Title: "Examining the Role of Use of Force Policies in Ending Police Violence"
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Date: "September 20, 2016"

Executive Summary

We consulted legal experts, academics, and activists to identify a range of policies designed to impose common sense restrictions on how and when police use force against civilians. Then we reviewed the use of force guidelines of the nation's largest police departments to determine where these policies were currently in place and whether they were associated with fewer police-involved killings. We found all of the policies to predict lower rates of police-involved killings, with substantially fewer police-involved killings among departments that have more of these policies in place. These results suggest specific changes to police department use of force policies can significantly reduce police violence in America.

Introduction

The police shooting of Michael Brown, Jr. in Ferguson, Missouri, catalyzed a national debate about police use of deadly force and the ways in which police violence impacts black communities. According to available data, police kill over 1,000 people each year in America - a rate far higher than other developed nations. Rates of police-involved killings have been found to vary dramatically across police departments, including police departments within the same states (Ross 2015). A number of theories have been proposed to explain why some police departments kill civilians at higher rates than others. The dominant theory among law enforcement is that police-involved killings are determined by the number of encounters between police and civilians and the threat posed to officers during these encounters. For example, police chiefs tend to explain the disproportionate number of black people killed by police in their cities as a consequence of crime rates in black communities and the perceived threatening nature of those killed by police (Teich 2013; Glaser 2014). More crime leads to more arrests, which increases the likelihood of an officer using deadly force to apprehend a "threatening" or "resisting" subject, the theory goes (MacDonald et. al 2001). By contrast, activists and sociologists have asserted that elevated rates of police-involved killings result from police bias and structural factors such as poverty, racism, and economic inequality. Systems and structures maintain control and "order" over communities of color by flooding them with police officers who are then more likely to encounter, arrest, and use force against people of color for the same behaviors as their white counterparts (Smith 2004; Terrill and Reisig 2014; Goffman, 2014; Ross 2015; Goff et al., 2016).

Largely absent from the debate has been an examination of how rules and regulations regarding police use of force shape how officers handle these encounters. Specifically, what role do administrative policies governing how and when officers can use force play in influencing the degree to which officers use deadly force against civilians? Previous research has shown wide variation in the kinds of restrictions placed on use of force by police departments (Garret and Stoughton 2016). The wide variation in policies creates a kind of natural experiment that enables us to begin to determine which policies lead to greater or lesser police violence. While previous studies have shown more restrictive use of force policies predict lower rates of deadly and less lethal force in individual police departments, the current study expands upon this body of research to examine the relationship between use of force policies and police-involved killings among the nation's largest city police departments (Fyfe 1979; White 2001; Terrill and Paoline 2016).

Methodology

Use of force policies for the nation's largest municipal police departments were obtained through Freedom of Information Act requests asking for "all current policies maintained by the department regarding use of force." Among the 100 police departments requested, 94 departments submitted use of force policies. 3 of these policies were heavily redacted and, as such, were excluded from the analysis. In cases where a department

changed their use of force policy in 2016, the previous version of the policy was used. After consulting legal experts, academics, and police reformers, eight specific policy restrictions were identified as particularly relevant to decisions about how and when officers can use force. The following policies were included in this analysis:

1. Require officers to de-escalate situations, when possible, before using force.

2. Use a Force Continuum or Matrix that define/limit the types of force and specific weapons that can be used to respond to specific levels of resistance.

3. Restrict chokeholds and strangleholds (including carotid restraints) to situations where deadly force is authorized or prohibiting them altogether.

4. Require officers to give a verbal warning, when possible, before using deadly force.

5. Prohibit officers from shooting at people in moving vehicles unless the person poses a deadly threat by means other than the vehicle (for example, shooting at people from the vehicle).

6. Require officers to exhaust all other reasonable alternatives before resorting to using deadly force.

7. Require officers to intervene to stop another officer from using excessive force.

8. Require officers to report both uses of force and threats/attempted uses of force (for example, reporting instances where an officer intentionally points a firearm at a civilian) (Referred to in this study as 'Comprehensive Reporting').

These policies are consistent with previous scholarship on this issue (for example, Garret and Stoughton 2016) as well as recommendations from recent Department of Justice consent decrees and police reform groups ranging from Campaign Zero to the Police Executive Research Forum. Use of force policy documents from 91 police departments were reviewed to identify the extent to which they included these eight policies. A Use of Force Policy Scale was calculated based on the number of these policies currently in place for each police department.

