		0.489		0.491		0.488	
Overall											0.480		0.471		0.471		0.473		0.471	
Wald X^2	259.59	0.000	258.51	0.000	259.70	0.000	260.47	0.000	258.63	0.000	52.85	0.000	51.09	0.000	50.96	0.000	51.19	0.000	50.63	0.000

Note: **The *b* coefficient for the effect of Rate of Assaults on Officers per 1000 Officers employed in the state was displayed to four decimal places to indicate the direction of the effect. Listing a *b* value of 0.000 with a standard error of 0.000, with a *p* value of 0.000 seemed confusing, so we chose to display the results to the 4th place.

characteristics, none were consistent predictors of the rate of OIDs per 100,000 residents per year. Like the models displayed in Table 3, the measures concerning the states' incorporation of Supreme Court precedent or the number of restrictions on officers' ability to use force were not consistent predictors and did not explain more of the variation in the rate of officer-involved deaths per 100,000 residents per year. Consequently, these measures do not seem to add much to the understanding of patterns of officer-involved deaths within the United States. The total variance explained by the models was consistently around $r2 = 0.470 - 0.480$, with the variation explained between states increasing to 0.49-0.50.

Because we calculated multiple regression models for the number of officer-involved deaths in each state per year, along with the rate of OIDs per 100,000 residents, a Bonferroni alpha correction provides important context (Van der Weele & Mathur, 2019). To address the issue of Type 1 error being increased through making multiple comparisons, we divided our significance threshold ($p = 0.05$) by the number of tests for each outcome measure and then by the total number of tests calculated. Thus, a more conservative threshold for statistical significance would be $p < 0.01$ for five tests or $p < 0.005$ for 10 tests. Across the 10 models, only the natural logarithm of population size consistently exceeded both of the more conservative significance thresholds. In Models 1-5, which assessed the number of OIDs per year, the state's Violent Crime Rate per 100,000 residents was also a consistent positive predictor at the higher significance thresholds but was reduced to non-significance when examining the models of the Rate of OIDs per 100,000 residents.

Discussion

The current study examines the impact of state laws concerning how officers can use force to affect the number of civilians killed by law enforcement within the state. This is a relevant topic for study as the United States is currently dealing with widespread efforts to reduce the number of people killed by law enforcement. Across the 10 panel regression models displayed here, the state's population size and violent crime rate per 100,000 residents were the strongest and most consistent predictors of both the number of OIDs per year and rate of OIDs per 100,000 residents per year that occurred in each state each year, net of other factors. This is consistent with both logic and the current understanding of the criminal justice system: A more violent state per capita would lead to more law enforcement contacts, which would also correspond to more uses of force, independent of other factors. Consequently, an exploration of potential mediators to this relationship, such as differences in OIDs across other state-level factors might be beneficial.

Additionally, the results of the models indicate that the number of restrictions that states have placed on how officers use force does not have a consistent effect on the number of officer-involved deaths per year or the rate of OIDs per 100,000 residents per year. This does not mean that state-level restrictions on officer behavior have no effect, however. Rather, officers' decision to use force can also be affected by laws concerning when officers must intervene coercively, such as mandatory arrest laws for domestic violence or state laws concerning stops, searches, and warrants, rather than the restrictiveness indices shown here. As agency policies are the most direct control on officer behavior (Fyfe, 1988; Stoughton et al., 2021; Terrill & Paoline, 2017), reform efforts may concentrate on creating agency-level policies that restrict how officers use force. Agency policies found to reduce the number of officer-involved deaths consistently might be mandated at the state or national level to update all agencies on the best practices known.

Overall, other research findings have highlighted the importance of addressing systemic issues, such as implicit bias, in reducing the number of officer-involved deaths. Additionally, providing officers with training in de-escalation techniques, trauma-informed policing, and other strategies to manage stress can help reduce the overall incidence of using deadly force and OIDs (Bailey et al., 2022; Engel et al., 2020, 2022). However, these reforms might not have a direct or immediate effect on law enforcement behavior. Efforts to address organizational characteristics, community disadvantage, or the hiring, training, and retaining of personnel would be isolated to individual jurisdictions or states, rather than across the U.S. at once. Thus, the only means by which this systematic reform occurs is when the U.S. Supreme Court has taken steps to dramatically reform the law enforcement field.

