Policing and Population Health: The Relationship between Militarization and Lethal Use of Force

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A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2019

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Program Authorized to Offer Degree:

Epidemiology

University of Washington

Abstract

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At present, the United States has no reliable and accessible federal surveillance system for lethal use of force by law enforcement. National dialogue on use of force has highlighted police militarization as a particularly concerning and potentially related trend but poor data limit the ability of researchers and practitioners to study this relationship. This dissertation uses innovative integration of interdisciplinary data to advance the study of militarization and use of force with the goal of supporting evidence-based and health-oriented policing practices. It includes construction of a new conceptual framework for militarization, a multistage data linkage process of four crowd-sourced lethal use of force databases, and a nationally representative, cross-sectional ecological analysis of the association between militarization and lethal use of force from 2013-2017.

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FREQUENTLY USED ACRONYMS

ACS	American Community Survey (formerly the United States Census)
ADI	Area Deprivation Index
BJS	Bureau of Justice Statistics
CDC	Centers for Disease Control and Prevention
FBI	Federal Bureau of Investigation
LEA	Law enforcement agency
LEMAS	Law Enforcement Management and Administrative Statistics
UCR	Uniform Crime Reporting program
UOF	Use of force

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ACKNOWLEDGEMENTS

It is with endless thanks that I would like to acknowledge my dissertation committee members, Drs. Carina Fourie, Ali Rowhani-Rahbar, and Dale Willits, for supporting this innovative and exciting research and providing invaluable technical and content expertise throughout the process. Their enthusiasm for exploring the intersection of population health and policing through a lens of epidemiologic methods was essential for the success of this project. In particular, I wish to acknowledge my Chair, Dr. Anjum Hajat, for her continuous support and guidance over the past years and her willingness to think creatively with me about how to tackle the more challenging aspects of this work. I am infinitely thankful for her mentorship, patience, and kindness. To the twelve subject matter experts who graciously contributed their time and thoughts to this work, I am forever grateful. Their voices bring meaning to this work that the data on their own simply cannot. I also acknowledge with tremendous gratitude the love, generosity, and support of my wonderful husband, Nadav. Without him and the strength of my family and friends, I would likely have stopped writing somewhere in Chapter 1.

DEDICATION

This dissertation is dedicated to those whose deaths are discussed within these pages.

"Every power to do good is also a power to do harm and everything that can save life can also destroy it."

Egon Bittner (1970). The Functions of Police in Modern Society: A Review of Background Factors, Current Practices, and Possible Role Models. *National Institute of Mental Health, Center for Studies of Crime and Delinquency*. (page 122)

Chapter 1. INTRODUCTION

1.1 POLICING AS A POPULATION HEALTH ISSUE

In recent years, numerous population health leaders have called for policing to be studied as a health issue and for deaths associated with law enforcement to be treated as notifiable conditions, reportable to public health agencies.[1,2] Law enforcement agencies (LEAs) influence wellbeing, morbidity, and mortality of the communities they serve; therefore, population health researchers and practitioners should seek collaborations with law enforcement leaders to evaluate how exactly policing practices affect the public and how to improve those outcomes.[3] However, the historical roots of policing in the United States are complex, with direct ties to slave patrols and the enforcement of racist Jim Crow laws.[4-6] As such, to approach policing through a population health lens, it is crucial to acknowledge this past and its contribution to the differential effects of policing on certain communities.

Injuries and deaths among non-officers occurring as a result of police encounters or while in custody are a fundamental population health issue of policing in the U.S. Hereafter, these injuries and deaths will be referred to as lethal and nonlethal use of force (UOF). Several high-profile lethal UOF cases in recent years have drawn public criticism of policing practices and fueled national dialogue on the impact of policing on health, especially in non-White communities.[7-13] Researchers have been aware of racial and ethnic disparities in UOF for decades,[14] with recent data confirming a disturbingly greater risk of mortality among non-Hispanic Black (2.8 times) and Hispanic men (1.7 times) compared to White men.[15] Yet the implications of policing on population health are not limited to simply physical injuries and death. Alang and colleagues proposed five mechanisms through which officer UOF is associated

with poor health outcomes among individuals and for communities as a whole; 1) fatal injuries; 2) adverse physiological response; 3) racist public reactions resulting in stress; 4) arrests, incarcerations, and legal, medical and funeral bills; 5) integrated oppressive structures.[16] The results are increased morbidity and mortality, stress, financial strain, and systematic disempowerment. Building on the work of Alang and colleagues, Figure 1.1 offers a visual representation developed as part of this research of three key pathways through which policing influences population health. These pathways are situated within a broader structure of race, racism, institutionalized racism, and systemic racism, in addition to other societal prejudices and inequities. Relevant studies and historical context are discussed below, highlighting the individual, community, and systemic pathways identified in Figure 1.1.

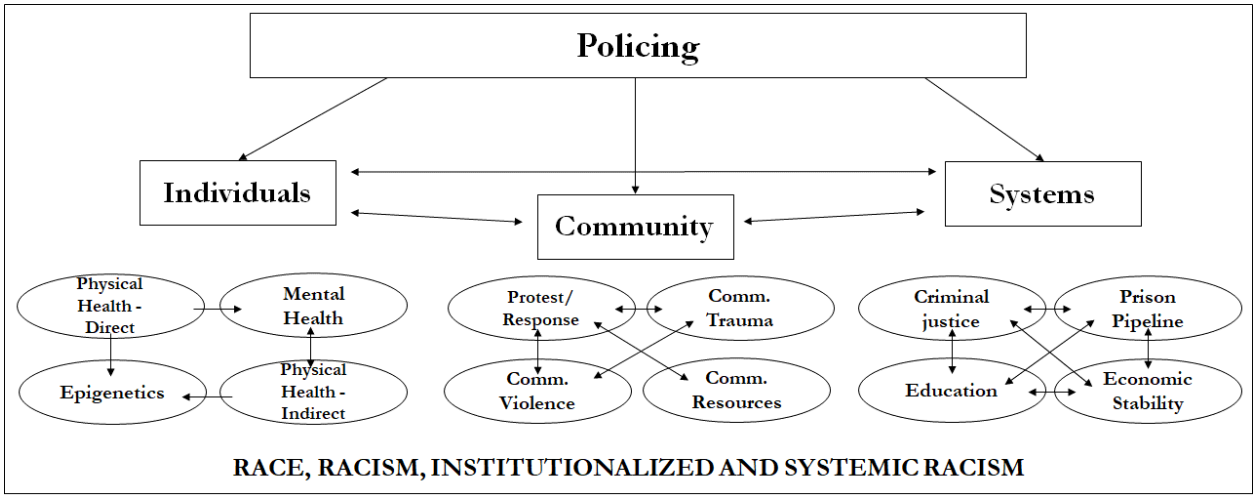

Figure 1.1 Conceptual framework for the relationship between policing and population health

1.1.1 *Policing and the Individual*

Individuals with criminal histories are more likely to have subsequent police contact compared to those without criminal histories.[17] This is concerning, given evidence indicating that repetitive police contact can have dangerous mental, physical, and hereditary health consequences. After physical injury and death, one mechanism – direct and indirect effects of

policing on mental health - may be the issue most frequently discussed in the context of police-community interaction. One U.S. study found that anxiety symptoms were significantly associated with how frequently men had been stopped by police, in addition to their perception of the intrusiveness of the encounter.[17] The same study also found that individuals who reported police intrusion in their lives were more likely to report symptoms of post-traumatic stress disorder (PTSD). The more intrusive the encounter, the stronger the PTSD symptoms.

With a relative dearth of research on the effects of policing on population health, much can be learned from other fields that explore explanatory mechanisms (e.g., stress and hypersecretion of cortisol) for other traumatic encounters that could also feasibly explain the effects of police behavior on health. Among refugees, risk factors for the development of mental health disorders include exposure to traumatic armed conflict, torture, female sex, poverty, unemployment, low education, discrimination, marginalization, poor health care, crowding, collapse of social networks, and traumatic events like death of a loved one.[18] While it would be unwise to argue for the equivalence of refugees of war and minority communities in the U.S., many risk factors that affect mental health among refugees are common within non-refugee communities that face similar traumas.

Humans are in fact quite resilient, yet the onslaught of chronic trauma can push the limitations of the body and mind.[18] Depression, anxiety, personality disorders, panic disorders, and substance abuse have all been identified as long-term reactions to traumatic incidents.[18] For example, exposure to certain types of discrimination, including “police abuse,” was found to have a dose response relationship with certain psychoses among Black adults.[19] Witnessing or experiencing violent police-community encounters (e.g., unwarranted searches, deaths, harassment) can lead to strong emotional and physiological effects.[16,19] Biological pathways of

stress can be activated through repetitive exposure to public discussion of police-community relations colored by racism.[16] The way lethal UOF deaths are presented and debated in the public media, with accusations and blame thrown out by talking heads, can induce stress, pain, and lack of self-worth among community members.[16,20] In fact, a 2017 study conducted in Baltimore in the wake of the police-related death of Freddie Gray, found that maternal depressive symptoms were significantly higher among women in proximal neighborhoods in the months following Gray's death compared to before.[21] One study examining the effects of chronic exposure to discrimination found increased prevalence of coronary artery calcification.[22] Meanwhile, among Latinx immigrants, higher rates of poor mental health were associated with living in states with exclusionary climates surrounding immigration policy, suggesting that discrimination or feeling excluded or marginalized can have immediate implications for mental health.[23]

A second mechanism by which policing can influence individual health is through biological pathways related to chronic exposure to stressors like violence or intimidation. This can trigger a physiological response and strain bodily organs and systems.[16] Allostatic load, a measure of multisystem dysregulation which incorporates several physiological responses to stress, is associated with diabetes, ulcers, heart disease, cognitive decline, autoimmune disorders, and death.[16] One study found that allostatic load is a significant contributor to higher mortality among Black adults in the population, independent of other factors like socioeconomic status.[24] The epigenetic implications of policing may also include a pathway through allostatic load, whereby chronic exposure to stress from a particularly imposing police presence can lead to altered gene transcription/expression and epigenetic changes that can be passed on hereditarily.[25] Labonté and colleagues explored the epigenetic relevance of PTSD, a known consequence of exposure to trauma, through examination of several indicators, including salivary cortisol

levels.[26] They found lower salivary cortisol levels among sufferers of PTSD, and concluded that early life stress can interfere with genetic expression through various mechanisms, including DNA methylation.[26,27] More research is needed to expand our understanding of how these sorts of epigenetic effects may compound or dissipate over generations, and how more specific aspects of policing may contribute to the process.

1.1.2 *Militarization and the Community*

While the narrative around police-community interaction often orbits at the individual level, there is a wealth of evidence on community-level effects of trauma and dynamics between the individual and community. A survey of 14 different international communities exposed to armed conflict revealed that individual and community-level responses to ongoing trauma can be discordant.[28] For example, researchers found that among individual victims of trauma, there was a sense of resignation to an "inevitable" cycle of violence. But, at the community-level, the higher the proportion of victims, the stronger the group-level support for legal humanitarian norms, especially over longer durations. In other words, community resilience can develop when there is a shared vulnerability and desire for justice, even when individuals themselves may experience a more negative personal reaction to trauma.[28] Community resilience is built by empowering communities to create and maintain safe public spaces, clean parks, improve housing quality, and expand transportion.[29] But in the face of chronic violence and trauma, perceived negative encounters with law enforcement, and disadvantage due to established systemic racism, such resilience can be difficult to build.

A 2004 study asked drug users and non-drug users in New York City about their perceptions of and experiences with police and "police-perpetrated violence." [30] The authors found that especially among drug users, a marginalized population with limited community

cohesion, there was frequent report not only of physical abuse from law enforcement, but also of "psychological violence." Continual exposure to traumatic incidents and UOF by law enforcement can strain what community resilience does exist, drain resources, and lead to higher community-wide morbidity.[18]

An Israeli study aimed to identify specific factors associated with better and poorer health outcomes across several communities exposed to the chronic stress of repetitive rocket fire and extreme violence.[31] Protective factors included community solidarity, a sense of belonging, and confidence in governmental and legal authorities. For these communities in southern Israel, group-level resilience in the face of frequent sirens and rocket fire protected individual mental health.[31] If U.S. policing is at times characterized by some of the same patterns of armed conflict seen in the communities examined in these two studies (e.g. unexpected and repetitive violence; fear and confusion), one might reasonably conclude that these findings would hold relevance in this country as well. A primary difference to note, however, is that in the Israeli communities in this study there was a strong sense of trust in governmental and legal authorities that is lacking in many U.S. communities most affected by violence caused by police.[31] The perpetuation of mistrust between law enforcement and the community can ultimately leave individuals isolated from law enforcement services, hesitant to seek essential support and protection in the event of a violent crime or another emergency.[16,32] This cycle contributes to increased violence and instability within the community, as reportable incidents go unreported.

Law enforcement's contribution to the mass incarceration of minority communities has had drastic economic implications for individuals, families, and communities as a whole.[4] After incarceration, many people lose their jobs and have to cope with long-term psychological trauma and injury, all of which can yield lower productivity and unattainable financial stability.[16,33] For

a community, the prolonged absence of incarcerated individuals can increase financial burden on those left behind due to legal fees, it can lead to grief and anxiety, and it can lower productivity as people participate in protests or plan and attend vigils or funerals.[16] Resources are ultimately drained from the community, perpetuating financial strain, which fuels cycles of poverty, limits access to health care, causes food insecurity, preserves low housing standards, contributes to morbidity later in life, and may ultimately perpetuate poor police-community relations.[4,16,34]

1.1.3 *Unique Communities, Unique Responses*

In 2016, the National Academies of Sciences, Engineering, and Medicine hosted a Roundtable on Population Health Improvement to specifically discuss community violence as a public health issue.[29] Participants discussed the role of violence as a social determinant of health, and the many ways in which a community exposed to trauma can suffer long-term effects. The roundtable identified deterioration of economic and educational environments and intergenerational poverty as some of the long-term community impacts of exposure to trauma. Youth exposed to community disorder and violence, including physical and emotional, are more likely to experience repeated victimization and to perpetrate violent acts throughout their lives.[35,36] Disadvantage is ultimately concentrated in communities that face more trauma, and thus a cycle of poverty, disadvantage, and violence is perpetuated.[37]

What then, might the role of law enforcement be with regards to some of these key social determinants of health and community wellbeing? Police encounters can be experienced by different communities in different ways,[38] in some part due to the fact that communities are often policed differently. Police response to protests provide evidence of inequity in how policing agencies react to certain communities.[39,40] The 2017 and 2018 Women's Marches, were lauded by some as successful peaceful protests, and by others as an example of blatant discrimination by

law enforcement.[41] Marchers received high-fives from officers who wore their standard uniforms, sometimes sporting the pink hats of the movement. Protests in response to lethal UOF in Ferguson, Baltimore, and other cities around the country were faced with tanks and officers in riot gear. Some protestors encountered tear gas, crowd-dispersal mechanisms, and officers chanting the protesters' own mantra, "Whose streets? Our streets!"[8,11,42] Even Occupy Wall Street protests in 2013 were faced with more severe police response than a white nationalist rally in Charlottesville in 2017, during which a woman was killed by a white nationalist motorist.[43-45] This pattern suggests that there is indeed an increased likelihood of severe police response to certain protests depending on the motivation for the protest at hand.

Contextual and neighborhood characteristics, including the frequency of police stops in the area, socioeconomic patterns, and ethnic and racial diversity all contribute to disparate responses to police interaction.[38] In communities rife with frequent stressors and entrenched in a society of oppression, isolation, and victimization, the effects of police encounters may be felt strongly. Meanwhile, in one study conducted among Black college students, stress associated with police encounters was found to be no higher than stress tied to other life events unassociated with police.[46] This study highlights the pressing need for more research on the impacts of law enforcement on a variety of communities, as the implications of police-public interactions can vary.

1.1.4 *Perpetuating Systems of Oppression*

While some may argue that cyclic patterns of violence and injustice in societal systems do not fall under the purview of population health, there exists abundant literature describing the ways in which violence and systemic discrimination contribute to health outcomes. Particular

trends in policing, including the disproportionate UOF against some communities over others, reinforce longstanding national traditions of racism, segregation, and racial hierarchy through legitimization of aggressive police reaction to minorities.[5,37,47] This can encourage a mindset whereby violent response to police becomes a means of self-preservation for minority community members.[37] While some people are the victims of heightened surveillance and state control, Gamal argues that others are the beneficiaries of a politicization of "protection."[37] Through the Civil Rights era and the "war on drugs," minority communities have indeed been targeted, and their maltreatment was codified in federal, state, and local government structures and decrees.[5,37,47] Special weapons and tactics (SWAT) teams demolished homes and splintered families who were targets of unfounded and excessive intervention from drug-busting agencies.[5] Modern day policing is founded on this history, and combined with a trend towards swift and aggressive militaristic tactics, minority communities are left particularly vulnerable.

As previously discussed, the mass incarceration of communities of color in the past several decades has resulted in intergenerational poverty and economic disadvantage. Systemic inequities in the way law enforcement seek and receive warrants, judges hand down sentences, and courts demand impossible fees are well established.[48,49] Yet, despite historical evidence of these systemic failures, they are allowed to persist. It is generally only in response to federal consent decrees and the leadership of evidence-driven and ambitious police leaders that changes to these longstanding injustices are made.[49,50] However, the financial implications after generations of continued abuse through the legal system are vast, affecting individuals, families, and entire communities, by reducing access to education, health care, and safe living environments. Indeed, the effects of arrest and incarceration patterns on certain communities can contribute to family dysfunction, community disorganization, financial instability, and patterns

of violence and crime at the community level, leaving youth at higher risk of subsequent encounters with the criminal justice system.[51] While policing practices are not directly nor solely responsible for each of these issues, they contribute to and preserve patters of inequity and injustice that underly them.

1.2 Surveilling Use of Force

Early efforts to quantify UOF in the U.S. estimated that in the late 1960's and early 1970's approximately 2-4% of all homicides were caused by law enforcement, while around half of these were among Black or African American individuals.[14,52] Scholarly efforts to study the true burden of UOF are, however, faced with several challenges. The 2013 Death in Custody Reporting Act (DCRA) requires states to report deaths occurring "during and shortly after" arrest, detainment, and incarceration on a quarterly basis (i.e. arrest related deaths – ARDs).[53] However, in the absence of consistent enforcement and a reliable, national surveillance system for such events, the true burden of UOF is undoubtedly underestimated by governmental entities, thereby limiting the ability to conduct etiologic research around the causes and effects of this form of violence.[54-57] Evaluations of the since decommissioned Arrest Related Deaths Program of the Department of Justice indicate that it captured only around 50% of all lethal UOF cases.[53,54,56,57] The Federal Bureau of Investigation (FBI) tracks lethal UOF data through collection of Supplemental Homicide Reports (SHRs) voluntarily submitted by LEAs for deaths occurring within their jurisdiction (both by officers and the public); however, this program also has well-established problems, including underreporting, missing data, and inaccuracies.[55,58-61]

The Centers for Disease Control and Prevention (CDC) also surveils lethal UOF, albeit with its own underestimation concerns. The CDC compiles National Vital Statistics System

(NVSS) and injury data, accessible through the Web-Based Injury Statistics Query and Reporting System (WISQARS), to estimate the burden of UOF. In 2016, the CDC reported 245.3 "legal intervention" injuries and 1.8 "legal intervention" deaths per 1,000,000 people.[62] However, inconsistent coding, standardization, and review methods contribute to data inaccuracies and missingness that reduce the utility of CDC data for studying these deaths. This system also disproportionately misses cases in which a firearm was not involved.[56,58] The National Violent Death Reporting System (NVDRS), also hosted by the CDC and accessible through WISQARS, collects extensive data from medical examiners, coroners, and law enforcement around violent deaths and contextual factors.[63] While this rich data is valuable for researchers and has been found to capture around 93% of lethal UOF cases, inclusion of all 50 states was not established until 2019.[64]

In 2016, then U.S. Attorney General, Loretta Lynch, announced efforts to improve data collection on lethal UOF through enforcement of the 2013 DCRA, though the rollout of a new program for data collection suggests limited transparency and data availability for public use. In 2019, the FBI officially launched the National Use-Of-Force Data Collection program, claiming it to be the first national-level effort to aggregate data on UOF, though the FBI has no jurisdiction to require LEAs to report their data. Specifically, the FBI states that "*The goal of the collection is not to provide insight into specific use-of-force incidents, but instead to offer a comprehensive view of the circumstances, subjects, and officers involved in such incidents nationwide."*[65] A pilot study of the program informed system usability refinements[66] but it appears that there will vast restrictions on data accessibility for public or research purposes.[67,68]

The most robust data on lethal UOF, at least from 2013 onward, comes not from any government entity but from publicly led and crowd-sourced efforts to more accurately estimate the

national burden of UOF. These public databases are not dependent on death records, using a combination of crowdsourced information, police reports, and news and social media, and generally expand the lethal UOF definition to include lethal events that occur outside the context of arrest (e.g., traffic stops). Many programs have existed for limited periods, collecting a year or two of data and sharing it publicly. Three key programs with longer tenures are run by The Washington Post (WP), Fatal Encounters (FE) and Mapping Police Violence (MPV).[69-71] In 2018, WP identified 986 fatal officer-involved shootings, while MPV and FE identified 1166 and 1545 deaths, respectively, involving firearms or other means (e.g., tasers, physical force, chemical sprays). These varied estimates reflect disagreement in lethal UOF definitions and data capture techniques across programs. These and other public UOF databases often refer to each other, reviewing cases identified by the other systems and applying their own case definition. These processes guarantee substantial overlap between the programs, and yet there are still some differences and cases are still missed.[56]

Despite numerous governmental and non-governmental attempts to accurately quantify UOF in the U.S., the simple fact exists that without the power of the federal government to require reporting on these cases and without some incentivization for reporting in addition to a universal definition, establishing a unified and reliable surveillance system is unlikely. Until the time that such a database exists, researchers and practitioners much rely on the available systems, note their flaws, and interpret their findings with caution. In this dissertation, four non-governmental databases were used to generate a robust estimate of the true burden of lethal UOF in the US.

1.3 Militarization in Policing

Prior research on the subject of militarization is discussed in depth in Chapter 2. Briefly, our understanding of the causes, consequences, and state of police militarization is hampered by a lack of consistency in how researchers define, conceptualize, and operationalize it.[72,73] Many of the approaches for measuring militarization have yet to be validated and most of this research also lacks the engagement of all relevant stakeholders who could provide expertise in constructing a fully inclusive definition of militarization.[74]

Much of the foundational research on the topic of militarization has been conducted over the past three decades by criminologist, Dr. Peter Kraska,[75-83] and most other militarization literature is rooted in his proposed conceptualization of the construct or one of its four specific dimensions: material, cultural, organizational, and operational.[83-90] Most efforts to study the phenomenon have taken on one or two domains of Kraska's definition,[74,91-94] though one recent study attempted to more broadly assess the full definition among LEAs.[95] Some researchers have tried to quantify militarization by focusing primarily on acquisition of military-grade equipment by LEAs, but findings and methodologic approaches have varied substantially. The federal 1033 program has drawn particular media and public attention in recent years for its role in bringing military surplus items to LEAs.[74,84-95] However, this program also transfers items that are not necessarily militaristic in nature and the acquisition of militaristic items does not in itself demonstrate if or how these items are used.[74] In addition, material gear is but one of the four dimensions in Kraska's definition.[96]

While there are some similarities across these efforts to study militarization in U.S. LEAs, there is still no consensus on a single definition for this complex construct.[72,83,97] Furthermore, only limited research has examined the role of public perception around issues of

policing practices and encounters with the community.[73] As such, establishing a definition for militarization on which researchers, law enforcement, and the public can agree is essential to supporting good research, making evidence-based policy change, and shifting the discourse on policing and community wellbeing towards realistic progress. At minimum, a better understanding of how the perceptions of these groups relate to each other can inform future research. Indeed, public rhetoric around this subject may point to a variety of concepts all labeled as "militarization." To study this phenomenon and make meaningful comparisons between findings, researchers should draw upon some unified definition or framework of militarization and they should make clear the approach they intend to use for operationalizing it. To enact effective policies around militarization, legislators need reliable and consistent research that identifies distinct and modifiable mechanisms that policies can realistically address. Clarifying how individual policing practices relate to one another and to the broader topic of militarized policing trends can help with articulation of specific public concerns and how to address them, ensuring clear communication between both community and policing entities.

1.4 DISSERTATION AIMS

The purpose of this research was to advance the study of policing as a population health issue through application of epidemiologic methods and integration of interdisciplinary data sources related to militarization and lethal UOF. The key objectives of this study were to:

- **Aim 1a**: **Develop a conceptual framework for police militarization:** Conduct literature review and interviews with subject matter experts in law enforcement, criminal justice, law, sociology, activism, philosophy, and other relevant fields.
- **Aim 1b: Operationalize police militarization:**
    - **1b.i –** Using 2013 Law Enforcement Management and Administrative Statistics (LEMAS) survey, conduct a principal components analysis to assess data agreement with the qualitatively-derived framework.
    - **1b.ii** – Develop a militarization metric based on Aims 1a and 1b.i using 2013 LEMAS survey data.
- **Aim 2: Develop a national dataset of lethal UOF:** Combine data from four public databases on lethal UOF for 2013-2017: Fatal Encounters, The Washington Post, The Guardian, Mapping Police Violence.
- **Aim 3: Evaluate if police militarization is associated with a higher rate of lethal UOF at the agency level, accounting for several community and agency characteristics.**
    - *Hypothesis: Law enforcement agencies that are more militarized have a higher rate of lethal UOF than agencies that are less militarized.*

Chapter 2. DEFINING MILITARIZATION

A revised version of this chapter was published in Police Quarterly *as a manuscript titled: A Conceptualization of Militarization in Domestic Policing.*[98]

2.1 BACKGROUND

The 2014 death of Michael Brown in Ferguson, Missouri at the hands of police officer Darren Wilson, and the resulting public outcry, fueled a national dialogue on policing practices.[12,99,100] Paramilitary policing practices (e.g., special weapons and tactics - SWAT - teams) and integration of military-based tactics have also received increasing attention in the public arena, especially concerning police response to public demonstrations in cities like Ferguson and Baltimore.[76,80,96] In 2014, President Barack Obama signed Executive Order 13684, creating the interdisciplinary President's Task Force on 21st Century Policing in order to "to strengthen community policing and trust among law enforcement officers and the communities they serve."[101] The task force outlined several recommendations grouped into six primary pillars: Building Trust and Legitimacy; Policy and Oversight; Technology and Social Media; Community Policing and Crime Reduction; Officer Training and Education; and Officer Safety and Wellness. The two overarching recommendations from the task force (i.e. creation of a National Crime and Justice Task Force and expanded support for community-based initiatives addressing poverty, education, and health and safety) have made little progress at the national level.

An increasing number of researchers and police chiefs across the country are speaking out in favor of data-driven policing and evidence-based practice.[102,103] However, with over 17,900 police departments nationwide, reaching consensus with regards to policies and practices is a challenge; dramatic differences can be driven by state-level variation in criminal law, local

historical practice and traditions, availability of grants and financial resources, and unique characteristics of the population served. National guidelines and data-based reports produced by organizations like the International Association of Chiefs of Police and the Police Executive Research Forum are poised to improve agreement and consistency in policing throughout the U.S., but such reports are also adopted at the discretion of individual agencies.[104]

As the nature of policing in the United States is complex and ununiform, so too have been efforts to study it systematically. One of the most important issues facing police today is the extent to which the "guardian" or "warrior" mentality should be promoted. Indeed, there is ongoing concern regarding the lack of systematic data on police use of force and the efficacy of de-escalation tactics,[105] with popular press, books, and academics alike suggesting that "police militarization" may play an important role in understanding the tension between and outcomes of interactions between law enforcement and the communities they serve.[5,73,92] Yet, understanding the causes, consequences, and state of police militarization is hampered by a lack of consistency in how researchers define, conceptualize, and operationalize it.[72,73] Similarly, many of the approaches for measuring militarization in these studies have yet to be validated.[74] Most of this research also lacks the engagement of all relevant stakeholders who could provide expertise in constructing a fully inclusive definition of militarization. This paper begins by exploring the historical roots of modern-day policing and various efforts to study the subject of militarization, followed by a description of a new qualitative study designed to develop a more precise definition for this concept.