Other factors that have been identified in previous studies to be predictors of police-involved killings were compiled using the most recent agency- and/or jurisdiction-level data available, including:

1. Total Population within Jurisdiction (US Census 2010)

2. Number of Arrests (FBI Uniform Crime Report 2012, Adjusted for non-reporting)

3. Number of Officers (FBI Uniform Crime Report 2012)

4. Reported Assaults on Officers (FBI Law Enforcement Officers Killed and Assaulted Report 2014)

5. Percent Minority Residents (US Census 2010)

6. Median Income (US Census ACS 2013)

7. Income Inequality (Gini Coefficient from US Census 2012)

To evaluate the relationship between these variables and police-involved killings, data on police-involved killings from January 1, 2015 through July 15, 2016 were compiled from The Guardian's The Counted database. These data were then cross-checked with the Washington Post's Fatal Police Shootings database spanning the same time period, resulting in the inclusion of a few additional cases that were unique to the WaPo database. Data from 2015-2016 were used because they reflect outcomes occuring during the time the police use of force policies used in this analysis were in effect. There was substantial geographic variation and variation in size of jurisdiction among the 91 police departments used in our analysis. Collectively, these departments represented 32 states (plus the District of Columbia) and had jurisdictions ranging in population from 208,916 residents to over 8 million.

Findings and Analysis

Consistent with previous research (Garret and Stoughton 2016), there was wide variation in the degree to which police departments included the proposed policy restrictions on use of force (see Figure 1 below). The only policies adopted by a majority of police departments were the requirement that police issue a verbal warning before shooting civilians (N=56 departments) and the adoption of a use of force continuum (N=77 departments). As illustrated in Figure 2, there was also wide variation in the rates of police-involved killings across police departments. Among the 91 police departments examined, only 7 did not kill someone over the time period analyzed.

To assess the relationship between police department use of force policies and police-involved killings, we compared the average rate of police-involved killings per population of police departments that had these policies with those that did not (See Figure 3). As illustrated in Figure 4, all eight policies included in our analysis were associated with lower rates of police-involved killings. The policies that were associated with the largest reductions in police-involved killings per population were policies that require comprehensive reporting (25% reduction), require officers to exhaust all other reasonable means before shooting (25% reduction), and that ban chokeholds and strangleholds (22% reduction).

While each individual policy predicted lower rates of police-involved killings, the fewest killings per population were observed among police departments that had several of these policies in place. For example, departments with 4 or more of restrictive use of force policies in place had 37% fewer police-involved killings per population than those that had 0 or 1 of these policies in place (See Figure 5). Importantly, using rates of killings per population does not account for differences in the number of high-risk encounters between police and civilians among jurisdictions with similar sized populations. Officers have been found to be up to 20 times as likely to use force while making an arrest compared to overall police contacts (Smith et al., 2009). In this light, we examined whether police departments with more restrictive use of force policies also had fewer killings per 100,000 arrests. After adjusting for arrest rates, six of the eight use of force policies included in our analysis were associated with fewer killings per 100,000 arrests and police departments with 4 or more policies implemented had 38% fewer killings per arrest than those with 0 or 1 policies in place (See Figure 6).

To determine whether this relationship was significant, we created a negative binomial regression model that considered the number of restrictive use of force policies implemented (use of force policy scale), the number of arrests made by the department, the demographic composition of each city, size of the police force, number of assaults on officers, and the median income and level of inequality in each city. We included population as an offset variable in the analysis to normalize the results by the total population within each jurisdiction.

Table 1 outlines the results of the analysis. Our model establishes a significant, negative relationship between the number of use of force policies that police departments implement and the number of people these departments kill. Consistent with previous research, higher numbers of arrests, reported assaults on officers, and a higher proportion of minority residents predicted higher numbers of police-involved killings. And consistent with our hypothesis, police departments with more restrictive use of force policies were less likely to kill people, even after taking these factors into account. As we anticipated, the coefficent in both models was negative and statistically significant.

Next, we estimated the effect size of the number of use of force policies on the number of police-involved killings. According to our model, after controlling for other factors, each additional use of force policy implemented on average reduces the number of police-involved killings by roughly 1 (.85). This represents an 15% reduction in police-involved killings for each additional policy implemented (See Figure 7 for calculations). Given the average department had already implemented 3 of the use of force policies included in the analysis, implementing the remaining five policies would reduce their number of killings by 54% percent. Reductions would be even greater for police departments that had fewer than 3 of these policies already in place. Police departments that implement all eight use of force policies would kill 72% fewer people on average than departments with none of these policies in place.

