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A Public Policy Approach to Life After Service for U.S. Military Veterans: Mental Health, Homelessness, and Reintegration

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A Public Policy Approach to Life After Service for U.S. Military Veterans:
Mental Health, Homelessness, and Reintegration

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Public Policy

by

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Abstract

This dissertation, through a public policy lens, examines life after U.S. military service as it relates to reintegration, the ability of state-level veteran-specific mental health programs to address veterans' mental health challenges, and states' ability to address veteran homelessness. First, I use 2019 Centers for Disease Control and Prevention (CDC) Behavioral Risk Factors Surveillance Survey data, along with various measures of state-level characteristics, to examine the influence of relevant state-level policies on veterans' mental health outcomes. Based on multi-level modeling results, findings suggest that the presence of at least one state-level veteran specific mental health program may be a mitigating factor of veterans' mental health challenges while miscellaneous veteran program spending does not appear to have a significant impact. Second, I examine state-level factors contributing to the reduction of veteran homelessness through the lens of state capacity theory and use the Department of Housing and Urban Development (HUD) Point-in-Time of homeless persons estimates and geographic information system (GIS) mapping. Findings suggest that, along with costs of living indicators and veteran unemployment rates impacting veteran housing stability, a state's capacity to manage resources, notably their ability to connect homeless veterans and available resources via robust relationships with community stakeholders, is key to enhancing homeless veteran outcomes. Lastly, I examine factors contributing to veteran reintegration, through a socio-ecological lens of veteran reintegration, using 2011 Pew Research Center's Veteran Survey data. Findings based on time-series negative binomial regression models suggest that veterans reporting better reintegration experiences are less likely to have served in combat and experienced military-related trauma, are currently in better health, felt supported by military leadership in help-seeking, and report lower levels of family strain.

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Dedication

Throughout my 43 years of existence, I seem to frequently be labeled as an underdog. So, this dissertation is dedicated to *all* my detractors. My motivation to achieve has *always* been fueled best by the potent formula of doubt. So, yes, thanks to all those who expressed their opinions of doubt about me. It has been fun proving so many people wrong yet again. On to achieve the next goal!

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Introduction

This dissertation examines, through a public policy lens, life after service for U.S. military veterans. In particular, it explores the influence of military service as it relates to the efficacy of state-level veteran-specific mental health programs, states' ability to address veteran homelessness, and veteran reintegration outcomes. The first chapter examines the extent to which state government veterans' mental health programs aid in mitigating lingering mental health issues among U.S. military veteran residents. The second chapter examines socio-ecological influences that contribute to veteran reintegration outcomes. Lastly, the third chapter examines state capacity indicators and their influence of on reduced veteran homelessness.

As early as 1988, Congress sought to address the public policy problem of U.S. military veterans' mental health with the passage of section 115 of Public Law 100-322, also known as the Veterans' Benefits and Services Act¹ (1988). The Department of Veterans Affairs (VA) began national implementation of primary care-mental health integration (PC-MHI) in 2007, funded by the Mental Health Enhancement Initiative (Post et al. 2010). From 2006 through 2010, nearly 2.1 million veterans received mental health care from the VA² (U.S. Government Accountability Office 2011, 7). Over 1.7 million veterans received mental health treatment in fiscal year 2018, services that include counseling, therapy, medication, peer support with other veterans, or a combination of these things (VA 2022). While the VA endeavors to address veterans' mental health, including its recent responses to the STRONG Veterans Act (Williams

¹ As early as 1946, Congress acknowledged the public policy problem of U.S. military veterans' mental health via the National Mental Health Act; however, the law did not limit its target population to veterans, yet its effect diminished the influence of states in favor of federal policy making power (Grob 1944).

² Total number of veterans who received mental health care from the VA: 897,129 in 2006, 952,662 in 2007, 1,027,992 in 2008, 1,118,646 in 2009, and 1,203, 530 in 2010.

2022) and the Cleland-Dole Act (Motter 2023), the public policy problem is one that that has maintained its salience on the institutional agenda. Thus, many states have either developed their own veterans' mental health programs or partnered with the VA to address lingering issues such as veteran homelessness, reintegration, and veterans' mental health at large.

Public data concerning veterans' mental health is readily available and covers a multitude of mental health issues. Findings from the National Vietnam Veterans Readjustment Study suggest that the lifetime prevalence of post-traumatic stress disorder (PTSD), among male and female Vietnam War veterans is 30.9% and 26.9%, respectively (Weiss et al. 1992, 372). It is estimated that up roughly 400,000 VA-enrolled veterans held a PTSD diagnosis³ (Spoont et al. 2013, 6). Roughly 23% of female veterans reported sexual assault while serving in the military (VA 2019a). From 2008 to 2017, there were over 6,000 veteran suicides annually, a rate in which veterans were notably overrepresented among the U.S. adult population (VA 2019b).⁴ The Bureau of Justice Statistics estimates that 43% of incarcerated veterans in 2011-2012 had four or more prior arrests (Bronson et al. 2015). The Department of Housing and Urban Development (HUD) estimates that over 37,000 veterans experienced homelessness on a given night in January 2019 (Henry et al. 2020, 54). In light of these data, it is evident that veterans' mental health remains an ongoing public policy issue, often impacting a veteran's reintegration to civilian life, at times resulting in veterans being caught up in an "institutional circuit" of homeless shelters, jails, and mental health treatment settings (Kasprow et al. 2000, 1017).⁵

³ Spoont et al. (2013, 6) also report that up to 20% of post-9/11 veterans have PTSD.

⁴ In 2018, the VA reported that veteran suicides increased nearly 26% from 2005 to 2016 (VA 2018, 3).

⁵ This institutional dilemma is also complicated by instances of substance abuse, which often introduces additional risk factors for loss of housing among veterans (Ghose et al. 2013; O'Connell, Kasprow, and Rosenheck 2012).

It may be the case that veterans' experiencing mental health issues comprise a relatively small subpopulation within the United States. The U.S. Census Bureau estimated that the total U.S. military veteran population was roughly 16.5 million in 2021 (Gilligan 2022). Among the U.S. military veteran population, approximately nine million are enrolled in the VA health care system (Wang et al. 2021, 1). As well, the size, scope, and mission of the VA exemplifies the salience of the public policy issue and its ability to garner attention on various institutional agendas. The VA is surpassed only by the Department of Defense in number of employees (U.S. Office of Personnel Management 2018) and employee salaries (U.S. Treasury Department DataLab n.d.) while ranking seventh in total budget size (Greer 2016). Given the magnitude of the VA and its mission, it holds as a bureaucratic system subject to implementation challenges and evaluation (Rosenheck 1986; Stevens 1991). Further, the VA motto was adopted in 1959, derived from President Lincoln's second inaugural address that sought to unify the country amidst the final weeks of the Civil War, acknowledging the obligation "to care for him who shall have borne the battle and for his widow, and his orphan" (VA 2009).

Support for U.S. military veterans is also found among the general public. Roughly 64% of the general public believe Americans look up to people who have served in the military, 67% believe veterans are more disciplined, and 59% believe veterans are more patriotic (Igielnik 2019). Another poll found that 70% of people believe veterans have a positive impact on the U.S. economy (VA 2014). However, almost half of respondents to this survey associated an image of a homeless man with veteran status, despite veterans comprising roughly 10% of the total U.S. homeless persons population (VA 2014). This may suggest that Americans have some level of awareness of veterans' mental health issues. If so, such data would align with a 2021 survey, finding that 87% of American adults support the need to do more for veterans, with 51%

of those surveyed viewing mental health care as the biggest need among veterans (Coe et al. 2021, 5). Given the existence of mental health issues among veterans, that these issues are ongoing for many veterans, and the combined institutional and public policy support for supporting veterans' mental health needs, these conditions offer reasonable justification for further research regarding veterans' mental health through a public policy lens.

When reviewing the literature, it is reasonable to anticipate that the stigmatization of help-seeking among veterans (e.g., Hoge et al. 2004), as well as influences stemming from military culture (e.g., Weiss and Coll 2011), may play a role in the mental health outcomes for many veterans. While the stigmatization of help-seeking is not exclusive to members of the U.S. Armed Forces and its veterans (e.g., Coleman et al. 2017; Corrigan 2004; Mansfield et al. 2005), the stigmatization of help-seeking among U.S. military veterans is relatively well studied within academic research (e.g., Blais and Renshaw 2013; Calhoun et al. 2002; Cornish et al. 2014; Health et al. 2017; Hoge et al. 2004; Hom et al. 2017; Kulesza et al. 2015; Rosen et al. 2011; Shin et al. 2012). The VA (2008) also recognizes the stigmatization of help-seeking as a known barrier to mental health care for veterans in need of mental health services, to include housing assistance and reintegration. As noted by Burnam et al. (2009), veterans' individual attitudes and beliefs play a role in the stigmatization of help-seeking, including the military culture paradigm.

Military culture has been recognized as a distinct sub-culture of American civil society (Weiss and Coll 2011). Generally, military culture consists of values such as unit cohesion, a rigid hierarchical structure, devotion to duty and the mission, stoicism, and a constant state of combat readiness (Weiss and Coll 2011). The authors note that this posture becomes even more pronounced after a service member experiences combat. However, Weiss and Coll note the

tendency of warriors to stringently avoid facing one's inner "enemy" of mental health challenges (2011, 78). Thus, the stigmatization of mental health and help-seeking are often cited as being ingrained in military culture (Langston et al. 2007). While veterans may sometimes stigmatize help-seeking, some veterans do seek help from veteran transition and/or reintegration programs; however, research suggests there may be a lack of recognition of the challenges faced by veterans and their families as they transition to civilian life (Sayer, Carlson, and Frazier 2014). Given the data regarding veterans' mental health issues discussed earlier, such lingering policy problems (e.g., homelessness and reintegration), unanswered questions, and knowledge gaps further support the need for continued research. However, considerations for the practical implications are worthy of consideration.

This dissertation, through a public policy lens, examines life after service for U.S. military veterans as it relates to the ability of state-level veteran-specific mental health programs to address veterans' mental health challenges, states' ability to address veteran homelessness, and veteran reintegration. Much of the available literature regarding veterans' mental health is centered at the national level, with research regarding state-level veterans' mental health programs appearing to be relatively scarce. Thus, two chapters within this dissertation examine the ability of state-level policies and programs to aid ameliorating veterans' mental health.⁶ These chapters provide an opportunity, when much of the existing literature is centered at the national level, to examine the efficacy of state-level veterans' mental health policies and programs. Inferences drawn from these studies may contribute to a better understanding of what

⁶ The other chapter, regarding veteran reintegration, utilizes national survey data that do not include veterans' state of residency.

among these state-level policies and programs works; and perhaps, what the federal government may learn from states as laboratories of public policy (Volden 2006).

First, this dissertation's examination of state-level veterans' mental health programs to effectively address veterans' mental health challenges aligns with two themes emerging from research linking military culture to the stigmatization of help-seeking, recommendations of a clinical nature (e.g., Cornish et al. 2014; Cornish et al. 2019; Weiss and Coll 2011) and those pertaining to policy changes (e.g., McGuffin et al. 2021; Rosen et al. 2011; Westphal and Convoy 2015). This may suggest that policy plays an important role alongside clinical innovations as it relates to mitigating veterans' stigmatization of help-seeking. Next, this dissertation's examination of state capacity to address veteran homelessness finds that:

- States better at managing their debt in proportion to their revenue will display a greater capacity to reduce their homeless veteran population.
- The availability of permanent supportive housing beds indicates a capacity to move veterans from unsheltered status through to a more permanent housing solution.
- States spending less per capita on criminal justice corrections and more on veteran programs demonstrate more success in sheltering their homeless veterans.
- Costs of living indicators and veteran unemployment rates impact veteran housing stability.

These findings suggest a state's capacity to manage resources, notably their ability to connect homeless veterans and available resources via robust relationships with community stakeholders, is key to enhancing homeless veteran outcomes.

Lastly, this dissertation's examination of factors related to veteran reintegration, answers the call of Elnitsky et al. (2017) for more research utilizing the adapted Socio-Ecological Model of veteran reintegration. As noted by Lazier, Gawne, and Williamson, even if a conceptual framework of veteran reintegration were to take hold, researchers, policy makers, and other key stakeholders would need to take additional steps to "address gaps in data, in particular, the veteran family" (2016, 54). This study supports a combined set of conclusions posited by Elnitsky et al. and Lazier, Gawne, and Williamson. Based on the results of this study and others, broader policy-level inferences suggest 1) the need for a unified definition of veteran reintegration for application in future research as a means of advancing the science on reintegration, and 2) innovative collaboration between researchers and policy makers (e.g., the 2015 Department of Veterans Affairs Office of Policy and Planning forum) to "drive a more robust, veteran-focused dialogue around the myriad of policy issues affecting the lives of veterans and their families" (Lazier, Gawne, and Williamson 2016, 54). Overall, findings from this dissertation suggest that research regarding veterans' mental health outcomes, through a public policy lens, may suggest that policy plays an important role alongside clinical innovations provide further insight for key stakeholders to enhance program efficacy, a greater return on investment for taxpayers, and overall social utility.

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The Effects of State-level Veterans' Mental Health Programs on Veteran Mental Health

Abstract

From 2006 through 2010, nearly 2.1 million individual U.S. military veterans received mental health care from the Department of Veterans Affairs (VA). Over 1.7 million veterans received mental health treatment from the VA in fiscal year 2018. Though these contributions by the VA have helped many veterans, many other veterans struggle with ongoing mental health challenges. State veterans' mental health programs augment these federal efforts, but how effective are these programs in ameliorating veterans' mental health? Relying on a wealth of research regarding veterans' stigmatization of mental health help-seeking, including the influence of military culture, this study uses Centers for Disease Control and Prevention 2019 Behavioral Risk Factors Surveillance System survey data and geographic information system mapping to examine the efficacy of state veterans' mental health programs. Findings from multilevel zero-inflated Poisson regression models suggest that, as opposed to other state-level veterans' programs – those *not* primarily focused on veterans' mental health – targeted state-level veterans' mental health programs do provide positive contributions. Despite this, and in line with veterans' stigmatization of help-seeking, veterans will typically be less forthcoming than nonveterans to questions regarding one's mental health status. This study's results, along with additional research, may offer practitioners and policymakers additional insights regarding the efficacy of state veterans' mental health programs – what works well and what may be less efficacious – not only for veterans, but also for taxpayers that often fund such programs.

