

# Associations Between State Intimate Partner Violence-Related Firearm Policies and Injuries Among Women and Men Who Experience Intimate Partner Violence

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## Original Contribution

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# Abstract

**Background:** Comprehensive state firearm policies related to intimate partner violence (IPV) may have a significant public health impact on non-lethal IPV-related injuries. Research indicates that more restrictive firearm policies may reduce risk for intimate partner homicide, however it is unclear whether firearm policies prevent or reduce the risk of non-lethal IPV-related injuries. This study sought to examine associations between state-level policies and injuries among U.S. IPV survivors.

**Methods:** Individual-level data were drawn from the National Intimate Partner and Sexual Violence Survey, a nationally-representative study of noninstitutionalized adults. State-level data were drawn from a firearm policy compendium. Multivariable regressions were used to test associations of an IPV firearm policy climate index, as well as individual policies, with non-fatal IPV-related injuries (N=6,565).

**Results:** On average, states had 2 IPV-related firearm policies (range 0 to 6). Overall, IPV-related firearm policy climate was associated with lower odds of experiencing injuries (aOR[95% CI]= .95[.91, .98]). Three specific policies were associated with IPV-related injuries. Individuals who reported IPV and live in states that required firearm surrender of persons convicted of IPV-related misdemeanors (aOR[95% CI]=.78 [.64, .95]), prohibited firearms to persons subject to IPV-related protective orders (aOR[95% CI]=.82[.68, .97]) and convicted of stalking (aOR[95% CI]=.77[.64, .92]) had lower odds of experiencing injuries than individuals living in states without these policies.

**Conclusions:** Restrictive state firearm policies regarding IPV may provide unique opportunities to protect IPV survivors from injuries.

## Introduction

Intimate partner violence (IPV) is a critical public health problem that can have significant effects on population health.<sup>1,2</sup> In the United States (U.S.), more than one in three women (36.4%) and men (33.6%) experience some form of IPV in their lifetime.<sup>3</sup> An extensive body of research illustrates the adverse physical, mental, sexual and reproductive health<sup>4,5</sup> outcomes associated with experiencing IPV. For example, it is estimated that 41% of women and 14% of men who experience IPV experience some form of physical injury.<sup>6</sup> Research has drawn increasing attention to the most severe outcome of intimate partner - homicide. Half of intimate partner homicides in the U.S. are committed with firearms,<sup>7</sup> and 85% of victims are women.<sup>8</sup> In the context of nonfatal injuries, firearms can be used to exert power and control dynamics within a relationship.<sup>9</sup> An intimate partner's access to firearms has been associated with more severe IPV,<sup>10</sup> police-reported physical assaults,<sup>11</sup> and firearm-related threats.<sup>12</sup> Yet, despite these findings, the relationship between an intimate partner's firearm access and the risk of nonfatal injuries among IPV survivors remains understudied.

Comprehensive state firearm policies related to IPV may be a protective factor of nonfatal injuries among U.S. IPV survivors. Previous research suggests that more restrictive firearm policies may reduce risks for

intimate partner homicide,<sup>7</sup> however we are unaware of any study to date that uses a socio-ecological approach to examine associations between structural factors such as firearm policies and non-fatal IPV-related injuries among individuals who experience IPV. Structural factors such as policies and laws can create and maintain climates in which IPV is legitimized or prohibited, and these climates may, in turn, affect the wellbeing of individuals who experience IPV.

There have been several advances in protecting the livelihood of individuals who experience IPV. For example, the 1994 Violence Against Women Act (VAWA), which was reauthorized in 2000, 2005, and 2013, is a federal law that provides responses to multiple forms of violence, including IPV, sexual assault, dating violence and stalking.<sup>13</sup> Under the 1994 VAWA, individuals are prohibited from firearm possession if they are subject to an IPV-related restraining order.<sup>14</sup> Also, federal policies prohibited firearm possession among persons convicted of IPV-related felonies; in the 1996 reauthorization, the prohibition was extended to misdemeanors.<sup>7</sup> However, states can enact their own statutes that differ from federal policies and laws.<sup>7</sup> As a result, there can be greater variability in state vs. federal policies in relation to IPV. The potential heterogeneity in state IPV-related firearm policies may differentially impact the wellbeing of victims based on their state of residence.