Discussion

We found that the number of use of force policy restrictions adopted by police departments is a significant and influential factor in predicting the number of people killed by these departments. These results suggest that advocacy efforts focused on pushing police departments to adopt more restrictive use of force policies can produce meaningful reductions in the number of police-involved killings. Among the measures identified, policies requiring comprehensive use of force reporting, prohibiting chokeholds and strangleholds, and requiring officers to exhaust all other means before using deadly force were associated with the largest reductions in police-involved killings. And while the scope of this study was limited to examining how restrictive use of force policies impact police-involved killings, researchers have found reductions in other forms of police use of force among departments that have implemented similar policies (Terrill and Paoline 2016). This suggests that these policies can reduce police violence beyond impacting police-involved killings.

Despite their potential impact, only 1 in 3 of America's largest city police departments currently have four or more of these policies in place. This suggests a large proportion of police-involved killings could be prevented through common sense policy changes that have yet to be adopted by the nation's foremost police and city leaders. Some police organizations have opposed these restrictions saying they might endanger officers or prevent officers from defending themselves against threats (Mather 2016; Emslie 2016; Canterbury and Cunningham 2016). We find that these assumptions are not supported by the data. Officers in police departments with more restrictive policies in place are actually less likely to be killed in the line of duty, less likely to be assaulted, and have a similar likelihood of sustaining an injury during an assault (See Figures 8, 9, and 10).

Future research should build upon these findings by examining the extent to which this relationship between use of force policies and police-involved killings is caused by the policies themselves or the broader culture of the police department and police leadership that adopts these measures. Ultimately, policies can only be as effective as they are enforced by police and city leaders - suggesting further advocacy may be needed to establish meaningful enforcement and accountability mechanisms. It's also unclear whether the means by which these policies are adopted makes a difference in terms of their effectiveness. For example, it may be that police department policies adopted voluntarily have a greater impact than those adopted as requirements under Department of Justice consent decrees. This, too, should be the subject of further research.

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Figures and Regression Tables

Use of Force Policy (N=91)	Number of Police Departments with Policy (N=91)	Percent of Police Departments with Policy
Has Use of Force Continuum	77	85%
Requires Warning Before Shooting	56	62%
Requires De-Escalation	34	37%
Requires Exhaust Other Means Before Shooting	31	34%
Duty to Intervene	30	33%
Bans Chokeholds and Strangleholds	21	23%
Restricts Shooting at Moving Vehicles	19	21%
Requires Comprehensive Reporting	15	16%

Figure 1: Use of Force Policy Adoption among Police Departments (Including 2016 Updates).
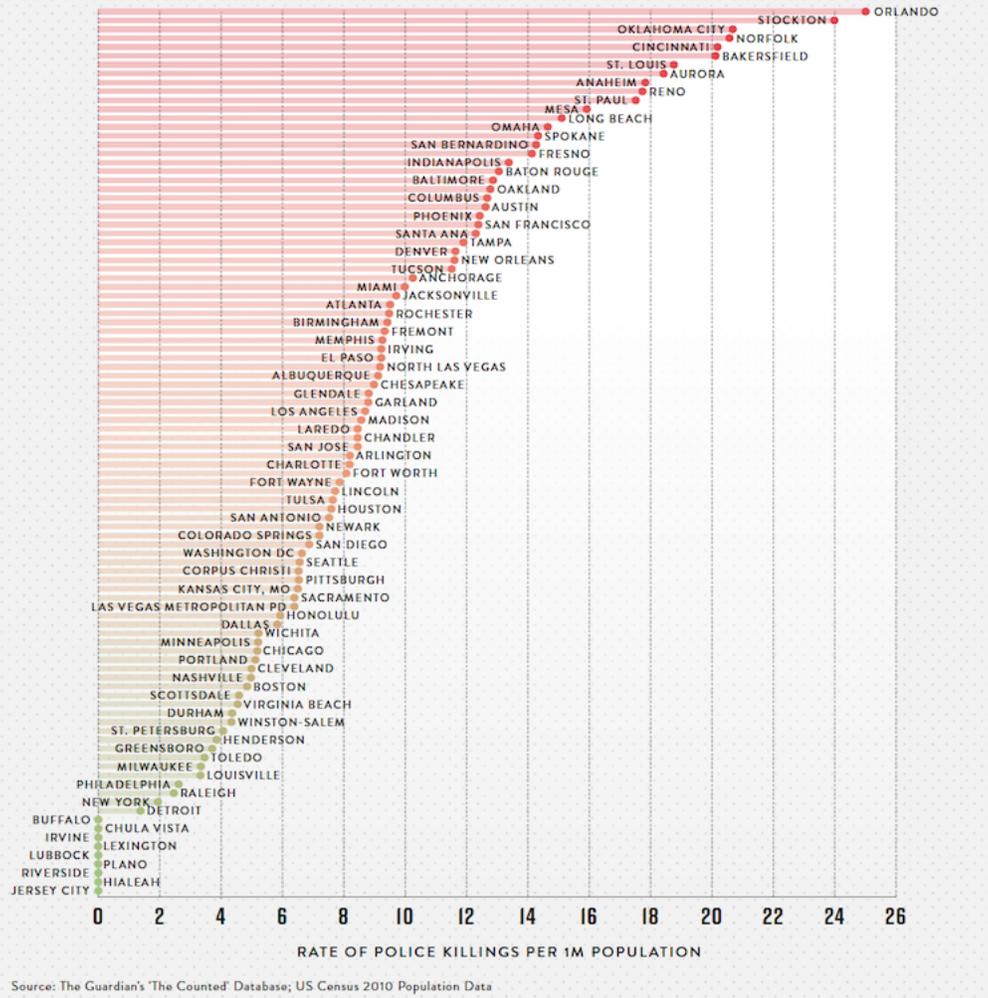
Figure 2: Rates of Police-Involved Killings among America's Largest City Police Departments.