2.1.1 *Militarization – A National Conversation*

Protests in the streets and on the field after events such as the death of Michael Brown in 2014 and the non-indictment of the officer that shot him, after other police-related deaths and

related legal proceedings, and in response to broader trends and growing tensions, have contributed to a national conversation around how police engage with the public. [5,7,8,10,12,40,42,45,73,106-110] Yet, connecting these fatal encounters to systemic underlying factors that may contribute to them is methodologically challenging, particularly given the complex history of the nation's policing institutions and the variability in agency and jurisdictional rules. Even so, media outlets have contributed to a rising national awareness of the concept of "militarization" in American policing as a possible explanation for a documented rise in police-related deaths. Headlines mention "police militarization", particularly when describing police response to demonstrations or protests.[11,43,84,87] However, such headlines rarely offer a precise definition for this term, generally referencing increased use of equipment designed originally for the military or presenting images of police-civilian encounters with officers heavily armed, accompanied by tanks, and wearing riot gear.[11,43,84,87,111] Without a shared understanding of what militarization really is, people may in fact be talking about different phenomena, be it in casual conversation, on national television, or academic research.

Militarization tends to be discussed with a much narrower focus among policing researchers and national policing organizations. In a 2014 blog post, the International Association of Chiefs of Police touched on the issue of militarization, focusing exclusively on the proliferation of SWAT teams and referencing concerns raised by an American Civil Liberties Union report on the subject [112,113]. In its 2016 report "Guiding Principles on Use of Force," the Police Executive Research Forum (PERF) explicitly mentions the term "militarization only once in the 136-page document, in reference to a conversation around "perceptions of 'militarization' of police in response to large-scale demonstrations," though possible components of militarization are discussed separately throughout the report.[114] A 2015 report documenting a gathering of police

chiefs as part of the PERF "Critical Issues in Policies Series," offers more detail around "militarization," highlighting the difference between gear acquired via the military versus gear that looks like it may have military origins.[115] Conversely, Fortenbery (2018) presents a broader contextual conversation around the history of militarization trends in the US in a 2018 piece for the FBI's Law Enforcement Bulletin.[116]

2.1.2 *Militarization Research*

Balko offers a layman's history of militarization in his 2014 book "Rise of the Warrior Cop," which documents the evolution of police forces from early Roman times to modern day.[5] He highlights several themes throughout, including the growth of a "warrior versus guardian" mentality and its relation to historical events; shifts in policing culture, both as a result of internal trends and external events; and the ebb and flow of police-community relations. While Balko's work is a rich catalogue of the development of contemporary policing, it proposes no methodologic techniques for quantifying or studying militarization systematically.

Much of the foundational research on the topic of militarization has been conducted over the past two decades by Dr. Peter Kraska.[75-83] In 1997, Kraska and Kappeler conducted a survey of large U.S. police departments and found a marked rise in the number of paramilitary units (PPUs), an increase in their activity, a general shift of PPUs into mainstream policing, and a strong connection between PPUs and the military.[75] In the same year, Kraska and Cubellis studied agencies serving smaller populations and identified a similar pattern of normalization and expansion of PPUs.[76] Another study by Kraska and Paulsen found a similar pattern of normalization around PPUs in domestic policing, diving deeper into the cultural patterns within police departments that may help explain these findings.[77] In 1999, Kraska published a paper offering a theoretical assessment of militarization in the U.S. and trends towards a more military

model of domestic policing.[80] Kraska offered insight on societal trends, the criminal justice system, language and rhetoric, and the relationship between militarization and militarism in order to further contextualize the expansion of militarized policing.

Kraska's 2007 study of militarization proposes a concrete definition for the concept and metrics for directly measuring it.[83] Kraska posits that because police have always held at least some "militaristic" characteristics in the U.S., any research into the subject should examine militarization on a continuum. He proposes four dimensions, or indicators, of militarization. The first, "material", includes equipment, technology, and weaponry of military origin. The second, "cultural", describes the language, beliefs, values, and appearance of police. The third, "organizational", emphasizes PPU activities. The final indicator is "operational" and focuses on "patterns of activity" that are based on military practices, including in supervisory structures, high risk situations, and intelligence gathering. Limited efforts to test the proposed assumptions around the nature and proliferation of militarization have been conducted.[96]

Some researchers have tried to quantify militarization by focusing exclusively on the transfer of military-grade equipment to local policing agencies. Of particular interest has been the 1033 program, which has drawn media and public attention in recent years.[84-88] The 1033 program was established in 1996 as part of the National Defense Authorization Act and allows for the transfer of surplus military gear from the Department of Defense to state and local law enforcement agencies. In 2015, President Obama passed an executive order that limited some of the materials that could be transferred under the 1033 program; in 2017, President Trump reversed the order.[85,117]

A number of scholars have started to explore the contours of the 1033 program in regard to policing. Johnson and Hansen (2016), for example, conducted a survey of law enforcement

agencies to evaluate participation in the 1033 program.[89] They found that while a majority (61%) of agencies participated in the program, acquisition of military-like equipment differed geographically and by certain agency characteristics, like size. Furthermore, those that participated in the program acquired military weapons and vehicles far less frequently than other gear, contradicting media-driven concerns around a massive influx of military-grade weapons into local law enforcement agencies. Work by Radil and colleagues suggests that there is notable spatial variation regarding which departments tend to acquire gear from the 1033 program and reported that from 2006 to 2013, transfers under 1033 increased by 1414%.[90]

Much of the work making use of 1033 data to measure militarization has focused on militarization as an outcome variable. For example, Burkhardt and Baker (2018) found that agencies which tend to rely on asset forfeiture to generate revenue are more likely to secure MRAPs from the 1033 program.[91] Drawing on Kraska's early work on militarization, Koslicki and Willits (2018) examined the association between a department's community policing strategies and militaristic trends, defined as equipment acquisitions via the 1033 program.[74] Unlike other researchers who made use of the 1033 data, Koslicki and Willits (2018) attempted to recode the 1033 data to focus on what they considered more "militaristic" acquisitions, noting that much of the equipment available from the 1033 program is not militaristic in nature, even if it is military surplus. They found that despite the simultaneous rise of community policing and police militarization in the U.S., these strategies appeared inversely associated. Furthermore, the authors concluded that militarization in the form of 1033 acquisitions varies dramatically between departments, suggesting that if there is a nationally rising trend in militarization, a certain subset of agencies may be responsible for most it.

Other work making use of these data has examined 1033 as a predictor of use of force outcomes. Delehanty and colleagues, theorized that military equipment acquisitions through the 1033 program are directly related to increases in militarization across all four of Kraska's dimensions [83,92]. The authors examined the total value (US$) of 1033 acquisitions in relation to lethal use of force, but they did not differentiate between types of equipment (e.g. assault rifles, body armor, medical equipment), nor did they account for actual equipment use. Lawson (2018) found that departments which obtained more gear from the 1033 program (US$) used force more frequently than other agencies, results supported by other research.[93] Conversely, other work suggests that militarization might have positive consequences for police agencies. Bove and Gavrilova (2017), for example, found that military aid (measured in the total dollar amount of the items received from the 1033 program) could reduce street-level crime and produce deterrence.[94] Though these results suggest that 1033 acquisitions are related to policing outcomes, it is not entirely clear that 1033 data are the best suited to measure militarization. As Koslicki and Willits (2018) note, many of the items included in the 1033 data are not necessarily militaristic. Moreover, the acquisition of militarized items does not in and of itself demonstrate the usage of these items. Indeed, it is possible to imagine scenarios in which police departments obtain expensive militaristic equipment from the 1033 program and yet are largely regarded as community-focused and non-militarized. Phillips (2014) for example, argues that the increased application of patrol rifles to the standard equipment of police officers can be viewed as evidence of militarization or as a rational response to certain scenarios that should be used only at appropriate times, yet research is largely silent on how to determine the best way to study such policy shifts.[118]

While most researchers have adopted simple measures of militarization (either as an independent or outcome variable), there are some examples where more nuanced measures of militarization have been used. Baumgart (2016) for example, used several policies, practices, and characteristics of individual police departments to create a composite measure of militarization. Using both 1033 data and information from the Law Enforcement Management and Administrative Statistics dataset, Baumgart constructed a militarization index based on agency stock of military equipment, use of paramilitary tactics, and focus on military-style policing. He found a national increasing trend in militarization, particularly in larger departments.

While there are some similarities across these efforts to study militarization in U.S. law enforcement agencies, there is no consensus on a single definition.[72,83,97] Indeed, the studies described above made use of a variety of strategies to measure militarization, ranging from SWAT team deployments, 1033 data on acquistions in general, 1033 data coded to focus on military acqusitions, to composite measures making use of both organizational and 1033 data. Establishing a definition for militarization on which researchers, law enforcement, and the public can agree is essential to supporting good research, making evidence-based policy change, and shifting the discourse on policing and community wellbeing from an apparent standoff to meaningful progress. To study this phenomenon and make meaningful comparisons between findings, researchers should draw upon a unified definition of militarization and make clear the approach they intend to use for operationalizing it. To enact effective policies around militarization, legislators need reliable and consistent research that identifies distinct and modifiable mechanisms that policies can in fact address. Similarly, public rhetoric around this subject may point to a variety of concepts all labeled as “militarization.” Clarifying how

individual policing practices relate to one another and to the broader topic of militarized policing trends can help with articulation of specific public concerns and how to address them, ensuring clear communication between both community and policing entities.

2.1.3 *Study Objectives*

The primary aim of this qualitative study was to explore the concept of "militarization" and to develop a broadly encompassing definition for this based on interviews with an interdisciplinary set of experts and with reference to existing literature on militarization. Ideally, this definition would be applicable to all law enforcement agencies across the country and could be used to inform future research efforts. This study also sought to identify specific characteristics of or factors within policing agencies that may directly indicate the presence of militarization.

2.2 METHODS

2.2.1 *Researcher Characteristics*

The present study included qualitative interviews with subject matter experts (SMEs) across a variety of fields. One lead researcher conducted all interviews and analyses under the oversight of a multidisciplinary advisory committee, representing expertise in epidemiology, law, sociology, criminology, applied philosophy, and medical ethics. The lead researcher (M.S.) has post-secondary training in community health and social psychology, graduate level degrees in epidemiology, and professional experience in public health research and practice. Specific expertise in public health interviewing and focus group facilitation reduced the risk that researcher biases were introduced during interviews. Her personal views are not expected to have

affected the results of this study given the involvement of the advisory committee, use of an interview guide, and her professional background in conducting qualitative and quantitative systematic data collection.

2.2.2 *Participant Identification*

A nonprobabilistic, purposive sampling approach was used to identify participants for inclusion in this study. A list of key characteristics was defined to ensure a heterogeneous sample of interviewees that could maximize the breadth of experiences contributing to this research and support saturation of themes during the analytic stage.[119]Areas of expertise particularly relevant to this study included law enforcement, military, psychology, community activism, faith and religion, criminology, journalism, and law. The study also aimed to include SMEs from a variety of states representing the four major geographic regions in the U.S. (e.g. West, Midwest, Northeast, and South) to account for regional variability. Potential SMEs were identified via professional conferences, personal interaction, and referral, and were contacted to ascertain willingness to participate. Interviews were conducted from April-August 2018, primarily via phone with one in-person interview.

2.2.3 *Ethical Issues Pertaining to Human Subjects*

The current study was evaluated by the Human Subjects Division at the University of Washington and received exempt status. Participants were offered a $50 honorarium after interview completion, either in the form of an Amazon.com gift card or donation to a charitable organization of their choosing. The honoraria are not expected to have influenced study findings as they were mentioned only once in a recruitment email and were not disbursed until after all interviews were complete in October 2018.

2.2.4 *Data Collection Instruments and Technologies*

Literature review informed creation of a semi-structured interview guide that was used during all interviews (Appendix). SMEs were first asked to provide information on their academic training, professional experience, and personal details they deemed relevant to the conversation. The interviews focused primarily on how the interviewee, in their personal and professional opinion, would define militarization. Interviewees were asked to reflect on what experiences or events may have contributed to their views. The researcher asked follow-up prompts as appropriate, providing clarifications to questions when needed. Participants provided verbal consent to have their interview recorded. Interview audio files were transcribed using a professional service and uploaded to Atlas.ti 7 software for analysis.[120]

2.2.5 *Qualitative Data Analysis Approach*

The analysis of the transcribed interviews was guided by grounded theory: an inductive method whereby concepts are systematically generated from qualitative data without use of pre-defined paradigms.[121] Grounded theory proposes that researchers should review individuals' experiences in order to guide study of certain social phenomena, particularly those for which limited or no previous research exists.[121] Though there is research on militarization, the lack of consensus around a definition for militarization lends this construct well to a grounded theory approach.

This study implemented the key steps in a grounded theory-based analysis, including data collection; identification and coding of smaller concepts or themes in the data; continuous comparison of codes across the data with aggregation into related groups, as appropriate; recording of the researcher's in-progress thoughts about the data in the form of "memos";

theoretical sampling, consisting of strategic collection of additional data to help clarify emerging questions; and theoretical saturation, whereby all aspects of the overall theory under development are substantiated by the available data, with no new themes arising as coding and analysis reaches conclusion.[121,122] More specifically, the lead researcher coded the qualitative interviews, with continuous review of codes, combining them, as appropriate. As patterns appeared throughout the coding process, M.S. noted them in memos and identified areas where further data were required to fully explore an arising theme. Finally, as no new concepts appeared in the interviews, M.S. identified overarching themes among the codes and memos, using these to construct broader domains comprising a definition of militarization.

2.2.6 *Data Quality and Validation*

To improve the validity and reliability of this research, the present study aimed to address several methods for increasing qualitative study credibility outlined by Patton.[123] First, *triangulation* of data from multiple sources helped reduce systematic bias in this study; more robust explanations result from closer assessment of complex areas where disagreements in the data may cluster. Data sources in this study included existing literature, qualitative interviews with SMEs representing multiple perspectives, confirmatory review of preliminary findings by said SMEs, and input from a diverse advisory committee. Second, the lead researcher specifically looked for *negative cases*, or inconsistencies in the data, that may indicate a particularly complex or divisive aspect of militarization. The researcher identified patterns where these inconsistencies occurred and characteristics of the data that may help explain these patterns. For example, themes directly contradicting each other may be the result of a heterogenous sample of interviewees. Third, throughout the analytic process, the lead researcher explored *competing themes* in the data and literature to determine the viability of alternative

explanations. The absence of obvious conflicting alternatives improves confidence in the developing theory.[123]

2.3 RESULTS

2.3.1 *Study Participants and Interviews*

Twelve subject matter experts were enrolled in the study, representing the four main regions in the U.S. and seven states, including California, Massachusetts, Missouri, New Mexico, New Orleans, New York, Washington, and the District of Columbia. Areas of expertise represented by the interviewees included: criminal justice, education, journalism, law, local and county law enforcement, tribal policing, federal government, military, religion, activism, anti-racism, and psychology (Table 2.1). Interviews on average lasted 51 minutes (range: 27, 76). Follow up emails were sent to all 12 SMEs to request confirmatory review of proposed themes and several additional questions formulated during data analysis. Their responses were integrated into the final analysis of the data.

Table 2.1 Subject matter expert (SME) characteristics

SME	**Geographic Region**	**Background* (Academia/Law, Community, Federal, Military)**
1	Midwest	Academia/Law
2	West	Academia/Law, Policing
3	West	Policing
4	Northeast	Academia/Law
5	East	Federal, Military
6	Midwest	Community
7	South	Community
8	South	Policing
9	Midwest	Community
10	Northeast	Academia/Law
11	East	Federal, Policing
12	West	Policing

**To protect the privacy of SMEs, further detail on professional background is not provided*

2.3.2 *Codes*

Thirty-six codes were identified and appeared with varying frequency across the 12 interviews (Table 2.2). A subset of 11 codes captured more general and contextual information (e.g. "community characteristics"). Only one code appeared across all 12 interviews, "militarization = gear," sometimes repeating within a single conversation as interviewees responded to individual prompts. Those without policing background tended to indicate that the equipment an agency owns and the military tactics it implements are directly related to militarization. One SME from a native tribal community stated that *"[Militarization is] when tactics used in a war are placed within…local policing systems,"* while an academic SME with journalistic background shared:

> *"I would define militarization as both resources and practices, either implemented or codified in military police procedures in order to deal with community-level policing issues on a day to day basis..."*

Two community activists offered similar views:

> Referencing a particular demonstration: *"…I think part of [the change in atmosphere] was [not] being able to see in the police officers that they were people, they were human beings, and they were worried and scared…when they put on the helmets and the shields, it was like they could have been machines."*
>
> *"So, I think loosely, police being given weapons, tools, and technology, that directly was [sic] for our military…Attending protests and seeing tanks, and sound weapons, and assault rifles, and riot gear, and tear gas is something that puts the conversation in a*

completely different realm for me. I think if the training and the equipment is provided by the military or is equivalent to the training and equipment that the military receives, that police force, whether they are out giving parking tickets, or dealing with traffic violations, or whatever the case may be, I think the police force is always militarized because at any given moment they can engage in a militarized…I don't think that there's an on and off switch. I think that once you flip the switch, it is what it is."

Of particular note was an underlying theme that community members' perceptions of police forces are also part of what defines a given agency's militarization status. Two SMEs with ties to academia further explained the importance of public assessment of police attire and intent, in addition to community reaction to perceived intimidation or force:

"It goes from like the outfits that are worn, like all the heavy gun protection…by police and helmets and gear, to kind of their presence and intent…when approaching individuals or community members is forceful. It's meant to intimidate."

"Police forces acquiring literally military vehicles, and wearing armor, and appearing as more of a military force than the maybe traditional old view of 'the patrol person in the squad car walking the beat and resorting to baton or a night stick or perhaps a gun in the case of emergencies.' Again, from simply a superficial standpoint, police officers looking like they are in the military. Looking like what we used to only think of as a SWAT team would look like, [that is militarization]."

Table 2.2 Code appearances across subject matter expert interviews and mapped to relevant domains of militarization

Code	# of Interviews	Relevant Domains*
Militarization = gear	12	G
Impacts on community	11	Y
Militarism	10	Y
Policing culture/mindset	10	C
Policies and practices in the police agency	9	P
SWAT	9	P, M
Tactics	9	M
Community characteristics	8	Y
Extra-agency forces cause M	8	C
Militarization = how things are used	8	G, P, M
Militarization is on a scale	8	Y
Protests and militarization	8	P, M
Race or racism	8	C
Use of force	8	Y
Intra-agency forces cause M	7	P,
Officer training	7	T, C
Paramilitary structure	7	P, M
Atmosphere/tone	5	C
Media and public use of term	5	Y
Police agency organizational leadership	5	C, P
Some gear is necessary and is not the same as militarization	5	G
De-escalation	4	T, M, P
Context defines militarization	3	C, P
Fear	3	Y
Militaristic gear *can* be used in a way that equals militarization	3	G, M, P
Militarization is a response to the community	3	C
Police agency size	3	Y
Sex and gender identity	3	Y
All agencies have militarization	2	Y
Data issues	2	P
Military is different from domestic police	2	M
Military veterans	2	T
The presence of police can equal militarization	2	C
Military is influenced by domestic police	1	Y
Officer mental health/psychology	1	C
Police readiness for response	1	M, P

*****Domains of militarization are described in Figure 1 and include *Gear/Technology (G); Protocols/Procedures for Community Interaction (P); Military Tactics (M); Officer Culture/Mindset (C); Training and Requirements (T).* Codes marked with a "Y" inform contextualization of the domains, recommendations for measurement, and potential external factors related to militarization.

One SME with police training stated, *"when I think militarization, I'm thinking equipment and use of,"* referring to the relevance of situational context when assessing militarization. Other SMEs with similar police training reiterated that it is important to differentiate between ownership and application of military-based equipment and tactics, with one commenting that *"…Using armored vehicles and other types of heavy equipment. There is a place for that in law enforcement, but only absolutely as needed."* This logic was echoed by other SMEs with policing background another SME with extensive criminology and research background:

> *"I think [militarization is] the use of weapons and equipment that were primarily developed for use by the military but have been adopted by police departments…But to get at whether or not a department is militarized, you would have to weigh in the usage of it. Because some of these departments, they just get it for free. And the moment you say free, they're like, 'Sure, I'm sure I could use a tank.' I mean they're probably never gonna use a tank."*

Across 10 of 12 SMEs was a belief that "policing culture and mindset" are relevant to any discussion of militarization. One SME with a policing background commented generally on the subject:

> *"…Everything an officer does…[is] predicated on making a decision. And decisions are driven by your personal philosophy, what you see as your role. What you think you're supposed to be doing to get the picture. And so, why aren't we talking about philosophy in the Academy? Why aren't we addressing the culture?...I think most people, when they talk about militarization, they focus on the equipment…I think many people believe that by*

getting the equipment, that caused police departments to become more militarized. I don't think it's that simple…It's the culture. One thousand percent this is driven by culture."

Within the code "policing culture/mindset" SMEs with policing backgrounds discussed the distinction between a "warrior" versus "guardian" mentality and offered examples of how these mindsets are demonstrated within agencies and may relate to militarization:

"Yeah, we wear the guardian hat, but we [also] have to be tactical sometimes. We have to use that tactical equipment. We have to use the assault rifle. We have to, but that doesn't define our primary function. That's sort of an objective that has to be accomplished sometimes, but we should be approaching the way we do our job under that guardian mentality."

"I saw a while back some recruiting video for some small police department somewhere…cops in SWAT gear busting stuff up and rolling around with armored vehicles and machine guns and helmets and masks on…The whole emphasis of that recruiting video was, 'Come join our department so you can kick ass,'…And that's the wrong way of looking at things."

Other SMEs made similar statements, with one noting that the culture of policing is tied to the unambiguous concept of being a warrior, and another noting that a militaristic mindset is often rooted in contemporary approaches to law enforcement, like zero-tolerance policing. Meanwhile, SMEs without policing background also emphasized the importance of culture and mindset in policing, highlighting an "us vs. them" mentality, referencing both personal experiences and general impressions:

In reference to a particular set of demonstrations: *"[Militarization is] the way the police are interacting with the people. Using military tactics and treating us as what they even describe as 'enemy combatants'…How they refer to us, how they think about us…You have made me your enemy, and now you are in constant attack mode…And that, to me, is what a military does. A military goes and figures out who their enemy is, and they attack them."*

"I do believe that the largest single factor influencing [militarization] is the personnel…Increasingly what I am seeing in [midwestern city] is the rising to the white shirt level of individuals with a stronger military background than others, resulting in the infusion of a mindset and a culture which is more militaristic…You have this preexisting departmental flavor…which is to shore up its military mindset and protocols because those are the tools that they have. That's the mindset that they have...and when situations reach certain levels of tension, you'll hear time and time again [the] mantra 'it's us or them' and the people saying [it] are the cops."

One SME with legal background, when asked to reflect on what militarization "looks like" in a police force, succinctly captured the views of several other SMEs, highlighting both the importance of what a police force is physically wearing, and the situational context highlighted by SMEs with policing background:

"Well, [militarization is] obviously something that must be contextualized with a particular situation…There are times and occasions when law enforcement will respond to a particular situation with indicia of force that seems to be disproportionately harsh and overbearing given the underlying situation…The presence of fully vested armored vehicles filled with personnel covered from head to toe with riot gear and instruments that are often

not only commonly associated with the military, but in fact were from the military…given to municipalities by the federal government. In many cases, municipalities liked to utilize their own resources to shore up the perception of law enforcement capacity by buying higher-end armored personnel carriers and gas masks, and riot gear and SWAT team regalia such that there was fear that was induced in the hearts and minds of those who were subjected to that military-like presence of law enforcement."

Additional quotations related to the codes identified in Table 2 are summarized more generally in Table 2.3 as part of the broader themes generated during analysis.

2.3.3 *Themes*

To better characterize the complex interplay of many of these codes and improve valid representation of the data, M.S. identified related codes and patterns across interviews and translated them into themes (Table 2.3). Some themes were comprised of a single code containing robust commentary that tended to be relatively uniform. For example, *policing culture and mindset* were discussed extensively by multiple SMEs, all expressing the importance of these factors when defining an agency's militarization status; SMEs described how officers and agencies perceive their role (e.g. guardians vs. warriors) and how they view the community they serve (e.g. enemy vs. partner) as essential to defining militarized policing. The breadth of this commentary offered sufficient detail for this code to warrant its own standalone theme.

Some themes were constructed to connect several related codes or smaller themes to each other. For example, SMEs discussed multiple training-related topics, including de-escalation and community-oriented policing training requirements, and these were grouped together under a

broader *training* theme. Similarly, SMEs identified several *internal agency factors* (e.g. leadership tone and priorities) and *external agency factors* (e.g. local government trends and federal grant availability) that might contribute to militarization.

Table 2.3 Key themes derived from coded qualitative interviews with subject matter experts

Militarization is driven by **policing culture and mindset**
Intra-agency factors drive militarization
- Organizational leadership sets the tone regarding militarization
- Hiring **veterans** preferentially is/is not an indicator of militarization
Requirement for certain **officer trainings** can either indicate a push away from militarization or a push towards it.
- **De-escalation** training is/is not related to militarization.
- **De-escalation** training indicates internal trends/culture in an agency that may suggest less militarization.
Gear/equipment with military origin used by local law enforcement is/is not an indicator of militarization
- It's about *how* the gear/equipment are used that defines militarization
- **Owning the equipment** automatically makes a department militarized
Military **tactics** used by law enforcement define militarization
- **SWAT** is necessary and not does not have to indicate militarization when used in the "right" way.
o **SWAT** is a fundamental example of militarization.
Extra-agency factors cause/prevent/are indicators of militarization
- **Federal programs (1033), state funding, and other grants** often define what agencies will have (gear/tech) or seek out.
- Some agencies will seek things out that they don't necessarily need, just because they can.
- Some agencies acquire gear/tech that they otherwise would not be able to if not for these means.

While some of these composite themes were unidirectional, others were more complex, often representing opposing viewpoints on the same topic. The *gear and equipment* theme was constructed from codes both positively and negatively associating equipment acquisitions with

militarization. Codes related to how equipment is used and in what settings also contributed to this theme, with additional variability in SME

Such patterns of disagreement within a theme often represented variation by SME background (e.g. police training versus none). However, many topics garnered feedback that varied less systematically. For example, on the topic of military veterans on police forces (a subset of the *internal agency factors* theme), some SMEs with police training and some without felt the presence of military veterans in local law enforcement agencies increases militarization.

> Police training: *"…If you have a significant portion of your hires [who] are former military, you're automatically going to have a cultural shift. There's just going to be an underlying culture to that department that is gonna [sic] lean towards that philosophy because that's what they know."*
>
> No police training: *"It's my impression with police forces where you have veterans present, those who are not vets like to in fact, puff out their chest and make sure that they are holding themselves…[like]the seasoned, salty-mouthed vet who may [actually] be extraordinarily cautious and learned with respect to his or her use of a weapon on duty…*

Conversely, other SMEs saw militarization even in the absence of veterans.

> *"You have a militarization of departments that are even without former military personnel presence, that are very much designed to mimic the infrastructure and the hierarchical structure of military [divisions]. You have this hierarchical chain of command. You have uniforms and ranks and protocols."*

In addition to themes exploring the root causes and defining characteristics of militarization, SMEs were asked to comment on the effects of militarization on communities and individuals, with related codes forming a broader theme around the *effects of militarization* that is beyond the scope of this paper.

2.3.4 *Domains*

Key themes were aggregated one step further into five overarching domains that represent the different ways militarization was defined by SMEs (Figure 1). Each domain encompasses themes covering multiple topics. Some themes and codes crosscut domains as well. Each domain is also comprised of themes indicating direct and inverse associations between specific factors and militarization.