Previous research on IPV-related firearm policies suggests that these types of policies may function as “health-related policies.” The CDC describes “health-related policies” as the “formal or informal written statements that are designed to protect or promote health.”<sup>15</sup> One example is how IPV-related policies influenced HIV transmission. A recent study found that the positive association between IPV prevalence and HIV diagnoses was significantly attenuated in states with more IPV-related healthcare policies compared to states with fewer policies.<sup>16</sup> Notably, this study suggested that state policies were associated with women’s HIV vulnerability such that trauma-informed healthcare environments may create safe spaces to identify women experiencing IPV and better address their health concerns. In the context of IPV-related firearm policies, it is possible that individuals residing in states with more restrictive firearm possession policies have better health outcomes, including fewer nonfatal injuries. Policies are structural determinants that can directly and indirectly influence population health and well-being,<sup>17</sup> and more research examining the health implications of IPV-related firearm policies are needed.

Decades of research guided by the social-ecological model has underscored that individual-, relationship- and community-level factors influence the prevalence of IPV<sup>18</sup> and its associated health consequences; yet, structural factors such as policies remain understudied. Thus, the current study aimed to examine the association between IPV-related firearm policies implemented at the state level and nonfatal injuries among individuals who experience IPV. We hypothesized that individuals who experience IPV living in a state with a more restrictive firearm policy climate (i.e., several IPV-related firearm policies) would have lower odds of nonfatal injuries than individuals who experience IPV living in states with a less restrictive firearm policy climate (i.e., fewer IPV-related firearm policies). Given the dearth of research on the differential associations of individual policies and gender, these relationships were explored and no specific hypotheses were advanced.

# Methods

## Study Sample

Individual-level data were drawn from the National Intimate Partner and Sexual Violence Survey (NISVS), a cross-sectional, nationally representative epidemiologic survey of the non-institutionalized English and Spanish-speaking U.S. population aged 18+.<sup>19</sup> The survey was conducted in 50 states and the D.C. and administered from January 2010 to December 2010. NISVS is a random digit dial (RDD) telephone survey with dual-frame sampling that assessed multiple forms of interpersonal violence including IPV, sexual violence, and stalking among females and males. A total of 18,049 interviews were conducted using landline telephones (45.2%) and respondents' cell phones (54.8%). The study protocol was approved by the Office of Management and Budget (OMB# 0920-0822) and the Institutional Review Board of the Research Triangle Institute, International. Further information on the study design, training, data collection, and study implementation are published elsewhere.<sup>19</sup>

The current study was exempted by [Institution masked for peer review] IRB because the focus was secondary data analysis of de-identified data. The current analyses were restricted to women and men who experienced lifetime physical, sexual, and/or psychological IPV (N=6,565). This data was analyzed in 2020.

## Measures

### *State-level Data*

**State IPV Firearm Policy Climate.** We examined 6 state-level firearm policies regarding IPV extracted from a compendium on IPV-related firearm policies created by Frattaroli and colleagues,<sup>20</sup> which have been consistently used in previous research.<sup>7,21,22</sup> The six policies are: 1) Prohibition of firearm possession by persons convicted of IPV-related misdemeanors; 2) Firearm relinquishment for IPV-related misdemeanor; 3) Prohibition of firearm possession by persons subject to IPV-related restraining orders; 4) Prohibition of firearm possession by persons subject to IPV-related protective orders; 5) Prohibition of firearm possession by persons convicted of stalking, and 6) Removal of firearms from the scene of an IPV incident. It is important to note that restraining orders are civil and initiated by the victim whereas protective orders are initiated in criminal procedures.<sup>23</sup> For each policy, states were coded as a 1 (presence) or 0 (absence). The coding was based on 2010 policies and legislations given the timeframe of the data collection of the NISVS. An index variable was created by summing the responses across all 6 policy variables. These policy variables were then linked to the NISVS individual-level data.