Police Department	Requires De-Escalation	Bans Chokeholds and Strangleholds	Duty to Intervene	Requires Warning Before Shooting	Restricts Shooting at Moving Vehicles	Requires Comprehensive Reporting	Requires Exhaust Other Means Before Shooting	Has Force Continuum	Number of Policies	Killings by Police	Killings by Police per 1M Residents
Albuquerque	1	0	1	1	1	0	0	1	5	5	9.2
Anaheim	0	0	1	1	0	0	0	1	3	6	17.8
Anchorage	1	0	0	0	1	0	0	1	3	3	10.3
Arlington	1	0	0	0	1	1	1	1	5	3	8.2
Atlanta	0	1	0	0	0	0	0	1	2	4	9.5
Aurora	0	0	1	0	1	0	0	1	3	6	18.5
Austin	0	0	1	1	0	0	0	1	3	10	12.7
Bakersfield	0	0	0	1	0	0	0	0	1	7	20.1
Baltimore	0	0	0	1	0	0	1	0	2	7	12.9
Baton Rouge	0	0	0	0	0	0	1	1	2	3	13.1
Boston	0	1	0	0	1	0	1	1	4	3	4.9
Buffalo	0	0	0	0	1	0	1	1	3	0	0.0
Chandler	1	0	0	1	0	0	0	1	3	2	8.5
Charlotte	0	0	0	1	0	0	0	1	2	6	8.2
Chicago	1	0	0	0	1	0	0	1	3	14	5.2
Chula Vista	0	0	1	1	0	0	0	0	2	0	0.0
Cincinnati	1	0	0	1	1	0	1	1	5	6	20.2
Cleveland	1	1	1	0	1	0	0	1	5	2	5.0
Columbus	0	1	0	1	0	0	0	1	3	10	12.7
Corpus Christi	1	1	1	1	0	0	1	0	5	2	6.6
Dallas	1	0	0	0	0	0	1	1	3	7	5.8
Denver	1	0	0	1	0	0	1	1	4	7	11.7
Detroit	0	1	0	1	0	0	1	1	4	1	1.4
Durham	1	0	0	0	0	0	0	1	2	1	4.4
Fort Wayne	0	0	0	1	1	0	0	1	3	2	7.9
Fort Worth	0	1	0	0	0	0	0	1	2	6	8.1
Fremont	0	0	1	1	0	0	0	0	2	2	9.3
Fresno	0	0	0	1	0	0	0	0	1	7	14.2
Garland	0	0	0	1	0	0	0	0	1	2	8.8
Glendale	0	0	0	0	0	0	1	1	2	2	8.8
Greensboro	1	0	0	0	0	0	0	0	1	1	3.7
Henderson	1	0	1	0	0	0	1	1	4	1	3.9
Honolulu	1	0	0	1	0	0	0	1	3	2	5.9
Houston	0	0	0	0	0	0	0	1	1	16	7.6
Indianapolis	0	0	0	1	0	0	0	0	1	11	13.4
Irvine	0	0	1	1	0	0	0	1	3	0	0.0
Irving	0	0	0	0	0	0	0	0	0	2	9.2
Jacksonville	0	1	0	1	0	0	0	1	3	8	9.7
Kansas City, MO	0	0	0	0	0	0	0	0	0	3	6.5
Laredo	0	0	0	1	0	0	1	1	3	2	8.5
Las Vegas	1	0	1	1	0	0	0	1	4	13	6.4