Gear/Technology. While equipment acquisition is one aspect of this domain, so too are situational factors that guide agency use of the gear. The domain emphasizes gear and technology of military origin, either originally designed for or directly transferred from military bodies.

Protocols/Procedures for Community Interaction. Agencies' written and informal rules around community engagement, both during and outside of arrest-related incidents, are captured under this domain. For example, programs to increase community oversight, weapon deployment rules, officer attire, and pursuit policies are included.

Military Tactics. This domain primarily focuses on SWAT and other tactical methods employed or developed by the military.

Officer Culture/Mindset. Military supervisory structures (i.e. captain, sergeant, etc.) in addition to personal beliefs, values, and overall attitude toward the role of police are included in this domain. Themes related to the "guardian versus warrior" mentality and racial bias are also captured here.

Training and Requirements. This domain includes themes on educational requirements, military veterans (particularly educational exceptions), training requirements for new hires, and continuing education.

These domains aim to capture both tangible and readily visible examples identified by individuals with knowledge of police agency structures, policies, and practices, while also representing non-officer public perceptions. They also allow for discordant views of different groups without prioritization of any one SME's perspective over another's. For example, within the domain of "gear/technology," the reality that some SMEs endorsed an "ownership" based view and others an "application" perspective is captured without preference to one or other.

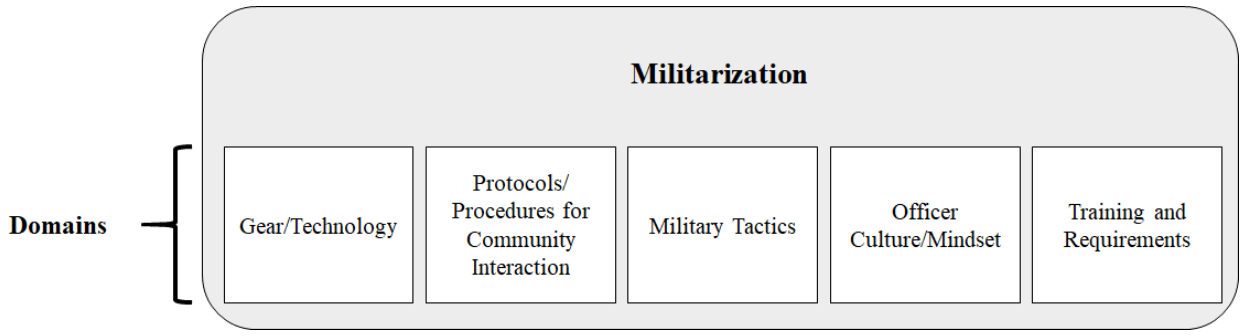

Figure 2.1 Proposed framework for militarization and five underlying domains

2.4 CONCLUSIONS

The heterogeneity within each of the domains in the proposed framework highlights an overarching theme of this study; people have different opinions on the definition of militarization

that are rooted in their professional and personal experiences. The 12 interviewees included in this study were a diverse group of experts representing multiple geographic regions and various personal and professional experiences. Including individuals with policing background and those from other arenas ensured a more robust assessment of militarization than focusing on the perspectives of a single homogeneous group.

A primary strength of this study was the use of qualitative research methods to elucidate the various features of militarization identified by diverse participants. This helped characterize the concept of militarization with a granularity and range beyond that which has been described in previous research. These study findings align most closely with Kraska's four indicators of militarization (material, cultural, organizational, operational) and proposed continua for measuring them.[83] The present study, however, does not limit the five proposed domains to bidirectional continua (low to high militarization), as it captures both positive and inverse relationships between the domains and militarization. For example, prior studies on militarization in domestic law enforcement that have focused exclusively on equipment acquisition address a single critical feature of one of the domains presented in the proposed framework. This study does not render its predecessors obsolete, but rather offers some contextualization across studies with discordant definitions for militarization or conflicting findings related to the societal or agency-level origins of militarization. These findings support previous studies that have found disagreement across academic research and professional resources, and suggests broader unifying themes worthy of further examination.[72] At a minimum, this work suggests that researchers should be wary of discussing the causes and consequences of militarization when using measures that capture only one aspect of the concept. This is not to say that such research cannot have value, but the results of these studies are potentially much more

informative about those specific elements (the acquisition of military gear, for example) than they are about militarization in general.

One might argue that this study failed to identify a central definition of militarization and that disagreement between interviewees is a weakness of the study design. However, the lack of consensus in this study among this relatively small group of experts around a single concise definition of militarization, is not necessarily a flaw. Instead, this result is a primary strength of the study. Put succinctly, there is disagreement about what counts as militarization and this disagreement is important to consider when thinking about how to best study militarization. In fact, given the diversity of the participants in this study, it is a fair assumption that a study conducted among a larger group of people representing an even more diverse set of backgrounds would likely yield a similar lack of consensus rather than more agreement between individuals. Such disagreement does not necessarily mean that militarization cannot be defined precisely; rather, it indicates that militarization may be a multi-dimensional construct whose specific features should be studied separately and with acknowledgement of their position within and contribution to the larger construct. Therefore, research conducted in this area need not use a single method for measuring militarization. Researchers should define clearly which components of militarization they plan to study, how they intend to operationalize them, how their work is situated within the broader framework, and discuss the implications of not addressing other components of militarization.

2.4.1 *Study Limitations*

There are some limitations of the present study that warrant mention. First, only 12 SMEs were included in this study due to resource constraints. Therefore, specific assessment of geographic variation or differences across geography and SME background using only these 12

individuals is not recommended. However, given the professional and regional diversity of these 12 individuals and saturation of themes identified during analysis, the results generated by this smaller sample size are likely still valid. It is important to note that generalization was not the primary goal of this qualitative analysis, but, instead, the goal was to generate insights regarding militarization and how to best define it. Such theoretical insights can be drawn from smaller samples with subject matter experts. Additionally, previous research has found that thematic saturation can be achieved with as few as 12 interviews [119]. Second, the interviews were conversational and were allowed to flow organically without restriction to the questions in the interview guide, which may have permitted the researcher's reactions to SME responses to influence their subsequent comments. However, the fluid nature of these interviews also allowed for concepts that were not strictly discussed in the interview guide to appear, and interviewer prompts encouraged further exploration of new and emerging themes.

Finally, caution should be used when generalizing the results of this study for use in future research and practice. The proposed defining framework for militarization is a product of the methods used to conduct this study, the specific participants, and contemporary culture, and may therefore not align exactly with what a separate group of experts, in another time, interviewed by another researcher may generate. This study does, however, offer a baseline from which future efforts to characterize this construct and its specific features can begin.

2.4.2 *Directions for Future Research and Application*

The results of this study point to several opportunities for future research. First, potential geographic (e.g. urban vs. rural), professional, and personal identity (e.g. race/ethnicity, gender identity) differences in how people define militarization warrant additional study and would further validate the proposed framework. Second, the discordant views of SMEs represented in

this study may be better operationalized or measured using a different approach; future studies could explore how to best represent these discrepancies. Third, applying the proposed defining framework to study how militarization may or may not influence certain societal, community, or health outcomes could support research in multiple fields, including policing, criminal justice, and public health.

Ideally, future work seeking to examine police militarization as a whole will devise of and include measures of each of the five domains identified in this research. Research which examines only some of these elements is still very much needed and of value, but such research cannot fully address the causes and consequence of militarization. Given the multi-dimensional and contentious nature of the concept of militarization, it is entirely possible that different domains of militarization might be caused by different factors and, in fact, have different outcomes for police-community relations and interactions. For example, the factors which promote the acquisition and use of militarized gear might be different than the causes of other aspects of militarization. Indeed, it is even likely that these domains affect each other, as it is easy to envision police training shifting toward a more militaristic model following the acquisition of militarized gear, as the officers in a given department would likely need training to understand how to use the gear that was obtained, should such a need arise. Embedded in this though is the idea that future work must be clear about how militarization is defined and measured and for what purpose, with a clear need for more work that taps into dimensions beyond the presence of militarized gear. One of the most pressing research needs is to identify which of these domains is most important in shaping police-community relations. In addition to this, research which compares these domains to public perceptions of militarization is also essential, as a better understanding of how and when the public views a police agency as

militarized is largely lacking in the literature (for an exception, see Fox et al, 2018). While the five overarching domains were generated by a diverse set of SMEs, it is clear that there is considerable heterogeneity in how police-trained versus non-police trained experts viewed militarization. Yet, in some sense, community perspectives are crucial here, as whether they view an agency as more or less militarized is likely to shape their interactions with representatives from that agency, regardless of how that agency views itself.

Ultimately the value of this research is dependent on its ability to support meaningful dialogue, promote evidence-based research and practice, and guide effective policy around domestic policing in the U.S. Through validation of community and policing perspectives alike, this framework encourages all stakeholders to engage in these processes while minimizing alienation and capitalizing on the benefits of interdisciplinary collaboration. As the national discussion on domestic policing continues, this research offers a template for discussion between law enforcement agencies and the communities they serve and an anchoring point for future efforts to study the history and consequences of this phenomenon.

Chapter 3. OPERATIONALIZING MILITARIZATION

3.1 General Approach

Chapter 2 describes the creation of a robust conceptual framework of militarization that encompasses previous efforts to study this concept while also expanding upon them to better represent the experiences of all relevant stakeholders. Twelve individuals with expertise in a broad array of fields, including policing, community activism, law, military, and psychology, participated in qualitative interviews around the causes, definition, and impacts of militarization in United States law enforcement agencies (LEAs). Their responses were analyzed using a grounded theory approach and five key domains of militarization were generated: Gear/Technology; Protocols/Procedures for Community Interaction; Military Tactics; Officer Culture/Mindset; Training and Requirements. An ideal study of militarization would capture information on all five domains among LEAs, allowing for extensive exploration of their individual and collective effects on various policing outcomes. However, the granularity of detail that would best capture the nuance of these domains is likely absent or limited in existing administrative policing datasets.

The rich qualitative analysis that yielded the five domains of militarization informed a two-step process for constructing operationalizable metrics of the overall construct and its subcomponents using data from the 2013 Law Enforcement Management and Administrative Statistics (LEMAS) survey. First, a principal component analysis (PCA) was implemented to determine if natural clustering in law enforcement agency characteristics aligned with the five domains. The second step involved manual construction of a militarization metric through

integration of the results of the PCA and other the themes and domains derived from the qualitative study.

3.2 Principal Components Analysis

The process of conducting the PCA included four key steps. First, was review of all variables in the LEMAS survey instrument and mapping to the five militarization domains defined in Chapter 2. Second, was selection of a limited set of variables representing these domains for inclusion in the PCA. Third, were primary and secondary PCA analyses, applying different assumptions. Fourth, was interpretation of the PCA results.

Review of all questions in the LEMAS survey instrument yielded 33 individual variables that were deemed relevant to the concept of militarization (Appendix B). In any PCA, observations must have complete data for all included variables; some recoding and collapsing of missing responses, as appropriate, in addition to accounting for deliberate survey skip patterns reduced but did not eliminate missingness in the data. Of the 2,826 participating agencies, 1,322 were included in the PCA. PCAs are most effective where the number of observations is greater than five times the number of variables, thus there were sufficient observations to proceed with the PCA.[124] Prior to any analytic steps, the 33 variables were mapped to the five militarization domains to ensure that all domains were represented. Some variables were in fact related to more than one domain, an unsurprising result given that each domain is comprised of several subordinate concepts, many of which are cross-cutting.

The first PCA was conducted using an orthogonal solution. Informed by eigenvalues greater than one, scree plot, and interpretability of the components (hereafter, factors – see Appendix B), further evaluation was conducted of the first eight factors using a varimax rotation.

Interpretation of the factors began with describing what the variables in each factor had in common to identify what domains each factor represented. Through this process the following was determined: (1) While variables generally loaded strongly onto only one factor their loadings on the remaining factors were not as close to zero as is expected in a clean PCA. Four variables were excluded from interpretation as they loaded strongly onto more than 1 factor. (2) Some factors had only two variables that loaded strongly while others had more. (3) Variables that loaded together tended to be closely tied conceptually. For example, variables related to multijurisdictional task forces all loaded onto factor three and variables describing community policing requirements and training efforts loaded together onto factor six. Factor loadings are shown in the Appendix B.

Mapping the eight factors directly onto the five domains revealed that multiple factors related to multiple domains. The resulting visual representation of this demonstrates the limited clarity offered by focusing exclusively on how factors related to domains (Figure 3.1).

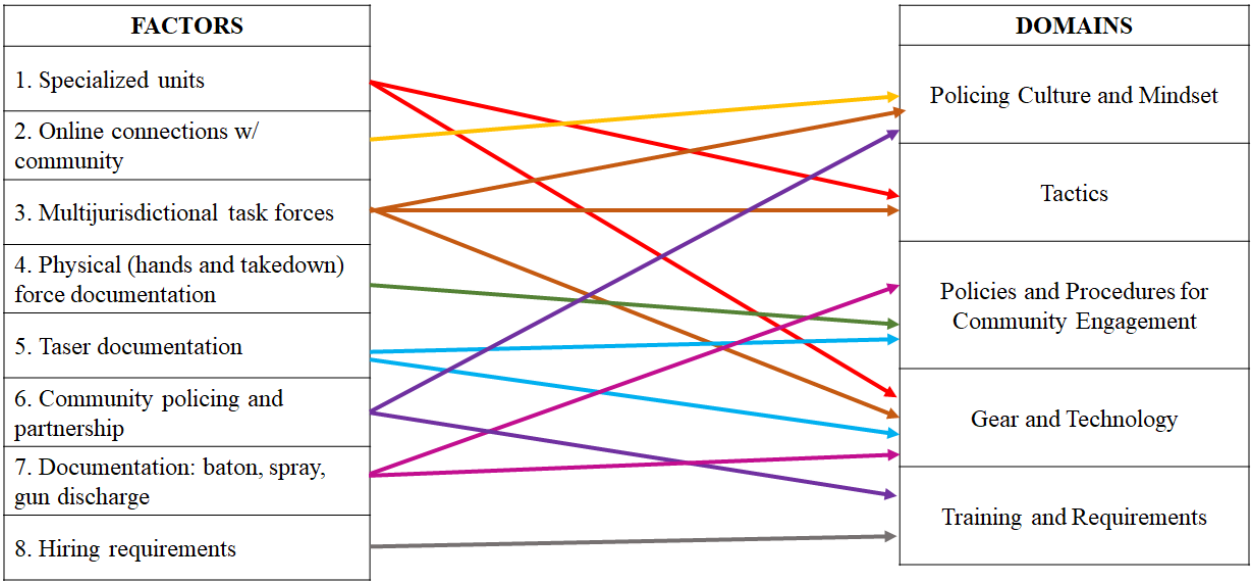

Figure 3.1 Mapping principal component analysis-generated factors to five domains of militarization

In an effort to disentangle the interrelatedness of these factors and domains, the factors were next mapped onto the more detailed subordinate themes within the five domains. Table 3.1 shows how the factors (top) related to the themes (left). Where there was overlap of factors across multiple themes or themes across multiple factors, it was clear why and where the distinction was (e.g. tasers vs. other specific weapons vs. physical force). All of these steps were repeated in a secondary PCA that accounted for clustering in the data. The results were comparably complex and offered no additional conclusions to support next steps.

It would be inappropriate to use the results of this PCA alone to summarize militarization in LEAs as the factors did not clearly represent the five domains of militarization. However, the clustering of related variables within factors suggested a framework for manually constructing several indices capturing these five domains. For example, the fact that variables related to multijurisdictional task forces were clearly correlated and loaded onto similar factors suggested that some subset of them may be well-suited for a composite measure. Similarly, variables related to policing culture and mindset tended to cluster in the PCA results and that pattern suggested how these variables may be combined more succinctly.

An important limitation of these PCA analyses was the use of an orthogonal solution which assumes independence between the components generated by the PCA. The purpose of using PCA here was to determine if the five domains of militarization, which are inherently related to each other in some capacity by virtue of the fact that they each define a component of the same broader construct, were naturally existing in these limited LEMAS variables. Thus, there may have been some violation of the independence assumption. However, the impact of such a violation on the overall research is limited as the PCA was one of many resources that informed subsequent manual construction of militarization metrics.

Table 3.1 Factors identified in principal component analysis of militarization and related themes from qualitative interviews with interdisciplinary subject matter experts

Factors → **Themes ↓**	**1-** Specialized units	**2-** Online connections w/ community	**3-** Multijurisdictional task forces	**4-** Physical (hands and takedown) force documentation	**5-** Taser document-ation	**6-** Community policing and partnership	**7-** Documentation: baton, spray, gun discharge	**8-** Hiring requirements
1. Militarization is driven by **policing culture and mindset**		**X**				**X**		
2. **Intra-agency factors** drive militarization						**X**		**X**
2a. Organizational leadership sets the tone regarding militarization								
*2b. Hiring **veterans** preferentially is/is not an indicator of militarization*								
2c. Requirement for certain trainings for officers can either indicate a push away from militarization or a push towards it. (e.g. de-escalation)								
3. **Gear & equipment** with military origin used by local law enforcement is/is not an indicator of militarization					**X**		**X**	

*3a. It's about **how** the gear & equipment are used that defines militarization*								
*3b. **Owning the equipment** automatically makes a department militarized*								
4. Military **tactics** used by law enforcement define militarization	**X**			**X**				
*4a. **SWAT** is necessary and not does not have to indicate militarization when used in the "right" way OR SWAT is a fundamental example of militarization.*								
5. **Extra-agency** factors cause/prevent/are indicators of militarization			**X**					
5a. Federal programs (1033), state funding, and other grants often define what agencies will have (gear/tech) or seek out.								

3.3 METRIC CONSTRUCTION

Final metric construction involved a marriage of the domains of militarization defined in Chapter 2 and the quantitative results of the PCA. Variables that clustered together in the PCA were generally kept together and assigned to one of the five domains (Table 3.2). There were two exceptions to this. First, in-service training on de-escalation practices was separated from other variables related to community engagement and added to the domain related to training and requirements. This was because in-service training is clearly a form of training administered by LEAs and interpretability of the metric for practical application was improved by moving this to the corresponding training domain. Second, two variables denoting agency authorization of rifles and shotguns that were not included in the PCA were added to the gear and technology domain. Qualitative interviews suggested that while required documentation for gear and technology use may relate to internal policies and procedures, the type of firearms authorized to officers may be more directly related to gear and technology.

Twenty-three variables were included in the metric (Table 3.2). "Not applicable" values for all variables and missing values accompanied by earlier responses that indicated deliberate skip patterns were re-coded to reflect survey design and maximize sample size. Individual variables were re-coded such that positive values represented increased militarization and negative values represented a shift away from militarization, beyond neutrality, and towards active efforts to improve LEA-community relations. Some variables were a collapsing of multiple LEMAS variables into single variable. For example, two variables related to SWAT capabilities were combined to create a single variable denoting access to *any* SWAT capabilities. Similarly, open and closed-hand tactic documentation were combined into a single hand-tactics

variable. Variables around documentation for using specific types of gear (baton, spray, firearm, and taser) were also combined such that each LEA received a single score representing if all, some, or none of their authorized technologies required documentation. Thus, for an LEA that did not permit use of a baton, the agency would neither be penalized nor rewarded (receiving a score of 0) for lack of documentation for baton use. This was then added to the scores for firearms, tasers, and sprays. In cases where there were greater than two categories of response and there was a clear "norm" in terms of national standards, then the "norm" value was coded as 0. For example, the vast majority of LEAs had a high school education hiring requirement, thus these agencies received a 0 score while those with stricter requirement received higher values and lower values were given to agencies with less stringent hiring practices.

Table 3.2 Five domains of militarization and variables captured in the 2013 Law Enforcement Management and Administrative Statistics survey with militarization metric coding scheme[1]

Variable	Coding Scheme (point value)
Policing Culture & Mindset	
Uses community survey	Yes (-1) No (1)
Problem-solving encouraged	Yes (-1) No (1)
Community partners engaged	Yes (-1) No (1)
Website available to public	Yes (-1) No (1)
Online incident reporting	Yes (-1) No (1)
Social media presence	Yes (-1) No (1)
Gear & Technology	
Officers must wear armor at all times	Yes (1) No (-1)
Rifles authorized	All or some sworn officers (1) Not authorized (-1)
Shotguns authorized	All or some sworn officers (1) Not authorized (-1)

Table 3.2 Continued

Protocols & Practices for Community Engagement	
Use of force reporting required	Yes (0) No (1)
Vehicle pursuit policy	Permitted or no policy (0) Pursuit discouraged or prohibited (-1)
Foot pursuit policy	No policy (1) Policy (0)
Use of closed/open hand tactics – documentation required	All permitted require doc (-1) Some permitted require doc (1) No doc required for permitted (2) None permitted (0)
Use of firearm, baton, taser, spray – documentation required	All permitted require doc (-1) Some permitted require doc (1) No doc required for permitted (2) None permitted (0)
Display of firearm, baton, taser, spray – Documentation required	All permitted require doc (-1) Some permitted require doc (1) No doc required for permitted (2) None permitted (0)
Training & Requirements	
Educational hiring standards	No minimum requirement (1) High school (0) Some college or associates (-1) Bachelor's degree (-2)
Military exception for educational requirements	Yes (1) No (0)
Some in-service training in de-escalation	All full-time sworn officers (-1) Half or more (0) Less than half (1) None (2)
Tactics	
Any specialized terrorism unit	Yes (1) No (0)
Any SWAT capabilities	Yes (1) No (0)
Any specialized gang unit	Yes (1) No (0)
Participates in multijurisdictional task force/s	Yes (1) No (0)
Multijurisdictional drug task force	Yes (1) No (0)

[1]Scores above 0 represented greater militarization and those below 0 represent a shift away from militarization, not just towards neutrality (0)

For each of the five domains, each agency's responses were summed to determine a domain-specific score. All five domains were combined to create an overall score for militarization that was standardized with a mean of 100 and standard deviation of 20 to simplify interpretation. In sensitivity analyses (described in Chapter 5), these domain-specific scores were converted into binary dummy variables split at the median.

3.4 RESULTS

Overall summary statistics for both the individual and composite militarization metrics are presented in Table 3.3 and Figure 3.2 displays the distribution of the standardized composite scores for all agencies. Distributions of domain-specific scores were skewed and non-normal. This is unsurprising given that domains were comprised of only three to six variables with summed values dispersed over a range of no more than 12 points. However, the distribution of composite militarization scores followed a far more normal distribution with minimal skewness. The peaks in the distribution were due to the nature of how these variables were coded.

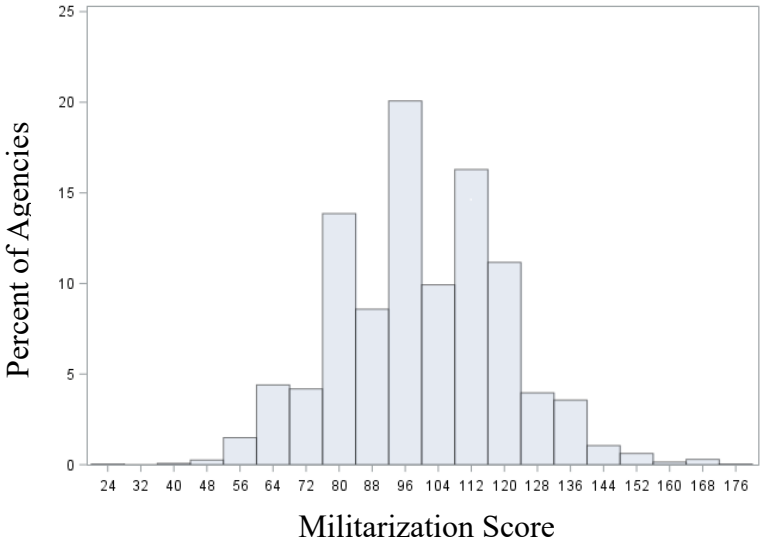

Figure 3.2 Distribution of standardized composite militarization scores

In this research, the composite militarization metric was examined categorically in the form of quintiles, as continuous representation of the data may poorly account for any

insufficiencies in the available underlying variables and had limited interpretability. Sensitivity analyses examined militarization in its continuous form; the benefits of each parameterization were compared and these results informed recommendations regarding the use of this metric and potential improvements for future research.

Table 3.3 Descriptive statistics for individual domain-specific and composite militarization metrics

	Policing Culture & Mindset	**Gear & Technology**	**Protocols & Practices**	**Training & Requirements**	**Tactics**	**Composite** *(standardized)*
Range (min, max)	12.00 (-6.00, 6.00)	6.00 (-3.00, 3.00)	12.00 (-4.00, 8.00)	6.00 (-3.00, 5.00)	5.00 (0.00, 5.00)	157.23 (22.34, 179.58)
Mean (SD)	-0.66 (3.30)	-1.26 (1.14)	-0.11 (2.03)	0.99 (1.40)	2.89 (1.73)	100.00 (20.00)
Median	0.00	3.00	0.00	1.00	3.00	98.42
Mode	0.00	3.00	1.00	2.00	5.00	93.35

Chapter 4. USE OF FORCE DATA LINKAGE

4.1 PURPOSE

In the United States, all deaths are captured via vital statistics regardless of cause. However, while the cause of death is some cases is clearly identifiable, in others it can be more complicated. Lethal use of force (UOF) encounters between law enforcement and the public that are appropriately classified as such have the cause of death listed as "legal intervention" by the Centers for Disease Control and Prevention (CDC).[62] However, cause of death is sometimes incorrectly identified in the field by medical examiners and coroners, reported inappropriately, or not readily available in national vital statistics data for other administrative reasons. Meanwhile, prior federal efforts to monitor lethal UOF cases are similarly flawed; evidence suggests that federal databases, including the now defunct Arrest-Related Deaths program housed by the Bureau of Justice Statistics (BJS), missed around 50% of true lethal UOF cases.[56,57] As of September 2019, there remains no single database of lethal or nonlethal UOF to which 100% of law enforcement agencies report. In 2016, former U.S. Attorney General, Loretta Lynch, announced efforts to improve federal data collection on UOF.[67] The Federal Bureau of Investigation's (FBI) National Use-of-Force Data Collection program officially launched in 2019, but data will not be available for several months, will likely offer only restricted access for public and research purposes, and will undoubtedly suffer from the same flaws as prior governmental monitoring efforts due to the fact that reporting into it is voluntary.[66,68]

In response to a lack of data on lethal UOF, several non-governmental efforts have been established to track these cases more robustly and in real-time but there remains no universally agreed-upon definition for UOF.[56,125] Table 4.1 contains the specific language used by four

community-led databases to describe their methods, case definitions, and additional exclusion and inclusion criteria. While annual estimates are relatively similar across databases, variation due to these criteria and case identification methods is certain. Thus, some deaths are captured in only one database while others are captured by multiple.

While all public databases capture cases that traditionally fall under the BJS definition of an "arrest-related death" and deaths classified as "legal intervention deaths" in the CDC's National Vital Statistics System (NVSS), they diverge on issues like if the officer was on or off-duty, the mechanism of death (e.g. gun, taser, vehicle collision, hands-on force), and if the death occurred during or after an interaction but was not the direct fault of the officer (e.g. heart attack). In order to identify cases, each database uses volunteers or staff to read police reports, media coverage, and social media reports of individual cases and apply their criteria to determine if they are eligible for inclusion. Sometimes further investigation is conducted. However, there is no automated process for case identification in any of these systems. The purpose of this study was to implement data linkage techniques to combine four public databases on lethal UOF into a single database containing a deduplicated list of these deaths for 2013-2017 nationwide. In doing so, this study will leverage the strengths of each included system to create one of the most robust national resources on lethal UOF to date.

4.2 Data Sources

Fatal Encounters (FE) was established in 2013, though the dataset includes retrospective data collected from 2000 onward, updated weekly by a team of researchers. Of all the public databases listed here, FE is the most inclusive, with no listed exclusion criteria in its methodology. Manual review of deaths identified by this database yielded several that were in

fact suicides or due to other non-police-related causes but for which police were present at the time of death. For example, FE includes deaths whereby a person is killed due to crashing their own car during a vehicle pursuit. The database also captures cases involving drug overdoses and deaths caused by off-duty officers. Therefore, compared to the other public databases, annual estimates of lethal UOF from FE are higher. However, with such high sensitivity there is some increase in false positive cases as well, but this may not necessarily be a flaw; there remains no universal definition for UOF and deaths that other databases exclude can provide additional insight into the nature of police-community encounters and how these events are classified.