Introduction

As early as 1988, Congress sought to address the public policy problem of U.S. military veterans' mental health via section 115 of Public Law 100-322, also known as the Veterans' Benefits and Services Act⁷ (1988). Since 2014, additional federal actions have been taken to address veterans' mental health, including the Veterans Access, Choice and Accountability Act (Jordan 2014), the Clay Hunt Suicide Prevention for American Veterans Act (Leonard 2015), Executive Order 13822 (Lamothe 2018), The MISSION Act (Sisk 2018), and the Sgt. Ketchum Rural Veterans Mental Health Act (Lilley 2021). The Department of Veterans Affairs (VA) began national implementation of primary care-mental health integration (PC-MHI) in 2007, funded via the Mental Health Enhancement Initiative (Post et al. 2010). Spanning three presidential administrations, these actions suggest that veterans' mental health remains as a salient, bipartisan public policy issue at the federal level.

From 2006 through 2010, nearly 2.1 million veterans received mental health care from the VA⁸ (U.S. Government Accountability Office 2011, 7). Over 1.7 million veterans received mental health treatment in fiscal year 2018, services that include counseling, therapy, medication, peer support with other veterans, or a combination of these (VA 2021a). These data exemplify the federal government's large-scale, nationwide efforts to address veterans' mental health. Though millions of veterans have received treatment through the federal VA system, data indicate that many other veterans struggle with mental health issues.

⁷ As early as 1946, Congress acknowledged the public policy problem of U.S. military veterans' mental health via the National Mental Health Act; however, the law did not limit its target population to veterans, yet its effect diminished the influence of states in favor of federal policy making power (Grob 1944).

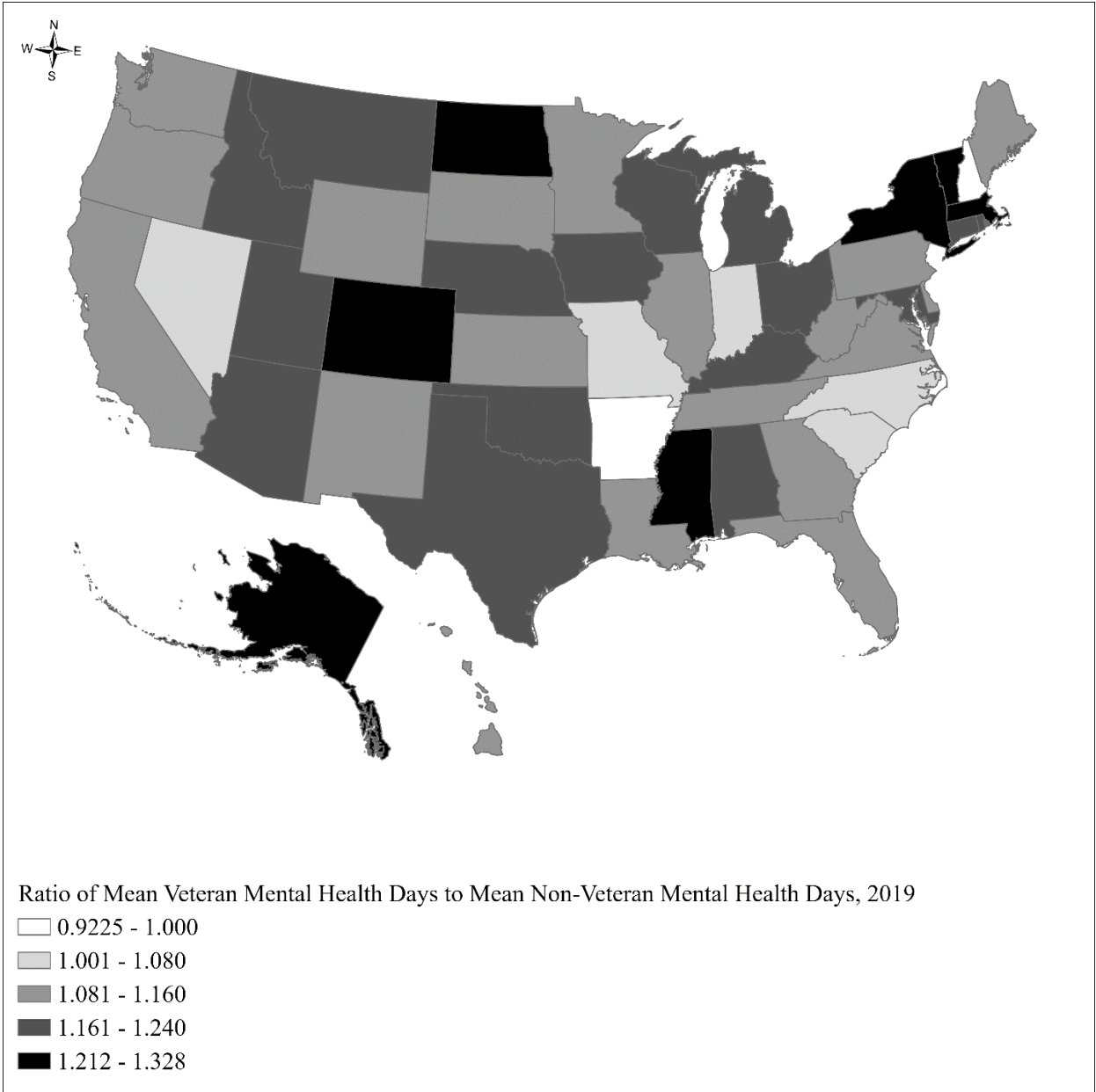
⁸ Total number of veterans who received mental health care from the VA: 897,129 in 2006, 952,662 in 2007, 1,027,992 in 2008, 1,118,646 in 2009, and 1,203, 530 in 2010.

Data regarding veterans' mental health covers a myriad of mental health issues. The National Vietnam Veterans Readjustment Study findings indicate that the lifetime prevalence of PTSD among Vietnam War veterans is 30.9% among males and 26.9% among females (Weiss et al. 1992, 372). In 2013, Spoont et al. estimate that up to 20% of post-9/11 veterans have post-traumatic stress disorder (PTSD), and about 400,000 VA-enrolled veterans held a PTSD diagnosis (2013, 6). Roughly 23% of female veterans reported sexual assault while serving in the military (VA 2019a). There have been over 6,000 veteran suicides each year spanning 2008 to 2017, and in 2017 the suicide rate for veterans was 1.5 times higher than that of nonveteran adults when adjusting for population differences (VA 2019b). Another VA statistic notes that veteran suicides increased nearly 26% from 2005 to 2016 (VA 2018, 3). The Bureau of Justice Statistics estimates that 43% of incarcerated veterans in 2011-2012 had four or more prior arrests (Bronson et al. 2015). The Department of Housing and Urban Development (HUD) estimates that over 37,000 veterans experienced homelessness on a given night in January 2018 (Henry et al. 2018, 54).

While these data paint a broad picture of recent trends in veteran mental health, the Centers for Disease Control and Prevention (CDC) conducts an annual Behavioral Risk Factor Surveillance System (BRFSS) survey comprised of more than 400,000 adult interviews across all 50 U.S. states (CDC 2014). This survey includes a question asking respondents if they have “ever served on active duty in the United States Armed Forces, either in the regular military or in a National Guard or reserve unit.” The BRFSS also asks respondents to indicate “how many days within the past 30 days was your mental health *not* good?” When combined with each respondent's state of residence, these data offer a state-level snapshot in time of veterans' self-reported mental health compared to that of nonveterans. Figure 1 displays the ratio of mean

veteran mental health days to the mean nonveteran mental health days, according to the 2019 BRFSS survey data. As a ratio of mean veteran mental health days (i.e., the numerator) over mean nonveteran mental health days (i.e., the denominator), According to figure 1, only two states, Arkansas and New Hampshire, held a higher mean score for nonveteran mental health days in 2019 than that of veterans; therefore, 48 of the 50 U.S. states held a higher rate of self-reported mental health days for veterans than that of their nonveteran counterparts.

Figure 1: Ratio of Mean Veteran Mental Health Days to Mean Nonveteran Mental Health Days, 2019



Note: Values reflect for each state the ratio of mean veteran mental health to the mean nonveteran mental health days.

Given that many veterans still face a variety of mental health issues, even amidst the large-scale efforts and successes at the federal level, state-level government programs, when available, may play a meaningful role in addressing mitigating veterans' mental health issues. Policy and program initiatives to address veterans' mental health needs have primarily focused on increasing access to care by extending eligibility or hiring more providers, yet major quality gaps in mental health care remain (Burnam et al. 2009). Burnam and colleagues assert that, unless these gaps are addressed, the risk of increasing access to ineffective services will remain. The demand for mental health programs, such as those intended to address PTSD, has risen notably over the last several years, to include increased interest among older veterans (Rosenheck and Fontana 2007). If the goal is to address increased demand for veterans' mental health services via effective veterans' policies and programs, it may be reasonable to ask what role U.S. states may have in advancing this goal.

Prior to postulating such a question, it is first necessary to understand the various veterans' mental health programs offered by state governments. State government websites offer critical infrastructure for the advertisement and accessibility of available state-level veteran mental health programs. Many states have some form of executive branch department, agency, or office dedicated to serving U.S. military veterans. Mental health programs for veterans are often advertised under the state's own department of veterans' affairs website. Some of the most common veterans' mental health programs offered at the state level include a veteran crisis hotline, housing or homelessness assistance for veterans, veteran suicide prevention services, veteran substance abuse services, and peer support programs. Considering the level of policy attention given to mitigating veterans' mental health issues, a synopsis of currently available state-level veteran mental health programs is warranted.

Examples of Current State Veterans' Mental Health Programs

Each U.S. state government, like any local, state, or national jurisdiction, will have its own (systemic) policy agenda when adopting and implementing new policies (Anderson 2015, 96). With U.S. military veterans generally holding a highly deserving and politically influential social construction (Schneider & Ingram 1993), it may be reasonable to anticipate that veterans remain a salient subpopulation for state-level policy considerations, including programs designed to assist veterans with ongoing mental health needs. However, following a search for advertised veterans' mental health programs and services on state government websites,⁹ 22 out of 50 states gave no readily available indication of a current state-sponsored mental health program for veterans.¹⁰ This section describes a few of these state veterans' mental health programs.

While the VA offers a national toll-free crisis hotline for veterans¹¹ (VA 2021b), six states were found to advertise their own veterans' crisis hotline. The state of Florida advertises two veteran crisis hotlines – The Fire Watch and 1-844-MyFLVet – both supported by state legislation. The Fire Watch is a multi-jurisdictional government entity formed in 2019 (The Fire Watch 2021). On at least one occasion it has received \$200,000 in state funding support via the 2021 Florida Senate Bill 2500 that was signed into law by Governor DeSantis (The Florida Senate 2022). The 1-844-MyFLVet program received \$150,000 from the Florida legislature in 2014 to create the peer-based pilot program, \$400,000 from the Florida Department of Veterans' Affairs in 2017, and over \$1.5 million from the Florida Department of Children and Families from 2019 to 2021 (The Florida Senate 2021, 4-5). Crisis hotline programs such as these,

⁹ Please refer to the “Data and Methods” section for a detailed explanation of the data collection methods used to determine the availability of veterans' mental health programs for each state.

¹⁰ The five most common state government veteran mental health programs identified include: Veteran crisis hotlines, housing or homelessness assistance for veterans, veteran suicide prevention services, veteran substance abuse services, and peer support programs.

¹¹ 1-800-273-8255

whether they are partially funded by or fully under the authority of state governments, provide an additional avenue of support for veterans in need.

In 1992, the VA and the Department of Housing and Urban Development (HUD) partnered to establish the HUD-VA Supported Housing (HUD-VASH) program (Rosenheck et al. 2003). HUD-VASH “offers homeless veterans a Section 8 voucher through HUD to subsidize their rent and VA case management services to support their housing tenure” (Tsai et al. 2013, 1040). This federal program began with fewer than 4,000 housing vouchers for homeless veterans, but that number increased to just over 48,000 in 2008 (Montgomery et al. 2013, 506). Tsai et al. (2013) find that the HUD-VASH program, one of the largest supported housing programs in the U.S., has been effective in housing homeless veterans. Amidst these successes, some veterans still face unmet housing needs. However, states such as California¹² offer state government housing/homelessness program in addition to robust federal initiatives. The Veteran’s Bond Act of 2008 authorized \$900 million in California state funds to help veterans purchase single-family homes through the California Department of Veterans Affairs Loan Program (California Department of Housing and Community Development 2022). In 2013, the Veteran’s Bond Act of 2008 was restructured to include multifamily housing for veterans (California Department of Housing and Community Development 2022). As well, California’s Veterans Housing and Homeless Prevention Bond Act of 2014 established a series of program goals – funding 4,800 new veteran housing units, ensuring 50% of the funding serves extremely low-income veterans, and making at least \$75 million available annually for the development

¹² In 2020, California accounted for 31% of all veterans experiencing homelessness in the United States and 53% of all unsheltered veterans (U.S. Department of Housing and Urban Development 2021, 56)

and preservation of affordable housing for veterans and their families (California Department of Veterans Affairs n.d.).