Lexington	0	0	0	0	0	1	1	1	3	0	0.0
Lincoln	1	0	0	1	0	0	1	1	4	2	7.7
Los Angeles	0	1	1	0	0	0	0	1	3	33	8.7
Louisville	1	0	0	1	1	0	1	1	5	2	3.3
Lubbock	0	0	0	0	0	0	1	1	2	0	0.0
Madison	0	1	0	1	0	0	1	1	4	2	8.6
Mesa	0	0	0	1	0	0	0	1	2	7	15.9
Miami	0	1	1	1	1	0	1	1	6	4	10.0
Milwaukee	0	0	1	1	0	0	0	1	3	2	3.4
Minneapolis	0	0	0	0	0	0	0	1	1	2	5.2
Nashville	0	0	0	1	0	0	1	1	3	3	5.0
New Orleans	1	1	1	0	1	1	0	1	6	4	11.6
New York	0	0	1	1	1	0	1	1	5	16	2.0
Newark	0	0	1	1	0	0	1	1	4	2	7.2
Norfolk	1	0	0	0	0	0	0	1	2	5	20.6
North Las Vegas	0	0	0	0	0	0	1	0	1	2	9.2
Oakland	1	0	1	0	0	1	1	1	5	5	12.8
Oklahoma City	0	0	0	1	0	0	0	1	2	12	20.7
Omaha	0	0	0	1	0	0	0	1	2	6	14.7
Orlando	0	0	0	0	0	0	0	1	1	6	25.2
Philadelphia	1	1	1	1	1	0	1	1	7	4	2.6
Phoenix	0	0	1	1	0	0	0	1	3	18	12.5
Pittsburgh	1	0	0	0	0	0	0	1	2	2	6.5
Plano	0	1	0	1	0	1	1	1	5	0	0.0
Portland	0	0	0	1	0	1	0	1	3	3	5.1
Raleigh	0	0	1	1	0	1	1	1	5	1	2.5
Reno	0	0	0	0	0	0	0	0	0	4	17.8
Riverside	1	0	0	1	0	0	0	1	3	0	0.0
Rochester	0	0	0	0	0	0	0	1	1	2	9.5
San Antonio	1	0	1	0	0	0	0	1	3	10	7.5
San Bernardino	1	0	1	1	0	0	0	1	4	3	14.3
San Diego	0	0	0	1	0	0	0	1	2	9	6.9
San Francisco	0	0	0	1	0	1	0	1	3	10	12.4
San Jose	0	0	0	0	0	0	0	1	1	8	8.5
Santa Ana	0	0	0	1	0	0	0	1	2	4	12.3
Scottsdale	0	0	0	1	0	0	0	1	2	1	4.6
Seattle	1	1	1	1	0	1	0	1	6	4	6.6
Spokane	0	0	1	1	0	0	0	1	3	3	14.4
St. Louis	0	0	0	1	1	0	1	1	4	6	18.8
St. Paul	1	1	1	1	0	1	1	1	7	5	17.5
St. Petersburg	1	1	0	1	1	0	1	1	6	1	4.1
Stockton	0	0	0	0	0	0	0	0	0	7	24.0
Tampa	0	0	0	0	0	0	0	1	1	4	11.9
Toledo	0	0	0	1	0	0	0	1	2	1	3.5
Tucson	0	0	0	0	1	0	1	1	3	6	11.5
Tulsa	0	1	0	1	0	0	0	1	3	3	7.7
Virginia Beach	0	1	1	1	0	1	0	0	4	2	4.6
Washington DC	1	1	0	1	1	1	1	1	7	4	6.6
Wichita	0	0	0	1	0	1	0	1	3	2	5.2
Winston-Salem	1	0	0	1	0	1	0	1	4	1	4.4