The Washington Post: Police Shooting Database (WP) began tracking lethal UOF in 2015, focusing exclusively on cases involving officer discharge of firearms. Data collection is ongoing as of 2019, with regular updates as new deaths occur. As this database is limited to shootings, estimates tend to be lower than other public databases that include deaths by other means. The benefit of firearm-focused deaths is that the circumstances surrounding a particular death can be easier to glean from police and public reports than deaths with less distinct causes, for example, choking. However, this is not to say that a firearm-related death in which an officer is present is with certainty the fault of the officer. For example, suicide by firearm in the presence of an officer where the decedent pulled the trigger himself is not uncommon, particularly in the Fatal Encounters data.

Mapping Police Violence (MPV) began identifying lethal UOF deaths in 2014 and provides detailed visual representations as part of annual reports summarizing data collection efforts. In addition to capturing deaths by all causes resulting from the direct actions of on-duty law enforcement officers, MPV also captures deaths caused by off-duty police officers. As previously mentioned, there is no universal definition for UOF that either includes or excludes

deaths caused by off-duty officers, and there is certainly reason to examine these deaths as at least a subtype of a broader UOF definition.

The Guardian: The Counted (TG) dataset monitored lethal UOF in 2015 and 2016 but has since stopped publishing updates to their publicly-available datasets. Included in these data are deaths by various causes, though several exclusion criteria are also listed. TG aims to include only deaths resulting from direct actions of law enforcement officers in addition to non-drug overdose deaths that occur while a person is in police custody. This latter item is of particular importance as the distinction between arrest-related and in-custody-related deaths is generally not addressed clearly by these public databases, let alone by federal data monitoring efforts.

4.3 METHODS

4.3.1 *Linkage Technique*

Data missingness and errors are common in UOF datasets, in part because the data are generated by the public and by media and formal reporting from involved police departments is inconsistent. With different organizations using their own slightly different methods for case classification and recording other variables, the deterministic power of many potential matching variables is imperfect. Misclassification of some variables, misspellings, and typos are also problematic, further complicating the process of identifying a single death across multiple databases using any particular set of matching variables.

In the absence of prior research comparing the validity of deterministic and probabilistic approaches to linking multiple lethal UOF datasets, both techniques and a variety of statistical packages capable of implementing them were reviewed. To maximize the number of true matches (sensitivity) identified across the selected databases in this study while balancing also

the need to minimize false matches (positive predictive value), a joint deterministic and probabilistic linkage approach was implemented using The Link King software.[126]

Table 4.1 Public databases on lethal use of force: Definitions and inclusion criteria

Data Source	Process	Definition	Specific Exclusion Criteria
Fatal Encounters[71]	In order of number of records reported: i) paid researchers; ii) public records requests; iii) open-sourced data. All open-sourced records are researched to avoid duplication and investigated to verify the event and surrounding circumstances.[127]	People killed through interactions with law enforcement.	N/A
Washington Post: Police Shooting Database[69]	Local news reports, law enforcement websites, and social media, and monitoring independent databases such as Killed by Police and Fatal Encounters.	Shootings in which a police officer, in the line of duty, shoots and kills a civilian	Deaths of people in police custody, fatal shootings by off-duty officers, and non-shooting deaths.
Mapping Police Violence[70]	Sources: Fatal Encounters, the U.S. Police Shootings Database, and KilledbyPolice.net. Original research to further improve the quality and completeness of the data; searching social media, obituaries, criminal records databases, police reports and other sources to identify the race of 91 percent of all victims in the database.	A case where a person dies as a result of being chased, beaten, arrested, restrained, shot, pepper sprayed, tasered, or otherwise harmed by police officers, whether on-duty or off-duty, intentional or accidental…Known police killings [including]; arrest-related deaths (according to Bureau of Justice Statistics definitions); unintentional, off-duty and/or in-custody deaths.	Killings by vigilantes or security guards who are not off-duty police officers.
The Guardian: The Counted[128]	Police reports and witness statements, monitoring regional news outlets, research groups and open-source reporting projects (e.g., Fatal Encounters and Killed by Police).	Any deaths arising directly from encounters with law enforcement. Including, but not limited to people who were shot, tasered and struck by police vehicles as well those who died in police custody.	Self-inflicted deaths during encounters with law enforcement.

Using FE as the base dataset, WP, TG, and MPV datasets were imported and linked based on first name, last name, date of death, sex, and race. Standard operating settings provided by The Link King were used and manual review of all uncertain links was conducted during the linkage process for each new dataset. Manual review was generally required for common nicknames, spelling discrepancies, unknown characters, or in cases where one or two matching variables were different between datasets, but the others were the same. Once all four datasets were linked, variables from the source datasets were merged in and a final deduplication was run to identify any remaining links that had been missed in prior iterations. At the time of this study, efficient linkage methods for greater than two datasets at a time were still under development. This final deduplication step aimed to reduce some of the bias of using a staged linkage process with a single base dataset. Any remaining bias is likely minimal as extensive data cleaning was implemented prior to the linkage process.

For deaths identified by multiple databases, values for each variable in the final deduplicated dataset could be drawn from only one of the source datasets. If a particular death had only one corresponding value for the agency involved, then that value was kept. While in most cases there was agreement across databases, where there was disagreement, a prioritization scheme based on the relative stringency of the review process for cases was used to help define these values. Typically, WP and TC values were prioritized, except for cause of death and county of death where MPV was used because neither WP nor TC captured this information. MPV was also prioritized for the agency involved as MPV had the least missingness compared to TC and FE who also captured this information. FE was not prioritized for any variables as the other databases reported stricter review processes and guidelines for inclusion, suggesting lower risk of error in the values for the variables included in this study.

4.3.2 *Exclusion Criteria*

This study classified a lethal UOF death as a death caused by the direct action of a law enforcement officer either on or off duty in addition to deaths among people in custody. In order to apply this case definition, two groups of exclusions were made to the final linked dataset. In addition, these exclusions aimed to balance data validity with replicability for future research. Manual review of all cases is a time-consuming process that can only be undertaken by teams with substantial person power. By establishing a hierarchy of automated exclusions based on available data points for individual deaths, this study aimed to address misclassification of lethal UOF deaths as efficiently as possible, recognizing the potential implications for sensitivity and positive predictive value.

The first exclusion was based on a 2018 study by Edwards, Esposito, and Lee who conducted a manual review of 20% of each "cause of death" category in the FE database to estimate what proportion of each category did not meet their case definition, which aimed to capture only deaths caused by direct police action.[129] They excluded all deaths coded as "suicides" in addition to deaths attributable to vehicular collision, falls, fire or smoke inhalation, and cases where the cause of death was listed as "unknown" or similar. These exclusions were designed to address a majority of misclassification in the study data but errors were inevitable. In addition to applying these specific exclusions in the present study to final deduplicated dataset, there was also one death caused by a "bomb" and it was presumed that the Edwards, Esposito, and Lee approach would have excluded this case as well. Cases in which no cause of death was listed could not be evaluated using these criteria, but they were not excluded as these deaths were identified by MPV, TG, or WP suggesting that they underwent more stringent review than had they been identified by FE alone.

The second round of exclusions were based on a limited manual review of the current data. In a random sample of 20 deaths, 15% (n=3) were in fact suicides that had been coded with a different cause of death (e.g. gunshot). Deaths identified by FE included a brief "description" variable offering a 1-2 sentence summary of the circumstances surrounding the death. The earlier manual review in addition to review of another 20 cases identified phrases such as "self-inflicted," "suicide," and "killed himself" in the description variable among deaths that should have been excluded based on the case definition established for this study. Thus, cases containing any of these phrases in their description were excluded as well.

4.4 RESULTS

While a plan for data linkage and exclusions was established a priori, unexpected data challenges and technical glitches arose during the process and required additional attention. First, across all four databases, naming conventions varied substantially. While FE, for example, often had nicknames included in quotation marks or middle names listed between first and last names, other databases tended to report first and last names only. The Link King has a limited number of linkage variables to which a name can be assigned and with variation in the number of names for a single person appearing in multiple databases, it was necessary to automate selection of a first and last name in each database for use in the final linkage process. Special characters including "ñ" and accented letters were inconsistently used across databases as well and required standardization prior to linkage. Spelling errors, differences in dates, and inconsistent race or sex coding required some manual review via the Link King interface, which generates reports of potential matches with slight differences that require investigator approval.

Another key challenge of the linkage process was a lack of established methodology or available software to facilitate linkage across more than two databases. While traditional programs can readily merge two datasets on any number of variables, the process becomes increasingly complex as more datasets are added. The fundamental challenge comes with selection of the overriding version of each variable that will carry into the next linkage. One approach is to use a consolidation process by which the investigator selects one dataset or the other as the source of the name variable value, for example. Another option involves separately linking each dataset to each other dataset and then subsequently combining and relinking across the linked datasets from the prior stage. This process is arduous, and the relative benefits are not well established. This study used FE as the base dataset to which all other data were linked, thus FE values were used to inform the linkage process. The full multi-step linkage was conducted three times to ensure consistent results and in doing so, it was decided that a final deduplication process after all datasets were combined would help in eliminating any previously unmatched rows that should have been linked.

Figure 4.1 describes the results of the data linkage and exclusions. Prior to exclusions, 8,607 deaths were identified across the four death databases. Exclusions based on Edwards, Esposito, and Lee[129] reduced the estimate to 6,783. Further exclusions based on the presence of language suggesting suicide in the situational descriptions of cases identified in FE reduced the estimate to 6,458 cases. The 325 deaths removed in Round 2 exclusions were around 5% of cases that would have been kept had only Round 1 exclusions been conducted. Assuming that the manual review that identified 15% misclassification after Round 1 exclusions is representative of all the data, as much as 10% of cases in the final dataset could be classified as true lethal UOF deaths when in fact they were suicides. However, given that some of the automated exclusions in

Round 1 likely removed true lethal UOF deaths from the data (e.g. a vehicular death that was truly the result of an officer's driving), the annual lethal UOF estimates at the national level are likely minimally biased.

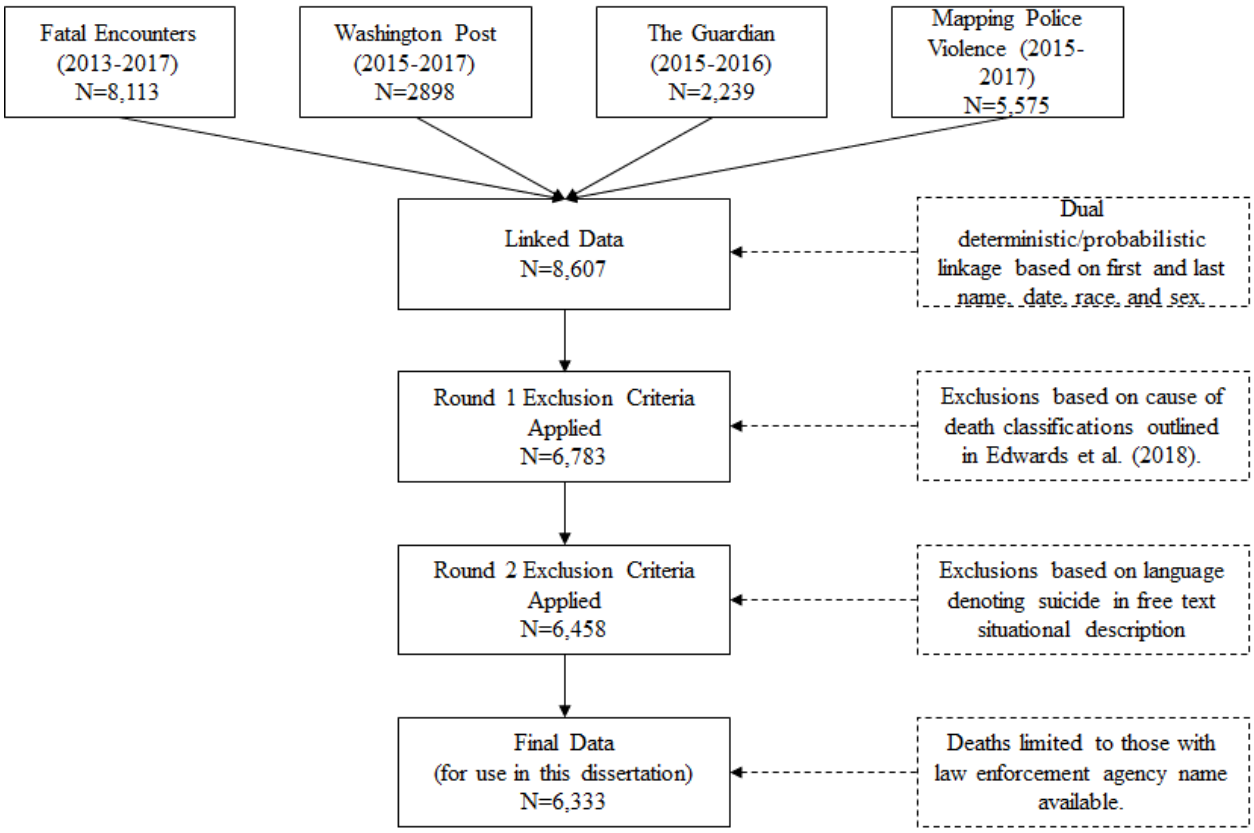

Figure 4.1 Data linkage and exclusions for lethal use of force deaths identified by four public databases, 2013-2017

To facilitate subsequent analysis of deaths aggregated to the law enforcement agency responsible for each incident, an additional 125 cases without any agency information were excluded. Table 4.2 indicates the proportion of cases in each year that were identified by each of the four databases for the agency-limited sample of 6,333. Across years, each database captured a similar proportion of overall cases identified. This consistency suggests that case definitions for each database were not altered between years and offers some quantitative comparison of the breadth of each case definition in relation to the others. In all years, FE captured the most cases

overall. TG only tracked deaths in 2015 and 2016; during those two years, it identified roughly the same proportion of cases as MPV. WP identified the lowest proportion of cases across the years in which it operated, which is due to the fact that its case definition was restricted to deaths involving firearms. Table 4.3 shows for each year the proportion of deaths identified by one, two, three, or four databases. In each year, most deaths were identified by all operating databases.

Table 4.2 Proportion of lethal use of force deaths identified by four public death datasets, 2013-2017, N=6,333

	2013 N=1,243 n(%)	**2014 N=1,200** n(%)	**2015 N=1,379** n(%)	**2016 N=1,310** n(%)	**2017 N=1,201** n(%)
Fatal Encounters	1,243(100)	1129(94.1)	1,224(88.8)	1,220(93.1)	1,184(98.6)
The Guardian	-	-	1,089(79.0)	1,041(79.5)	-
Washington Post	-	-	921(66.8)	889(67.9)	880(73.3)
Mapping Police Violence	-	1,050(87.5)	1,096(79.5)	1,035(79.0)	1048(87.3)

Note: Columns will not add to 100% as a single death could be identified by multiple databases.

Table 4.3 Proportion of lethal use of force deaths identified by one, two, three, or four public databases annually, 2013-2017

	2013 N=1,243 n(%)	**2014 N=1,200** n(%)	**2015 N=1,379** n(%)	**2016 N=1,310** n(%)	**2017 N=1,201** n(%)
One database	1,243(100)	221(18.4)	292(21.2)	263(20.1)	158(13.2)
Two	-	979(81.6)	90(6.5)	85(6.5)	175(14.6)
Three	-	-	130(9.4)	96(7.3)	868(72.3)
Four	-	-	867(62.9)	866(66.1)	-

4.5 CONCLUSIONS

The value of this particular linkage exercise is three-fold. First, it yields the most robust dataset of lethal UOF cases presently available, drawing upon four real-time data reporting

efforts. Further, it employs exclusion criteria that restrict the data to limit the inclusion of deaths that did not result from law enforcement action. Reversal of these exclusions can also facilitate analysis of deaths meeting a less restrictive case definition that occurred either as a result of *or* in the presence of law enforcement. Given the continued lack of consensus around the exact deaths that should be included in analyses exploring the role of law enforcement, this linked data offers tremendous flexibility. Second, this linkage offers a longitudinal comparison of the relative inclusivity of each of these four databases. While their case definitions vary, the results of this linkage indicate an overall agreement between databases while also highlighting the value of including more than one database in any particular analysis of lethal UOF. Third, these results underscore the profound need for a reliable federal database that not only captures *all* lethal UOF cases nationwide but that is also readily available to researchers and practitioners alike. The labor-intensive process of linking multiple datasets undoubtedly suffers from misclassification and duplicate records, despite application of several safeguards against them. A regulated and validated system at the national level would hopefully produce more reliable estimates of the true burden of UOF and facilitate easier linkage with other governmental datasets. However, the FBI's new data collection effort will likely be plagued by the same issues as its predecessors, including the absence of mandated reporting from law enforcement agencies, a limited case definition, delayed data availability, and redacted or limited data access outside of the agency.

The data generated through this study offer a temporary, albeit complicated, solution to a problem of national importance. While a fully manual review of all potential cases validated by multiple researchers would have been the ideal, timeliness, replicability, and cost were all factors in the design of this study. The linkage methods employed and the exclusions applied here can be replicated for subsequent years; however, just as the current process attempted to balance

internal validity with future replicability, so too should any subsequent efforts to conduct a similar linkage. For now, these data can be examined in relation to federal, state, and local policies, policing practices, and community-level factors that may be associated with patterns of lethal UOF. But future work is needed to identify even more timely, replicable, and cost-effective mechanisms for accurately identifying these events and linking them to other criminal justice, health, and community-level datasets.

Chapter 5. MILITARIZATION AND LETHAL USE OF FORCE: AGENCY-LEVEL ANALYSES

5.1 INTRODUCTION

5.1.1 *Use of Force*

For the past several decades researchers have explored the ways in which police in the United States interact with the public and the factors that predict the nature of those interactions. Of particular concern have been injury and mortality among community members as a result of encounters with law enforcement or while in custody. Hereafter, these injuries and deaths will be referred to as lethal and nonlethal use of force (UOF). Several high-profile lethal UOF cases have drawn public criticism of policing practices in recent years and have fueled national dialogue on the impact of policing on population health, especially in non-White communities.[7-13] Efforts to quantify UOF in the late 1960's and early 1970's found that approximately 2-4% of all homicides annually in the U.S. were caused by law enforcement; roughly half of these were among African American or Black individuals.[14,52] Meanwhile, from 2010-2014, one study found an alarming disparity in the risk of lethal UOF among non-Hispanic Black (2.8 times) and Hispanic (1.7 times) men compared to White men.[15] However, generating truly accurate estimates of these events offers several methodologic challenges due to the absence of a publicly available database tracking them and disagreement around a formal case definition.[125]

Federal efforts to track *nonlethal* UOF have been essentially nonexistent, while *lethal* UOF surveillance efforts suffer from underreporting by around 50%, missing data, and inaccuracies, according to assessments of the now decommissioned Arrest Related Deaths Program of the Department of Justice, the Federal Bureau of Investigation's (FBI)

Supplementary Homicide Reports, and the Centers for Disease Control and Prevention's (CDC) National Vital Statistics System.[53-61] Comparatively, the CDC's National Violent Death Reporting System (NVDRS) captures roughly 93% of "legal intervention deaths"; however, surveillance is limited to the 23 states in which NVDRS operates.[64] In 2019, the FBI officially launched the National Use-Of-Force Data Collection program; however, the FBI has no authority to require law enforcement agencies (LEAs) to submit their data, a flaw this system shares with its predecessors. Furthermore, while a pilot study of the program was conducted to inform system usability refinements, it appears that there will be vast restrictions on data accessibility for public and research purposes.[66-68]

The most robust data on lethal UOF comes not from any government entity but from crowd-sourced efforts to more accurately surveil these deaths. These public databases rely on a broader range of information sources than government systems; in addition to traditional death records and police reports, these systems use citizen reports, news reports, and social media. They also tend to expand the lethal UOF definition to include events that occur outside the context of arrest (e.g., traffic stops) while some also include deaths caused by off-duty officers. Some of these efforts operated only briefly (e.g., The Counted[124], operated by The Guardian) while others are ongoing. Three of the longest running programs are run by the Washington Post[69] (WP), Fatal Encounters[71] (FE), and Mapping Police Violence[70] (MPV). In 2018, WP identified 986 fatal "officer-involved shootings", while MPV and FE identified 1,166 and 1,545 deaths, respectively, involving firearms and other means (e.g., tasers, physical force, chemical sprays). These varied estimates reflect disagreement in how these programs define lethal UOF and the techniques they use to capture them, a fundamental challenge for researchers in this arena.[125] These and other public UOF tracking programs frequently review each other's data and apply their own inclusion

criteria, which guarantees some level of agreement between systems but still results in missing cases across all systems.[56] Until a time when LEA reporting of UOF incidents is federally required and enforced, researchers and practitioners must rely on alternative data sources, note their flaws, and interpret their findings with caution.

5.1.2 *Police Militarization*

Protests and public reaction to high profile deaths caused by law enforcement and the legal proceedings surrounding these events have increased national awareness and concern around how police engage with the public, particularly, the topic of militarized policing.[5,7,8,10,12,40,42,45,73,106-110] Dr. Peter Kraska developed the first concrete measurements for militarization within LEAs and conducted most of the foundational research in this area over the past three decades.[75-83] Kraska proposed that militaristic practices are ubiquitous, though variable, across policing agencies and should be measured by four indicators: material, cultural, organization, and operational characteristics. Researchers and media outlets have focused heavily on Kraska's material indicator of militarization, specifically emphasizing the transfer of military-grade equipment to local policing agencies and expansion of special weapons and tactics (SWAT) capabilities.[74,84-94,130,131] Of primary interest has been the 1033 program which facilitates the transfer of surplus military-grade equipment to domestic LEAs. However, simply acquiring items through this program does not necessarily guarantee their use while many of the items available through the 1033 program are not necessarily militaristic in nature.[74,132] While some researchers have studied Kraska's other indicators more closely, there have been only limited efforts to examine more than one at the same time, with no consistency across operationalizations.[72,83,95,97]

In 2019, Simckes and colleagues proposed a new conceptual framework for militarization based on qualitative analysis of interviews with a broad range of stakeholders with expertise in

policing, criminal justice, law, and community activism.[98] The empirically-based framework identifies five multidimensional domains encompassing a range of agency-level factors related to militarized policing: gear/technology, protocols/procedures for community interaction, officer culture/mindset, training and requirements. This framework expands upon Kraska's four indicators, enabling researchers to more easily compare across disciplines and explore ways that varying definitions of militarization may relate to each other. Indeed, despite decades of study dedicated to these topics, neither militarization nor lethal UOF have universally agreed upon definitions. Researchers, practitioners, policy makers, and the public have different perspectives not only on how to define these two phenomena but also how (and sometimes if) they should be studied. Even so, mounting evidence continues to indicate that characteristics and practices of LEAs themselves are related to how frequently and in what situations officers use force.[92,93,133-137]

5.1.3 *Study Objectives*

The present study builds upon prior research by engaging contemporary data on a nationally representative sample of LEAs to examine the relationship between militarization and agency rates of lethal UOF. This study will operationalize Simckes' conceptual framework of militarization using LEA administrative data and linking it to a novel database of lethal UOF deaths. It will also account for several key community level factors closely tied to social determinants of health that may influence the dynamics between militarization and UOF and the effects of police-community encounters on population health.[134,138] Finally, the merging of the conceptual framework and the novel UOF database will offer new perspective on the approaches used to study militarization and UOF and opportunities for future research to continue to refine these techniques. With integration of population health research methods and related theories of

how health interacts with societal conditions into a traditionally criminal justice topic, this research also contributes to expanding efforts to explore the intersection of policing and health.

5.2 METHODS

This cross-sectional ecological study examines the association between agency-level militarization and rate of death due to lethal UOF by officers among a nationally representative sample of LEAs in the U.S. during the period of 2013-2017. All data that were not already captured at the LEA-level were aggregated to the relevant LEA for analysis and interpretation.

5.2.1 *Participants*

The participants in this study included 2,740 local and county LEAs that participated in the 2013 Law Enforcement Management and Administrative Statistics (LEMAS) survey administered by Bureau of Justice Statistics (BJS). This survey is conducted every two years among a nationally representative sample of LEAs across the U.S. Excluded from the study were 76 state, federal, and tribal LEAs. These agencies were excluded for several reasons. First, studying LEAs with nested jurisdictional boundaries is complicated, as denominators are not mutually exclusive. Second, the organizational structures, funding mechanisms, and standard function for these agencies are quite different from their local and county counterparts. Consider a state highway patrol agency's day-to-day focus on vehicular safety compared to the daily responsibilities of a police department in a major urban setting. These agencies clearly have different priorities and purposes. It is also important to note that very few deaths were attributed to state agencies (e.g., state highway patrol, state fish and wildlife) and thus, their exclusion is not expected to affect the study findings. Third, tribal agencies serve sovereign nations and have unique relationships not only with the communities they serve but also with government entities,

suggesting that the etiologic mechanisms that explain militarization and UOF may work differently for tribal agencies. Therefore, only local and county agencies were included in this study and functional differences between these two types of agency and concerns around overlapping populations and jurisdictional boundaries were accounted for through stratified models, which also facilitated interpretation for practical use.[139]

An additional ten LEAs with less than one full time officer were excluded. Agencies with only part-time coverage likely serve a very different function than agencies with round-the-clock officer support. These small agencies may simply not need someone on duty at all times or they may have officer sharing agreements between jurisdictions. For example, a small community without major demand for law enforcement can contract with a neighboring agency for support on an as-needed basis. This would indicate that the organizational and cultural factors relevant to a larger agency might not hold the same meaning for an agency averaging less than one officer at any given time. Furthermore, the nature of lethal UOF events associated with these agencies may be quite different from their larger full-time counterparts, suggesting the potential benefit of examining these agencies separately.

5.2.2 *Exposure*

The primary exposure of interest in this study was militarization as defined by a composite metric developed based on a conceptual framework of militarization developed by Simckes' et al.[98] Briefly, qualitative interviews were conducted with an interdisciplinary group of 12 subject matter experts on the topic of militarization, its definition, contributing factors, and downstream effects. Interviews were analyzed using a grounded theory approach and five key domains of militarization were identified: policing culture and mindset, military tactics,

procedures and protocols for community engagement, gear and technology, and training requirements. These five domains were operationalized into five individual metrics consisting of between three and six individual and composite variables drawn from the 2013 LEMAS survey (Figure 2.3). Each LEA was assigned a score for each domain based on its responses to the survey and a single composite metric comprised of a summation of the five individual metrics was calculated (Chapter 3). Composite militarization scores were standardized to a mean of 100 and standard deviation of 20 to simplify interpretation and remove negative values; scores ranged from roughly 22 to 180 with greater values indicating more militarization. It is important to note that the scale was from *less to more militarized* and not from non-militarized to militarized. Agencies with higher scores reported more militaristic characteristics while agencies with lower scores demonstrated a greater number of characteristics associated with actively trying to reduce militarization. Agencies falling in the middle of the scale had a blend of militaristic and anti-militaristic characteristics. For example, a single agency might have received positive points for not requiring reporting on officer weapon use but received negative points for having a broad range of community engagement and outreach activities designed to improve agency culture and mindset.

A single "unit" of militarization in the composite metric had limited practical interpretability; the difference between agencies separated by a single "unit" has no direct meaning without examining the underlying characteristics of each agency. In this research, the cumulative presence of several agency characteristics was of most interest. Thus, for purposes of this study and to increase opportunities for practical applications and interpretation, the militarization scores were translated into quintiles; the lowest quintile represented the least militarized of the agencies and the highest quintile represented the most militarized.