**State Covariates.** We also controlled for the prevalence of firearm ownership and violent crimes. State firearm ownership was measured as the percentage of suicides committed with firearms for each state.<sup>24,25</sup> Suicide data was collected from the Centers for Disease Control and Prevention's Web-Based Injury Statistics Query and Reporting Systems database.<sup>26</sup> State violent crimes was measured as the

percentage of violent crimes (i.e., murder, rape, robbery and aggravated assault) for each state. Violent crime data was collected from the Uniform Crime Reporting Statistics database.

### ***Individual-Level Data***

**Nonfatal Injuries.** NISVS assessed participant report of injuries as a result of an experience of IPV (e.g., “Were you ever injured when this/any of these things happened with any of these people?”). Participants were able to respond as Yes, No, and I don’t know. For the current analysis, this variable was dichotomized as Yes (1) vs. No (0).

**Socio-demographics.** Participants were asked to self-report socio-demographics: sex (female, male); age (<10, 11-17, 18-24, 25-34, 35-44, 45-54, and 55+); education (no schooling, 1-8<sup>th</sup> grade, some high school, high school graduate, technical or vocational school, some college, college graduate, postgraduate), ethnicity (Hispanic, not Hispanic); and race and ethnicity (Black, White, Hispanic, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and Other).

### **Analysis**

Frequencies of socio-demographics were calculated for women and men who experience IPV. Weighted logistic regression models were conducted to examine associations between the IPV firearm policy climate index score and nonfatal injuries. Weights were based on the sampling weights. Additional models were conducted to examine associations between the six specific policies and nonfatal injuries independently. Moderation was also assessed by adding product terms between policy variables and sex variable (female vs. male). All models included age, race and ethnicity, and education. All analyses were conducted in 2020 using SAS to account for the complex sample design.

## **Results**

Table 1 displays the sample characteristics of NISVS women and men participants who reported IPV (N = 6,565, 36.4% of the sample [unweighted]). The majority of participants were ages 45 or older (52.3%), had more than a high school education (57.8%), and identified as Non-Hispanic white (74.5%).

Table 1  
Demographic Characteristics of NISVS Participants Who Experienced  
IPV, United States, 2010

Characteristics	Women (n = 3,976)	Men (n = 2,589)
<b>Age</b>		
18–24	408 (10.2)	353 (13.6)
25–44	1371 (34.5)	998 (38.5)
45 +	2201 (55.4)	1232 (47.6)
<b>Race and Ethnicity</b>		
Non-Hispanic Black	362 (13.6)	244 (9.4)
Hispanic	310 (12.1)	238 (9.2)
Non-Hispanic Another Race	293 (5.2)	189 (7.3)
Non-Hispanic White	3011 (69.0)	1903 (73.5)
<b>Education</b>		
< High School	404 (14.5)	248 (9.6)
High School Graduate	1365 (38.6)	742 (28.7)
> High School	2196 (46.9)	1598 (61.7)
<i>Note.</i> Number of participants is unweighted.		

Figure 1 displays the state-level distribution of the firearm policies. The median number of policies was 2 firearm policies. 3.8% of the states had 6 policies, 11.5% had 5 policies, 11.5% had 4 policies, 9.6% had 3 policies, 11.5% had 2 policies, 15.4% had 1 policy and 26.9% of states had no policies. Among states with at least 1 policy, the three most common policies were prohibition of firearm possession for IPV-related misdemeanors (71.0%), prohibition of firearm possession for IPV-related restraining orders (60.5%), and prohibition of firearm possession for IPV-related protective orders (42.1%).

Table 2 presents the adjusted associations of the overall IPV firearm policy climate with nonfatal injuries. After adjusting for state- and individual-level characteristics, overall IPV firearm policy climate was associated with injuries (aOR = .95, 95% CI = .91, .98, p = .01), such that for each 1 policy increase related to a significantly lower odds of reporting nonfatal injuries. We also examined the individual associations with each of the 6 policies. Individuals living in states that required firearm surrender of persons convicted of IPV-related misdemeanors (aOR = .78, 95% CI = .64, .95, p = .01), prohibited firearm possession to persons subject to IPV-related protective orders (aOR = .82, 95% CI = .68, .97, p = .02), and states that prohibited firearm possession to persons convicted of stalking (aOR = .77, 95% CI = .64, .92, p < .01) had lower odds of reporting injuries than individuals living in states without these protections.