Figure 3: Rates of Police-Involved Killings and Use of Force Policy Adoption by Police Departments (Excluding Changes Made to Use of Force Policies since 2016.

RESTRICTIVE USE OF FORCE POLICIES ARE ASSOCIATED WITH FEWER POLICE KILLINGS

Percent fewer police killings per capita for police departments with each policy implemented

-25% Requires Comprehensive Reporting

-25% Requires Officer Exhaust All Other Means Before Shooting

-22% Bans Chokeholds and Strangleholds

-19% Has Use of Force Continuum

-15% Requires De-escalation

-9% Duty to Intervene

-8% Restricts Shooting at Moving Vehicles

-5% Requires Warning Before Shooting
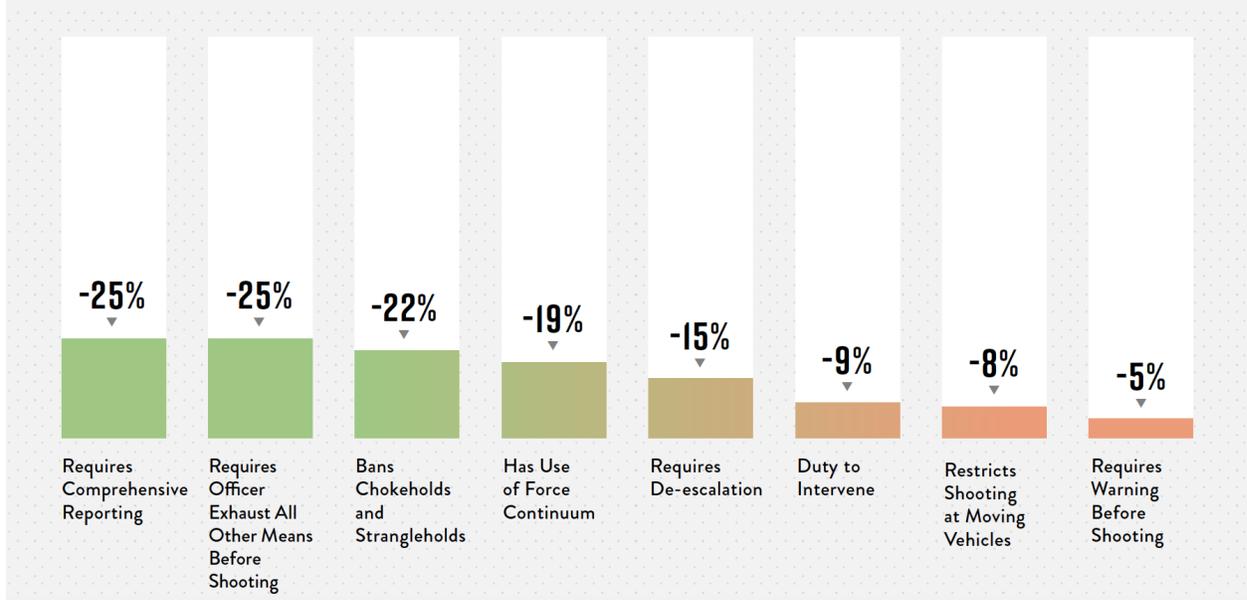
Figure 4: Use of Force Policies Associated with Fewer Police-Involved Killings per Population.
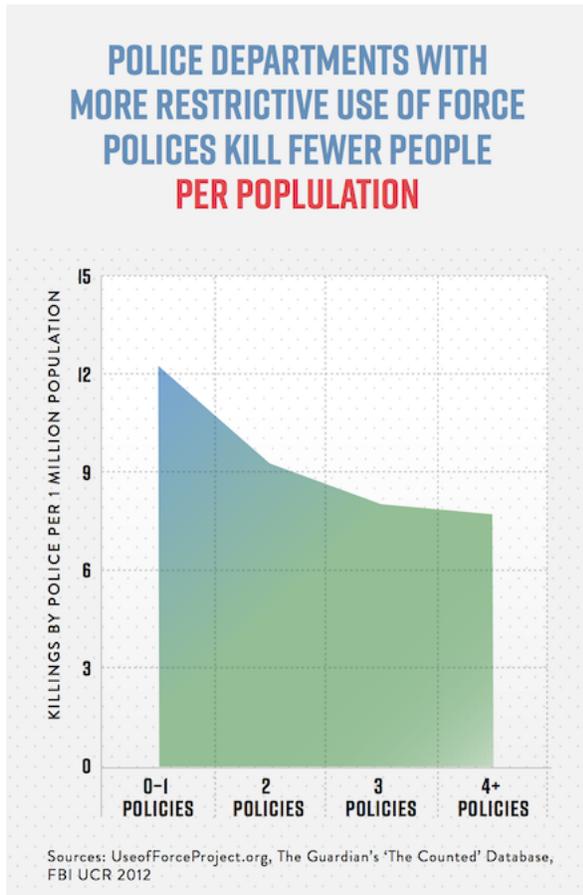
Figure 5: More Restrictive Use of Force Policies Predict Fewer Police-Involved Killings per Population.
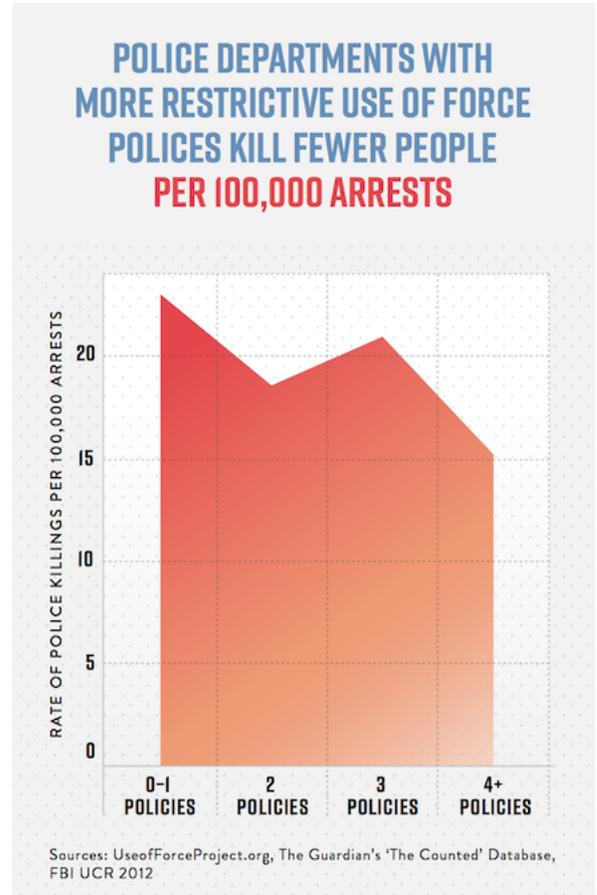
Figure 6: More Restrictive Use of Force Policies Predict Fewer Police-Involved Killings per Arrest.