5.2.3 *Outcomes*

The primary outcome of interest in this study was the rate of lethal UOF deaths occurring from 2013-2017 at U.S. county and local LEAs. A five-year period was selected due to low incidence of lethal UOF events across the country; most LEAs report no lethal UOF events in a given year. This technique of aggregating deaths across multiple years has been recommended for the study of lethal UOF since the 1970's, when Sherman and Langworthy examined the validity and comparability of multiple data sources tracking lethal UOF in the U.S..[140]

To estimate the number of cases per agency during the 2013-2017 study period, probabilistic data linkage was employed to create a unified dataset of lethal UOF cases identified by four public databases that track such deaths: The Guardian, The Washington Post, Fatal Encounters, and Mapping Police Violence. These methods have been described in depth previously (see Chapter 4). Briefly, using LinkKing[126] software, data available for 2013-2017 from these four sources were linked probabilistically by name, date of death, and race. An initial 8,607 cases were identified and further restricted to include only those meeting the current case definition. Cases for this study were classified as deaths caused by the direct action of a law enforcement officer either on or off-duty. In order to apply this case definition, two groups of exclusions based on prior research[129] and new manual review of string text patterns were made to the final linked dataset. By establishing a hierarchy of automated exclusions using available data points for individual deaths, this study aimed to balance data validity and replicability for future research. The deaths identified through this process where further limited, as described below, for the present analyses. During the study period, the 2,740 participating LEAs were responsible for a total of 3,474 lethal UOF deaths.

Along with the count of deaths per agency, two denominators were used to estimate the rate of lethal UOF deaths during the study period. The first was the population served by the LEA during 2012 as defined by American Community Survey[141] estimates for jurisdictional boundaries (either Census place or county) for each LEA. This estimate is widely used in criminal justice research and is relatively easy to interpret. The second denominator was the number of fulltime sworn officers, estimated as follows, to account for officers employed only part-time:

$$\#\ full-time\ sworn\ officers + 0.5(\#\ part-time\ sworn\ officers)$$

Estimating the exact population at risk of dying of a UOF death was not possible, given blurred jurisdictional lines, mobile populations, and the difficulty of assessing who is truly "at risk" within the population served. The ideal denominator would have been the number of interactions of all kinds in each jurisdiction. However, given that this is not an estimable number, the two denominators used here were selected to contextualize the pure count data and weight it appropriately for comparison between agencies. Both denominators permit some relative comparison between agencies of different sizes and serving variable populations. The number of full-time sworn officers may be a better proxy for the frequency of interactions with the public than the size of the community alone. A large population spread across a very broad geographic area may be served by a small county agency, for example, while a very dense county population will likely be served by a larger county LEA. Therefore, including the element of agency size may better capture the relative differences between agencies with regard to community interaction.

5.2.4 *Covariates*

Figure 5.1 displays the relationship between militarization, lethal UOF, and several covariates that were selected a priori for inclusion in regression analyses. Covariates were mostly captured in 2012, at the same time as militarization, but some were captured in 2013 and could not be temporally differentiated from lethal UOF which was captured from 2013 to 2017. In addition, the temporal relationship between some of the presented variables is more complicated when viewed longitudinally; however, in this study the data were considered cross-sectional and are thus presented in Figure 5.1 without repeated measurements. Specific methods for covariate measurement are described below.

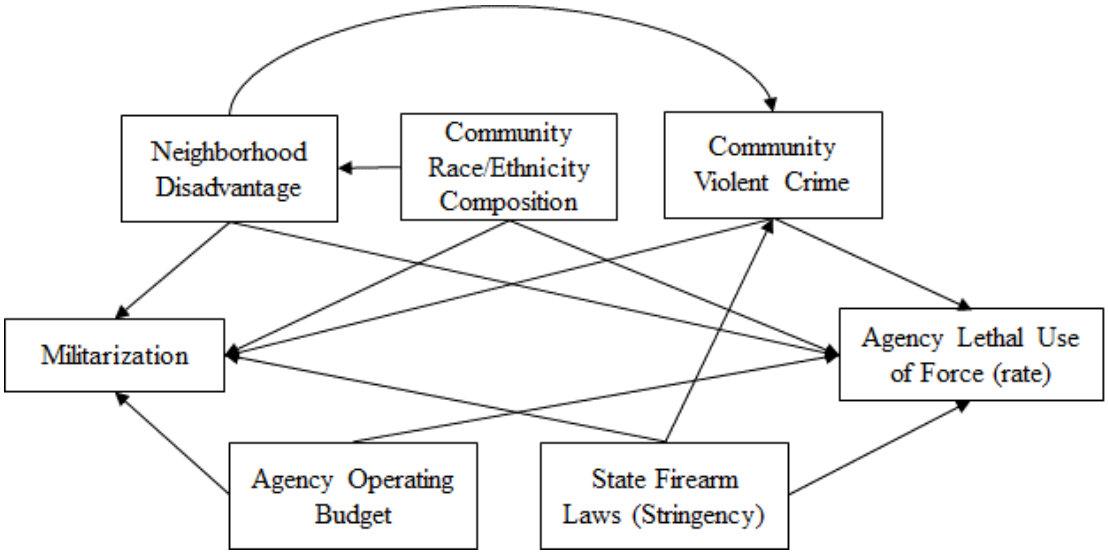

Figure 5.1 Relationships between militarization, lethal use of force, and community and agency-level covariates

5.2.4.1 Neighborhood Disadvantage

Meeks describes the historical progression of the "war on urban crime and war on the urban underclass" and the targeted and specific consequences for communities of lower socioeconomic status.[142] He highlights the evolution of policing towards more militaristic

practices as a reaction, in part, to the characteristics of the communities being policed. Meanwhile, community-level socioeconomic inequality, neighborhood disadvantage, and social disorganization have been previously linked to lethal UOF by police.[137,143-145] Including some assessment of neighborhood disadvantage in the present study was important for controlling the potential confounding effects of these characteristics on the relationship between militarization and lethal UOF. However, measuring these factors offered some methodologic challenges. Socioeconomic status, for example, is a well-established determinant of health outcomes and disparities across individual identity groups (e.g., race/ethnicity, sex, age,).[146-148] Researchers employ a range of techniques for quantifying socioeconomic status but the meaning behind these measurements, the reasoning for selecting a particular method, and the etiologic relevance for health outcomes of that selection are often not discussed.[148] For example, one might examine current income as a single measurement of socioeconomic status; however, this measurement is dependent on age, is associated with more nonresponse on surveys, and cost of living can differ dramatically across neighborhoods.[148] Educational attainment may seem a more informative proxy for the concept of socioeconomic status but it is not always associated with greater income, it can have different meaning for different cultural and social settings, and it fails to recognize the actual benefits (cognitive, psychological, social) gained during each year of education.[148] Put simply, neighborhood characteristics are complex and often include several subordinate concepts that, if examined in isolation, may offer an incomplete assessment of the broader construct.

Unfortunately, many standard health and mortality registries fail to capture detailed information on key social determinants of health like family socioeconomic status and neighborhood characteristics, so the ability to study the effects of these on individuals is

limited.[149] At an aggregate level, however, estimation of community characteristics using geographically-based ACS data is possible. The present analyses were conducted at the LEA level, as such, this study required appropriate aggregate measures of community characteristics for the relevant jurisdictional lines. As previously mentioned, Census place and county codes were used to approximate these boundaries.

A variety of indices have been constructed to estimate neighborhood disadvantage more robustly by capturing a range of neighborhood characteristics (e.g., income, housing, employment, and education) measured in the ACS.[149-151] Selection of one index for use in this study was based on availability of documented methods and prior applications in the social sciences literature.[146,147,152] This study employed the Area Deprivation Index (ADI), also commonly referred to as the Neighborhood Atlas. Developed in 2003 by Singh, the ADI was constructed using principal components analyses (PCA) which indicated 17 key variables (Table 5.2) that were ultimately included in the final index.[149] Singh used PCA factor loading scores as weights for each of these variables, summed them together to make a raw index score, and then standardized the final scores. Singh and other researchers using this index recommend transforming the scores into quintiles as the continuous data are less readily interpreted.[146,152]

To implement the ADI, ACS 2014 5-year estimate data were obtained via the Social Explorer platform.[153] These data were selected as they center around 2012, the same year in which militarization was assessed in this study. ACS variables comprising the ADI were used to construct the 17 ADI elements; a single element sometimes corresponded to a single variable (e.g., median gross income) while other elements required some further calculation. For example, the ACS does not publish a single variable that measures single parent households with children under 18 years of age; this was constructed by combining variables capturing father-

only and mother-only households and dividing this by the full number of families in the geographic zone. White collar professions are also not specifically identified in ACS data but an element of the ADI is the proportion of the workforce in white collar jobs. To address this, "non-service" occupations, as defined by the ACS, were considered white collar; however, there is no documentation available describing what Singh used when constructing original ADI. Income disparity also required some calculation. Using Singh's original bounds, income disparity was calculated as:

$$\log\left(100 * \frac{\#\ households{<}\$10{,}000\ annual\ income}{households\ {\geq}\$50{,}000\ annual\ income}\right)$$

Missing data for the 17 elements of the ADI were estimated using stochastic regression imputation. The 17 elements were then weighted by their relevant factor loadings and summed to produce a single raw ADI score for each geographic unit. While Singh published factor loadings from PCAs at the county, Census block, and Census tract levels, there are no published loadings for Census place. For these analyses, county-level factor loadings for the 17 ACS elements were applied to the Census place data. While this may introduce some bias, we anticipate little effect on our findings, as the variation between Singh's previously published factor loadings for different geographic units was minimal and Census place would logically fall somewhere within this spectrum as it is larger than tract and block but smaller than county. Weighted scores were standardized, in line with the original ADI methodology, to a mean of 100 and standard deviation of 20. In the final ADI variable, higher scores indicated greater deprivation while lower scores denoted less deprivation. Scores were then translated into quintiles, as indicated by Singh. This process was conducted separately for county-level ACS data and again for Census Place data, and eventually was linked to the final dataset using the relevant geographic identifier.

Table 5.1 Area deprivation index: American Community Survey (ACS) tables and factor weights

Component Variable	ACS Table	Factor Loading *(Weight)*
Education		
Population aged ≥25 y with <9 y of education, %	B15003	0.7885
Population aged ≥25 y with at least a high school diploma, %	B15003	–0.8231
Employment		
Employed persons aged ≥16 y in white-collar occupations, %	C24010	–0.6890
Civilian labor force population aged ≥16 y unemployed, %	B23025	0.5679
Income		
Families below poverty level, %	B17010	0.8796
Population below 150% of the poverty threshold, %	C17002	0.9266
Median family income, $	B19113	–0.9218
Income disparity[b]	B19001	0.8827
Median home value, $	B25077	–0.6740
Median gross rent, $	B25064	–0.7876
Median monthly mortgage, $	B25088	–0.7812
Housing		
Owner-occupied housing units, % (home ownership)	B25003	–0.4408
Households with more than 1 person per room, % (crowding)	B25014	0.4018
Single-parent households with children aged <18 years, %	B11003	0.3329
Households without a motor vehicle, %	B25044	0.4549
Households without a telephone, %	B25043	0.7830
Occupied housing units without complete plumbing, %	B25016	0.6392

[a] Weights drawn from Singh (2003)[149]
[b] Log of 100 * (households < $10,000 in income/ households ≥ $50,000 income)

All county agencies were assigned the relevant county-level ADI score and rank. Of the 2,034 local agencies included in this study, 1,561 were associated with ACS "place codes". Place codes are generated for major metropolitan areas and some other districts. Compared to smaller cities, major metropolitan areas tend to differ more from more rural areas situated in the same county, suggesting that using Place-oriented data rather than county-oriented data for these highly populated areas is preferable, where possible, 1,561 local agencies that did have a relevant place code were assigned ADI values associated with that place code. There were 473 local agencies that did not have a relevant place code who were instead assigned their county-level ACS values.

5.2.4.2 Neighborhood Racial and Ethnic Composition

The history of policing in the US, and in particular militarized policing, is inextricably linked to race and racism.[37] Militarization of a policing agency does not affect the racial and ethnic composition of the population served as one's personal race is static and unaffected by external factors. However, historical evidence indicates that an agency's militarized practices are indeed influenced by characteristics of the community it polices.[37] Furthermore, prior research also shows that law enforcement officers tend to use lethal force more frequently when encountering a person of color compared to a white individual.[32,129,145,154-161] At the community level, the proportion of Black or African American individuals in a given region has also been linked to lethal UOF.[109] In this ecologic analysis, the racial and ethnic composition of communities served by LEAs may play an important role in predicting the rate of lethal UOF deaths[129,143] and also influencing agency-level practices related to militarization.[37]

This study used ACS estimates of aggregate community racial and ethnic composition, through inclusion of two covariates: the proportion of the population that is Black or African American and the proportion of the population that is Hispanic. These data, collected by the ACS, are self-reported by respondents but are limited by the options available on the survey. Granularity is lost with the categories listed on the ACS and therefore some of this was translated to the present analyses. However, there is currently no evidence that more granular race and ethnic identities may be more strongly associated with lethal UOF or militarization, thus the broader categories should have sufficiently addressed potential confounding. It is also important to note that there is a difference between an aggregate proportion and the actual geographic distribution of racial and ethnic patterns in a given area. One prior study found that while LEAs in counties with higher *proportions* of African Americans were *less* likely to acquire new mine-

resistant ambush protected (MRAP) vehicles, when race was examined instead in the form of racial *segregation* there was a *positive* relationship between MRAP acquisition and increased segregation.[162] While the relationship between policing and health may be influenced differently by patterns of racial and ethnic segregation compared to overall racial and ethnic community composition, the former could not be accounted for with the data used in the present study but could be integrated into future research.

5.2.4.3 Violent Crime

Prior research conducted over the last several decades has established a relationship between neighborhood-level violence and shootings by police, suggesting that the criminogenicity of a particular area influences officer behavior.[109,140,143,145] In order to account for neighborhood criminogenicity in these analyses, violent crime rate was included as a covariate. The FBI defines violent crime as murder and nonnegligent manslaughter, rape, robbery, and aggravated assault. In the present study, data were drawn from the FBIs Uniform Crime Reporting (UCR) program for violent crimes reported by LEAs in 2012.[163] Violent crime estimates were calculated as the sum of all cases of murder and nonnegligent manslaughter, rape, robbery, and aggravated assault reported by each LEA to the UCR Program and divided by the population served to generate violent crime rates. The violent crime rate assessed at the start of the study period was assumed constant over the subsequent years, though there may in reality have been some variation. However, given the cross-sectional nature of the study, accounting for such subsequent variation in crime rate during the study period was not necessary. The longitudinal associations between policing and community trends in crime have been studied previously[164] and future study of repeated measures of crime, militarization, and UOF within communities may be warranted, but is beyond the scope of the current research.

5.2.4.4 State Firearm Policy

State laws related to gun access, background checks, gun sales, reporting requirements for lost or stolen guns, and regulation of ammunition vary by state and can influence both community availability of guns and patterns of gun violence.[165,166] Kivisto et al. found that stricter state-level firearm legislation was associated with fewer fatal shootings *by* police officers annually,[167] while Swedler et al. identified that a greater prevalence of firearms in the community was linked to increased firearm homicides *of* police officers.[168] Hemenway et al. found similar results, identifying elevated rates of fatal shootings by police officers in areas with greater household gun ownership.[169] While these studies do not address the etiologic relationship between firearm prevalence and militarization of LEAs, the association between firearm prevalence and deaths of police and caused by police suggests that firearm prevalence contributes to contentious community-police relations that are likely components or predictors of militaristic trends within LEAs.

To describe the cumulative stringency of state firearm policies and their relationship with firearm violence, the Giffords Law Center to Prevent Gun Violence[170] and the Brady Campaign[171] annually evaluate and rank states based on these policies. Laws deemed to be more stringent score higher while laws that increase the risk of gun violence result in point deductions from final scores. States are then ranked, scores curved, and letter grades assigned. This study employed the 2013 State Scorecard for gun laws which addresses 30 policies related to firearms.[166] Curved scores were linked to LEAs included in this study based on the agencies' home state. Overall, the median of the scores was 21.50, with a SD of 21.57 and range from 6 to 89. The State Scorecard did not include a value for Washington D.C., so agencies in D.C. were

assigned the score of the state with the most similar firearm policy profile which happened to be California (score=89).

While 2012 data were used for all other covariates, firearm policy stringency was measured in 2013 (the first year of deaths included in this study) due to a sharp increase in new state-level firearm legislation in the wake of the 2012 Newtown, Connecticut shooting at the Sandy Hook elementary school.[166] In 2013 alone, 21 states enacted new laws around gun violence. These scores essentially represent a ranking of states by policy stringency, and relative ranks are not likely to change substantially from year to year, with the exception of the shift from 2012 to 2013. Furthermore, this study is cross-sectional, and because the effects of new policies are not expected to result in immediate change in firearm access and prevalence, the fact that the firearm policy data are captured one year later than other covariates in these models is of minimal concern to interpretability and validity of the study findings.

5.2.4.5 Operating Budget

To quantify financial resources at the agency-level, LEMAS asks respondents to report the total operating budget in U.S. dollars. However, among included agencies, 7% were missing this value. With no unifying explanation for non-response in this variable, it was assumed missing values were missing at random and stochastic regression imputation was used to estimate these missing values. Stochastic imputation improves upon mean imputation techniques by leveraging known values of other variables to predict missing values rather than simply assigning an overall variable mean.[172] This technique also adds a normally distributed residual term to better account for variability in the data. Stochastic regression imputation was selected over more precise multiple imputation methods due to its simplicity and the fact that determining the relative ranking for this covariate was sufficient for these analyses. Four variables with no

missingness were included in the imputation model: size of the population served in 2012, number of fulltime sworn officers, agency stratification code (a LEMAS-defined variable describing agency size and jurisdiction – local, county, etc.), and the composite militarization score defined earlier. Values were imputed for 193 missing observations. Bivariate analyses confirmed that the final imputed version of the operating budget variable did not differ significantly from the original (p=.9788)

5.2.5 *Linking Death and Militarization Datasets*

Once the deduplicated dataset of lethal UOF deaths was finalized and the militarization scores for each LEA were calculated, these two datasets required merging at the LEA level. First, the specific agency responsible for each death had to be established so aggregate counts could be estimated. Unfortunately, with multiple originating datasets for the lethal UOF data, the method with which responsible agencies were identified, named, and input was inconsistent, as was notation of key geographic variables like the county or state associated with the death. This complicated the process of linking the aggregate lethal UOF data to the LEMAS militarization dataset, requiring several data management steps to ensure that LEA-identifying variables were comparable between the two datasets.

5.2.5.1 Responsible Law Enforcement Agency

An essential component of these analyses was the identification of a single agency responsible for any particular death such that a cumulative count could be calculated and then used in the final analyses. While it is not uncommon for multiple LEAs to respond to the same event, to attribute a single UOF death to multiple agencies would inflate our estimates of national UOF trends. Future efforts could, however, examine some of these multiagency responses and

how they might differ from those where only a single agency is involved. For purposes of these analyses, only a single agency was identified for each death.

In order to maximize the accuracy of agency identification, a dual automated and manual process of linking each death to a responsible agency was implemented. First, all deaths that did not have a county listed in any of the originating databases were manually assigned one based on the available information and news media records of the death. For example, if a death had a responsible agency listed as “King County Sheriff’s Department” then “King” was assigned as the county variable value. If a death did not have a county specified in the agency name, media reports were referenced. Second, county and state values were linked to the corresponding Federal Information Processing Standards (FIPS) code; one FIPS code is assigned to every county in the country. FIPS codes assisted with data quality checks and merging in subsequent steps, though as described below, FIPS place codes were also used for data merging.

Third, for deaths were multiple agencies were listed either by a single originating database or across multiple databases, a prioritization process (both using statistical analysis software and conducted manually) was used to select only a single agency. Specifically, where possible the most local agency (e.g., Seattle Police Department) was selected over higher level agencies (e.g., King County Sheriff). Where multiple local agencies were listed, generally the first agency was selected. However, in cases where agency names were difficult to decipher due to entry errors, a review of related new media reports was used to determine the primary agency involved. If a death was associated with a federal or tribal agency alone, with no local or county agency involvement, that death was excluded. In each of these steps, naming conventions and spelling errors were common, and several data cleaning techniques were used to try and limit the

proportion of cases requiring manual review. For example, labels such as “office” and “department” were removed as were all forms of punctuation.

5.2.5.2 Law Enforcement Agency Identifier Crosswalk

Once each lethal UOF death had a single responsible agency and county-level FIPS code associated to it, the deaths were linked to FBI Law Enforcement Agency Identifier Crosswalk (LEAIC) data (Figure 5.2). LEAIC contains a list of law enforcement and corrections agencies in the U.S., each assigned a series of identifiers associated with other FBI and non-FBI datasets (e.g., U.S. Census, UCR). While LEAIC does have a LEMAS identifier, it does not correspond accurately to any of the identifier variables in the LEMAS data, thus it was not used. Rather, a combination of FIPS code and agency name was used to merge LEAIC and UOF datasets, with the final goal of linking each death to a single LEAIC observation (agency). This process was complicated by several of the same naming convention issues described earlier, thus similar adjustments to the formatting of agency names in LEAIC were applied.

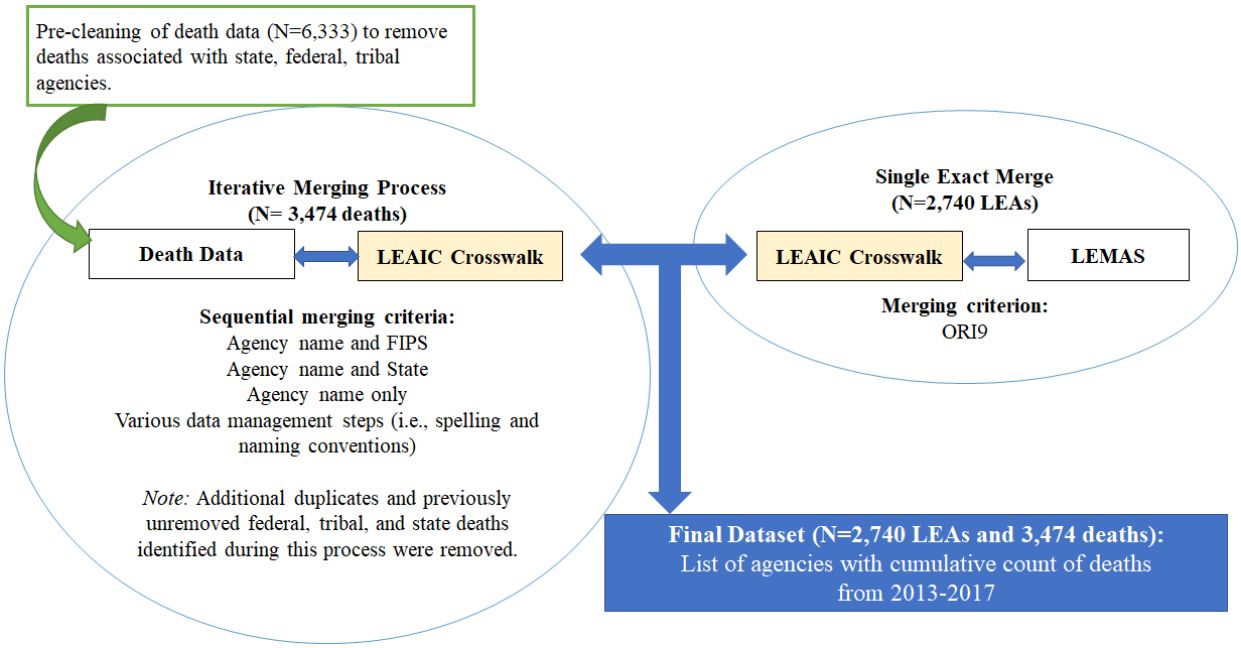

Figure 5.2 Steps for merging lethal use of force and militarization data

The process of linking agencies from the UOF and LEAIC datasets revealed certain patterns in the UOF data that required further attention. First, some deaths listed an agency name that was in LEAIC, but the FIPS code did not align. In some situations, this was a death that occurred outside of the jurisdictional lines of the agency involved. For example, during a vehicle pursuit that crossed state lines, one death occurred in a state that was not the same as the state to which the agency belonged, leading the person who input the UOF data to provide the correct agency name but state and county information for the location of death rather than the location of the agency. Similarly, an agency could be responsible for a particular death that occurred within their home state but outside of their jurisdiction, also leading to complications in the data entry process. As there were four original databases used to generate the list of deaths, the problems were compounded by variation in data entry methodology used by these different organizations. For deaths associated with a county agency, automated text searching was used to scan for the name of the county within the agency name and assign that as the county value for a particular death, overriding the name that was manually input originally. Deaths associated with local agencies also faced similar linkage issues. The most common of which was the use of additional labels (e.g., city, district, borough, township) inconsistently across the LEAIC and the UOF datasets. Through manual review of roughly 100 deaths, many of these patterns were identified and addressed through automated text searching and data management, but some required full manual correction. Many of these deaths occurred in Pennsylvania and New York, where these sorts of city naming conventions are more common.

The final combined lethal UOF and LEAIC dataset included a row for each death merged with agency data from LEAIC. One of these variables, ORI9, is unique to every agency in the country and is also captured in LEMAS. The first step required identification of ORI9 codes for

68 LEMAS agencies that did not have ORI9 codes listed in the LEMAS data. The next step was a simple merging of LEMAS and the UOF/LEAIC data by ORI9 code. At this stage, further exclusions were made for deaths associated with federal, state, and tribal agencies, and all deaths were aggregated to the agency level in a new "count" variable for the number of deaths associated with each agency during the study period. Using similar techniques and ORI9 codes, UCR data on violent crime were brought in for each agency. ACS data used to estimate the ADI, as described earlier, were also brought in using FIPS place and county identifiers.

5.2.6 *Analyses*

All analyses were conducted in either SAS 9.3 software[173] or STATA software[174]. Analyses were weighted by LEMAS sampling weights to permit extrapolation to all LEAs nationwide. Weighted descriptive analyses of exposure and covariate variables were calculated in the form of weighted frequencies and medians with 95% confidence intervals, both in total and stratified by agency type (i.e., county vs. local). A small number of agencies reported unusually high or low values for some of these variables, thus medians were estimated for continuous variables to account for some of the skewness that appeared in the means. The average rate of lethal UOF for each quintile of militarization was also estimated and stratified by agency type. For these weighted rates, means and standard deviations were presented; agencies frequently reported no deaths at all, and thus median values, which were mostly zero, were far less informative than means.

5.2.6.1 Primary Analyses

As the number of deaths caused by each agency was the primary outcome in this study, either a Poisson or negative binomial approach was required. Negative binomial regression

models were fit due to their ability to account for overdispersion present in the data. The size of the population served and the number of full-time sworn officers were each used in half of the models as offsets, which serve as denominators for the count data. All analyses were stratified by LEA type (i.e., county vs. local) as prior evidence suggests differences in the evolution and nature of militarization within agencies serving populations of varying size.[76,139] Eight crude and eight adjusted models were fit using the present data. Crude models included only the exposure (militarization) and an offset term. Adjusted models included as covariates total LEA operating budget, percent African American/Black and percent Hispanic in the community served, state firearm legislation stringency, and violent crime rate. Both rate ratios and rate differences for the lethal UOF during the study period were estimated. These effect measures were interpreted cross-sectionally.

5.2.6.2 Sensitivity Analyses

Sensitivity analyses were used to further explore the relationship between militarization and lethal UOF as defined in this study. First, to determine if potential lack of independence among LEAs within the same state might be driving the results, models were run both with and without the one state-level variable (state firearm policy stringency) to examine the effect on the standard errors. Second, continuous militarization scores were included in crude and adjusted models to rule out the possibility that there was any added value to maintaining this granularity in the models. Third, the militarization metric was subdivided into its component five domains which were then recorded into binary variables, up to and including the median compared to greater than the median. To test the potential value of examining these domain-specific operationalizations independently of each other, local agency models using the full-time sworn officer denominator were fit to estimate the rate ratio associated with each specific domain,

accounting for the same covariates as in the primary models. Finally, the primary negative binomial models were fit without an offset term; instead, they included a covariate for the ratio of the number of full-time sworn officers to the size of the population served. It is possible that accounting for both of these variables in the same model would better estimate the relative frequency of police-community encounters between jurisdictions than either of these variables alone. This ratio did not, however, approximate population density which may also be informative.