The Department of Veterans Affairs noted in a 2013 report that an average of 22 veterans died by suicide each day from 2009 to 2010 (Kemp and Bossarte 2013, 18). The report included an outline of the VA's planned policy changes set to take immediate effect. As well, a response from non-profit organizations, such as 22 Kill, recently renamed to One Tribe Foundation (2021), was also seen in the aftermath of the VA's 2012 Suicide Data Report. To aid in further assisting in the reduction of veteran suicides, several states have established veteran suicide prevention programs. The state of Washington has maintained suicide prevention policies dating back to at least 2012; however, a report by the Washington State Department of Veterans Affairs first notation of a veterans' suicide prevention initiative occurring in 2016 via (Washington state) House Bill 2793 (Garza 2020, 15-16). That initiative "required that the standards for suicide assessment, treatment, and management training include content specific to veterans" (Garza 2020, 16). In 2019 the state assembly provided funding that required the Washington state Department of Veterans Affairs to "develop and implement a statewide plan to reduce suicide among service members, veterans, and their families (Garza 2020, 16). In support of Presidential Executive Order 13861, Washington joined the VA's Governor's Challenge to end veteran suicide, which resulted in the creation of the Washington State SMVF¹³ Suicide Prevention Strategic Plan for 2021 through 2023, generated by the newly formed Washington state SMVF Suicide Prevention Advisory Committee (Garza 2020). This strategic plan enumerates three major priorities – identify SMVF and screen for suicide risk, promote connectedness and improve care transition, and increase lethal means safety and safety planning (Garza 2020). In

¹³ Service members, veterans, and their families.

2019, the VA reported that the average number of veteran suicides per day had decreased to 17.2 (VA 2021c, 5). Though the policy problem of veteran suicide persists, efforts from the VA, existing state level programs, and other organizations appear to have had a positive impact.

In a review of studies regarding risk factors for homelessness among U.S. military veterans, Tsai and Rosenheck (2015) find substance abuse to be a major risk factor for homelessness among U.S. military veterans. In line with such findings, the state of Connecticut offers veterans' substance abuse treatment on (at least) two fronts, first under the umbrella of Connecticut's Residential and Rehabilitative Services Program and under the state's substance abuse recovery program. The Residential and Rehabilitative Services Program, linked with the state's Veterans' Improvement Program offers an array of services for veterans with housing insecurity and includes substance abuse treatment when appropriate (Connecticut Department of Veterans Affairs 2022). Connecticut's substance abuse recovery program aids veterans in the process of transitioning from addiction to independence and reintegration via a 6-month program that includes clinical staff that design an individually tailored program for each veteran (Connecticut Department of Veterans Affairs 2022). While the VA continues to explore new and innovative ways to treat substance abuse among veterans, including computerized psychotherapies (Hermes, Tsai, and Rosenheck 2015), some states have established their own programs to further address the mental health need of U.S. military veterans.

Peer support has been increasingly utilized within the VA and has received the support of the Institute of Medicine for use with veteran mental health treatment (Hundt et al 2015). The effectiveness of peer support "may be explained in terms of an individual's improved self-efficacy due to peer learning about how to cope with and manage a stressful environment" (MacEachron and Gustavsson 2012, 587). Generally, peer support for veterans may manifest in

several different forms,¹⁴ and for each of the previous program types – crisis hotlines, housing/homelessness support, suicide prevention, and substance abuse services – at least one state incorporates peer support into its program design. First, Vermont offers the Vermont Veteran and Family Outreach Program’s 24-hour call center featuring peer support (Vermont Office of Veterans Affairs 2022). Next, the Texas Veterans Commission (TVC) was created by the Texas state government in 1927 in response to Texas veterans’ complaints about the shortcomings of federal services at that time (Texas Veterans Commission 2012). In 2013, the Texas legislature passed house bill 2392 requiring the Texas Department of State Health Services to develop a mental health intervention program for veteran that included peer-to-peer counseling, which resulted in the creation of the Military Veteran Peer Network under the TVC (Texas Coordinating Council for Veterans Services 2014, 27). The TVC’s Homeless Veteran Initiative provides peer support for homeless veterans of Texas via the Military Veteran Peer Network (2022). Finally, the state of Maryland the Veteran Suicide Prevention Plan (i.e., Maryland senate bill 521) in 2019 that, in part, ensured a peer support component would be built into its state-level suicide prevention program (LegiScan 2019).

Veterans’ Mental Health Services: A Dichotomy of Availability and Stigmatization

Following a synopsis of state-level veterans’ mental health programs, a review of the academic research on such program is warranted. While much of the available literature is centered at the national level, research regarding state-level veterans’ mental health programs appears to be scarce. When reviewing such research, it is reasonable to anticipate that the stigmatization of help-seeking among veterans (e.g., Hoge et al. 2004), as well as influences

¹⁴ To elaborate, veteran peer support may be found in programs beyond those few discussed in this section, including veteran treatment courts (Russell 2009).

stemming from military culture (e.g., Weiss and Coll 2011), may play a role in the mental health outcomes for many veterans. Prior to this endeavor, federal efforts to address veterans' mental health challenges warrant acknowledgement.

At the federal level, Congress sought to address the public policy problem of U.S. military veterans' mental health as early as the Veterans' Benefits and Services Act of 1998. Since that time, the VA has greatly expanded its efforts to provide comprehensive mental health treatment programs for U.S. military veterans, exemplified through a variety of publications and reports (e.g., VA 2011; VA 2018a; VA 2018b; VA 2022; Watkins et al. 2011; Watkins and Pincus 2011). These efforts by the VA to address the many mental health needs of veterans represent federal-level accomplishments towards ameliorating veterans' mental health. Even with such large-scale and positive contributions at the federal level, some veterans, as shown in the data, continue to experience mental health challenges. Thus, many states have implemented their own mental health programs for veterans.

State-level Veterans' Mental Health Program Research

A 2000 study found that 23.4% of surveyed U.S. military veterans¹⁵ reported usage of non-VA mental health services in the past six months (Hoff and Rosenheck 2000, 100). While Hoff and Rosenheck note that their study was unable to determine what types of non-VA services were used, there seems to be a clear demand for mental health services among veterans beyond the VA. As noted in the previous section, one such option includes state veterans' mental health programs. Rosenheck et al. note that the provision of mental health services suffered significant cutbacks, such as the closure of 62% of mental health inpatient beds between 1993

¹⁵ The three datasets used in this study include veterans who used "VA inpatient and outpatient psychiatric, substance abuse, and medical/surgical services" in fiscal year 1990 (Hoff and Rosenheck 2000, 98).

and 1998 (2001, 58). In turn, increased state and county mental hospital per capital expenditures were associated with reduced use of VA services by veterans receiving VA compensation for mental health reasons (Rosenheck et al. 2001). In a study of New York state VA behavioral health services users, Rosenheck et al. concluded that, in New York, there was “no evidence of any spillover effects resulting from the closure of almost one-third of VA inpatient mental health beds” from 1994 to 1997¹⁶ (2000, 187). Shifting from fiscal policy to the influence of management policy changes, Desai and Rosenheck (2002) found that Colorado VA patients were less likely to be cross-system users¹⁷ in counties that implemented a capitated managed care strategy.¹⁸ The authors note that that veterans who lived farther away from VA facilities were more likely to be cross-system users and speculated that veterans may prefer to access certain types of care from state programs, such as substance abuse care. Findings from these studies suggest, as do Miller and Intrator (2012), that state veterans’ mental health programs vary, and that they may do so according to individual state and intrastate policy arena.

Beyond the examination of significant policy shifts, whether fiscal, operational, or otherwise, several studies have demonstrated that many Veterans Health Administration users have elected to utilize non-VA mental health services, notably, state veterans’ mental health programs. Recalling the New York state study by Rosenheck et al., the authors also reported significantly greater cross-system use among veterans treated (only) for substance abuse and those treated for substance abuse and psychiatric concerns (Rosenheck et al. 2000). Burnam et al.

¹⁶ More results from this study will be discussed in the next paragraph.

¹⁷ Cross-system use, or dual use, generally refers to use of more than one health care system, such as the VA and Medicare (Hynes et al. 2007). For this study, cross-system use refers to veterans’ use of both VA and state-level veterans’ mental health programs.

¹⁸ Kaiser Family Foundation (2022) describes capitated managed care as a process where “states design and administer their own Medicaid programs within federal rules’ and “determine how they will deliver and pay for care for Medicaid beneficiaries.”

(2009) notes that many younger veterans have suggested being uncomfortable utilizing VA services, perceiving them to be oriented towards older veterans. Hester (2017) notes, when a mental health crisis occurs for low-wage families (e.g., in times of social and economic stress), veterans and their families must often rely on public-supported programs funded under the State Mental Health Services program. Burnam et al. (2009), Eaton (2015), and Howren et al. (2022) in their respective studies, found that rural veterans often do not have easy access to federal services. It is unclear to what degree these rural veterans also lack access to state mental health services.¹⁹ Given the utilization of state veterans' mental health programs by a variety of vulnerable veterans, as well as the variability of programs available across different states, these state programs augment federal efforts significantly (McDaniel et al. 2018). Finally, Burnam et al. note that:

Surveys and focus groups repeatedly show that the attitudes and beliefs of military service members and veterans inhibit them from seeking care for mental health problems. Military culture promotes pride in inner strength, self-reliance, toughness, and being able to 'shake off' ailments or injuries. Service members and veterans report that they would be seen as weak in admitting to having mental health problems. (2009, 774-775)

Thus, the stigmatization of help-seeking among veterans, to include the influence of military culture, is salient to examinations regarding the influence of state veterans' mental health policies on veterans' mental health outcomes.

Stigmatization of Help-Seeking Among Veterans

While the stigmatization of help-seeking is not exclusive to members of the U.S. Armed Forces and its veterans (e.g., Coleman et al. 2017; Corrigan 2004; Mansfield et al. 2005), the stigmatization of help-seeking among U.S. military veterans is relatively well studied within

¹⁹ Howren et al. (2022) do note the availability of telehealth technology has been helpful in improving access for rural veterans.

academic research (e.g., Blais and Renshaw 2013; Calhoun et al. 2002; Cornish et al. 2014; Health et al. 2017; Hoge et al. 2004; Hom et al. 2017; Kulesza et al. 2015; Rosen et al. 2011; Shin et al. 2012). The VA (2008) also recognizes the stigmatization of help-seeking as a known barrier to mental health care for veterans in need of these services. As noted by Burnam et al. (2009), veterans' individual attitudes and beliefs play a role in the stigmatization of help-seeking, including the military culture paradigm. Still, other factors have been found, including lack of income, less stable living situations, and illness-related cognitive and social skills (Drapalski et al. 2008). In many cases, the stigmatization of help-seeking is exacerbated among combat veterans (Hoge et al. 2004; Pietrzak et al. 2009). This trend persists despite a 2008 extension by Congress extending the veteran health care benefit for combat veterans to five years after their discharge (Seal et al. 2009). While both the VA and academic research recommends policy enhancements to alleviate stigmatic barriers, some veterans continue to hold onto these stigmas, including those linked to military culture.

Military culture has been recognized as a distinct sub-culture of American civil society (Weiss and Coll 2011). Generally, military culture consists of values such as unit cohesion, a rigid hierarchical structure, devotion to duty and the mission, stoicism, and a constant state of combat readiness (Weiss and Coll 2011). The authors note that this posture becomes even more pronounced after a service member experiences combat. However, Weiss and Coll note the tendency of warriors to stringently avoid facing one's inner "enemy" of mental health challenges (2011, 78). Thus, the stigmatization of mental health and help-seeking are often cited as being ingrained in military culture (Langston et al. 2007). In an examination of eight qualitative studies regarding stigmatization of help-seeking for mental health issues, Coleman et al. (2017) found that military leadership, while sometimes acting as a facilitator for help-seeking, would often be

perceived as a barrier to the same by others. Participants within these eight studies also noted that mental health professionals' familiarity with military culture was also a facilitator.

The Department of Defense has implemented policies aimed at destigmatizing mental health treatment (True et al. 2015). The VA acknowledges that veterans would benefit from broad communication, public education, and public policy efforts to promote mental health, increase understanding of mental health disorders, and eliminate barriers to help-seeking (VA 2018a, 18). To emphasize the prevalence of stigmatization of mental health help-seeking among military veterans (and service members), the American Psychological Association (APA) published a comprehensive set of guidelines for psychological practice with military service members and veterans (APA 2021). This APA guide includes recommendations that include efforts to stay abreast of governmental programs at the federal, state, and local levels. Two themes appear to emerge from research linking military culture to the stigmatization of help-seeking: recommendations of a clinical nature (e.g., Cornish et al. 2014; Cornish et al. 2019; Weiss and Coll 2011) and recommendations pertaining to policy changes (e.g., McGuffin et al. 2021; Rosen et al. 2011; Westphal and Convoy 2015). This may suggest that policy plays an important role alongside clinical innovations as it relates to mitigating veterans' stigmatization of help-seeking.