(exp(coefficient) - 1) x 100% = percent change per unit

(exp(-0.157) - 1) x 100% = 15% fewer police-involved killings per policy

(exp(-0.157)^(5 policies) - 1) x 100% = 54% fewer killings by moving from average police department's 3 policies to all 8 policies

(exp(-0.157)^(8 policies) - 1) x 100% = 72% fewer killings by moving from 0 policies to all 8 policies

Figure 7: Calculating Effect Size
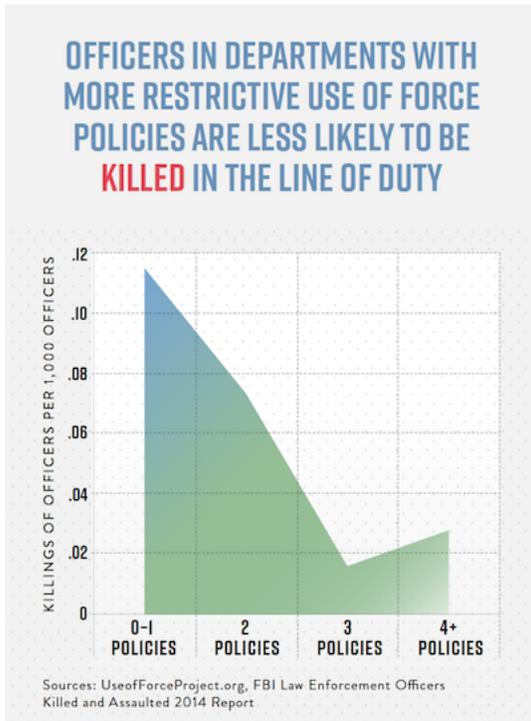
Figure 8: Departments with More Restrictive Use of Force Policies Have Fewer Police Killed in the Line of Duty.
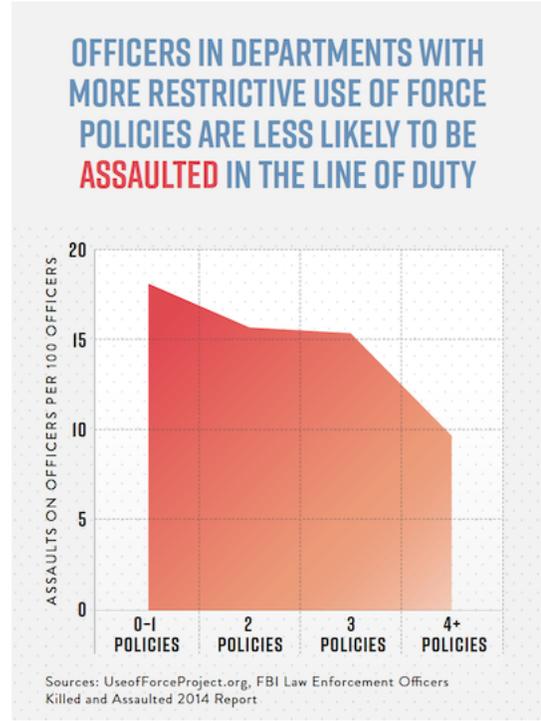