5.3 Results

A total of 2,740 LEAs were included in this nationally representative sample, of which 2,023 were local and 717 were county agencies (Table 5.3). Local LEAs tended to be situated in states with stricter firearm policies than county agencies and also had, on average, higher violent crime rates. Local agencies also served jurisdictions with more African American/Black and Hispanic residents than county LEAs. Among county LEAs, area deprivation was skewed lower, with 26.71% (95% CI: 24.30, 29.12) of local LEAs located in districts in the lowest quintile of area deprivation compared to 11% in the highest quintile. The pattern was less consistent among county LEAs, with the largest number (23.54%, 95% CI:18.82, 27.25) situated in regions in the third quintile for area deprivation, followed by 21.77% (95% CI: 18.43, 25.10) in the second and 20.00%(95% CI: 16.32, 23.69) in the fifth. Among local agencies, the distribution of militarization did not appear to follow a unidirectional trend either, with the greatest number of local agencies falling in the second quintile (26.03%, 95% CI: 23.21, 28.85) and the smallest number in the fifth (22.68%, 95% CI: 19.89, 25.47). County LEAs were most frequently in the fifth (28.55%, 95%CI: 24.62, 32.47) and second (23.81%, 95% CI: 20.23, 27.38) quintiles.

Overall, the mean lethal UOF death rate for all agencies was 1.18 deaths per 100,000 population served (standard deviation (SD): 14.16) and increased from 0.97 (SD: 9.18) to 1.49 (SD: 18.66) from the lowest to highest categories of militarization. The overall mean death rate per 100 full-time sworn officers was 0.65 (SD: 6.33), following a similar trend of lower rates among the lower militarization quintiles compared to the higher quintiles. Death rates varied between local and county agencies across both denominators. Overall, local LEAs were responsible for an average of 1.24 (SD: 15.57) deaths per 100,000 population served compared to 0.95 (SD: 9.10) among county agencies (Table 5.4), and local LEAs were responsible for 0.58 (SD: 6.22) deaths per 100 full-time sworn officers compared to 0.94 (SD: 6.61) for county agencies (Table 5.5). Death rates increased from the lowest to highest quintiles of militarization among local LEAs when estimated using the size of the population served, with the exception of the third quintile which had the second lowest death rate. Local LEA death rates fluctuated between quintiles even more when estimated using the full-time sworn officer denominator. Meanwhile county LEAs showed a mostly unidirectional increase in rates from the lowest quintile to the highest across both denominators, with the exception of the third quintile in both, which had the second highest death rate.

5.3.1 *Primary Analyses - Local Law Enforcement Agencies*

Crude rate ratios for the relationship between militarization and lethal UOF among local LEAs were consistently statistically insignificant across both population size and agency size models, with estimates ranging between 1.14 (95% CI: 0.84, 1.54) and 1.24 (95% CI: 0.90, 1.20) (Tables 5.6 and 5.7). This suggests that greater militarization was not significantly associated with more deaths than agencies with the least militarization. Rate ratios across both models decreased after covariate adjustment and remained statistically insignificant. This shift in the rate

ratios closer to zero suggests that the collective association between the covariates and militarization was in the same direction as the association between the covariates and lethal UOF. The direction of these relationships is in line with prior literature. On the absolute scale, rate differences between the lowest level of militarization and the higher quintiles were also statistically insignificant (Tables 5.8 and 5.9). For example, among local LEAs, an excess of 0.07 deaths death per 100 full-time sworn officers (95% CI: -0.17, 0.32) would be expected for agencies with the highest militarization compared to the lowest militarization. Again, however, these rate differences were not statistically significant.

5.3.2 *Primary Analyses – County Law Enforcement Agencies*

Crude rate ratios for the relationship between militarization and lethal UOF among county LEAs were statistically insignificant as well, with no particularly notable patterns emerging across levels of militarization (Tables 5.6 and 5.7). Adjustment for covariates had different effects on the rate ratio estimates, with rate ratios moving away from zero for the second and third quintiles and closer to zero for the third and fourth. However, the effect estimates overall moved only slightly after confounding adjustment and the comparability of the confidence intervals suggests that conclusions should likely not be drawn from this divergent pattern. Rate differences were also statistically insignificant but were greatest comparing agencies with the lowest and the highest two levels of militarization (Tables 5.8 and 5.9).

Table 5.2 Weighted[1] descriptive statistics (median or % and 95% confidence interval) for law enforcement agency[2] and jurisdictional characteristics

	Local LEAs n=2023	**County LEAs n=717**	**Total N=2,740**
Median state firearm policy stringency[3]	21.19(20.04, 22.33)	15.97(15.76, 16.19)	19.87(18.45, 21.30)
Median % African American/Black (community)	3.19(2.76, 3.62)	2.30(1.61, 2.99)	2.96(2.54, 3.38)
Median % Hispanic (community)	4.46(4.09, 4.84)	3.53(3.08, 3.99)	4.29(4.01, 3.51)
Median number of violent crimes per 1000 people	5.95(5.25, 6.65)	2.38(2.08, 2.67)	4.66(4.06, 5.26)
Area Deprivation Index quintile distribution[4]			
(lowest deprivation) Quintile 1	26.71(24.30, 29.12)	14.86(12.43, 17.29)	24.29(22.32, 26.26)
Quintile 2	23.81(21.25, 26.38)	21.77(18.43, 25.10)	23.40(21.24, 25.55)
Quintile 3	22.35(19.65, 25.04)	23.54(19.82, 27.25)	22.59(20.32, 24.87)
Quintile 4	16.11(13.59, 18.63)	19.83(16.24, 23.43)	16.87(14.73, 19.00)
(highest deprivation) Quintile 5	11.02(8.69, 13.36)	20.00(16.32, 23.69)	12.86(10.85, 14.86)
Militarization quintile distribution[4]			
(lowest militarization) Quintile 1	17.58(15.41, 19.75)	10.47(7.92, 13.03)	16.13(14.33, 17.93)
Quintile 2	26.03(23.21, 28.85)	23.81(20.23, 27.38)	25.58(23.21, 27.94)
Quintile 3	16.24(14.17, 18.30)	19.09(15.81, 22.37)	16.82(15.04, 18.59)
Quintile 4	17.47(15.09, 19.86)	18.09(14.76, 21.42)	17.60(15.58, 19.61)
(highest militarization) Quintile 5	22.68(19.89, 25.47)	28.55(24.62, 32.47)	23.88(21.52, 26.24)

[1] Sampling weights assigned from the Law Enforcement Management and Administrative Statistics survey (2012)

[2] LEAs: Law Enforcement Agencies

[3] State firearm policy stringency from the 2013 State Scorecard *(Brady Campaign and Giffords Law Center to Prevent Gun Violence).* Higher scores correspond to stricter policies, overall score range: 6, 89.

[4] The percent of agencies in each quintile.

Table 5.3 Weighted[1] rates (number of deaths per 100,000 population) by law enforcement agency[2] type and militarization status: 2013-2017

		Local LEAs Mean Rate (SD)	County LEAs Mean Rate (SD)	Total Mean Rate (SD)
Overall		1.24(15.57)	0.95(9.10)	1.18(14.16)
(lowest militarization)	*Quintile 1*	1.04(10.02)	0.49(2.66)	0.97(9.18)
	Quintile 2	1.17(15.39)	0.60(2.95)	1.06(13.39)
	Quintile 3	1.10(12.69)	0.96(6.96)	1.07(11.38)
	Quintile 4	1.38(18.57)	0.64(3.48)	1.22(15.90)
(highest militarization)	*Quintile 5*	1.46(19.65)	1.60 (16.36)	1.49(18.66)

Table 5.4 Weighted[1] rates (number of deaths per 100 full time sworn officers) by law enforcement agency[2] type and militarization status: 2013-2017

		Local LEAs Mean Rate (SD)	County LEAs Mean Rate (SD)	Total Mean Rate (SD)
Overall		0.58(6.22)	0.94(6.61)	0.65(6.33)
(lowest militarization)	*Quintile 1*	0.54(4.65)	0.58(2.73)	0.54(4.37)
	Quintile 2	0.55(5.32)	0.70(3.12)	0.58(4.86)
	Quintile 3	0.51(4.89)	0.79(4.56)	0.57(4.80)
	Quintile 4	0.70(8.64)	0.77(4.07)	0.71(7.65)
(highest militarization)	*Quintile 5*	0.61(7.43)	1.48(11.45)	0.82(8.94)

[1] Sampling weights assigned from the Law Enforcement Management and Administrative Statistics survey (2012)
[3]LEAs: Law Enforcement Agencies

Table 5.5 Rate ratios[1] of lethal use of force per 100,000 population served across levels of law enforcement agency[2] militarization, 2013-2017

	Local LEAs		**County LEAs**	
	Crude RR (95%CI)	Adjusted[3] RR(95%CI)	Crude RR (95%CI)	Adjusted[3] RR (95%CI)
Militarization (low to high)				
Quintile 1	*(reference)*	*(reference)*	*(reference)*	*(reference)*
Quintile 2	1.21(0.92, 1.59)	1.14(0.86, 1.50)	1.05(0.67, 1.65)	1.08(0.74, 1.60)
Quintile 3	1.22(0.90, 1.64)	1.08(0.81, 1.44)	0.95(0.57, 1.60)	1.03(0.66, 1.63)
Quintile 4	1.24(0.90, 1.20)	1.18(0.86, 1.63)	1.17(0.70, 1.97)	1.12(0.72, 1.77)
Quintile 5	1.20(0.86, 1.67)	1.12(0.81, 1.55)	1.21(0.75, 1.97)	1.16(0.76, 1.77)

Table 5.6 Rate ratios[1] of lethal use of force per 100 full-time sworn officers across levels of law enforcement agency[2] militarization, 2013-2017

	Local LEAs		**County LEAs**	
	Crude RR (95%CI)	Adjusted[3] RR(95%CI)	Crude RR (95%CI)	Adjusted[3] RR (95%CI)
Militarization (low to high)				
Quintile 1	*(reference)*	*(reference)*	*(reference)*	*(reference)*
Quintile 2	1.20(0.90, 1.60)	1.13(0.85, 1.51)	1.04(0.68, 1.58)	1.05(0.71, 1.57)
Quintile 3	1.14(0.84, 1.54)	1.06(0.79, 1.43)	0.93(0.57, 1.52)	0.99(0.62, 1.58)
Quintile 4	1.23(0.88, 1.71)	1.21(0.87, 1.69)	1.23(0.76, 2.00)	1.21(0.77, 1.92)
Quintile 5	1.20(0.85, 1.68)	1.11(0.79, 1.55)	1.24(0.79, 1.94)	1.17(0.76, 1.80)

[1] Rate ratio (RR)
[2] Law enforcement agency (LEA)
[3] Adjustment for: Area Deprivation Index, community % African American and % Hispanic, operating budget, violent crime rate, and state firearm law stringency

Table 5.7 Rate differences[1] of lethal use of force per 100,000 population served across levels of law enforcement agency[2] militarization, 2013-2017

	Local LEAs		County LEAs	
	Crude RD (95%CI)	Adjusted[3] RD(95%CI)	Crude RD (95%CI)	Adjusted[3] RD (95%CI)
Militarization				
Quintile 1	*(reference)*	*(reference)*	*(reference)*	*(reference)*
Quintile 2	0.28(-0.10, 0.66)	0.18(-0.20, 0.56)	0.03(-0.25, 0.31)	0.06(-0.22, 0.34)
Quintile 3	0.28(-0.14,0.71)	0.11(-0.29, 0.50)	-0.03(-0.34, 0.28)	0.03(-0.37, 0.35)
Quintile 4	0.31(-0.15, 0.77)	0.24(-0.22, 0.70)	0.11(-0.24, 0.45)	0.09(-0.25, 0.42)
Quintile 5	0.26(-0.22, 0.73)	0.16(-0.29, 0.62)	0.13(-0.195, 0.46)	0.11(-0.21, 0.44)

Table 5.8 Rate differences[1] of lethal use of force per 100 full-time sworn officers across levels of law enforcement agency[2] militarization, 2013-2017

	Local LEAs		County LEAs	
	Crude RD (95%CI)	Adjusted[3] RD(95%CI)	Crude RD (95%CI)	Adjusted[3] RD (95%CI)
Militarization				
Quintile 1	*(reference)*	*(reference)*	*(reference)*	*(reference)*
Quintile 2	0.14(-0.08, 0.36)	0.09(-0.12, 0.30)	0.03(-0.30, 0.36)	0.05(-0.30, 0.39)
Quintile 3	0.10(-0.13, 0.33)	0.04(-0.17, 0.25)	-0.06(-0.42, 0.31)	-0.01(-0.40, 0.38)
Quintile 4	0.16(-0.10, 0.43)	0.15(-0.11, 0.41)	0.18(-0.25, 0.60)	0.18(-0.25, 0.60)
Quintile 5	0.14(-0.13, 0.41)	0.07(-0.17, 0.32)	0.19(-0.20, 0.57)	0.14(-0.24, 0.53)

[1] Rate difference (RD)

[2] Law enforcement agency (LEA)

[3] Adjustment for: Area Deprivation Index, community % African American and % Hispanic, operating budget, violent crime rate, and state firearm law stringency

5.3.3 *Sensitivity Analyses*

Removing the variable for state firearm policy stringency had no notable impact on standard errors; a lack of independence among within-state LEAs did not likely drive the final results. However, further assessment of the role of potential clustering in the data is warranted in future research. Models fit with a continuous militarization predictor offered similarly insignificant effect estimates to the primary models for the association between militarization and lethal UOF, suggesting no added benefit of examining this construct on a continuous scale. Furthermore, effect estimates based on the continuous militarization variable had less meaningful interpretations. None of the models containing binary militarization domain predictors significantly predicted lethal UOF in this study. Models fit with a covariate for the ratio of the number of full-time sworn officers to the size of the population served produced comparable estimates to the primary models, identifying no statistically significant relationships between militarization and lethal UOF. As these sensitivity analyses offered no meaningful or significant findings, the data for these analyses are not presented here.

5.4 DISCUSSION

The present study findings at first glance appear to support the hypothesis that there is no association between militarization and the lethal UOF. The notion that these concepts are entirely unrelated is unlikely; a wealth of interdisciplinary literature agrees that there are associations between components of the proposed conceptual framework for militarization and the lethal UOF.[93,109,137,139,175-178] However, it is still possible that these null findings indicate that militarization and lethal UOF are truly unrelated constructs. Under these circumstances, future research ought to examine these issues as separate phenomena of policing that may have some

contextual relevance for each other rather than any causal association. For example, one could study the role of lethal UOF in a community in predicting individual or aggregate mental health outcomes among community members, including militarization as a potential stratifying concept rather than a mediator of the UOF→mental health relationship. One might also examine militarization and lethal UOF collectively as potential risk factors for a community that has previously experienced trauma, or as outcomes of some other higher level factor that influences how LEAs engage with the communities they serve.

It may also be that lethal UOF is simply too rare an event to be of practical or statistical significance. The rate differences shown here (i.e., the excess deaths expected due to greater levels of militarization) were so small and statistically insignificant that they suggest that changing militarization within agencies may have no practical impact on the number of lethal UOF deaths in any direction. However, there may be other outcomes (e.g., depression, anxiety, psychosis, injury) associated with militarization that are not only more common but also may offer more concrete points for intervention. Therefore, the null findings presented here may indicate the advantages, both practical and statistical, of shifting research to examine more readily modifiable policing factors associated with population health.

If there is in fact a true relationship between militarization and lethal UOF, as the literature suggests, the reason for the present null findings likely lies in the nature of the data used to conduct these analyses. First, data on lethal UOF in the U.S. is flawed. As previously discussed, there is widespread underreporting and a lack of consensus around how to define a death caused by law enforcement,[54,56,57,175,179] with various studies implementing their own inclusion criteria to meet their research needs.[64,125,129] Furthermore, the lack of a publicly available national database on these deaths has forced researchers to turn to crowdsourced efforts

to trace lethal UOF. Indeed, a systematic review of 56 empirical studies on the UOF found that operationalization of UOF was not only inconsistent across these studies, but also often relied on unvalidated survey items administered to convenience samples.[125] The present study was therefore constrained by the definitions employed by the source UOF databases (i.e., The Washington Post, The Guardian, Fatal Encounters, Mapping Police Violence). The integration of multiple data sources and manual application of further inclusion criteria improved the validity of the present study, but without a gold standard to which to compare, the actual accuracy of the death data included in this research cannot be fully evaluated.

The second data-related issue that may explain the lack of statistically significant findings in this research relates to the measurement of militarization. The conceptual framework for militarization employed in this study describes five domains under which several subordinate concepts are situated (see Chapter 2). The present study was limited to existing data related to these domains, namely, the results of the 2013 LEMAS survey. Despite its limitations, LEMAS is still one of the most, if not *the* most, robust assessments of policing practices among a nationally representative sample of LEAs. However, this national survey, while a rich source of administrative data, was not designed to capture all aspects of these five domains. Unfortunately, militarization was likely incompletely operationalized using the 2013 LEMAS elements alone. A more complete metric for militarization based on a larger set of specifically designed questions might yield very different results. With a new conceptual framework to support survey design around the topic of militarization, future iterations of the LEMAS survey could include elements related to the five domains. Similarly, other efforts to study agency factors could intentionally gather information relevant to the study of all five domains of militarization and a greater number of the subordinate concepts. The collected data elements would then be used to inform a

holistic metric that would produce increased precision and validity in estimates of the association between militarization and lethal UOF.

5.4.1 *Strengths*

This study had several notable strengths. The present research is founded upon one of the most robust efforts to quantify the true national burden of lethal UOF in the U.S. Any research relying on vital statistics or other federally gathered data on UOF is not only incomplete but will also be delayed for months to years, depending on the speed with which the hosting agencies release their annual data. Research using crowd-sourced data is more flexible and can be updated in real-time as new cases are reported. However, where most research using these crowd-sourced databases relies on one or two databases to identify deaths over a one-year period, this study included data from four databases that had never previously been linked all together and deaths occurring over a five-year period. This process ensured that the greatest number of true cases of lethal UOF were identified while leveraging a probabilistic linkage process and limited manual review to increase the positive predictive value of the final dataset. While the final analyses in this study were limited to deaths attributed to respondents to the 2013 LEMAS survey, this sample was nationally representative of all agencies across the U.S. In addition, the linkage process yielded an unrestricted national database of lethal UOF deaths that can be used in future studies of LEAs and community encounters. Documentation of the linkage and cleaning processes employed are described in detail in Chapter 4 and can be replicated as surveillance of these cases continues in future years.

Since Kraska's early work on defining and quantifying militarization, there have been no major efforts to develop competing theories or conceptualizations. Simckes' proposed conceptual framework[98] builds upon Kraska's, drawing from the experiences and knowledge of a

multidisciplinary group of stakeholders to better align with contemporary culture, dialogue, and research in this field. This study was the first to use Simckes' new conceptual framework, and offers insight around operationalization, data quality, and analytic considerations for future research. The present study also brings awareness to the complexity of militarization as a concept of study and demonstrates its relevance to interdisciplinary audiences.

While militarization and UOF have been studied previously, this study is among the first of its kind to unite across several datasets representing population health and criminal justice, while also strategically framing the research around mortality, with relevance for public health and policing audiences alike. As researchers from disparate fields examine the same subject, the conclusions they draw and the recommendations they make will be based on the norms of their disciplines. This interdisciplinary expertise can be leveraged to produce more creative and holistic solutions to issues that affect both population health and safety. For example, research on the topic of trauma-informed policing, whereby officers receive training for working with people who have experienced trauma or violence, has found it to be an effective way to support victims.[180,181] This health-oriented approach empowers law enforcement by giving them the tools to be advocates for the health and wellbeing of the communities they serve. Militarization and UOF are perhaps more contentious topics in the current political climate, but the complex role of law enforcement to protect and serve an ever-evolving society suggests that a similarly interdisciplinary approach to studying these topics and developing solutions would be beneficial.[101,182,183] The present study exemplifies how population health researchers can contribute to these processes.

Another strength of this study is its ecologic design, which circumvents several of the barriers to studying militarization and lethal UOF at the individual event level. Identification of

situational characteristics for each incident can be biased and inconsistent within and across agencies; LEAs are often hesitant to share the details of the circumstances surrounding these deaths outside of their own agency. For this reason, capturing both the nuances of militarization present in any particular incident and any subcategorization of UOF is made quite difficult. Ecologic assessment of the LEA-level death rates and agency and community-level characteristics can not only circumvent these data quality and access challenges but it also elevates the unit of analysis to the most practical level for intervention. A change made at the agency level will presumably influence all eligible employees and be enforced by the agency. While adherence may be inconsistent among individual officers, the fact that the agency has chosen to adopt the new policy is in itself an indication of agency culture and priorities, also relevant to the conceptual framework of militarization. While prior research has examined the situational and individual level factors at play in lethal UOF episodes,[184-188] they undoubtedly suffer from bias due to issues with data access and quality, and may have less practical relevance at the agency level. In contrast, the present study offers an analytic framework that supports immediate applicability to LEAs nationwide.

5.4.2 *Limitations*

This study had some limitations worth noting. First, in the absence of reliable and available national data on lethal UOF, this research was limited by the quality of the data that were available. While this was one of the most rigorous efforts to quantify the burden of these deaths nationally and included several safeguards to minimize bias, it likely still suffered from underreporting and possible misclassification.

Second, in order to maximize the statistical power of this study to detect a true relationship between militarization and lethal UOF, a five year cumulative number of lethal UOF

deaths was estimated for participating agencies. However, the LEMAS survey is run only every two years and the participating agencies change with each iteration, making it impossible to get repeated data on militarization for the 2013 participants. It was also, therefore, not possible to establish if militarization and lethal UOF have some kind of cyclic relationship over time. Without repeated measurements of militarization, the analyses here are limited to a cross-sectional interpretation such that no causal inference should be made.

Third, the use of an ecological study design precludes interpretation of these data at the individual level. For example, one could not draw conclusions around the risk of death for a single person based on the militarization of their local LEA and an aggregated death rate. However, given the rarity of lethal UOF deaths, the absolute risk for individual people is still nearly zero. As such, to get at individual level risk, one might consider examining a jurisdiction in which the rate of these deaths is relatively higher and exploring the individual characteristics associated with the greatest risk of death. There is already, however, abundant research around some of these factors (e.g., race, sex).[129,189-192]

Fourth, the quality of the militarization metric employed in these analyses was dependent on the data that were used to operationalize it. Despite the application of a data-driven conceptual framework, the 2013 LEMAS survey was not designed with this conceptual framework in mind. Therefore, there was a constraint on the breadth and depth of the underlying concepts of militarization that could be captured using this data source. To address this in the analytic stage, both composite and domain-specific models were fit, permitting comparison of the potential merits of both modelling approaches and identification of any specific domains that appeared to be under-defined. Future research should identify new sources of data on agency factors that could contribute to more detailed metrics based on Simckes' conceptual framework.

Fifth, the ADI is not a perfect measure of the full range of underlying community characteristics that may be relevant to the study of policing and UOF. For example, the ADI strongly emphasizes socioeconomic status and specific characteristics of housing, and these may not be the best representation of social inequities associated with, for example, residential segregation by race and ethnicity. However, the ADI scores essentially offer a comparative ranking between geographic regions, and if these unmeasured features have a similar distribution geographically to those that *are* captured by the ADI, then we might expect little difference in the relative ranks should those unincluded items have been included. In other words, the ADI may not capture every detail of interest, but it still offers a strong relative comparison between regions.

Sixth, the ACS, while a rich source of community level data, does not always capture all elements with the greatest accuracy and may have introduced some bias into the estimation of the ADI scores used in these analyses. For example, a question meant to capture the number of single-parent households restricts to “mother only” and “father only” options, failing to recognize the presence of non-heterosexual couples or nonbinary parents. It is unclear how these families are represented in this national data which makes it difficult to predict the direction of the bias resulting from misclassification. However, ethical considerations aside, these numbers are likely very small and therefore are expected to have had minimal impact on these study findings. The ACS also offers restricted options for respondents to provide their racial and ethnic identity, so estimates of the proportion of each jurisdiction comprised of African American/Black and Hispanic communities may contain some amount of error. This nondifferential misclassification by race would have occurred across all jurisdictions nationally though, so the effect on the final models is likely minimal.

The seventh limitation of this study involved identification of the geographic bounds for each LEA, which dictated how other community level variables were linked to each agency. To maximize the correct linkage between LEAs and their corresponding ACS geographic region, the LEAIC was used as a middle step, as it contains a broader set of agency-specific identifiers and was built for the purpose of facilitating such linkages. While counties are clearly established in the LEAIC and ACS, the process is more complex for local agencies. For LEAs serving regions within counties (i.e., cities, townships, boroughs), restricting to the municipality served is preferable to assigning community characteristics representing the broader county as a whole. ACS Place codes approximate these narrower municipal lines. However, among the local agencies captured in this study, there were 473 for whom a Place code was not defined in the LEAIC. As such, these LEAs had to be linked to the county level ACS estimates, introducing some bias into the community characteristics captured for these districts. However, LEAs serving the largest municipalities across the nation were more likely to have a Place code assigned and these were the jurisdictions that likely differed the most from their surrounding county. Therefore, using Place codes, where it was possible to do so, likely addressed some, though not all, of the potential bias introduced by this issue.

The eighth limitation of this research was the absence of control for clustering or lack of independence between LEAs. However, selecting a variable on which to examine clustering in the data offers some challenges. While examining state-level clustering can account for lack of independence between LEAs that share the same state-level policies or funding mechanisms, the proximity between LEAs across state lines may represent an even more impactful dependence structure as may intra-state variation around community characteristics. Jurisdictions situated near state borders may in fact be influenced by neighboring state policies, sometimes more than

from their own state. For example, firearm restrictions in Pennsylvania may influence the presence of firearms in Allegany County, Virginia which is on the border with Pennsylvania. Similarly, we might see other state-level or county-level factors crossing over these geographic boundaries to influence how police-community encounters unfold. Within states, LEAs may have partnerships, joint training exercises, or other patterns of intersection that contribute to shared practices, policies and procedures, and resources with their neighboring agencies. As such, future research should employ spatial analytic techniques to account for potential clustering, including but not limited to state boundaries. A spatial approach would also be helpful in addressing another limitation of this study. The proportions of each community that were African American/Black and Hispanic were captured in aggregate but without any assessment of the geographic distribution of race and ethnicity. Future efforts should endeavor to assess the spatial relationships between these factors, accounting for residential segregation and the associated sociocultural and economic patterns that may influence policing practices and outcomes.

5.4.3 *Conclusions*

This study underscores the importance of careful interpretation and consideration of methods and researcher assumptions when reviewing research on complex sociocultural phenomena. Disagreement between the results of different studies on a single subject is quite commonplace but understanding why these disagreements appear is critical for future research and for interpreting results accurately. The underlying data can be faulty, the case definition can be unusually broad, or perhaps the authors simply were trying to measure a different construct altogether from what the reader expected. Without caution, incorrect conclusions can be drawn and policies can be constructed on less-than-ideal evidence. The present study serves as a prime

example of why careful examination of the data, methods, and analytic assumptions of any project is essential. One could easily draw a quick conclusion from this research that militarization and UOF are unrelated. But a careful reader will recognize a lengthy discussion of the present study's methodologic processes, limitations, and potential alternate explanations for the results at hand, linked to prior research. Indeed, this study demonstrates the challenges of studying these two concepts and identifies the specific barriers to accurate and precise estimation of the association between militarization and UOF.

Research at the intersection of policing and population health continues to gain traction in professional and academic circles. Yet with more researchers engaging nontraditional data sources and implementing new methods to answer these critical research questions, the comparability of the various efforts to conduct research in this area is weakened. As such, it is crucial that authors share their methods with their readers in greater detail than perhaps they might when conducting research on a more established subject. This information can then be used by other researchers and practitioners to help them understand the context in which these studies were conducted, interpret them accurately, replicate as appropriate, and decide how they can most appropriately apply the findings to improve the health and safety of the public.