Table 2

Adjusted Associations Between IPV Firearm Policy Climate and Nonfatal Injuries: NISVS Participants Who Experience IPV, United States, 2010

Independent Variables	aOR (95% CI)	p-value
Overall Policy Index	.94 (.89, .98)	.01
<i>Specific Policy</i>		
Prohibition of firearm possession by persons convicted of IPV-related misdemeanors	1.11 (.91, 1.36)	.29
Firearm relinquishment for IPV-related misdemeanor	.78 (.64, .95)	.01
Prohibition of firearm possession by persons subject to IPV-related restraining orders	.87 (.72, 1.05)	.14
Prohibition of firearm possession by persons subject to IPV-related protective orders	.79 (.66, .96)	.01
Prohibition of firearm possession by persons convicted of stalking	.73 (.60, .90)	< .01
Removal of firearms from the scene of an IPV incident	.88 (.73, 1.07)	.21
aOR = adjusted odds ratio, CI = confidence interval. Adjusted analyses included individual-level characteristics (i.e., age, sex, race and ethnicity, and education) and state-level characteristics (i.e., firearm ownership, violent crime).		

We explored sex (female vs. male) as a moderator on the relationships between firearm policies (i.e., overall and individual) and nonfatal injuries. There was no evidence of sex moderating these relationships (all  $p$ -values were greater than .05).

## Discussion

To our knowledge, the present study is the first to use population-based data to examine the implications of IPV-related firearm policies and nonfatal injuries among individuals who experience IPV. Our findings indicate that IPV-related firearm policies are associated with lower odds of nonfatal injuries. Individuals residing in states with a more restrictive IPV firearm policy climate had a lower odds of reporting nonfatal injuries. In particular, further examination of specific policies indicates that policies that prohibiting firearm possession among individuals issued protective orders or convicted of stalking may be particularly important drivers of the association of restrictive policies and nonfatal injuries. Collectively, our findings illustrate that policies that reduce partners' access to firearms help survivors' additional safety and protection. This evidence underscores the importance of addressing "upstream" approaches, such as protective policies, to improve survivors' wellbeing.

In general, our findings support the claim that IPV-related firearm policies are health-related policies, as illustrated by showing that IPV-related firearm policies were associated with better wellbeing in the form

of lower odds of nonfatal injuries. Supportive health-related policies have the potential to affect large groups of people simultaneously while fostering a culture of health.<sup>15</sup> Individuals who experience IPV residing in a state with a more restrictive firearm policy climate tended to have lower odds of nonfatal injuries than individuals residing in states with a less restrictive policy climate. Previous research has found strong relationships between firearm access and IPV, such that firearm access is associated with more severe violence<sup>10</sup> and the likelihood of firearm threats increases when partners have access to a firearm<sup>12</sup>. Another study found that firearm access was characteristic of a subgroup of perpetrators who commit more severe forms of IPV.<sup>11</sup> Thus, more restrictive IPV-related firearms policies may reduce a perpetrator's mechanism of injury.<sup>27</sup> Prohibition of firearm possession may also reduce the chances of a firearm being used as a weapon against victims, either directly or indirectly. Our findings provide support for state policies that protect the wellbeing of victims of IPV.