Implications

While the results discussed above demonstrate that the state laws concerning how officers use force indicate that they lack a consistent effect, there are still some important policy implications to draw. First, changing state laws about how officers use force to reduce the number of officer-involved deaths may not have an impact. However, this does not necessarily mean that reforms are hopeless. Rather, states can mandate and support policies that are proven to reduce uses of force overall, such as de-escalation training (Engel et al., 2020, 2022). The Federal Government can then set national

policy through incentives to adopt best practices. Further, the state laws evaluated by Stoughton and colleagues (2021) may play an important role in the disciplining of officers for misusing force.

However, it is possible that the laws have not been enforced when trying to hold officers accountable for their actions in civil or criminal court. No data were incorporated in this study concerning officers who ran afoul of these laws, were investigated for misconduct, or were investigated for excessive or brutal uses of force. These unmeasured factors might indicate that the laws themselves are not being enforced rather than the laws being ineffective. Political and public pressure to strictly evaluate officer-involved death cases to determine whether the officer(s) acted inappropriately based on existing laws and precedent might represent an important stopgap measure while governments enact other reforms. Future research can explore these issues in more detail to understand if there is a change in officer behavior after a misconduct allegation or determination.

Reducing violence within the state, such as by encouraging problem-oriented approaches and addressing drivers of violent behavior identified by criminology (Land et al., 1990; McCall et al., 2010) might be more effective than focusing on reducing officer-involved deaths in isolation. These might include focused deterrence and place-based policing strategies to reduce violent crime, as well as more long-term efforts to improve education and employment and reduce poverty within the state. While concentrated disadvantage had a slight inconsistent impact on the number of OIDs per year and the rate of OIDs per 100,000 per year, reducing violent crime rates within the state might lead to secondary benefits in civilians assaulting law enforcement, thereby reducing their need to use force to resolve situations (Fridel et al., 2020; McCall et al., 2010).

Finally, examining law enforcement culture and officers' mindsets concerning the continuum of militarized warrior to guardian-centric approaches would be beneficial to identify what can be done to emphasize a procedurally-just mindset for officers across the U.S. (Carlson, 2020; Stoughton, 2016). Law enforcement might benefit by incorporating the tenets of trauma-informed policing, which stresses the importance of acknowledging and addressing the effects of trauma on individuals and communities (Clark et al., 2023; Rich, 2019). It prioritizes addressing the root causes of criminal behavior and engaging in interactions with empathy and sensitivity. By integrating trauma-informed approaches, law enforcement agencies can more effectively meet the needs of individuals experiencing trauma, mental illness, or adverse experiences. Moreover, acting with procedural justice towards community members, both in individual interactions and in agency communications with the public, might help agencies generate the support needed to accomplish their mission of protecting their communities. Without that support, the relationship between law enforcement and the public will only become more strained.

Limitations

Several limitations provide important context for our findings and directions for further research into this topic. First, focusing on officer-involved deaths, rather than counts of deadly force, might have reduced the impact of the state laws and concentrated disadvantage to non-significance. It is possible that these factors affect the likelihood of officers using force, up to deadly force, in their interactions with civilians, but the low number of encounters with law enforcement that lead to death obfuscates those effects. More comprehensive data collection is needed to address this issue as only force resulting in death is captured with this study. However, our work's focus on OIDs means that our results are relevant to the most severe outcome possible for a use of force: death. Similarly, the effectiveness of medical intervention, as well as distance traveled to adequate care might also play a role in OIDs within more rural areas. However, there is no comprehensive database of law enforcement use of deadly force that did not result in a death across the United States, and it likely does not exist for most states. Consequently, the use of officer-involved deaths as the outcome measure, rather than uses of force more broadly, represents the most comprehensive means of studying this topic that exists across the U.S.

Relatedly, this article used the Mapping Police Violence dataset, which might present an issue with the potential for officer-involved deaths to be missing from this analysis. However, the lack of systematic data collection concerning officer-involved deaths by the U.S. federal government makes the use of datasets built from media reports the next best option to study this topic. As a result, it is possible that cases might have been missed by the Mapping Police Violence organization or were not covered by or reported to the media, as noted by Comer and Ingram (2022). This might lead to areas without print or electronic media institutions in the jurisdiction, such as rural communities, to not be represented in this data. Similarly, the LEOKA dataset is a voluntary component of the UCR, with roughly 66%, rather than the UCR's 90+%, participation. As such, its impact on the results shown here might overstate its true effect.