Figure 9: Departments with More Restrictive Use of Force Policies Have Fewer Assaults on Officers.
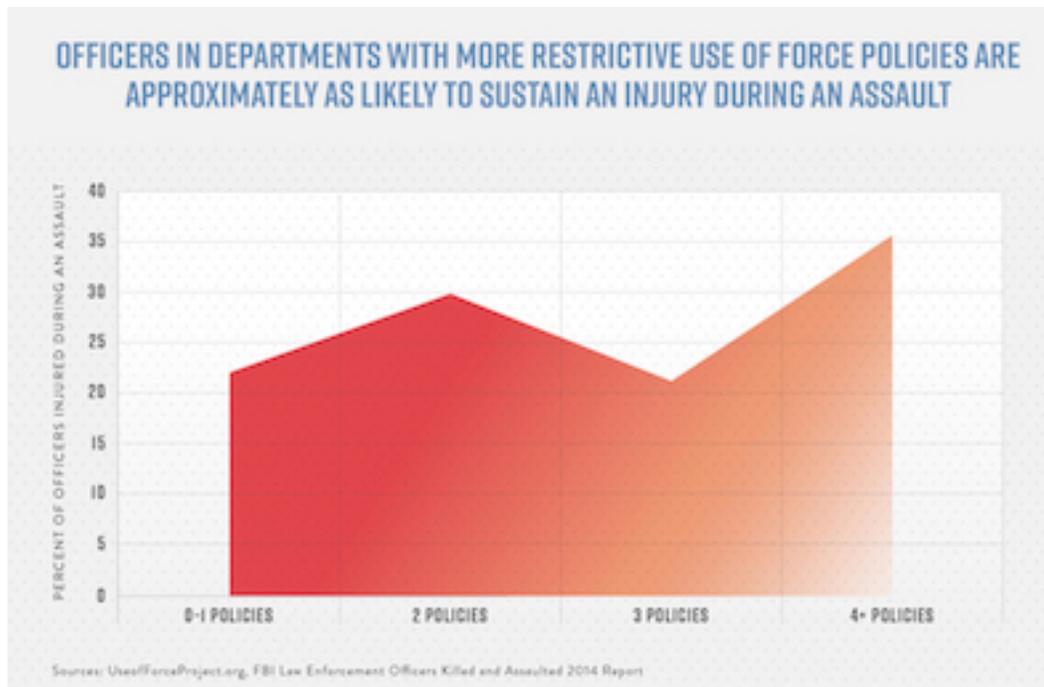

Figure 10: Officers in Departments with More Restrictive Use of Force Policies are Approximately as Likely to Sustain Injuries during an Assault.

Table 1: Use of Force Policy Regression Table

	Dependent variable:
	Killings by Police (Offset by Population
Use of Force Policy Scale	−0.157*
	(0.074)
Arrests	0.917***
	(0.173)
Number of Officers	0.010
	(0.122)
Assaults on Officers	0.001*
	(0.001)
Percent Minority	1.772**
	(0.687)
Inequality	0.145
	(1.692)
Income	0.845
	(0.543)
Constant	−21.597*
	(10.249)
Observations	91
Log Likelihood	−262.384
θ	1.085*** (0.192)
Akaike Inf. Crit.	540.769
Note:	*p<0.05; **p<0.01; ***p<0.001