Chapter 6. DISCUSSION

Over the first five chapters of this dissertation, I have argued for the examination of policing practices as a population health issue, identified several challenges to studying the intersection of law enforcement and health, and presented new methods and resources to further advance this field of study. In this final chapter, I will summarize the products of this dissertation, reflecting on the contributions to the fields of epidemiology, criminology, and population health, and to the health and safety of our communities.

6.1 Why This Work Matters

Every death that results from a police-community encounter is preventable. Be it through de-escalation training for officers or changing the trust dynamics between a law enforcement agency (LEA) and the community, these deaths need not occur. From a population health perspective, I hoped to use this research to bring attention to the important intersection of policing and health, while demonstrating how methods, knowledge, and data of both fields can be leveraged together to reduce mortality. I also intended to use this research to bring awareness to the social justice issues related to differential policing practices across communities and how a population health framework can help to articulate and address these challenges.

Social determinants of health influence our wellbeing through the mechanisms of daily life. How a particular neighborhood is policed is a critical social determinant of individual and collective health. As discussed in Chapter 1, individuals, communities, and systems can be affected by policing practices and norms through several pathways. Where a police force embodies a “warrior” mindset in relation to the community it serves, the general atmosphere and specific actions taken by officers in the field can harmfully influence population health. When a

person lives in a community where fear of negative interaction with law enforcement is high or where they regularly encounter a police force in whom they have little trust, the effects on mental health can be profound. The impacts of simply living in such an environment, let alone experiencing a direct negative encounter, can be internalized and transmitted intergenerationally as well. For this reason, it is critical that population health researchers and practitioners approach the topic of policing with consideration for the multifaceted ways in which it can affect health and the disproportionate burden of negative effects among particularly vulnerable populations.

In this work, I specifically examined the effect of policing on mortality, not because I believe it is the most common or most preventable negative outcome of police-community encounters, but rather, because it is the most readily quantifiable. This in itself is a problem, as these deaths are only a small proportion of a larger body of interactions that are not as well defined nor documented. Improving surveillance of all negative encounters between police and the community, be they fatal or not, should be a priority and this research underscores the importance of addressing this surveillance gap. With better data and the lessons learned from the present research researchers will be empowered to identify effective preventative steps that can improve overall community wellbeing while also preparing officers with the tools they need to better serve their communities.

6.2 Barriers

The biggest barrier to reducing lethal use of force (UOF) and improving police-community encounters is getting all of the key stakeholders to the table. The historical roots of policing in this country can make establishing trust between law enforcement and the public an arduous task. Indeed, a lack of trust in the "other" in this arena is well established.[5,32,193] So while

communities call for police reform, engaging with the system they wish to change is often not a priority. Meanwhile, officer concern around negative community perception and reciprocated frustration directed at the public can stifle dialogue and progress. There are indeed some agencies with programs designed to promote trust-building and community-engagement work but this is not necessarily a sweeping norm in all LEAs across the country. However, change cannot come without buy-in from all stakeholders. More practically, *we cannot change the police without the police.* Therefore, the first and perhaps biggest barrier to truly addressing the issue of lethal UOF and contributing policing practices is getting all stakeholders to talk and listen to each other. This is where I believe population health researchers and public health agencies can play a critical role. Using scientifically rigorous methods to gather, analyze, and interpret relevant data, we can frame the conversation around a shared interest: health and safety.

Generating this data-driven evidence, however, raises its own challenges. While aggregate statistics on crime and victimization are readily available, information on certain agency characteristics and specific police-community encounters are more difficult to acquire. Factors associated with militarization, for example, may not be accessible to researchers from non-law enforcement entities because the information may not be collected formally or LEAs may not be willing to share this information externally. For lethal and nonlethal UOF, surveillance is inconsistent, data are notoriously flawed, and individual LEAs are reticent to share these numbers, if they have them at all. As discussed in Chapter 4, alternative data sources are available, but these too present their own challenges. However, the absence of perfect data should not preclude the study of policing and health.

By beginning to characterize the data challenges, I believe this research lays a roadmap for how we can improve data collection and analytic techniques in the future. While the ideal

next steps would include establishing universal and comprehensive collection of information from LEAs facilitated and enforced by some governmental body, the nature of this country's legal and political climate make this unlikely for the foreseeable future. Therefore, learning to use what we do have as effectively as possible while contextualizing our work in the realities of the data challenges we face is the most feasible and necessary solution. The study of injury and mortality in relation to a network of risk factors is a fundamental part of population health research, and through the integration of epidemiologic methods with traditional criminal justice data, our collective understanding of these issues and how to respond to them can be improved. I chose to pursue this dissertation research with the full knowledge that data on militarization and UOF are lacking, in part because I recognized the potential utility of applying epidemiologic methods to an important but understudied issue. I also set out to push the bounds of epidemiology to include what I believe to be a critical population health topic from which our field has remained notably absent.

6.3 Knowledge Generated

In this dissertation, I present replicable and practical approaches for studying the complex construct of militarization and quantifying the burden of lethal UOF. In doing so, this research lays the groundwork for more universal practices for future research in this field which will facilitate comparison across studies and better understanding of the problems at hand. In each chapter I have presented a new resource to support ongoing study of policing and population health. In Chapter 1, I reviewed the historical underpinnings and contemporary issues associated with policing and population health and presented a new framework depicting how policing practices influence population health through individual, community, and systemic pathways

(Figure 1.1). In Chapter 2, I described the construction of a new conceptual framework for militarization based on qualitative interviews with a set of interdisciplinary stakeholders. By describing the process by which I built this framework, future researchers will be able to more accurately apply this framework to their own work and will also be able to replicate these methods on their own. Chapter 3 details the process of translating the conceptual framework presented in Chapter 2 into a quantifiable metric using Law Enforcement Management and Administrative Statistics (LEMAS) survey data. This chapter is particularly important for future researchers who can replicate the presented methods to create improved metrics using other data sources. Chapter 4 describes the multistage process of linking four crowd-sourced databases on lethal UOF, the assumptions and exclusion criteria, and the challenges of implementing this linkage. It is my hope that Chapter 4 demonstrates to readers that while there is still no accessible and reliable federal data on UOF, there are practical alternatives. In Chapter 5, the products of the preceding chapters are brought together and analyzed. The key product of this chapter is perhaps not the analytic results themselves, but rather the consolidation of all the methodologic considerations that went into the study design, analysis, and interpretation of the data.

6.4 Directions for Future Research

The construction of a novel database of lethal UOF deaths, a new conceptual framework for militarization, and example analyses including both of these resources present several opportunities for future research to further advance the study of policing and population health. I envision four major avenues for this work: analytic opportunities with the current data, investigating the fundamental differences between agency types and their influence on health,

applying the proposed conceptual framework for militarization, and exploring militarization in relation to nonfatal policing outcomes.

6.4.1 *Analytic Opportunities with Current Data*

While neither the primary nor sensitivity analyses I conducted in this dissertation yielded statistically significant results, this does not necessarily mean that there is no relationship between the concept of militarization and lethal UOF in the present data. Future research should continue to explore the best statistical techniques for evaluating this relationship. One consideration is the appropriateness of the regression modelling technique. I selected negative binomial regression because it uses count data in the outcome while also adjusting standard error estimates when the outcome data are over-dispersed among participants, as they were in this study. However, there are several other analytic techniques that may offer their own benefits. For example, in future research looking at subsets of agencies (e.g., LEAs of a certain size) there may be less dispersion in the data, which could justify the use of Poisson regression models instead of negative binominal. Also, with most LEAs reporting no deaths annually, zero-inflated regression models (e.g., zero-inflated Poisson) may be worth consideration.

Future efforts should also consider what the *true* denominator should be in this sort of research. I stated in earlier chapters that lethal UOF deaths arise from the total encounters between police and the community. That is, every encounter – good, bad, and neutral – that happens between an LEA and its community is "at risk" of becoming a lethal encounter and therefore should be included in the ideal denominator. We can assume that under the simplest conditions, as the number of encounters with the public increases there should be an increase in the number of deaths caused by law enforcement purely because there are more events "at risk,"

so to speak. However, most interactions between law enforcement and the public never get counted at all. Denominators that approximate the relative frequency of community encounters between jurisdictions are likely the best alternative. In this research, I chose two such denominators: the number of full-time sworn officers and the size of the population served. While these denominators had their strengths, they also shared two important flaws: 1) a failure to account for the fact that differences in basic agency practices, location in a jurisdiction, or other characteristics may influence the actual number of encounters officers have with the public and 2) the absence of any measure of population density, which is implied in the ideal denominator described above. Future research should explore if there are any alternatives that may better approximate the relative frequency of interaction between LEAs and the public.

New analyses of the current data could also be expanded to include spatial analytic techniques and integration of more geographic data in order to more fully account for population density and demographic distributions. While in sensitivity analyses I created a covariate for the ratio of the number of full-time sworn officers to the size of the population served and included that instead of an offset term in the primary models, this relatively simple analysis only crudely captured how frequently we might expect LEAs to interact with the public. Spatially rooted data, like a land mass to population served ratio, would be more accurate. Beyond this, determining the characteristics of each population served and how these characteristics are distributed geographically within and between jurisdictions will permit more complete adjustment of confounding variables that likely have some geographic interdependence.

6.4.2 *Disaggregating Law Enforcement Agencies*

In this dissertation, I chose to stratify my analyses by agency type in order to account for the fact that agency type might influence the way that militarization and lethal UOF relate to each other. However, stratification simply by county versus local LEA may be insufficiently granular in national studies; further disaggregation of agencies that may in fact have very little in common could increase the validity of future research. If the goal is to create stratified groups with members that are similar to each other on everything except the "exposure" of interest, then it is important to identify the classification of agency types that best accomplishes this. For example, the FBI and Seattle Police Department (SPD) are both law enforcement agencies, however, they have vastly different functions. The way that militarization operates in the FBI and SPD depends on several factors that are inevitably different between these two agencies, such as political influence, jurisdictional reach, and funding. Such differences can also appear among agencies of the same "type"; it may be that two county agencies differ substantially in size and on many of these same factors. Stratification can help account for some of these basic functional differences and for more nuanced organizational or operational differences but the challenge is knowing exactly how to stratify. This issue has been addressed in previous work by Kraska[75,76] and Willits and Nowacki,[139] but in the criminological literature there is still disagreement around the value of stratification by agency type or size. From a population health perspective, the importance of stratification in this particular scenario is somewhat clearer. The etiologic relationship between militarization and UOF may be masked by effect modification caused by agency type unless it is accounted for appropriately. The exact nature of the differences between agency types or even how those "types" should be defined requires additional study. For example, is the number of officers the most significant feature of an LEA or perhaps some combination of organizational

structure, geographic jurisdiction size, or funding mechanisms? It may be more appropriate for this research to be undertaken by those with expertise in law enforcement administration, policing practices, and policing history rather than population health. However, with input from population health researchers, categorization of policing agencies could take into consideration agency-level factors that might influence health as well.

6.4.3 *Applying the Militarization Conceptual Framework*

The conceptual framework for militarization developed in this dissertation is meant to be a flexible tool to facilitate operationalization and future study of the concept. Prior research on militarization can be mapped to the five domains of this framework while new research can be grounded in it as well, thus permitting easier comparison across studies and easier interpretation for practical application. In this dissertation, I operationalized militarization in only one way and using one set of variables from the LEMAS survey; however, there are certainly other ways that these data may be used to operationalize the conceptual framework that could be tested. One might assign point values differently to the included variables, weighting them based on their relevance or impact on daily operations, for example. Another researcher may also find some variables in the LEMAS survey that they believe capture some of the subordinate concepts in the framework in ways that I myself did not recognize. One could also apply the conceptual framework to different subsets of LEAs. For example, the current methods could be expanded to federal, state, and tribal agencies, which were not included in this research. Analysis over a shorter timeframe, limited geographic region, or restricted agency size may also reveal how operationalization of the framework should best be implemented under different circumstances.

In addition to the 2013 LEMAS survey used in this research, one avenue for future research may involve partnership with the LEMAS team to include some items specifically mapped to the conceptual framework in new survey iterations. One of the challenges of retrospective research using secondary data is the inability to control not only what data are collected but also how they are collected. Phraseology and framing can affect that quality of the data captured and, to improve the internal validity of research on militarization, it would be ideal to have researchers involved in the survey design process. The established relationship between the Bureau of Justice Statistics (BJS), who administers the survey, and LEAs is invaluable, particularly with regard to the collection of potentially sensitive agency information. Establishing trust between new-to-the-scene researchers and LEAs is not feasible on the standard research timeline, nor is it likely to be anywhere as effective as partnering with organizations like BJS who are known and respected among policing agencies. As such, collaboration with these leaders in law enforcement research and practice is essential and would support our collective understanding of how policing affects population health.

6.4.4 *Different Policing Outcomes and Population Health*

Mortality is perhaps the most obvious and concrete population health outcome there is, providing a strong argument for the value of applying a population lens to a traditionally non-health topic like policing. However, deaths caused by law enforcement are rare. During the five-year study period examined in this research, 85% of participating agencies were responsible for no deaths at all, indicating that a minority of agencies nationally are responsible for the majority of deaths. Such a rare event introduces some challenges from a methodologic standpoint but also

brings into question how impactful this research may be in comparison to efforts focusing on more frequent negative outcomes of police-community encounters.

Without diminishing the importance of lethal UOF, future research should begin exploring ways to more effectively study nonlethal UOF events, including physical injury, hospitalization, and short and long term mental health consequences. Not only are these nonfatal outcomes more common than fatal ones but they also can be experienced repeatedly by community members. The challenge, however, is in their identification. As with lethal UOF, there is no federal monitoring for nonlethal UOF, nor do all LEAs have the same reporting requirements internally. National surveys of LEAs might be revised to capture some information on these nonlethal UOF cases but LEAs have the same concerns about reporting these data as they do for lethal UOF, bringing into question the validity and utility of such tools for studying UOF. Additionally, the effects of these encounters may not always be immediate, making them even harder to track.

Population health-oriented mediums may offer an effective alternative to LEA surveys alone. Several national, public health surveys include supplements to their base survey gathered at various intervals in order to capture more detailed information on a range of topics. To enhance individual-level data on nonlethal UOF, a supplement on police-community encounters could be included in an existing public health survey. The supplement could capture if an individual experienced a nonlethal UOF event, the nature of the encounter from their perspective, immediate or long-term health consequences, the name of the agency or agencies involved, and geographic information to facilitate linkage to LEMAS and other LEA datasets. The data would be at the individual person level rather than event level and could be subject to bias related to recall due to delayed reporting, social desirability, or the influence of individuals'

prior experience. These biases may also affect data captured directly by LEAs, however, and should not disqualify discussions around the potential use of public health survey supplements. Potential host surveys could include the Behavioral Risk Factor Surveillance Survey (BRFSS), National Health Interview Survey (NHIS), or the National Crime Victimization Survey (NCVS). Even local surveys could be designed to better assess individual experience of nonlethal UOF and the agencies involved. However, turning to a public health platform to collect data on policing-related outcomes requires some careful consideration of the effects of this work on partnerships with law enforcement. Experts and leaders in law enforcement research and practice should be involved in the creation of any new surveys designed to examine this topic of shared interest, not only because of the impact on their own fields, but also because of the knowledge they bring. To exclude law enforcement from conversations on policing and health would alienate the most important partner in improving how our communities are policed.

6.5 Implications for Public Health Practice

Interdisciplinary response to the intersection of policing and population health is the responsibility of public health practitioners as well. For public health agencies to truly represent the health of the public, they must include in their scope all factors that may influence the health of the communities they serve. To ignore the influence of criminal justice and law enforcement would be to neglect a major social determinant of health with differential impact on already marginalized communities. Just as departments of health work closely with alcohol and tobacco regulation agencies, transportation authorities, and environmental health programs, so too should they actively seek and maintain partnerships with their colleagues in law enforcement. Departments of health should work with LEAs to identify and implement health-oriented officer

training, to provide officers with the skillset to respond to people in mental health crisis, engage with victims of trauma, and be aware of how their own behavioral patterns influence the people they encounter. Public health agencies should also collaborate with data technicians within LEAs, sharing knowledge of public health surveillance techniques to improve how LEAs track health-related events, and helping to set priorities for health-related initiatives. Finally, public health agencies can help bridge the divide between community and law enforcement and encourage progress toward a shared goal of community wellbeing.

6.6 Closing Thoughts

The absence of perfect data should not be the enemy of progress. Indeed, field epidemiologists often act in response to an outbreak before the final numbers are in, in order to prevent ongoing disease transmission. When a hurricane hits the southern United States, first responders do not wait to activate until after thorough data collection; they begin work immediately and adapt as more information arrives. So, when critics of using imperfect data question the value of this and other research that is pushing the bounds of how we study complex societal phenomena, they ought to consider the consequences of waiting for the perfect data to come around. Using existing data to begin defining the issue and the data landscape allows us to make informed decisions around improving surveillance and data collection going forward. We must understand the gaps in order to fix them and beginning with data that have already been collected limits the burden on researchers and practitioners innovating on the front lines.

Imperfect data are not the only challenge to making progress on population health issues; it is also about the stakeholders. To increase community vaccination rates, campaigns that ignore the personal needs and beliefs of community members are bound to fail. Similarly, public health

messaging around breastfeeding must take into consideration the values and norms of the target population. In other words, public health must be oriented around the community. This is where using a population health lens to study policing may differ from a criminological approach. While this research examines militarization and lethal UOF at an agency level, the definition of militarization employed is rooted in the views of not only policing practitioners but community members as well. Population health also brings with it an emphasis on prevention, which can be lacking in contexts where the focus is on response. This is not to say that a holistic approach to studying the effects of policing on the public cannot be undertaken by non-public health bodies. Rather, population and public health leaders are already equipped with the tools and history of engaging disparate stakeholders around a shared health concern in order to prevent poor outcomes. I believe it is our responsibility as a field to leverage this expertise to further support population health and safety.

The voices of everyone affected by violent police-community encounters should be heard and validated. People are angry, hurting, and distrustful and this makes progress that much more difficult. It is my hope that this research helps to empower policing and public health practitioners, community members, and researchers trying to study and shed light on the population health effects of policing. This work is poised to contribute to productive conversations between law enforcement and the community by drawing attention to shared goals and priorities, while continuing to hold central the experiences of those most harmed by these encounters. Simply because there are different views and it may feel that we are oscillating between extremes does not mean that progress is not possible. Bringing every stakeholder to the table is the first step. Listening to each other is the second. The third, is using data to support evidence-based change that upholds and advances the wellbeing of our communities.

REFERENCES

1. Krieger N, Chen JT, Waterman PD, Kiang MV, Feldman J. Police killings and police deaths are public health data and can be counted. *PLoS Med.* 2015;12(12):e1001915.
2. Bylander J. Civil unrest, police use of force, and the public's health. *Health Aff (Millwood).* 2015;34(8):1264-1268.
3. Shepherd JP, Sumner SA. Policing and public health-strategies for collaboration. *JAMA.* 2017;317(15):1525-1526.
4. Alexander M. *The New Jim Crow: Mass Incarceration in the Age of Colorblindness* New York The New Press; 2010.
5. Balko R. *Rise of the warrior cop: The militarization of America's police forces.* New York: PublicAffairs; 2014.
6. Waxman OB. The history of police in America and the first force *Time Magazine*2017.
7. Juzwiak R, Chan A. Unarmed people of color killed by police, 1999-2014. *Gawker*2014.
8. Lartey J. St Louis police condemned for 'alarming' attitude towards protesters *The Guardian*2017.
9. Mindock C. Taking a knee: Why are NFL players protesting and when did they start to kneel? *The Independent*2018.
10. Somashekhar S, Rich S. Police shot and killed 984 people in 2015, according to report. *Washington Post*2016.
11. Swaine J. Ferguson police: A stark illustration of newly militarized US law enforcement. *The Guardian*2014.
12. Swaine J, Laughland O, Lartey J, McCarthy C. Young black men killed by US police at highest rate in year of 1,134 deaths. *The Guardian* 2015.
13. Tate J, Jenkins J, Rich S, et al. How The Washington Post is examining police shootings in the United States. *The Washington Post*2016.
14. Binder A, Scharf P. Deadly force in law enforcement. *Crime & Delinquency.* 1982;28(1):1-23.
15. Buehler JW. Racial/ethnic disparities in the use of lethal force by US police, 2010-2014. *Am J Public Health.* 2017;107(2):295-297.
16. Alang S, McAlpine D, McCreedy E, Hardeman R. Police brutality and black health: Setting the agenda for public health scholars. *Am J Public Health.* 2017;107(5):662-665.
17. Geller A, Fagan J, Tyler T, Link BG. Aggressive policing and the mental health of young urban men. *Am J Public Health.* 2014;104(12):2321-2327.
18. *Trauma, War, and Violence : Public Mental Health in Socio-Cultural Context.* New York: Springer; 2002.
19. Oh H, Cogburn CD, Anglin D, Lukens E, DeVylder J. Major Discriminatory Events and Risk for Psychotic Experiences Among Black Americans. *Am J Orthopsychiatry.* 2016;86(3):277-285.
20. DeVylder JE. Donald Trump, the police, and mental health in US cities. *Am J Public Health.* 2017;107(7):1042-1043.
21. Yimgang DP, Wang Y, Paik G, Hager ER, Black MM. Civil unrest in the context of chronic community violence: Impact on maternal depressive symptoms. *Am J Public Health.* 2017;107(9):1455-1462.
22. Lewis TT, Everson-Rose SA, Powell LH, et al. Chronic exposure to everyday discrimination and coronary artery calcification in African-American women: the SWAN Heart Study. *Psychosom Med.* 2006;68(3):362-368.
23. Hatzenbuehler ML, Prins SJ, Flake M, et al. Immigration policies and mental health morbidity among Latinos: A state-level analysis. *Soc Sci Med.* 2017;174:169-178.
24. Duru OK, Harawa NT, Kermah D, Norris KC. Allostatic load burden and racial disparities in mortality. *J Natl Med Assoc.* 2012;104(1-2):89-95.
25. Walsh A, Yun I. Epigenetics and allostasis. *Criminal Justice Review.* 2014;39(4):411-431.
26. Labonte B, Azoulay N, Yerko V, Turecki G, Brunet A. Epigenetic modulation of glucocorticoid receptors in posttraumatic stress disorder. *Transl Psychiatry.* 2014;4:e368.
27. Fiori LM, Turecki G. Investigating epigenetic consequences of early-life adversity: Some methodological considerations. *Eur J Psychotraumatol.* 2016;7:31593.
28. Elcheroth G. Individual-level and community-level effects of war trauma on social representations related to humanitarian law. *European Journal of Social Psychology.* 2006;36(6):907-930.
29. Thompson D. Community violence as a population health issue: Proceedings of a workshop—in brief. 2016; Washington D.C. .
30. Cooper H, Moore L, Gruskin S, Krieger N. Characterizing perceived police violence: Implications for public health. *Am J Public Health.* 2004;94:1109–1118.
31. Gelkopf M, Berger R, Bleich A, Silver RC. Protective factors and predictors of vulnerability to chronic stress: A comparative study of 4 communities after 7 years of continuous rocket fire. *Soc Sci Med.* 2012;74(5):757-766.
32. Thompson M, Kahn KB. Mental health, race, and police contact: Intersections of risk and trust in the police. *Policing: An International Journal of Police Strategies & Management.* 2016;39(4):807-819.
33. Miller TR, Lawrence BA, Carlson NN, et al. Perils of police action: A cautionary tale from US data sets. *Inj Prev.* 2016.
34. Szanton SL, Thorpe RJ, Whitfield K. Life-course financial strain and health in African-Americans. *Soc Sci Med.* 2010;71(2):259-265.
35. Turner HA, Shattuck A, Finkelhor D, Hamby S. Polyvictimization and Youth Violence Exposure Across Contexts. *J Adolesc Health.* 2016;58(2):208-214.
36. Wolke D, Copeland WE, Angold A, Costello EJ. Impact of Bullying in Childhood on Adult Health, Wealth, Crime, and Social Outcomes. *Psychol Sci.* 2013;24(10):1958-1970.
37. Gamal F. The racial politics of protection: A critical race examination of police militarization. *California Law Review.* 2016;104(4):979-1008.
38. Sewell AA, Jefferson KA. Collateral damage: The health effects of invasive police encounters in New York City. *J Urban Health.* 2016;93 Suppl 1:42-67.
39. Ullrich P. Crisis and control: The militarization of protest policing. *Surveillance & Society.* 2017;15(1):184-186.
40. Canella G. Crisis and control: The mlitarization of protest policing. *Social Movement Studies.* 2016;15(5):544-545.
41. Chen T. People have strong feelings about cops high-fiving people in the Women's March In Atlanta. 2017.
42. Campbell C. 'Militaristic and intimidating': St Louis police criticized as protests stretch on. *The Guardian*2017.
43. Stamper N. Paramilitary policing from Seattle to occupy Wall Street *The Nation*2011.
44. Dinno A. Do riot police serve public health? *Am J Public Health.* 2013;103(2):e5.
45. Jansen B. Charlottesville protests: Police failed to maintain order, report says. *USA Today*2017.