Conclusion

Based on this study, it does not appear that the incorporation of SCOTUS decisions within state laws, or the restrictiveness of state laws concerning how officers use force during an arrest, how officers use force to protect themselves or others, or the use of deadly force affect the number of officer-involved deaths that occur per year, nor the rate of officer-involved deaths per 100,000 residents per year. The bivariate analyses indicated that state laws concerning how officers use force may affect OIDs, but the inclusion of other relevant factors about the states in the multivariate analyses reduced those effects. Further, the state laws in question may not be the appropriate point to affect behavior. At this point, there has been comparatively less attention paid to state-level issues of what constitutes the reasonable suspicion necessary to begin an interaction through a *Terry* stop or issues where officers' behavior may have inadvertently escalated the situation to the point of using force. Efforts to reform the police at the state-level may need to consider the factors leading up to a use of force situation and provide more guidance concerning how officers can protect themselves and others while also reducing unnecessary harm.

Therefore, efforts to reduce OIDs may be more impactful at the local or national level. However, given that there are 18,000 law enforcement agencies across the 50 United States means that adequately studying each agency in isolation is a nigh-impossible task. Future research that identifies the larger patterns that exist within the data about incidents in which someone dies as the result of law enforcement's actions represents a valuable way for researchers to provide policymakers and the public with enough information to make informed decisions about how to make interactions with law enforcement safer for all parties involved.

Data Availability

This manuscript used data collected by the Campaign Zero's (2022) project "Mapping Police Violence" for the period of 2013-2019, along with data gathered by the American Communities Survey of the U.S. Census, and the FBI's Uniform Crime Report and Law Enforcement Officers Killed and Assaulted databases for the same period. Finally, the measures of state laws were created following Stoughton and colleagues' (2021) analysis of them.

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Appendix

Appendix A: The Effect of State Characteristics on the Number and Rate of Officer-Involved Deaths per Year

	Number of OID per Year								Rate of OID per Year							
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	B (se)	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*	*B (se)*	*P*
State Population Characteristics																
Population Size (ln)	0.867 (.067)	0.000	0.838 (.058)	0.000	0.853 (.059)	0.000	0.857 (.059)	0.000	-0.034 (.025)	0.181	-0.047 (.021)	0.028	-0.049 (.022)	0.027	-0.049 (.022)	0.027
Violent Crime Rate per 100k	-	-	0.002 (.000)	0.000	0.002 (.000)	0.000	0.001 (.000)	0.000	-	-	0.001 (.000)	0.000	0.001 (.000)	0.000	0.001 (.000)	0.000
Concentrated Disadvantage	-	-	0.047 (.029)	0.101	0.043 (.029)	0.140	0.063 (.030)	0.034	-	-	-0.019 (.019)	0.311	-0.018 (.019)	0.324	-0.010 (.019)	0.619
Number of Officers Killed	-	-	-	-	-0.013 (.010)	0.192	-	-	-	-	-	-	0.002 (.007)	0.773	-	-
Rate of Assaults on Officers per 1000	-	-	-	-	-	-	0.001 (.000)	0.034	-	-	-	-	-	-	0.0005 (.000)	0.008
Constant	-9.250 (1.066)	0.000	-9.388 (.916)	0.000	-9.593 (.936)	0.000	-9.658 (.932)	0.000	0.888 (.388)	0.022	0.741 (.329)	0.024	0.764 (.338)	0.024	0.620 (.335)	0.064
Log Likelihood	-1054.033		-1040.877		-1040.023		-1023.2233									
Wald Chi²	165.42	0.000	262.88	0.000	262.95	0.000	266.93	0.000	1.79	0.1805	58.97	0.000	59.16	0.000	68.58	0.000
BIC	2131.498		2116.901		2121.052		2087.331									
***R* Squared** Within									0.009		0.091		0.091		0.120	
***R* Squared** Between									0.042		0.398		0.400		0.403	
***R* Squared** Overall									0.028		0.300		0.302		0.311	