Importantly, these findings underscore the importance of firearm policies specific to stalking, protective orders and misdemeanors. Stalking is commonly used by perpetrators of IPV<sup>28</sup> and is strongly associated with more severe, and potentially lethal forms of violence.<sup>8,10</sup> While there is heterogeneity in IPV experiences among victims,<sup>29-31</sup> protective orders are options for victims experiencing ongoing violence.<sup>32</sup> Also, defendants of IPV are more commonly charged with misdemeanors.<sup>33</sup> Our results indicate that policies requiring firearm surrender in misdemeanor cases and prohibiting firearm possession in stalking cases and protective orders were related to lower odds of injuries. Prohibiting firearm possession among IPV perpetrators who stalk, are subject to protective orders and misdemeanors may reduce the odds of injury by removing a weapon that perpetrators can use to commit more consequential acts, such as threatening, controlling. This is critically important as 60% of misdemeanors arose from incidents that occurred in a shared residence.<sup>33</sup> Further, perpetrators who engage in stalking behaviors and those subject to protective orders may be particularly dangerous to one's safety and longevity; yet, there is no federal law that prohibits firearm possession for perpetrators who stalk and few states have legislation in place.<sup>34</sup> The implications of these findings are critically important as researchers have called for more attention regarding intimate partner stalking<sup>8,10,28</sup> and the utility of having a protective order as a safety strategy.<sup>23</sup> Coupled with previous research, our findings suggest greater adoption of firearm possession prohibition laws at the state level in order to improve the health of victims of IPV.

It is worth noting that there was no evidence that sex moderated the associations between firearm policies and nonfatal injuries. Our results suggest that state policies to restrict firearm access to abusive partners may prevent nonfatal injuries for *both* women and men. One potential explanation for the absence of a significant moderating effect by sex is due to how IPV-related firearm policies are written. IPV-related firearm policies examined in this study could be considered as "general" policies because they are not specific to population (e.g., female victims). Previous legal and public health research found that some general policies are, at times, written from a sex-blind perspective, such that these policies are designed around the experiences of a dominant group (e.g., men) and overlook the unique experiences of

the non-dominant group (e.g., women).<sup>35</sup> As a result, general policies may not meet the needs of vulnerable groups. However, our findings suggest that even general policies such as IPV-related firearm policies may have positive impact in the lives of both female and male victims. Though IPV-related firearm policies may not be written from a sex-blind lens, we are unable to guarantee that these policies have the same impact for all groups based on age, race and ethnicity, gender, class and other social identities. Future research examining IPV-related firearm policies and health outcomes (e.g., injuries) should consider using an intersectional approach and integrating biological explanations (i.e., sex) into the context of social factors (e.g., gender, class, age, race and ethnicity) in order to strengthen policies.

## Limitations

These findings should be interpreted considering the study's limitations. The NISVS is an ongoing nationally representative survey and although the second wave of data collection is complete, the second wave was not available at the time this manuscript was developed. As a result, our findings are based on cross-sectional data. The cross-sectional data do not allow for causal inferences. Future research should build upon our findings with the additional waves of data collection because longitudinal examinations can examine how policy changes influence health and wellbeing. Also, the presence or absence of a policy does not speak to the strength and/or enforcement in the state. It would be useful for future research to measure the implementation of IPV-related policies and how they influence health outcomes among women who experienced IPV. Our analysis does not allow us to assess mechanisms through which IPV-related firearm policies reduce injuries. It would be useful for future research to explore potential mechanisms linking IPV-related firearm policies to injuries. All the study variables were self-reported. Since IPV reporting can be influenced by social desirability bias, the prevalence of IPV may be misclassified.

## Conclusions

The current study adds to the research examining structural determinants of health among those who experience IPV. The current study demonstrated that a restrictive firearm possession policy climate at the state-level was associated with lower odds of injuries. Firearm possession policies may provide opportunities to reduce IPV injuries by potentially disrupting the mechanism of injury. Policies that prohibit firearms from potentially high-risk groups of perpetrators may help reduce adverse injury outcomes among victims.

## Declarations

### *Ethics Approval*

This study was a secondary data analysis of de-identified data and was exempted from IRB review ([Institution masked for peer review]: #1611018663).

### ***Consent for Publication***

Not applicable.

### ***Availability of data and material***

Some of the data that support the findings of this study are available from Inter-university Consortium for Political and Social Research but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Inter-university Consortium for Political and Social Research.

### ***Competing Interests***

The authors declare that they have no competing interests.

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### ***Author's Contributions***

TW conceptualized the study, oversaw data collection, led the analysis and wrote the first draft of the manuscript. TK facilitated access to the data, contributed to the analysis and provided substantive edits to the manuscript. RP abstracted data and coordinated data collection. AC and MK provided substantive edits to the manuscript. TS contributed to the conceptualization of the study, the interpretation of results and provided substantive edits to the manuscript. The author(s) read and approved the final manuscript.