Because this unique paradigm of military culture is shown to have a profound influence on many U.S. military veterans, prior research has often used the CDC BRFSS survey to examine veterans' (self-reported) mental health outcomes (e.g., Burnam et al. 2009; Hoerster et al. 2012a; Srivastava et al. 2018). Further acknowledging the uniqueness of military culture, several studies have examined potential differences in mental health outcomes between veterans and nonveterans (e.g., Britton et al. 2012; De Luca et al. 2016; Grossbard et al. 2013). To date, I

am unaware of prior studies that have tied in state-level policies to individual-level data of this nature. This study includes state-level data, including a measure derived from a systematic internet search to determine if each state offers one or more state-level veterans' mental health program.²⁰ Also included is U.S. Census Bureau annual state expenditure data such as state veterans' miscellaneous program spending.²¹

To demonstrate the range of available state-level veterans' benefits across the country, The U.S. Army (2022) hosts the "MyArmyBenefits" website as its official military benefits website. This website offers a drop-down-style menu of U.S. states and territories to choose from, which navigates the user to the selected state or territory. As noted by the U.S. Army, the listed *state* veterans' benefit programs include military specialty license plates, reduced license plate fees, state sponsored life insurance, disabled veterans hunting and fishing benefits, discounted camping for disabled veterans, as well as other tax benefits, education benefits, and employment benefits (2022). As well, navigating to an individual state government's website regarding veterans' benefits and services, such as the Texas Workforce Commission (2022)²² or California's "CalVet" veterans services²³ (2022), one may find available lists of veterans' benefits not specifically geared towards mental health. While these and other state-level programs may not seek to directly address veterans' mental health, it seems logical that the mission of these programs would be to enhance veterans' quality of life. Thus, assuming the

²⁰ This measure will be discussed in greater detail in the next section.

²¹ These data exclude services that can be classified under several other major expenditure functions, but includes: Veteran's information and guidance services, claims representation, federal and state benefits assistance, general veterans outreach services, financial grants or bonuses not contingent upon need, certification of training and education programs under federal "GI bills" programs, administration of VA home loans program, and administration of federal veterans life insurance programs (U.S. Census Bureau 2006 , 5-70).

²² State-level veteran programs listed on the Texas Workforce Commission (2022) website include job search assistance, pre-employment and work readiness, information and referral to support services, and life skills.

²³ State-level veteran programs listed on the California CalVet veteran services (2022) website include housing and homelessness prevention services, claims representation, the disabled veteran business enterprise program, the California Transition Assistance Program, regional outreach, and the incarcerated veterans program.

nature of these public policy programs is to do some measure of good for U.S. military veterans, these miscellaneous state-level programs may bear some degree of indirect influence on veterans' overall mental health.

Therefore, to better understand the influence of state veterans' mental health programs on veterans' mental health outcomes, through a public policy lens, this study utilizes 2019 CDC BRFSS survey data to examine the effectiveness of state veterans' mental health programs in pursuit of addressing public policy goals tied to veterans' mental health outcomes. Given the dearth of research centered on state-level veterans' mental health programs, questions remain regarding the ability of these programs, amidst increasing demands for these services, to mitigate lingering mental health issues for U.S. military veterans. As well, it is unclear if other state-level programs achieve the same results. Again, if the goal is to address increased demand for veterans' mental health services via effective veterans' policies and programs, it may be reasonable to ask what role U.S. states may have in advancing this goal. Therefore, this study asks:

RQ1: To what extent do state government veterans' mental health programs aid in mitigating lingering mental health issues for U.S. military veterans?

RQ2: To what extent do other, miscellaneous state-level veterans' programs aid in addressing mental health issues among U.S. military veterans?

The effectiveness of these programs is not only salient to veterans in need, but also to other key stakeholders, such as policy decision makers, practitioners, and taxpayers. This data-driven study does not rely on a specified theory as the foundation upon which its hypotheses are derived.

Instead, this study, through a public policy lens, relies on a wealth of research regarding

veterans' stigmatization of mental health help-seeking, including the influence of military culture for this purpose. In turn, this study utilizes a randomized subset of the 2019 BRFSS data to conduct its analyses, including geographic information system (GIS) mapping and multi-level zero-inflated Poisson regression models accounting for state-level policies and characteristics. The following section describes the data and methods to address this study's research questions and test its hypotheses using a variety of statistical techniques.

Data and Methods

To what extent do state government veterans' mental health programs aid in mitigating lingering mental health issues for U.S. military veterans? To what extent do miscellaneous state-level veteran programs achieve the same? Given the salience of veterans' mental health and the coinciding public policy attention given to this issue at the state level, this study uses 2019 CDC Behavioral Risk Factors Surveillance System survey data to examine the effectiveness of state veterans' mental health programs through a public policy lens. Relying on veterans' stigmatization of mental health help-seeking literature, the following hypotheses are posited:

Hypothesis H1: U.S. states offering one or more military veterans' mental health programs are more likely to see improved mental health among veteran residents.

Hypothesis H2: U.S. states spending more per capita on miscellaneous military veteran programs are more likely to see improved mental health among veteran residents.

Data

To test the above hypotheses, this study conducts secondary analyses of the 2019 CDC Behavioral Risk Factor Surveillance System (BRFSS) survey to better understand the effects of state-level veterans' mental health program on veterans' mental health. The BRFSS is a

collaborative project in which all 50 states have chosen to participate; however, New Jersey was “unable to collect enough BRFSS data in 2019 to meet the minimum requirements for inclusion in the 2019 aggregate data set” (CDC 2019a, 1). The 2019 BRFSS utilized cellular and landline telephone calls to collect self-reported data on health-related risk behaviors, chronic health conditions, and use of preventative services from the noninstitutionalized adult population (i.e., 18 years of age or older) residing in the U.S. (CDC 2019a). Therefore, the unit of analysis for this study is a noninstitutionalized adult residing in the U.S. The median response rate for all U.S. states and territories is 49.4% (CDC 2019b). The 2019 BRFSS data sample consists of 418,268 usable responses (CDC 2019c). Responses from the District of Columbia, Puerto Rico, and Guam were not included in this study’s sample,²⁴ resulting in a study sample of 407,186 respondents. U.S. military veterans comprised 52,246 of available responses. Given the relatively large 2019 BRFSS dataset, it is necessary to describe the methods utilized to address a relatively large dataset prior to conducting this study’s analyses.

Lin, Lucas, and Shmueli (2013) state that, with large samples, conclusions based on small-sample statistical inferences can mean ineffective or even misleading conclusions. More specifically, “a *p*-value measures the distance between the data and the null hypothesis using an estimation of the parameter of interest;” therefore, in regression analyses, such estimators have standard errors that become smaller as the sample size increases (Lin, Lucas, and Shmueli 2013, 907). The authors explain that “with a very large sample, the standard error becomes extremely small, so that even minuscule distances between the estimate and the null hypothesis become statistically significant (Lin, Lucas, and Shmueli 2013, 907).

²⁴ The 2019 BRFSS included 2,624 responses from the District of Columbia, 6,032 responses from Puerto Rico, and 2,426 from Guam.

There are various ways one may address the conundrum of large datasets according to Lin, Lucas, and Shmueli (2013), and one of these methods includes the utilization of one or more random subsets of the data. Prior use of randomized subsets may be found within existing research at-large (e.g., Buter and van Raan 2011; Hacker, Stone, and MacBeth 2016; Lynas, Houlton, and Perry 2021; Stang et al. 2006). Buter and van Raan elected to utilize a representative 5% random sample from an original dataset of nearly 13 million publications (2011, 609). Lynas, Houlton, and Perry conduct statistical analyses using a randomized subset of 3,000 publications (roughly 3.4%) from an initial dataset of 88,125 (2021, 2). Stang et al. elected to use a randomized subset of 2,365 subjects (49.1%) from an original dataset of 4,814 (2006, 86). Hacker, Stone, and MacBeth (2016) derive a 10% randomized subset of 1,865 studies for the purpose of checking inter-rater reliability and analysis. It is evident that the proportion of the randomized subset utilized for analysis may vary across studies. Lastly, these studies demonstrate that randomized subsets offer a reliable method when dealing with large dataset.

“FairSubset” Software

At a glance, there is more than one way to acquire a randomized subset. Ortell, Switonski, and Delaney state that agnostic randomization may be performed at the risk of unintentionally skewing the data (2019). Further, the authors posit that it is unreasonable to expect scientists to manually conduct randomization processes and to make selection decisions in an unbiased, random manner (Ortell, Switonski, and Delaney 2019). One method to avoid such a dilemma is available via the “fairsubset” package²⁵ (Delaney 2020). The “fairsubset” package

²⁵ Version 1.0.

aims to address problems of bias by offering a point-and-click tool designed to find subsets representative of the original data (Ortell, Switonski, and Delaney 2019).

The process performs the user-designated number of random subsets without replacement, which may be based on mean or median values. When using mean values, an average and standard deviation calculation is performed for each of the defined number of randomization iterations for each column, which is then saved in the tool's memory (Ortell, Switonski, and Delaney 2019, 3). Once this is complete, the tool calculates the difference between the subset average and the original dataset's average as well as similar calculations for standard deviation, then the tool "weighs both the average and standard deviations equally and then chooses which randomly chosen sample most closely resembles the original column of data" (Ortell, Switonski, and Delaney 2019, 3). The tool identifies the best subset for use based on its representativeness to the original dataset, and this matrix may be saved in file format (e.g., in comma-separated values formatting). Simply put, the ability of the "fairsubset" package to provide a representative subset of the original data offers a more accurate representation when conducting statistical analyses, one that helps to avoid the *p*-value problem as described by Lin, Lucas, and Shmueli (2013).

Prior to use of the "fairsubset", the R function "runif"²⁶ was utilized to request a random number between 20,000 and 50,000 to select this study's sample population (Lam 2010). The first number generated for this request was 32,807. Using the "fairsubset" package, a randomized, representative subset of 32,807 veteran and nonveteran respondents (roughly 7.84% of the original dataset) from the BRFSS data was generated.²⁷ The number of respondents per

²⁶ R version 4.2.1.

²⁷ The "fairsubset" software selected the most representative subset among 1,000 random iterations requested.

state for this subset ranges from 214 cases for Nevada to 1,408 cases for Florida. Supported by subsetting practices found in the previously mentioned prior research, this randomized subset is of suitable size for use with regression analyses.²⁸ Next, the distribution of responses to this study's dependent variable is of interest to the selection of suitable regression models.

Dependent Variable

The dependent variable for this study is derived from the 2019 CDC Behavioral Risk Factor Surveillance System survey question two from core section two. This question asks respondents, when considering their mental health, which includes stress, depression, and problems with emotions, how many days during the past 30 days was their mental health *not* good. This count data includes possible responses ranging from zero to thirty and various forms of non-answers. Figure A.1 of the appendix provides a graphical depiction of the frequency distribution of this measure for the randomized subset of 32,807 veterans and nonveterans, comprised of 20,809 zero values (roughly 63.52%), 11,266 non-zero values, and 702 non-responses. Poisson regression models offer a standard framework for analyses utilizing count data (Coxe, West, and Aiken 2008; Ridout, Demetrio, and Hindle 1998; Ridout, Hinde, and Demetrio 2001). Given the distributions of this study's randomized, representative subset, the selection of suitable regression models will be discussed in the next section.

Independent Variables

This study employs a multilevel design with independent variables comprised of individual-level measures and state-level measures. State-level measures originate from a variety of governmental data sources. All individual-level measures originate from the 2019 BRFSS

²⁸ The number of observations included in each model results is reduced by listwise deletion of cases in which some respondents did not provide meaningful responses to one or more included measures derived from BRFSS survey questions. This will be discussed in greater detail below.

dataset. Tables A.1.1 and A.1.2 of the appendix provides detailed variable descriptions for all individual-level and state-level measures that are included in this study's analyses. To aid in both the ease of interpretation and the likelihood of achieving convergence in the regression models, some measures were rescaled.

This study also includes state-level measures. First, a series of Internet searches for veterans' mental health programs advertised by state-government websites was conducted to generate the **state mental health program** measure. Internet searches were standardized using two keyword searches – “veteran mental health” plus the coinciding state name and “department of veteran affairs” plus the coinciding state name. These searches suggested that the five most readily available types of state veterans' mental health programs included veterans' crisis hotlines, housing or homelessness assistance for veterans, veteran suicide prevention services, veteran substance abuse services, and peer support programs. Though there may be existing state veterans' mental health programs that were not located through the standardized search methods, in-depth searches were focused on these five program types. This study defines readily available state veterans' mental health programs as those expressly advertised on state government websites, or via a link to a downloadable document file. This design was based on the premise that a veterans' access to such programs would reasonably hinge on his or her ability to readily identify an available program.

Additional state-level measures are derived from publicly available government datasets. First, the U.S. Census Bureau publishes an annual revenue and expenditures report for local area governments, including state-level data. These data are originally reported in thousands and include revenue and expenditure categories such as **state veterans' miscellaneous program**

spending²⁹ and **state health care spending**. Next, the CDC makes publicly available state-level **infant mortality** rates for each year. These data are provided as a ratio of infant deaths per 1,000 live births (CDC 2022a). Such data is commonly utilized as a proxy for population health within a given jurisdiction (e.g., Burdine et al. 2000; Reidpath and Allotey 2003; Schell et al. 2007) and may be useful as a proxy for health system resources in general (Farahani, Subramanian, and Canning 2009). Given that states differ in many ways, two measures – **state population** and state **veteran population** – are operationalized by calculating the data’s natural log. The natural log is the logarithm to the base of the mathematical constant e , where e is an irrational and transcendental number approximately equal to 2.718 (Pituch and Stevens 2016, 441). In an equation, e is known, as well as the value of each element comprising the variable; therefore, for each element’s value, e must be raised to the necessary power. The power by which e must be raised (for each element) becomes the newly operationalized value.

Second, prior research utilizing BRFSS data guided this study’s selection of individual-level measures (e.g., Grossbard et al. 2013; Hoerster et al. 2012b; Howren et al. 2011; Lehavot et al. 2012; Srivastava et al. 2018). These variables include measures categorized by the CDC – health care access, adverse childhood experiences, behavioral risk factors, and demographic characteristics. First, several studies utilizing BRFSS data, including those whose foci include U.S. military veterans, include measures of health care access, including whether one may **have health care coverage**, a **preferred personal care physician**, have experienced **financial barriers to care, last 12 months**, and when their **last checkup** was (Blosnich and Silenzio

²⁹ These data exclude services that can be classified under several other major expenditure functions, but includes: veteran’s information and guidance services, claims representation, federal and state benefits assistance, general veterans outreach services, financial grants or bonuses not contingent upon need, certification of training and education programs under federal “GI bills” programs, administration of VA home loans program, and administration of federal veterans life insurance programs (U.S. Census Bureau 2006 , 5-70).