46. Landers AJ, Rollock D, Rolfes CB, Moore DL. Police contacts and stress among African American college students. *Am J Orthopsychiatry*. 2011;81(1):72-81.
47. Stamper N. *To Protect and Serve: How to Fix America's Police.* New York: Nation Books; 2016.
48. Friedman B. *Unwarranted: Policing Without Permission.* New York: Farrar, Straus and Giroux; 2017.
49. *Ferguson Consent Decree*, 97, March 17, 2016 (Eastern District of Missouri, Eastern Division 2016).
50. *Seattle Consent Decree*, July 27, 2012 (Western District of Washington at Seattle 2012).
51. Mallett CA. The School-to-Prison Pipeline: Disproportionate Impact on Vulnerable Children and Adolescents. *Education and Urban Society*. 2016;49(6):563-592.
52. Kobler AL. Figures (and perhaps some facts) on police killing of civilians in the United States, 1965-1969. *Journal of Social Issues.* 1975;31(1):185-191.
53. H.R.1447 - Death in Custody Reporting Act of 2013. In: (2013-2014) tC, ed. *Public Law No: 113-242*2013.
54. Banks D, Couzens L, Blanton C, Cribb D. *Arrest-related deaths program assessment.* RTI International;2015.
55. Barber C, Azrael D, Cohen A, et al. Homicides by police: Comparing counts from the national violent death reporting system, vital statistics, and supplementary homicide reports. *Am J Public Health.* 2011;106(5):922-927.
56. Feldman JM, Gruskin S, Coull BA, Krieger N. Quantifying underreporting of law-enforcement-related deaths in United States vital statistics and news-media-based data sources: A capture–recapture analysis. *PLOS Medicine.* 2017;14(10):e1002399.
57. Planty M, Burch AM, Banks D, Couzens L, Blanton C, Cribb D. *Arrest-related deaths program: Data-quality profile.* Bureau of Justice Statistics, Office of Justice Programs, US Department of Justice;2015.
58. *The mation's two measures of homicide.* Bureau of Justice Statistics, Office of Justice Programs, U.S. Department of Justice, ;2014.
59. Klinger D. On the importance of sound measures of forceful police actions *Crimonology & Public Policy.* 2008;7(4):605-617.
60. Klinger D. On the problems and promise of research on lethal police violence. *Homicide Studies.* 2011;16(1):78-96.
61. Fox JA, Swatt ML. Multiple imputation of the supplementary homicide reports, 1976–2005. *Journal of Quantitative Criminology.* 2008;25(1):51-77.
62. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) Atlanta, GA2019.
63. Centers for Disease Control and Prevention. National Violent Death Reporitng System (NVDRS). Atlanta, GA2019.
64. Conner A, Azrael D, Lyons VH, Barber C, Miller M. Validating the National Violent Death Reporting System as a source of data on fatal shootings of civilians by law Enforcement officers. *Am J Public Health.* 2019;109(4):578-584.
65. FBI announces the official launch of the national use-of-force data collection [press release]. Washington D.C.: FBI National Press OfficeNovember 20, 2018.
66. *FBI releases summary of pilot study on the national use-of-force data collection.* Washington, D.C.: Federal Bureau of Investigation, ;December 10, 2018.
67. Justice Department outlines plan to enable nationwide collection of sse of force data [press release]. Department of Justice, Office of Public Affairs2016.
68. Federal Bureau of Investigation. National Use-of-Force Data Collection. In: Uniform Crime Reporting, ed. Washington D.C. 2019.
69. Police Shooting Database. In: Post TW, ed2019.
70. MappingPoliceViolence.org. Mapping Police Violence. mappingpoliceviolence.org. Accessed March 5 2017.
71. Burghart B. Fatal Encounters. 2019.
72. Bieler S. Police militarization in the USA: The state of the field. *Policing-An International Journal of Police Strategies & Management.* 2016;39(4):586-600.
73. Fox B, Moule RK, Parry MM. Categorically complex: A latent class analysis of public perceptions of police militarization. *Journal of Criminal Justice.* 2018;58:33-46.
74. Koslicki W, Willits DW. The iron fist in the velvet glove? Testing the militarization/community policing paradox. *International Journal of Police Science & Management.* 2018;20(2):143-154.
75. Kraska PB, Kappeler VE. Militarizing American police: The rise and normalization of paramilitary units. *Social Problems.* 1997;44(1):1-18.
76. Kraska PB, Cubellis LJ. Militarizing Mayberry and beyond: Making sense of American paramilitary policing. *Justice Quarterly.* 1997;14(4):607-629.
77. Kraska PB, Paulsen DJ. Grounded research into U.S. paramilitary policing: Forging the iron fist inside the velvet glove. *Policing and Society.* 1997;7:253-270.
78. Kraska PB. Enjoying militarism: Political/personal dilemmas in studying U.S. police paramilitary units. *Justice Quarterly.* 1996;13(3):405-429.
79. Kraska PB. Questioning the militarization of U.S. police: Critical versus advocacy scholarship. *Policing and Society.* 1999;9:141-155.
80. Kraska PB. Militarizing criminal justice: Exploring the possibilities. *Journal of Political and Military Sociology.* 1999;27:205-215.
81. Kappeler VE, Kraska PB. Normalising police militarisation, living in denial. *Policing and Society.* 2013;25(3):268-275.
82. Brent JJ, Kraska PB. Moving beyond our methodological default: A case for mixed methods. *Journal of Criminal Justice Education.* 2010;21(4):412-430.
83. Kraska PB. Militarization and policing--Its relevance to 21st century police. *Policing.* 2007;1(4):501-513.
84. Chen H. The best reporting on federal push to militarize local police. *Pro Publica*2014.
85. Jackman T. Trump to restore program sending surplus military weapons, equipment to police. *The Washington Post*2017.
86. Andrzejewski A. *The militarization of America: Non-military federal agencies purhcases of guns, ammo, and military-style equipment - Fiscal years 2006-2014: Oversight study* U.S. Non-Military Federal Agencies;2016.
87. Apuzzo M. War gear flows to police departments. *The New York Times*June 8, 2014.
88. Withers L. How bearcats became toys: The 1033 program and its effect on the right to protest. *George Washington Law Review.* 2016;84(3):812-842.
89. Johnson TC, Hansen JA. Law enforcement agencies' participation in the military surplus equipment program. *Policing-an International Journal of Police Strategies & Management.* 2016;39(4):791-806.
90. Radil SM, Dezzani RJ, McAden LD. Geographies of U.S. police militarization and the role of the 1033 program. *The Professional Geographer.* 2016:1-11.
91. Burkhardt BC, Baker K. Agency correlates of police militarization: The case of MRAPs. *Police Quarterly* 2018(In Press):1-13.

92. Delehanty C, Mewhirter J, Welch R, Wilks J. Militarization and police violence: The case of the 1033 program. *Research & Politics.* 2017;4(2):205316801771288.
93. Lawson E. Police militarization and the use of lethal force. *Political Research Quarterly.* 2018:106591291878420.
94. Bove V, Gavrilova E. Police officer on the frontline or a soldier? The effect of police militarization on crime. *American Economic Journal-Economic Policy.* 2017;9(3):1-18.
95. Baumgart Z. From copper to steel: Police militarization at the end of the 20th century. University of Wisconsin; 2016.
96. Koslicki W. SWAT mobilization trends: Testing assumptions of police militarization. *Policing-an International Journal of Police Strategies & Management.* 2017;40(4):733-747.
97. McMichael C. Pacification and police: A critique of the police militarization thesis. *Capital & Class.* 2017;41(1):115-132.
98. Simckes M, Hajat A, Revere D, Rowhani-Rahbar A, Willits D. A conceptualization of militarization in domestic policing. *Police Quarterly* 2019;(in press).
99. Filkins D. "Do not resist" and the crisis of police militarization. *The New Yorker*2016.
100. Sack K. Murder or self-defense if officer is killed in raid. *The New York Times*2017.
101. President's Task Force on 21st Century Policing. *Final report of the Pesident's Task Force on 21st Centry Policing.* Washington D.C. : Office of Community Oriented Policing Services;2015.
102. Sherman LW. *Evidence-based policing.* Police Foundation 1998.
103. Darroch S, Mazerolle L. Intelligence-led policing: A comparative analysis of community context influencing innovation uptake. *Policing and Society.* 2013;25(1):1-24.
104. *National consensus policy and discussion paper on use of force.* Association of State Criminal Investigative Agencies; Commission on Accreditation for Law Enforcement Agencies; Fraternal Order of Police; Federal Law Enforcement Officers Association; International Association of Chiefs of Police; Hispanic American Police Command Officers Association; International Association of Directors of Law Enforcement Standards and Training; National Association of Police Organizations; National Association of Women Law Enforcement Executives; National Organization of Black Law Enforcement Executives; and National Tactical Officers Association;2017.
105. Sherman LW. Reducing fatal police shootings as system crashes: Research, theory, and practice. *Annual Review of Criminology.* 2018;1(1):421-449.
106. García JJ-L, Sharif MZ. Black lives matter: A commentary on racism and public health. *Am J Public Health.* 2015;105:e27–e30.
107. Pew Research Center. *Sharp racial division in reactions to Brown, Garner decisions: Many blacks expect police-minority relations to worsen.* 2014.
108. Rembert DA, Watson J, Hill R. A trilogy of trepidation: Diverse perspectives on police violence targeting African American males. *Journal of Human Behavior in the Social Environment.* 2016;26(2):227-235.
109. Jacobs D, O'Brien RM. The determinants of deadly force: A structural analysis of police violence. *American Journal of Sociology.* 1998;103(4):837-862.
110. Hutto JW, Green RD. Social movements against racist police brutality and Department of Justice intervention in Prince George's County, Maryland. *Journal of Urban Health-Bulletin of the New York Academy of Medicine.* 2016;93:S89-S121.
111. Lockwood B. The militarizing of local police. *Forbes*2011.
112. American Civil Liberties Union. *War comes home: The excessive militarization of American policing.* New York, New York2014.
113. Beck C, Downing M, Lopez R. Militarization of special weapons and tactics teams In American policing: A Los Angeles police department perspective. *IACP Blog.* Vol 2018: International Association of Chiefs of Police; 2014.
114. Police Executive Research Forum. *Guiding principles on use of force.* 2016.
115. Police Exceutive Research Forum. *Defining moments for police chiefs.* Washington D.C.2015.
116. Fortenbery J. Police militarization in a democratic society *Law Enforcement Bulletin*: Federal Bureau of Investigation 2018.
117. Balko R. Obama moves to demilitarize America's police. *The Washington Post.*2015.
118. Phillips SW. Myths, militarism and the police patrol rifle. *Policing and Society.* 2014;26(2):185-196.
119. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods.* 2006;18(1):59–82.
120. *Atlas.ti* [computer program]. Version Version 7. Germany: Max-Planck Institute; 2013.
121. Glaser B, Strauss A. *The Discovery of Grounded Theory.* Hawthorne, NY: Aldine Publishing Company; 1967.
122. Engward H. Understanding grounded theory. *Nursing Standard.* 2013;28(7).
123. Patton MQ. Enhancing the quality and credibility of qualitative analysis. *HSR: Health Services Research & Politics.* 1999;34(5 Part II).
124. SAS Institute Inc. Chapter 1: Principal Component Analysis.
125. Hollis ME. Measurement issues in police use of force: A state-of-the-art review. *Policing: An International Journal.* 2018;41(6):844-858.
126. *The Link King* [computer program]. Version V9.0. Olympia, WA.
127. Stovall JR. *Surveillance of, and the impact of community policing on arrest-related deaths (ARDs): Exploring the surveillance of ARDs and the opportunities to prevent them in the United States*: Global Health: Health Metrics and Evaluation, University of Washington; 2016.
128. The Counted. 2017; https://www.theguardian.com/us-news/ng-interactive/2015/jun/01/the-counted-police-killings-us-database.
129. Edwards F, Esposito MH, Lee H. Risk of police-involved death by race/ethnicity and place, United States, 2012-2018. *Am J Public Health.* 2018;108(9):1241-1248.
130. NPR. MRAPs and bayonets: What we know about the Pentagon's 1033 program. 2014; https://www.npr.org/2014/09/02/342494225/mraps-and-bayonets-what-we-know-about-the-pentagons-1033-program. Accessed Nov 16, 2015.
131. Salter M. Toys for the boys? Drones, pleasure and popular culture in the militarisation of policing. *Critical Criminology.* 2014;22(2):163-177.
132. Congressional Digest. *Obama administration military surplus review: Excess military equipment transfers, asset forfeiture, and federal grants.* Washington DC: Congressional Digest;2015.

133. Hickman MJ, Piquero AR. Organizational, administrative, and environmental correlates of complaints about police use of force: Does minority representation matter? *Crime & Delinquency.* 2009;55(1):3-27.
134. Alpert GP, MacDonald JM. Police use of force: An analysis of organizational characteristics. *Justice Quarterly.* 2001;18(2):393-409.
135. Terrill W, Paoline EA. Police use of less lethal force: Does administrative policy matter? *Justice Quarterly.* 2017;34(2):193-216.
136. Paoline EA, Terrill W. Police education, experience, and the use of force. *Criminal Justice and Behavior.* 2016;34(2):179-196.
137. Parker KF, MacDonald JM, Jennings WG, Alpert GP. Racial threat, urban conditions and police use of force: Assessing the direct and indirect linkages across multiple urban areas. *Justice Research and Policy.* 2005;7(1):53-79.
138. Smith BW. The impact of police officer diversity on police-caused homicides. *Policy Studies Journal.* 2003;31(2):147-162.
139. Willits DW, Nowacki J. Police organisation and deadly force: An examination of variation across large and small cities. *Policing & Society.* 2014;24(1):63-80.
140. Sherman LW, Langworthy RH. Measuring homicide by police officers. *Journal of Criminal Law and Criminology.* 1973;70(4):546-560.
141. United States Census Bureau. American Community Survey. 2017; https://www.census.gov/programs-surveys/acs/news/data-releases.html?#.
142. Meeks D. Police militarization in urban areas: The obscure war against the underclass. *Black Scholar.* 2006;35(4):33-41.
143. Sorensen JR, Marquart JW, Brock DE. Factors related to killings of felons by police officers: A test of the community violence and conflict hypothesis. *Justice Quarterly.* 1993;10(3):417-440.
144. Terrill W, Reisig MD. Neighborhood context and police use of force. *Journal of Research in Crime and Delinquency.* 2003;40(3):291-321.
145. Klinger D, Rosenfeld R, Isom D, Deckard M. Race, crime, and the micro-ecology of deadly force. *Criminology and Public Policy.* 2016;15(1):193-222.
146. Kind AJ, Jencks S, Brock J, et al. Neighborhood socioeconomic disadvantage and 30-day rehospitalization: a retrospective cohort study. *Ann Intern Med.* 2014;161(11):765-774.
147. Kind AJ, Buckingham WR. Making neighborhood-disadvantage metrics accessible — The Neighborhood Atlas. *New Englad Journal of Medicine.* 2018;378(26):2456-2458.
148. Shavers V. Measurement of socioeconomic status in health disparities research. *J Natl Med Assoc.* 2007;99(9):1013-*1023.
149. Singh GK. Area deprivation and widening inequalities in US mortality, 1969–1998. *Am J Public Health.* 2003;93(7):1137-1143.
150. Christine PJ, Auchincloss AH, Bertoni AG, et al. Longitudinal associations between neighborhood physical and social environments and incident type 2 diabetes mellitus: The Multi-Ethnic Study of Atherosclerosis (MESA). *JAMA Intern Med.* 2015;175(8):1311-1320.
151. Health Innovation Program. 2000 Area Deprivation Index. 2014; http://www.hipxchange.org/ADI
152. Knighton AJ, Savitz L, Belnap T, Stephenson B, VanDerslice J. Introduction of an area deprivation index measuring patient socioeconomic status in an integrated health system: Implications for population health. *EGEMS (Wash DC).* 2016;4(3):1238.
153. Social Explorer - Mapping & Geospatial Data Tool. www.socialexplorer.com/. Accessed June 10, 2019.
154. Howell A. Forget "militarization": race, disability and the "martial politics" of the police and of the university. *International Feminist Journal of Politics.* 2018;20(2):117-136.
155. Ross CT. A multi-level bayesian analysis of racial bias in police shootings at the county-level in the United States, 2011-2014. *PLoS One.* 2015;10(11):e0141854.
156. Ross CT, Winterhalder B, McElreath R. Resolution of apparent paradoxes in the race-specific frequency of use-of-force by police. *Palgrave Communications.* 2018;4(61).
157. Fyfe JJ. Who shoots - A look at officer race and police shooting. *Journal of Police Science and Administration.* 1981;9(4):367-382.
158. Kahn KB, Davies PG. What influences shooter bias? The effects of suspect race, neighborhood, and clothing on decisions to shoot. *Journal of Social Issues.* 2017;73(4):723-743.
159. Gilbert KL, Ray R. Why police kill black males with impunity: Applying public health critical race praxis (PHCRP) to address the determinants of policing behaviors and "justifiable" homicides in the USA. *J Urban Health.* 2016;93 Suppl 1:122-140.
160. Bor J, Venkataramani AS, Williams DR, Tsai AC. Police killings and their spillover effects on the mental health of black Americans: a population-based, quasi-experimental study. *The Lancet.* 2018;392(10144):302-310.
161. Mummolo J. Militarization fails to enhance police safety or reduce crime but may harm police reputation. *Proc Natl Acad Sci U S A.* 2018;115(37):9181-9186.
162. Ajilore O. The militarization of local law enforcement: Is race a factor? *Applied Economics Letters.* 2015;22(13):1089-1093.
163. Federal Bureau of Investigation. Uniform Crime Reporting Program. 2019; https://www.fbi.gov/services/cjis/ucr.
164. Simpson R, Hipp JR. What came first: the police or the incident? Bidirectional relationships between police actions and police incidents. *Policing and Society.* 2017:1-19.
165. Giffords Law Center to Prevent Gun Violence. Domestic Violence & Firearms in Washington. . http://lawcenter.giffords.org/firearm-prohibitions-for-domestic-violence-misdemeanants-in-washington. Accessed May 27 2019
166. Brady Campaign, Giffords Law Center to Prevent Gun Violence. *2013 state scorecard - Why gun laws matter.* 2014.
167. Kivisto AJ, Ray B, Phalen PL. Firearm legislation and fatal police shootings in the United States. *Am J Public Health.* 2017:e1-e8.
168. Swedler DI, Simmons MM, Dominici F, Hemenway D. Firearm prevalence and homicides of law enforcement officers in the United States. *Am J Public Health.* 2015;105(10):2042-2048.
169. Hemenway D, Azrael D, Conner A, Miller M. Variation in rates of fatal police shootings across US states: The role of firearm availability. *J Urban Health.* 2018.
170. The Giffords Center to Prevent Gun Violence. 2019; https://lawcenter.giffords.org/.
171. Brady Campaign 2019; https://www.bradyunited.org.
172. Yim C. *Imputing Missing Data using SAS®: Paper 3295-2015.* California Polytechnic State University, San Luis Obispo.
173. *SAS* [computer program]. Version 9.3. Cary, NC: SAS Institute 2011.
174. *Stata Statistical Software: Release 14.* [computer program]. College Station, TX: StataCorp LP; 2015.
175. White MD. Assessing the impact of administrative policy on use of deadly force by on- and off-duty police. *Evaluation Review.* 2000;24(3):295-318.
176. White MD. Controlling police decisions to use deadly force: Reexamining the importance of administrative policy. *Crime & Delinquency.* 2001;47(1):131-151.

177. White MD. Examining the impact of external influences on police use of deadly force over time. *Evaluation Review.* 2003;27(1):50-78.
178. Lee H, Jang H, Yun I, Lim H, Tushaus DW. An examination of police use of force utilizing police training and neighborhood contextual factors A multilevel analysis. *Policing-an International Journal of Police Strategies & Management.* 2010;33(4):681-702.
179. Borrego A. *Arrest-related deaths in the United States: An assessment of the current measurement*, Arizona State University; 2011.
180. Rich K. Trauma-informed police responses to rape victims. *Journal of Aggression, Maltreatment & Trauma.* 2018;28(4):463-480.
181. Officer.com. *Trauma-Informed Policing.* Officer.com: Gale General OneFile;Jan 2013.
182. Bittner E. *The Functions of the Police in Modern Society; A Review of Background Factors, Current Practices, and Possible Role Models.* Rockville, MD: National Institute of Mental Health, Center for Studies of Crime and Delinquency; 1970.
183. Rumbaut RG, Bittner E. Changing conceptions of the police role: A sociological review. *Crime and Justice.* 1979;1:239-288.
184. Willits DW, Makin DA. Show me what happened: Analyzing use of force through analysis of body-worn camera footage. *Journal of Research in Crime and Delinquency.* 2018;55(1):51-77.
185. White MD. Identifying situational predictors of police shootings using multivariate analysis. *Policing.* 2002;25(4):726-751.
186. Ho T. Individual and situational determinants of the use of deadly force: A simulation. *American Journal of Criminal Justice.* 1994;18(1):41-60.
187. Jetelina KK, Jennings WG, Bishopp SA, Piquero AR, Gonzalez JMR. Dissecting the complexities of the relationship between police officer-civilian race/ethnicity dyads and less-than-lethal use of force. *Am J Public Health.* 2017;107(7):1164-1170.
188. McElvain JP, Kposowa AJ. Police officer characteristics and the likelihood of using deadly force. *Criminal Justice and Behavior.* 2008;35(4):505-521.
189. Durán RJ, Loza O. Exploring the two trigger fingers thesis: racial and ethnic differences in officer involved shootings. *Contemporary Justice Review: Issues in Criminal, Social, and Restorative Justice.* 2017;20(1):71-94.
190. Price JH, Payton E. Implicit racial bias and police use of lethal force: Justifiable homicide or potential discrimination? *Journal of African American Studies.* 2017;21(4):674-683.
191. Motley RO, Joe S. Police use of force by ethnicity, sex, and socioeconomic class. *J Soc Social Work Res.* 2018;9(1):49-67.
192. Tregle B, Nix J, Alpert GP. Disparity does not mean bias: making sense of observed racial disparities in fatal officer-involved shootings with multiple benchmarks. *Journal of Crime and Justice.* 2018;42(1):18-31.
193. Moule RK, Fox BH, Parry MM. The long shadow of Ferguson: Legitimacy, legal cynicism, and public perceptions of police militarization. *Crime & Delinquency.* 2018(In Print):1-32.

APPENDIX A

Chapter 2: Guide for interviews with subject matter experts on militarization

Part 1 – Background of SME

a. What is your current title or job?
b. Have you held any other professional positions you feel are relevant to our conversation today?
c. Describe any education, training, or professional work you've had in the following areas: public health, social justice, ethics, criminology, criminal justice, law, sociology, education, military, law enforcement, and government.
d. Do you have professional or personal experience with law enforcement and the issue of use of force? Please describe.

Part 2 – Militarization Overview

e. The media uses the word "militarization" to describe certain trends in policing in the United States. Given your experiences/expertise, how do you define militarization?
f. Can you give any examples of militarization from your personal or professional experience that help support your definition of this concept?
g. What does militarization look like in a local police force? (prompt: how do you know if a police force is militarized?)
h. In contrast to militarization, "militarism" is an ideology glorifying military capability and supporting its presence (to some degree) in government and policy. In your expertise, do you sense there is a trend in any direction regarding militarism in this country?

Part 3 – Measuring Militarization

i. Consider a single police force that you consider to be militarized, what specific policies and practices contributed to the militarization of that police force?
j. Are there any specific polices or practices that work in the opposite direction, i.e. reduce militarization of a police force? (prompt: do some things "balance out" others?)
k. Is militarization a yes/no issue, is it on a scale? (if "on a scale" follow with prompt: what differentiates levels of militarization)
l. Are there any outside factors that contribute to the militarization of a given police force? (prompt: federal programs, funding sources)
m. Are there characteristics of a community that you feel contribute to the level of militarization within a police agency? Please explain.

Part 4 – Impacts of Militarization of Community

n. If militarization is defined by military gear/artillery and military-rooted practices and policies, what impacts (e.g. health, social, infrastructural) does militarization of a police force have on a community, both in the short and long term?
o. Are communities that live with militarized police forces different from those without militarized police forces? (prompt: how would you characterize these communities?)
p. Some theories suggest that militarization is a response to the community, but other people feel it is driven more by other things, like internal police norms. Do you have any thoughts on this dynamic?

Part 5 – Wrap up

q. Are there any questions you would have asked had you been the interviewer in this conversation?
r. Do you have any questions for me?

APPENDIX B

Chapter 3: Factor loadings and select variables from a principal components analysis of militarization using 2012 Law Enforcement Management and Administrative Statistics Survey Data – SAS output

Rotated Factor Pattern

		Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9
COM_MIS	E1.COMMUNITY POLICING COMPONENT IN MISSION STATEMENT	-5	-25	-9	-4	-2	-56 *	-11	-9	-1
COM_SARA	E3.SARA-TYPE PROBLEM-SOLVING PROJECTS ACTIVELY ENCOURAGED	24	13	7	0	7	63 *	11	-3	-7
COM_TRN_INSRV	E2B.AT LEAST 8 HOURS OF IN-SERVICE COMMUNITY POLICING TRAINING	3	-16	-3	5	3	67 *	-3	-4	7
COM_PTNR	E6.PROBLEM-SOLVING PARTNERSHIP OR WRITTEN AGREEMENT WITH LOCAL ORGANIZATION	13	21	20	-1	-8	47 *	6	-3	0
COM_SURV	E9.UTILIZED INFORMATION FROM COMMUNITY SURVEY	21	32 *	4	2	6	37 *	-6	21	13
hir_req		-3	-12	-10	1	-2	0	-9	-78 *	13
HIR_MIL	C7.MILITARY SERVICE ALTERNATIVE TO EDUCATION REQUIREMENTS FOR SWORN PERSONNEL	10	-6	-2	3	-1	2	-7	81 *	11
web_data		23	89 *	16	6	3	11	3	3	5
web_rept		23	89 *	16	6	3	11	3	3	5
tech_social		19	51 *	13	8	8	10	7	-2	-20
ISSU_ADDR_BIAS	I1A.SPECIALIZED UNIT FOR BIAS/HATE CRIME	67 *	-8	2	14	-7	15	3	6	3
ISSU_ADDR_BOMB	I1B.SPECIALIZED UNIT FOR BOMB/EXPLOSIVE DISPOSAL	70 *	15	10	1	4	-4	3	2	-4
ISSU_ADDR_TERR	I1F.SPECIALIZED UNIT FOR TERRORISM	78 *	14	9	1	0	6	6	0	0
ISSU_ADDR_VIC	I1M.SPECIALIZED UNIT FOR VICTIM ASSISTANCE	61 *	13	7	6	7	10	-7	12	17
ISSU_ADDR_SWAT	I1N.SPECIALIZED UNIT FOR SPECIAL OPERATIONS	58 *	39 *	35 *	5	6	6	9	4	-5
ISSU_ADDR_GANG	I1J.SPECIALIZED UNIT FOR GANGS	73 *	21	16	2	5	13	8	-3	-14
ISSU_MULTI	I3.AGENCY PARTICIPATES IN MULTIJURISDICTIONAL TASK FORCES	17	20	86 *	4	1	8	6	1	-2
ISSU_TASK_SWAT	I4A.MULTIJURISDICTIONAL TASK FORCE FOR SPECIAL OPERATIONS	14	14	59 *	3	0	6	0	13	15
ISSU_TASK_DRUG	I4B.MULTIJURISDICTIONAL TASK FORCE FOR DRUGS	21	8	85 *	2	7	8	6	-4	-5
ISSU_TASK_GANG	I4C.MULTIJURISDICTIONAL TASK FORCE FOR GANGS	49 *	9	38 *	-2	-1	14	5	2	-14
uof_rec		2	-1	-3	-5	-5	-2	-1	3	-6
SAFE_RQUR_ALL	H8C.UNIFORMED FIELD/PATROL OFFICERS REQUIRED TO WEAR BODY ARMOR AT ALL TIMES	-7	28	5	6	5	32 *	1	14	-14
VEH_WPUR	G3.WRITTEN PURSUIT DRIVING POLICY	-7	3	-7	14	13	7	-19	3	
VEH_REST_NO	G6.NO WRITTEN POLICY ON FOOT PURSUITS	-10	-6	-1	1	-4	1	3	4	
SAFE_DOC_CHAND	H2M.DOCUMENTATION REQUIRED FOR CLOSED-HAND TECHNIQUE USE	8	11	6	78 *	3	-1	7	-1	
SAFE_DOC_OHAND	H2L.DOCUMENTATION REQUIRED FOR OPEN-HAND TECHNIQUE USE	4	3	1	86 *	4	6	11	1	
SAFE_DOC_TKDWN	H2K.DOCUMENTATION REQUIRED FOR TAKEDOWN TECHNIQUE USE	6	1	1	77 *	4	3	15	3	
SAFE_DOC_BAT	H2C.DOCUMENTATION REQUIRED FOR BATON USE	11	11	7	13	2	4	63 *	-7	
SAFE_DOC_SPRAY	H2F.DOCUMENTATION REQUIRED FOR OC SPRAY USE	6	2	2	14	3	8	68 *	7	
SAFE_DOC_DCHT	H2I.DOCUMENTATION REQUIRED FOR DISCHARGE OF TASER	7	10	3	3	90 *	-1	9	-1	
SAFE_DOC_DIST	H2H.DOCUMENTATION REQUIRED FOR DISPLAY OF TASER	2	2	4	8	92 *	6	-4	2	
SAFE_DOC_DCHF	H2B.DOCUMENTATION REQUIRED FOR DISCHARGE FIREARM	-4	-4	3	9	-1	5	62 *	2	
SAFE_DOC_DISF	H2A.DOCUMENTATION REQUIRED FOR DISPLAY OF FIREARM	-13	-2	-2	21	26	12	-9	1	

Printed values are multiplied by 100 and rounded to the nearest integer. Values greater than 0.3 are flagged by an '*'.

VITA

Maayan Simckes was born in Jerusalem, Israel and grew up in St. Louis, Missouri. She completed her undergraduate studies at Tufts University in Boston, MA in community health and social psychology. She went on to complete a master's in public health in epidemiology at the Saint Louis College for Public Health and Social Justice where she was inducted into the national Delta Omega public health honor society. Maayan then spent two years as an Applied Epidemiology Fellow with the Council of State and Territorial Epidemiologists, working at the Multnomah County Health Department in Portland, OR. She began her studies at the University of Washington School of Public Health in 2015. In 2018, Maayan was awarded a School of Public Health Endowed Fellowship to support her dissertation research and was selected in 2019 by the University of Washington as a finalist for the Graduate School Medal for scholar citizens. In 2019, Maayan joined the Washington State Department of Health as a Behavioral Health Epidemiologist in the Office of the State Health Officer where she continues her work promoting population health and equity.