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### ***Author's Information***

Not applicable.

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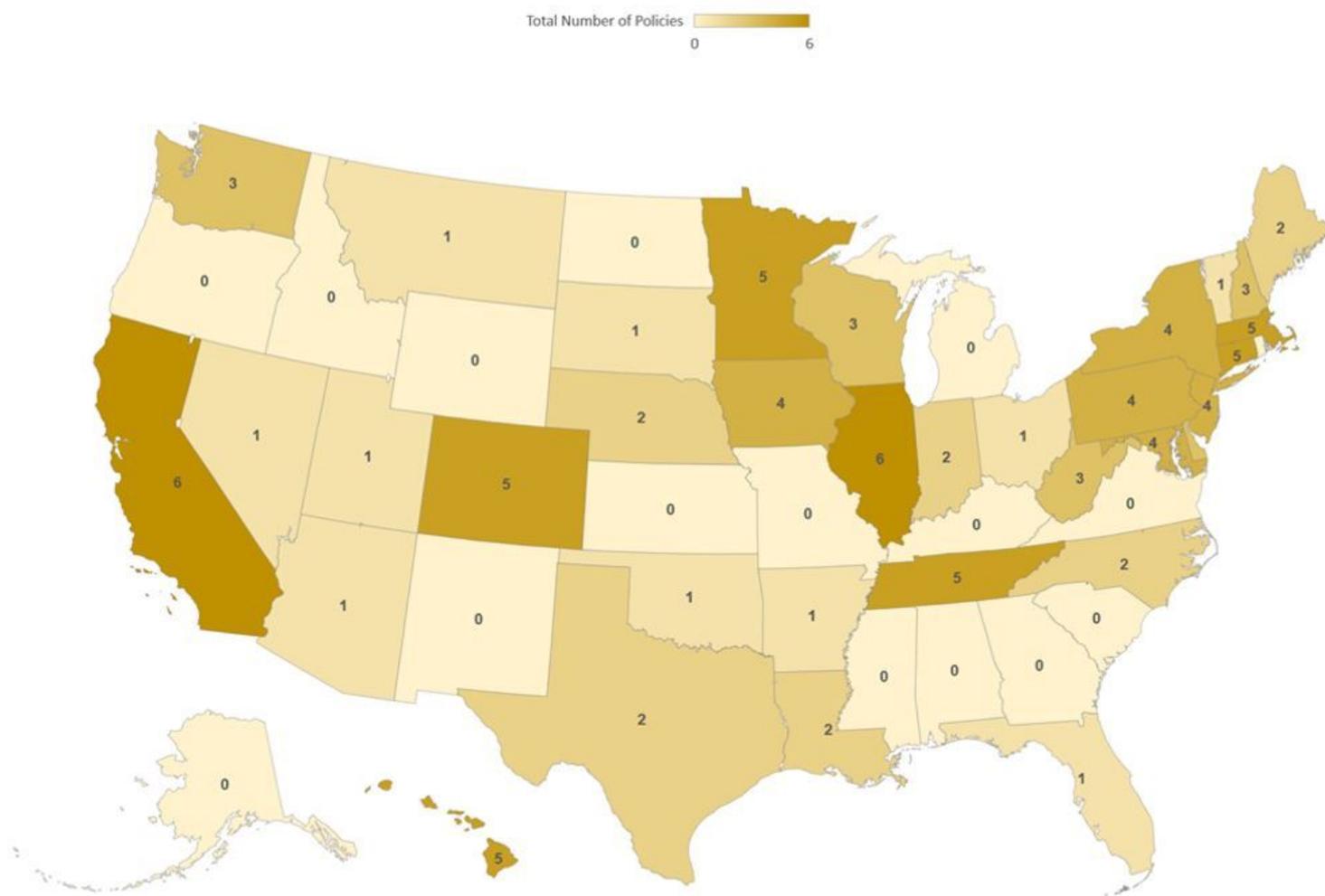
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## Figures



**Figure 1**

Distribution of state-level IPV firearm policy climates based on 2010 policies.