2013; Grossbard et al. 2013; Hoerster et al. 2012b; Lehavot et al. 2012). I also include a measure of having a **prior depression diagnosis** or not (Grossbard et al. 2013; Hoerster et al. 2012b).

Further, adverse childhood experiences (ACE) may play a role in an individual's state of mental health (Campbell et al. 2016; Lee and Chen 2017). The BRFSS includes a module of several measures of this nature, of which multiple studies have included as measures in their analyses – **improper touching by another, parents ever hit you, parents physically fought, parents got divorced, lived with a drug user, lived with an alcoholic, lived with a depressed person** (Campbell et al. 2016; Ford et al. 2014; Lee and Chen 2017; Merrick et al. 2018; Metzler et al. 2017). Third, inherent to the Behavioral Risk Factor Surveillance System survey, several studies include measures of behavioral risk factors in their analyses. Such risk factors include **cigarette use, smokeless tobacco use**, alcohol consumption (i.e., the **avg. alcohol consumption per drinking day** in the last 30 days), **exercise, last 30 days** (Hoerster et al. 2012b), and **body mass index**³⁰ (e.g., Blosnich and Silenzio 2013; Grossbard et al. 2013; Hoerster et al. 2012b).

Remaining individual-level measures are of a demographic nature. First, several studies using BRFSS data either test **veteran status** as an explanatory variable or using this measure as a grouping variable (e.g., Britton et al. 2012; Hoerster et al. 2012b; Lehavot et al. 2012; Luncheon and Matthew 2012; McDaniel, Albright, and Torabi 2020; Shen and Sambamoorthi 2012). Second, a measure of **geographic area of residence** is included. This study uses a three-level operationalization of geographic area of residence – urban, suburban, and rural settings – as used by multiple studies utilizing BRFSS data (Jones and Goza 2008; Roher, Borders, and Blanton 2005; Vander Weg et al. 2011), derived from the four-part BRFSS question. Lastly, several

³⁰ To aid in model convergence, body mass index is rescaled to a 1/1000 ratio.

individual demographic characteristics are included as seen in several studies using BRFSS data – being **currently employed, education, income, intimate partner status, gender, race,** and **age**³¹ (Hoerster et al. 2012b; Howren et al. 2011; Srivastava et al. 2018).

Modelling Approach

Multilevel Zero-Inflated Poisson Regression

Poisson regression models offer a standard framework for analyses utilizing count data (Coxe, West, and Aiken 2008; Ridout, Demetrio, and Hindle 1998; Ridout, Hinde, and Demetrio 2001). Ridout, Demetrio, and Hindle note that data are not often ideally fitted to the Poisson framework, often resulting in overdispersion in which the “incidence of zero counts is greater than expected for the Poisson distribution” (1998, 2). A key assumption of the Poisson regression model is “that the mean and variance of a response variable are equal” (Yang et al. 2017, 519). Thus, “equidispersion” is assumed in Poisson regression (Coxe et al. 2008, 130). Overdispersion and underdispersion present different inherent risks to the analysis and interpretation of regression models. Underdispersion is rare, and the more common occurrence of overdispersion result in summary statistics having a larger variance than anticipated (Cox 1983, 269). Coxe et al. state that:

If overdispersion is not accounted for, estimates of the standard errors³² will be too small, test statistics for the parameter estimates will be too large, significance will be overestimated, and confidence limits will be too small. (2008, 130)

Thus, the identification an adequate consideration for overdispersion will contribute to minimizing the risk of Type I error, or false positives (Harrison 2014).

³¹ To aid in model convergence, age was rescaled to a 1/100 ratio.

³² The denominator in test statistics such as the z -test and t -test (Johnson, Reynolds, and Mycoff (2019, 254-255).

While the qualifications of zero-inflated data are at times described as the presence of zero values beyond the expected probability distribution, often applied to Poisson distribution (Ridout, Demetrio, and Hindle 1998; Ridout, Hinde, and Demetrio 2001; Warton 2005), Yang et al. (2017, 523) assert that “it is not clear what the proportion of zeros is, after which the data should be considered as zero-inflated.” Still, the presence of numerous zeros does not necessarily indicate zero-inflation (Warton 2008). For instances of data displaying excessive zeros beyond what is expected in the Poisson model distribution, “it is sometimes assumed that there are two processes that produce the data” (Hox, Moerbeek, and Van de Schoot 2017, 144). Hox, Moerbeek, and Van de Schoot (2017, 114) further explain that “the assumption is that our data actually include two populations, not that always produces zeros and a second that produces counts following the Poisson model” (Hox, Moerbeek, and Van de Schoot 2017, 144). Given the prevalence of stigmatized help-seeking among some U.S. military veterans discussed in the previous section, it may be reasonable to anticipate that some veterans may accurately report zero mental health days to the BRFSS survey, while others may report zero mental health days due to perceived stigmatization of help-seeking and adherence to the military culture paradigm. Therefore, statistical tests for overdispersion and perhaps zero-inflation may be warranted.

The R package “AER”³³ hosts a test for overdispersion for generalized linear Poisson models. Research across various fields have use this test of overdispersion (e.g., Bost et al. 2015; Courtene-Jones et al. 2017; Heinonen et al. 2017; Schulz et al. 2021). An overdispersion test of the randomized subset returns an overdispersion value of 16.967 ($z = 54.652$, $p\text{-value} = 0.000$), indicating overdispersion for an expected Poisson model. This suggests that a test for zero-

³³ Version 1.2.10.

inflation is warranted. Next, the R package “DHARMA”³⁴ offers a conventional statistical test for the presence of zero-inflation in a generalized linear model via the “testZeroInflation” function. Research across various fields have also utilized this test of zero-inflation (e.g., Barnes, Diaz, and Arnaboldi 2021; Brooks et al. 2019; Roch et al. 2021; Santoiemma et al. 2019). “The plot shows the expected distribution of zeros against the observed values, the ratioObsSim shows observed vs. simulated zeros” (Hartig and Lohse 2022, 59). A value less than one means that the observed data has fewer zeros than expected and a value greater than one means that it is zero-inflation per model expectations (Hartig and Lohse 2022). For the randomized subset, results return a “ratioObsSim” value of 32.97 (p -value 0.000), indicating zero-inflation in the data.

Based on the above results, zero-inflated regression models with restricted maximum likelihood³⁵ are suitable for conducting analyses of the randomized subset.³⁶ An additional Wu-Hausman test, which enables researchers to distinguish between random effects models and fixed effects models (Bollen and Brand 2010), was conducted. Generally, if the Wu-Hausman statistic returns as statistically significant, a fixed effects approach should be used. Results showed this test statistic not to be statistically significant for the randomized subset, (statistic = 0.481, p -value = 0.6953). Therefore, multi-level zero-inflated Poisson regression models with mixed-effects were generated, using the “glmmTMB” function within the R package of the same name.³⁷ The “glmmTMB” package is designed to “fit linear and generalized linear mixed models

³⁴ Version 0.4.5.

³⁵ Restricted maximum likelihood is chosen over full maximum likelihood for having less bias in its estimations (Hox, Moerbeek, and Van de Schoot 2017, 28). As well, in “glmmTMB,” it is possible to include random effects in the conditional and zero-inflation models, but not in a dispersion model in which heteroskedasticity may be accounted for (Brooks et al. 2017, 380 - 381).

³⁶ As it relates to model selection (i.e., a proper parsimonious model), Anderson et al. (1994) state that the presence of overdispersion in the data severely weakens the ability of Akaike’s information criterion (AIC) to select a proper parsimonious model, often resulting in the selection of overfitted models. As well, Richards (2008) supports the notion that overdispersion is problematic when performing an AIC analysis.

³⁷ Version 1.1.3.

with various extensions, including zero-inflation” and “the models are fitted using maximum likelihood estimation via ‘TMB’ (Template Model Builder)” (Bronson et al. 2022, 1). Random effects are the varying coefficients in a multilevel model that “refers to the randomness in the probability model for the group-level coefficients” (Gelman and Hill 2006, 245). Thus, fixed effects may be thought of as “regressions in which coefficients do *not* vary by group” (Gelman and Hill 2006, 245). Further, this study takes into consideration the “maximal” random effects structure for linear mixed models (Barr et al. 2013; Bates et al. 2018). Barr et al. assert that this approach is advantageous over ANOVA-based approaches, notably when variances become small, maximal linear mixed models tend to “show better retention of their power relative to ANOVA-based approaches” (2013, 273). Lastly, consideration for the use (or exclusion) of survey weights should be given.

In response to growing demands for small area estimation methods with the BRFSS data, the CDC BRFSS developed a method to address these demands, which has been part of the BRFSS since 2011 (Pierannunzi et al. 2016). These methods necessitated a reliance on state-level rather than national-level weighting (Iachan et al. 2016; Jain 2010; Pierannunzi et al. 2016). Iachan et al. (2016, 1) make a critical observation in this regard:

Currently, CDC provides no additional guidance to BRFSS data users on how to adjust the weights provided for each individual state sample when they try to aggregate the state samples. As a result, these data users could introduce bias because the weighted distributions of the state samples do not always adhere to national demographic distributions. (2016, 1)

Iachan et al. (2016) assert that, due to the current reliance on state-level weighting, the development of national weights, along with a methodology for computing the associated variance estimates, is warranted. Based on these observations, this national-level study does not incorporate the described BRFSS-provided module weights (CDC 2021a).

Moderation of State-level Veterans' Programs by Veteran Status

This study also conducts two tests of statistical interactions, also referred to as a moderating effect – the moderation of states having one or more veterans' mental health programs by veteran status and the moderation of miscellaneous state veterans' program spending by veteran status (i.e., veteran or nonveteran). As stated by Bauman et al. (2002), sometimes the strength of the relationship between an explanatory variable and an outcome variable varies according to a third variable known as an effect modifier. This effect “is analogous to the concept of a statistical interaction, with the association $A \rightarrow C$ varying across levels of the moderator, B” (Bauman et al. 2002, 7).³⁸ When a statistically significant moderating effect is observed, interpretation of the main effects should be treated as conditional (Aiken, West, and Reno 1991, 131). In other words, main effects when a statistically significant moderating effect is observed generally need not be interpreted unless done so conditionally (Lorah and Wong 2018).

Due to the unique paradigm of military culture, often shown to have a profound influence on many U.S. military veterans' mental health outcomes, the potential differences in mental health outcomes between veterans and non-veterans has been a topic of interest in prior research (e.g., Betancourt et al. 2021; Britton et al. 2012; De Luca et al. 2016; Grossbard et al. 2013; Hoerster et al. 2012b; Hoglund and Schwartz 2014). Combined with the size and scope³⁹ of the VA, such studies highlight the significant public policy attention given to veterans' mental health. Thus, continued examination of veterans' mental health outcomes compared to their

³⁸ Differently, a mediator, or intervening causal variable, is on the causal pathway *between* the explanatory variable and the outcome variable (Bauman et al. 2002, 7).

³⁹ The VA is surpassed only by the Department of Defense in number of employees (U.S. Office of Personnel Management 2018) and employee salaries (U.S. Treasury Department DataLab n.d.) while ranking seventh in total budget size (Greer 2016).

nonveteran counterparts may play an important role, alongside clinical innovations, in the development of more efficacious mental health programs for U.S. military veterans.

Results

To what extent do state government veterans' mental health programs aid in mitigating lingering mental health issues for U.S. military veterans? Do other miscellaneous veterans' programs aid in this policy goal as well? To better understand the ability of states to effectively address the mental health of their veterans, this data-driven study utilizes 2019 CDC Behavioral Risk Factor Surveillance System survey individual-level data and 2019 data representing relevant state-level characteristics. Table A.2.1 of the appendix provides a frequency table for all dichotomous measures within the veteran and nonveteran subset of 32,807 respondents. Descriptive statistics for all other measures in this subset are provided in table A.2.2 of the appendix. Next, multi-level zero-inflated Poisson regression models are followed by analyses of two moderating effects of interest to this study:

1. Veteran status moderating the association of state veterans' mental health programs and individuals' self-reported number of mental health days.
2. Veteran status moderating the association of miscellaneous state veterans' program spending and individuals' self-reported number of mental health days.

As demonstrated by the many state-level veterans' mental health programs, it is important to note that an increase in an individual's rate of mental health days in a month, or any given time period, is not a desired policy outcome. Thus, interpretations of relationship directionality displayed in tables 1 and 2 are worth careful consideration. It is important to also note that the CDC and multiple studies have stated that causation either should not be implied from the CDC BRFSS data (e.g., CDC 2022b; Santaularia et al. 2016; The Rede Group 2019, 43)

or the ability to do so is limited (Pharr and Bungum 2012; Reisinger, Moss, and Clark 2018).

Lastly, this study is conducted through the lens of public policy; therefore, relationships better suited for interpretation and inference within the medical fields are outside the scope of this study. Tables 1 and 2 are generated from the randomized, representative subset of 32,807 veteran and nonveteran BRFSS survey respondents.⁴⁰

⁴⁰ Five additional randomized subsets of 32,807 veterans and non-veterans from the BRFSS survey were generated using the “fairsubset” package previously described. Results for the statistical interaction of veteran status and presence of one or more state-level veterans’ mental health program and the statistical interaction of veteran status and state miscellaneous program spending are shown in table A.3 of the appendix.

Table 1: Multilevel Zero-inflated Poisson Regression – Model 1

Model 1 - State Veteran Mental Health Programs				
Fixed Effects: Individual Attributes	IRR	SE	z	Pr(> z)
State mental health program	1.009	0.01	1.05	0.2920
Have health care coverage	1.014	0.01	1.03	0.3043
Preferred personal care physician	0.970	0.01	-3.92	0.0001
Financial barriers to care, last 12 months	1.039	0.01	3.14	0.0017
Last checkup	0.994	0.00	-1.24	0.2137
Prior depression diagnosis	1.005	0.01	0.51	0.6105
ACE: Improper touching by another	1.021	0.01	3.04	0.0023
ACE: Parents ever hit you	0.963	0.01	-7.62	0.0000
ACE: Parents physically fought	0.981	0.01	-3.24	0.0012
ACE: Parents got divorced	1.044	0.01	4.98	0.0000
ACE: Lived with a drug user	1.023	0.01	1.78	0.0746
ACE: Lived with an alcoholic	1.013	0.01	1.50	0.1344
ACE: Lived with a depressed person	1.036	0.01	3.61	0.0003
Cigarette use	0.997	0.00	-0.84	0.4031
Smokeless tobacco use	0.983	0.02	-0.83	0.4046
Avg. alcohol consumption per drinking day	1.007	0.00	5.64	0.0000
Exercise, last 30 days	0.997	0.01	-0.33	0.7408
Body mass index	0.991	0.01	1.49	0.1373
Veteran status	1.025	0.02	1.46	0.1431
Currently employed	1.005	0.01	0.70	0.4838
Geographic area of residence	1.010	0.00	2.02	0.0429
Education	0.979	0.00	-5.98	0.0000
Income	0.998	0.00	-0.96	0.3354
Have an intimate partner	0.992	0.01	-1.01	0.3123
Gender	1.003	0.01	0.45	0.6529
Race	1.010	0.01	1.12	0.2611
Age	1.078	0.02	3.48	0.0005
Veteran status * state veterans' mental health program	0.906	0.02	-4.46	0.0000
Zero-inflated model intercept	1.847	0.15	40.15	0.0000

Table 1 (Cont.)

Random Effects: State Attributes	Variance	SD
Random-effects intercept	3.2560	1.804
State misc. veterans' program spending	0.0028	0.053
State health care spending	<0.0000	0.001
Infant mortality rate	0.0035	0.059
Veteran population	0.0077	0.087
State population	0.0094	0.097
Log Likelihood	-54671	
AIC	109445	
BIC	109845	
Number of states	49	
Number of Observations	18783	

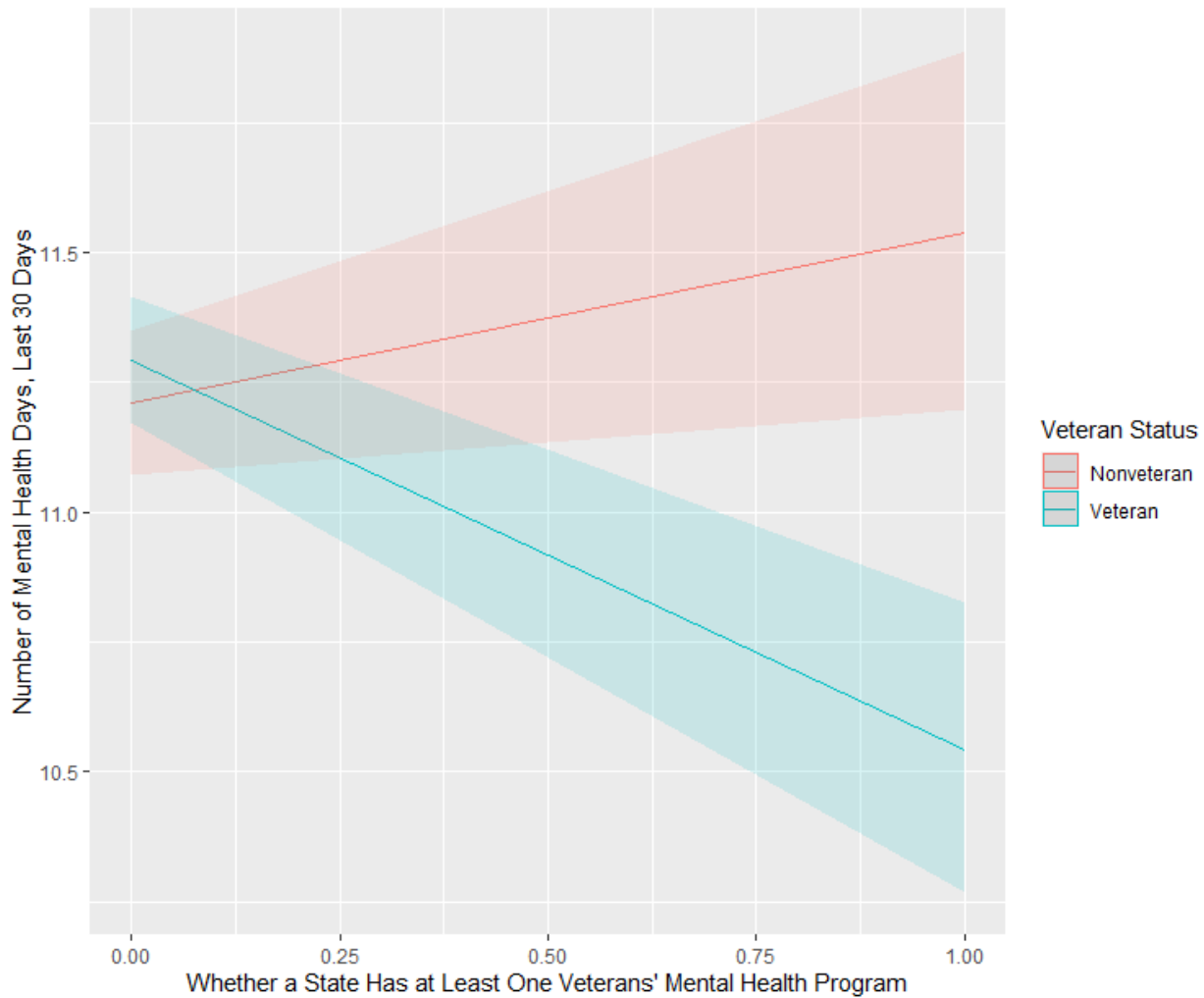
Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. The dependent variable is the number of self-reported mental health days.

Table 1, including incident rate ratios, yields several statistically significant associations. Those experiencing financial barriers to care are 3.9% more likely to experience mental health days than those without such barriers. Individuals indicating a higher rate of alcohol consumption per drinking day are 0.7% more likely to report having mental health days. As one lives closer to the inner city, from rural to suburban and suburban to urban, that individual is one percent more likely to report an increase in mental health days. Those with lower levels of formal education are roughly 2.1% more likely to experience an increased rate of mental health days. As well, older persons are about 7.8% more likely to report higher rates of mental health days than younger persons. Lastly, the moderating effect of veteran status on the effectiveness of state veterans' mental health programs in table 1 is of primary interest to hypothesis H1.

When controlling for individual-level factors representing health care access, adverse childhood experiences, behavioral risk factors, and demographic characteristics, plus the addition

of state-level measures with the aim of reducing unexplained variation at the group-level (Gelman and Hill 2006), this moderating effect is statistically significant, and may be interpreted not as a rate of change of mental health days per unit difference in state veterans' mental health days but rather that there are infinitely many different rates depending on veteran status (i.e., $1.009 \times 0.906^{\text{veteran status}}$). With such an interpretation, the moderating effect of veteran status on the effectiveness of state veterans' mental health programs may best be interpreted visually. Figure 2 predicts this moderating effect as it relates to mitigating an individual's rate of self-reported mental health days. It predicts that, when states offer one or more veterans' mental health programs, veterans' mental health days are reduced by about one day on average while nonveterans values increase slightly.

Figure 2: Moderation of State Veterans' Mental Health Programs by Veteran Status



Model 2, shown in table 2, tests the same relationships seen in Model 1, but instead tests for a moderating effect of veteran status on state miscellaneous veterans' program spending. Aside from the conditional main effects of the statistical interactions, statistically significant associations found in Model 1 may also be found in Model 2, and with matching directionalities. This suggests that the models are relatively consistent despite examinations of two different moderating effects. Lastly, the moderating effect of veteran status on the effectiveness of state miscellaneous veterans' program spending in table 2 is of primary interest to hypothesis H2.

Table 2: Multilevel Zero-inflated Poisson Regression – Model 2

Model 2 - State Veterans' Misc. Program Spending				
Fixed Effects: Individual Attributes	IRR	SE	z	Pr(> z)
State Veterans' Misc. Program Spending	1.003	0.002	1.31	0.1811
Have health care coverage	1.020	0.013	1.48	0.1390
Preferred personal care physician	0.969	0.008	-4.14	0.0000
Financial barriers to care, last 12 months	1.034	0.013	2.73	0.0064
Last checkup	0.995	0.005	-1.02	0.3075
Prior depression diagnosis	1.010	0.009	1.10	0.2730
ACE: Improper touching by another	1.021	0.007	3.07	0.0022
ACE: Parents ever hit you	0.963	0.005	-7.54	0.0000
ACE: Parents physically fought	0.983	0.006	-2.90	0.0037
ACE: Parents got divorced	1.047	0.009	5.22	0.0000
ACE: Lived with a drug user	1.022	0.013	1.70	0.0890
ACE: Lived with an alcoholic	1.014	0.009	1.62	0.1058
ACE: Lived with a depressed person	1.033	0.010	3.25	0.0011
Cigarette use	0.998	0.004	-0.62	0.5376
Smokeless tobacco use	0.981	0.020	-0.96	0.3358
Avg. alcohol consumption per drinking day	1.007	0.001	5.99	0.0000
Exercise, last 30 days	0.996	0.008	-0.42	0.6771
Body mass index	1.010	0.006	1.71	0.0882
Veteran status	0.954	0.011	-4.11	0.0000
Currently employed	1.004	0.008	0.59	0.5521
Geographic area of residence	1.010	0.005	2.07	0.0380
Education	0.979	0.004	-5.82	0.0000
Income	0.999	0.002	-0.69	0.4897
Have an intimate partner	0.994	0.008	-0.83	0.4082
Gender	1.001	0.008	0.14	0.8918
Race	1.011	0.009	1.25	0.2117
Age	1.090	0.021	4.00	0.0001
Veteran status * state veterans' misc. program spending	1.027	0.005	5.06	0.0000
Zero-inflated model intercept	1.847	0.015	40.15	0.0000

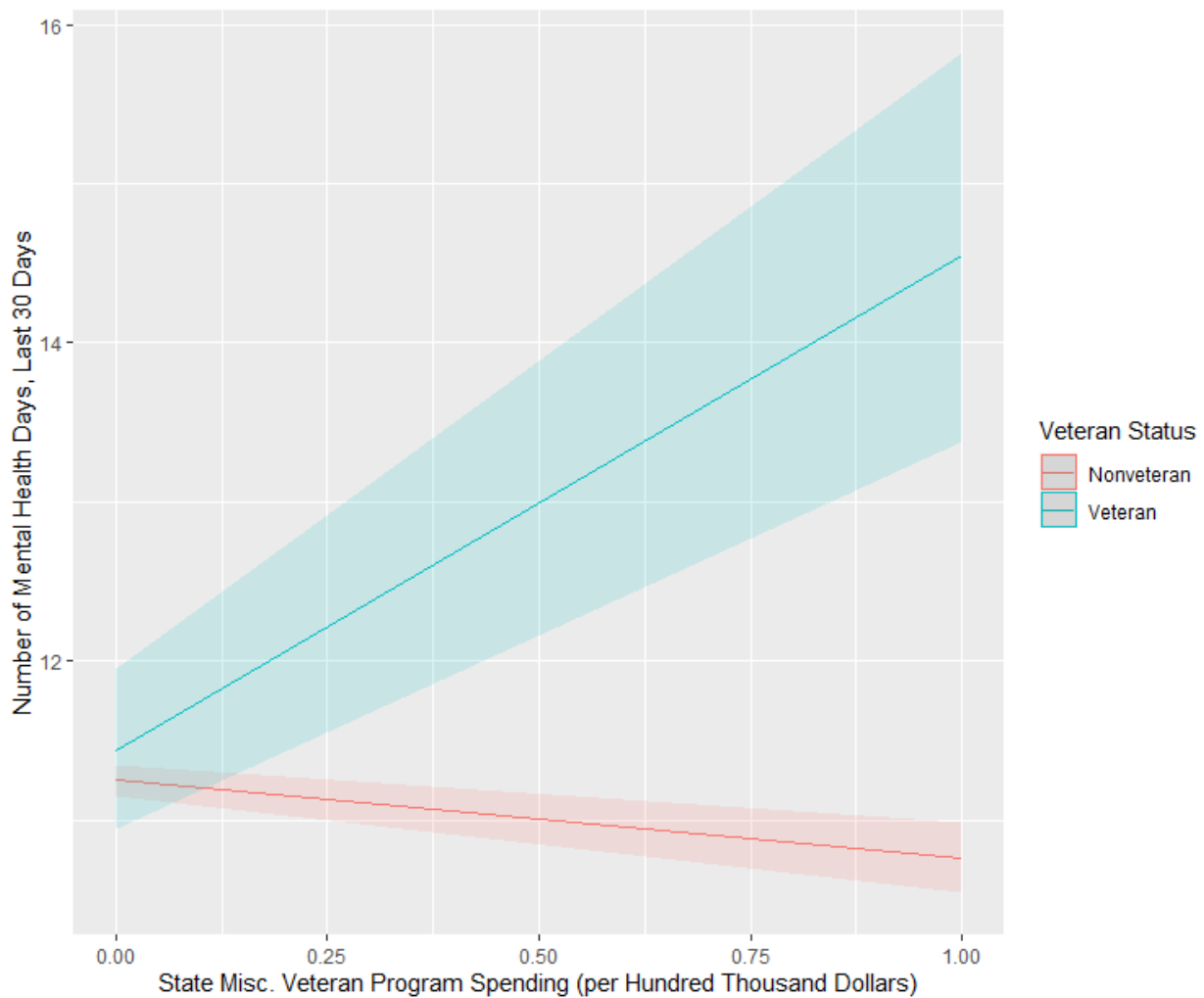
Table 2 (Cont.)

Random Effects: State Attributes	Variance	SD
Random-effects intercept	3.346	1.8292
State veterans' mental health program	0.025	0.1586
State health care spending	<0.0000	0.0007
Infant mortality rate	0.003	0.0568
Veteran population	0.008	0.0916
State population	0.009	0.0946
Log Likelihood	-54649	
AIC	109400	
BIC	109298	
Number of states	49	
Number of Observations	18783	

*Notes: *p<0.05; **p<0.01; ***p<0.001. The dependent variable is the number of self-reported mental health days.*

When controlling for individual-level factors representing health care access, adverse childhood experiences, behavioral risk factors, and demographic characteristics, along with state-level measures, the moderating effect of veteran status on state miscellaneous program spending is statistically significant. Like before this effect may be interpreted not as a rate of change of mental health days per unit difference in state miscellaneous veterans' program spending with infinitely many different rates depending on veteran status (i.e., $1.003 \times 1.027^{\text{veteran status}}$). This moderating effect of veteran status on the effectiveness of state veterans' mental health programs may again be best interpreted visually. Figure 3 predicts this moderating effect as it relates to mitigating an individual's rate of self-reported mental health days. It predicts that, when states spend more on miscellaneous veterans' programs, veterans' mental health days *increase* by nearly three days on average while nonveterans values slightly decrease.

Figure 3: Moderation of State-level Misc. Veterans' Programs by Veteran Status



Response rates to the 2019 BRFSS survey questions regarding one's mental health comprise an additional consideration when utilizing these data. An analysis of response rates to survey questions regarding one's mental health, among veterans and nonveterans, may be insightful when considering the potential influence of help-seeking stigmatization. Table A.4 of the appendix provides a detailed summary of selected study measures and the response rates by veteran status. The full BRFSS dataset was filtered into two subsets – those who reported being a

U.S. military veteran and those who did not. First, respondents from the District of Columbia, Puerto Rico, and Guam were excluded. As well, all respondents who did not clearly indicate their veteran status were excluded. Following these exclusions, 404,836 survey responses were available for the analysis of veteran and nonveteran response rates of select study measures relating to respondents' mental health⁴¹ (52,246 veterans and 352,590 nonveterans) First, 38,167 out of 52,246 veterans replied "0" to the mental health days question (73.1%) while 62.4% of nonveterans indicated zero mental health days. However, 2.3% of veterans did not offer a clear answer to this question, slightly higher than nonveterans. Fewer veterans reported a prior depression diagnosis, though slightly more veterans declined to answer this survey question. Conversely, veterans were more willing to share their drinking habits than nonveterans. Further, veterans were more prone to binge drinking.⁴²

Veterans' willingness to share data regarding adverse circumstances extends to survey questions regarding adverse childhood experiences. For all BRFSS survey questions included in this study regarding adverse childhood experiences, veterans were less likely to avoid answering these questions. Though results are mixed, veterans are, in most cases, more likely to respond

⁴¹ The CDC BRFSS codebook (2020) accounts for all 418,268 respondents when reporting veteran status responses. Only 407,186 respondents were included in this study's sample after filtering out: all respondents from the District of Columbia, Puerto Rico, and Guam. When sorting this study sample into two subsets – veterans and nonveterans – all remaining respondents who did not clearly indicate their veteran status were excluded, leaving 404,836 respondents for analysis. This leaves 2,350 respondents unaccounted for. However, responses to the veteran status survey question of "don't know/not sure" ($n = 151$), refusals to answer ($n = 874$), and instances of "not asked or missing" ($n = 1,374$) resulted in these respondents not being included in the study sample. Accounting for these responses, one would initially expect to see a study sample of 407,236. However, 49 of the nonresponses to the veteran status survey question came from individuals residing in the District of Columbia, Puerto Rico, and Guam. Those respondents were already excluded and should not be accounted for a second time.

⁴² According to the CDC (2022c) and the Substance Abuse and Mental Health Services Administration (2018), binge drinking is defined as four or more drinks in one session for females and 5 or more for males. Thus, this study takes a slightly more conservative approach to female binge drinking.

“no” or “never” to these childhood experiences. Inferences regarding these trends, along with those regarding hypotheses H1 and H2 are discussed in the following section.

Discussion and Conclusions

To what extent do state government veterans’ mental health programs aid in mitigating lingering mental health issues for U.S. military veterans? Do other miscellaneous veterans’ programs aid in this policy goal as well? To further our understanding of these potential relationships, this study’s analyses are derived from the 2019 CDC Behavioral Risk Factor Surveillance System survey and publicly available data regarding state-level characteristics. Though sources have cautioned against the suggestion of causality when using the cross-sectional BRFSS data (e.g., CDC 2022b; Santaularia et al. 2016; The Rede Group 2019, 43), results from this study’s analyses appear to lend some measure of support for the posited hypotheses.

Hypothesis H1 states: U.S. states offering one or more veterans’ mental health programs are more likely to see improved mental health among veteran residents. Results from table 1 and figure 2 suggest that, when controlling for individual-level factors representing health care access, adverse childhood experiences, behavioral risk factors, individual demographic characteristics, and state-level characteristics, veterans tend to report improved mental health when their state offers one or more state-level veterans’ mental health programs. This lends a reasonable degree of support for hypothesis H1. Results from five additional iterations of randomized subsets comprised of 32,807 respondents are reported in table A.3 of the appendix. Table A.3 indicates mixed results regarding the influence of state-level veterans’ mental health programs on respondents’ mental health by veteran status across multiple randomized subsets. Further, notably absent from the CDC BRFSS questionnaire is a potentially critical measure of

personal experience during military service – combat exposure. Research has highlighted the significance of combat exposure when considering mental health among military veterans (e.g., Coll, Weiss, and Yarvis 2012; Seal et al. 2009; Thomas et al. 2011; Wisco et al. 2017).⁴³ While some support for hypothesis H1 may be found, additional research, perhaps across multiple CDC BRFSS surveys or similar data capable of accounting for combat exposure, may be needed to further illuminate the strength of this association.

Hypothesis H2 posits U.S. states that spend more per capita on miscellaneous military veteran programs are more likely to see improved mental health among veteran residents. While table 2 displays a statistically significant moderating effect of veteran status on state miscellaneous veterans' program spending, figure 3 shows an increase in veterans self-reported mental health days as states spend more on these programs. This raises the question of whether these state programs are initiated in response to increased rates of mental health issues among its veterans. Though the trend displayed in figure 3 raises interesting questions, it does not offer tangible support for hypothesis H2.

An additional analysis of response rates to survey questions of a mental health nature, among veterans and nonveterans, yields results worthy of consideration for future research. The often-lower response rates from U.S. military veterans seen in table A.4 of the appendix suggests that veterans may be more reserved about specific events, such as adverse childhood experiences, and may be less willing to admit such experiences impact the veteran's mental health or that help should be sought. At least in terms of the 2019 BRFSS data, this trend may

⁴³ Additionally, it may be worth considering potential influences on the regression coefficients for the influence of state-level veterans' mental health programs on respondents' mental health by veteran status. The relatively small number of cases included in the randomized subset for states such as Nevada (214) and Alaska (253), when compared to other states, may influence the mixed results shown in table A.3 if veterans from such states are heterogeneous in their characteristics and perspective.

suggest a possible connection to prior research regarding the stigmatization of help-seeking among many veterans. Further, this lends support for the possibility of two types of zero values when a veteran is asked to self-report his or her recent mental health status – those that actually experienced no mental health days in the past 30 days, and those that *reported* no mental health days in the past 30 days. To be clear, this does not suggest that all military veterans would avoid answering such questions. Rather, these results may raise interesting questions for consideration in future research. Though some degree of support for hypotheses H1 is posited, questions and knowledge gaps remain, shedding light on the limitations of this study.

Limitations

This study offers a unique approach to the examination of state-level veterans' mental health programs and their potential for ameliorating the ongoing mental health challenges for many veterans. Given this, several limitations are apparent. First, the primary independent variable for this study, the presence of one or more state-level veterans' mental health programs, was constructed via a search for readily advertised veterans' mental health programs and services on state government websites. The five most identified state government veteran mental health programs via this search method include: veteran crisis hotlines, housing or homelessness assistance for veterans, veteran suicide prevention services, veteran substance abuse services, and peer support programs. There may be state programs in existence that were not located through the search methods used for this study, whether these were not readily advertised online or if such programs were of a different nature than the five categories included.

Another notable study limitation pertains to the cross-sectional nature of this study's analyses. As noted by the CDC (2021b), the BRFSS survey does not survey the exact same people year over year; therefore, the selection of time-series multi-level statistical tests would not

have been appropriate, or possible due to the “person-period” data structure requirements (Hox et al. 2017, 152). In turn, the choice of cross-sectional analyses results in the limited ability to infer causation (e.g., CDC 2022b; Santaularia et al. 2016; The Rede Group 2019, 43). An additional limitation of the 2019 BRFSS data lies with its available survey weights. Since 2011, the CDC BRFSS has used a weighting method relying on state-level weights rather than doing so at the national level (Pierannunzi et al. 2016). These methods necessitated a reliance on state-level rather than national-level weighting, and researchers may risk the introduction of biased weighting when looking to aggregate these state-level weights for national analyses, as state-level weights may not be reflective of national demographics. (Iachan et al. 2016). Further, the BRFSS is administered at the state level by contractors; therefore, the quality of data may vary from state to state (Jain 2010).

Next, limitations regarding the analysis of 2019 BRFSS data are also worthy of consideration. The 2019 BRFSS is comprised of a relatively large sample of 418,286 people. Respondents are asked scores of questions. Many respondents simply did not respond to one or more survey questions utilized as measures for this study. This trend was notably detrimental to attempted regression analyses of a veterans-only subset. Out of the 52,246 respondents who identified as military veterans, one attempted regression analysis resulted in the inclusion cases from only 17 states. This degree of listwise deletion was insurmountable. Given the focus of this study, the opportunity to examine access to state veterans’ mental health programs by geographic area of residence (i.e., urban, suburban, and rural) and its impact on veteran mental health outcomes would be desirable. However, this did not seem plausible, though this may be an important topic for future research.

Finally, additional aspects of individual mental health not available within the CDC BRFSS 2019 survey, such as mental health care utilization and awareness, are worth considering as potential study limitations. The stigmatization of help-seeking among military veterans has been discussed in previous sections of this study (e.g., Blais and Renshaw 2013; Calhoun et al. 2002; Cornish et al. 2014; Health et al. 2017; Hoge et al. 2004). However, it may be the case, for some, that greater availability of mental health programs may result in greater utilization (McCarthy et al. 2007). As this paper approaches state-level veterans' mental health program availability through a public policy lens, such considerations may be more appropriately addressed with research conducted by those with expertise in the medical fields. Despite these study limitations, and potentially others not listed above, inferences may be drawn regarding state-level veterans' mental health programs.

Conclusions

What conclusions may be drawn regarding the ability of state veterans' mental health programs to ameliorate U.S. military veterans' mental health? Results from this study suggest that targeted state-level veterans' mental health programs may demonstrate positive contributions amidst the full complement of available veterans' mental health programs (e.g., those offered by the VA and those offered at the local level). Based on the 2019 BRFSS data, the ability of other, miscellaneous state-level programs to reduce veterans' mental health issues, those *not* primarily focused on veterans' mental health, remains unclear. As well, the missed opportunity to examine both the influence of combat exposure and how veterans' geographic area of residence may influence access to state-level veterans' mental health programs illuminates opportunities for future research. Even if the overall impact of state veterans' mental health programs is positive, the possibility of reduced access across urban, suburban, and rural settings, as suggested by

Burnam et al. (2009), Eaton (2015), and Howren et al. (2022) may provide additional insight regarding the effectiveness of these programs. Given the combined efforts of practitioners and policymakers, it appears as though state veterans' mental health programs may be effective resources to aid in overcoming the stigmatization of help-seeking perceived by many veterans. However, many veterans still face ongoing mental health challenges.

The ongoing mental health challenges of veterans suggests that programmatic effectiveness is a salient area of emphasis for stakeholders. Based on the 2019 BRFSS data, it appears that targeted policies may work well for many veterans. This suggests some degree of efficacy for these state-level programs. This study's results, along with additional research, may offer practitioners and policymakers additional insights regarding the efficacy of state veterans' mental health programs – what works well and what may be less efficacious – not only for veterans, but also for taxpayers that often fund such programs. With many veterans still facing mental health challenges, many questions remain, leaving much opportunity for further research regarding state veterans' mental health program efficacy. So long as the stigmatization of help-seeking remains prevalent among U.S. military veterans – even if many are often more willing to self-report adverse experiences – the development of a comprehensive understanding of the state of veterans' mental health programs may remain somewhat elusive.

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Appendix

Figure A.1: Histogram of Self-Reported Mental Health Days, Last 30 Days

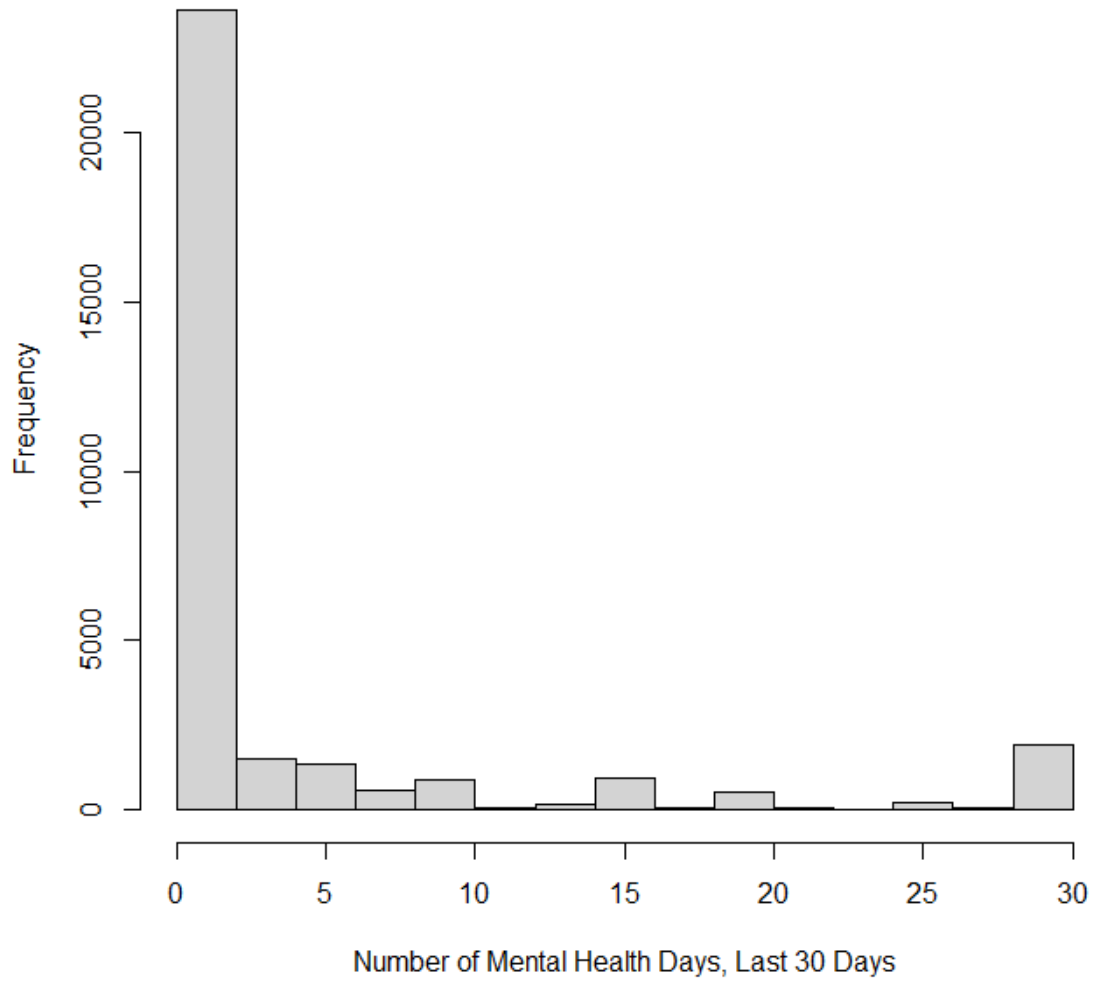


Table A.1.1: Variable Descriptions of BRFSS Individual-level Variables

Variable	Section and Question Number	Range	Operationalization
<i>Health Care Access</i>			
Mental health days, last 30 days	C2/2	0-30	Respondent provided number
Have health care coverage	C3/1	0-1	0=no, 1=yes
Preferred personal care physician	C3/2	0-2	0=no, 1=yes, only one, 2=yes, more than one
Financial barriers to care, last 12 months	C3/3	0-1	0=no, 1=yes
Last checkup	C3/4	1-4	1=5 or more years, 2=over 2 years but less than 5 years, 3=over 1 year but less than 2 years, 4=within past year
Prior depression diagnosis	C6/9	0-1	0=no, 1=yes
<i>Adverse Childhood Experiences</i>			
Childhood: Improper touching by another	M22/9	0-2	0=never, 1=once, 2=more than once
Childhood: Parents or adults hit you	M22/7	0-2	0=never, 1=once, 2=more than once
Childhood: Parents or adult physically fought	M22/6	0-2	0=never, 1=once, 2=more than once
Childhood: Parents divorced	M22/5	0-1	0=no, 1=yes
Childhood: Lived with a drug user	M22/3	0-1	0=no, 1=yes
Childhood: Lived with an alcoholic	M22/2	0-1	0=no, 1=yes
Childhood: Lived with a depressed person	M22/1	0-1	0=no, 1=yes

Note: For section and question numbers: C = core section number, and M = module number.

Table A.1.1 (Cont.)

Variable	Section and Question Number	Range	Operationalization
<i>Health Risk Behaviors</i>			
Cigarette use	C9/1	0-3	0=never, 1=former smoker, 2=smoke some days, 3=smoke every day
Smokeless tobacco use	C9/5	0-2	0=not at all, 1=some days, 2=every day
Avg. alcohol consumption per drinking day	C10/2		calculated average number of drinks per drinking day, last 30 days
Exercise, last 30 days	C11/1	0-1	0=no, 1=yes
Body mass index	M8/19		BRFSS calculated
<i>Demographic Characteristics</i>			
Veteran status	C8/13	0-1	0=nonveteran, 1=U.S. military veteran
Currently employed	C8/14	0-1	0=out of work for 1 year or more, out of work for less than 1 year, a homemaker, a student, retired, or unable to work; 1=employed for wages or self-employed
Geographic area of residence	M1/2	1-3	1=rural, 2= suburban, 3=Urban
Education	C8/6	1-6	1=never attended school or only kindergarten, 2=grades 1 through 8, 3=grades 9 through 11, 4=high school graduate or GED, 5=college or technical school 1 to 3 years, 6=college graduate
Income	C8/16	1-8	1= less than \$10,000, 2=less than \$15,000, 3=Less than \$20,000, 4=less than \$25,000, 5=less than \$35,000, 6=less than \$50,000, 7=less than \$75,000, 8=\$75,000 or more
Have an intimate partner	C8/5	0-1	0=divorced, widowed, separated, or never married; 1=married or member of an unmarried couple
Gender	observed	0-1	0=Female, 1=Male
Race	M8/7	0-1	0=Person of color, 1=Caucasian
Age	M8/14	0-80	Respondent provided number; imputed age value collapsed above 80

Note: For section and question numbers: C = core section number, and M = module number.

Table A.1.2: Variable Descriptions of State-level Variables

Variable	Data Source	Scale/Range	Description
State veterans' mental health program	State government websites	0-1	0=none of the programs listed below are offered; 1= At least one of the following programs offered - veterans' crisis hotline, homeless veterans program/ housing assistance, suicide prevention, substance abuse, or veterans' peer support
State misc. veterans' program spending	U.S. Census Bureau	Per hundred thousand	Dollars spent
State health care spending	U.S. Census Bureau	Per ten thousand	Dollars spent
Infant mortality rate	CDC	Ratio	Number of infant deaths per 1,000 live births
Veteran population	VA	Natural log	Natural log of state veteran population
State population	U.S. Census Bureau	Natural log	Natural log of in-state residents

Table A.2.1: Frequency Table of Dichotomous Independent Variables

Variable	<i>n</i>	%	Variable	<i>n</i>	%
Veteran status	32,721	100.0	Childhood: Lived with an alcoholic	32,534	100.0
Military veteran	4,231	12.9	Yes	7,669	23.6
Nonveteran	28,490	87.1	No	24,865	76.4
State mental health program	32,807	100.0	Childhood: Parents got divorced	32,009	100.0
Yes	18,818	57.4	Yes	7,830	24.5
No	13,989	42.6	No	24,179	75.5
Doctor visit too expensive to go	32,711	100.0	Exercised any, last 30 days	32,686	100.0
Yes	29,286	89.5	Yes	23,864	73.0
No	3,425	10.5	No	8,822	27.0
Have a health care plan	32,646	100.0	Currently employed	29,125	100.0
Yes	29,813	91.3	Yes	16,248	55.8
No	2,833	8.7	No	12,877	44.2
Previous depression diagnosis	32,618	100.0	Gender	32,807	100.0
Yes	6,252	19.2	Female	17,924	54.6
No	26,366	80.8	Male	14,883	45.4
Childhood: Lived with depressed person	32,398	100.0	Race	32,097	100.0
Yes	5,336	16.5	Caucasian	24,895	77.6
No	27,062	83.5	Person of color	7,202	22.4
Childhood: Lived with a drug user	32,507	100.0	Have an intimate partner	32,524	100.0
Yes	3,023	9.3	Yes	17,838	54.8
No	29,484	90.7	No	14,686	45.2

Table A.2.2: Descriptive Statistics of Study Variables

Dependent Variable	Mean	sd	Min	Median	Max
Mental Health Days - Last 30 Days	3.93	8.17	0	0	30
Independent Variable					
<i>Individual-Level</i>					
Preferred PCP	0.91	0.49	0.00	1.00	2.00
Last checkup	3.65	0.82	0.00	4.00	4.00
Childhood: Improper touching by another	0.18	0.54	0.00	0.00	2.00
Childhood: Parents hit you	0.40	0.76	0.00	0.00	2.00
Childhood: Parents physically fought	0.28	0.66	0.00	0.00	2.00
Cigarette use	0.68	0.96	0.00	0.00	3.00
Smokeless tobacco	1.01	0.19	1.00	1.00	2.00
Alcohol consumption	2.26	2.47	1.00	2.00	76.00
BMI ⁴⁴ (rescaled: 1/1000)	2.83	0.65	1.23	2.73	9.78
Geographic area of residence	1.93	0.80	1.00	2.00	3.00
Education	4.94	1.04	1.00	5.00	6.00
Income	6.00	2.09	1.00	7.00	8.00
Age (rescaled: 1/100)	0.55	0.18	0.18	0.58	0.80
<i>State-Level</i>					
Veteran program spending	0.42	1.71	0.00	0.06	9.80
Health care spending	119.33	121.33	11.32	60.21	501.54
Infant mortality rate	5.52	1.31	0.00	5.52	9.07
Veteran population	12.61	0.93	10.62	12.64	14.27
State population (natural log)	15.36	1.02	13.24	15.52	17.47

⁴⁴ Centers for Disease Control and Prevention codebook notes state: “WTKG3/ (HTM4*HTM4) (has 2 implied decimal places)” (CDC 2019c), where “WTKG3” refers to a respondent’s weight in kilograms and “HTM4” refers to a respondent’s computed height in meters.

Table A.3: Statistical Interaction Regression Results for the Five Additional Subsets Tested

Statistical Interaction Results by Randomize Subset	IRR	SE	z	Pr(> z)
<i>One</i>				
Veteran status * state mental health program	0.983	0.022	-2.09	0.0367
Veteran status * state veterans' misc. program spending	1.018	0.006	2.96	0.0031
<i>Two</i>				
Veteran status * state mental health program	1.086	0.023	3.51	0.0004
Veteran status * state veterans' misc. program spending	1.003	0.006	0.54	0.5907
<i>Three</i>				
Veteran status * state mental health program	1.102	0.023	4.31	0.0000
Veteran status * state veterans' misc. program spending	1.017	0.006	2.64	0.0083
<i>Four</i>				
Veteran status * state mental health program	1.045	0.023	1.95	0.0513
Veteran status * state veterans' misc. program spending	1.022	0.008	2.88	0.0039
<i>Five</i>				
Veteran status * state mental health program	0.992	0.023	-3.42	0.0006
Veteran status * state veterans' misc. program spending	0.997	0.007	-0.39	0.6935

Table A.4: Response Rates to Mental Health-related Study Measures by Veteran Status

Response Value	Veterans		Nonveterans	
	<i>n</i>	%	<i>n</i>	%
Mental health days	52,241	100.0%	352,582	100.0%
0	38,167	73.1%	219,852	62.4%
1+	12,879	24.7%	125,463	35.6%
Don't know/refused	1,195	2.3%	7,267	2.1%
Prior depression diagnosis	52,246	100.0%	352,590	100.0%
Yes	8,222	15.7%	68,755	19.5%
No	43,728	83.7%	282,001	80.0%
Don't know/refused	296	0.6%	1,834	0.5%
Average alcohol consumption per drinking day	26,917	100.0%	167,693	100.0%
1-4	24,235	90.0%	150,783	89.9%
5+	2,201	8.2%	13,617	8.1%
Don't know/refused	481	1.8%	3,293	2.0%
ACE: Improper touching by another	14,304	100.0%	92,444	100.0%
Never	13,008	90.9%	80,037	86.6%
Once	437	3.1%	3,795	4.1%
More than once	654	4.6%	6,937	7.5%
Don't know/refused	205	1.4%	1,675	1.8%
ACE: Parents ever hit you	14,318	100.0%	92,632	100.0%
Never	10,251	71.6%	70,695	76.3%
Once	844	5.9%	5,338	5.8%
More than once	2,944	20.6%	15,066	16.3%
Don't know/refused	279	1.9%	1,533	1.7%
ACE: Parents physically fought	14,328	100.0%	92,636	100.0%
Never	11,833	82.6%	76,275	82.3%
Once	505	3.5%	3,413	3.7%
More than once	1,615	11.3%	10,877	11.7%
Don't know/refused	375	2.6%	2,071	2.2%

Table A.4 (Cont.)

Response Value	Veterans		Nonveterans	
	<i>n</i>	%	<i>n</i>	%
ACE: Parents Divorced	14,199	100.0%	91,354	100.0%
Yes	3,307	23.3%	22,627	24.8%
No	10,712	75.4%	67,765	74.2%
Don't know/refused	180	1.3%	962	1.1%
ACE: Lived with a drug user	14,344	100.0%	92,745	100.0%
Yes	1,048	7.3%	8,710	9.4%
No	13,127	91.5%	83,194	89.7%
Don't know/refused	169	1.2%	841	0.9%
ACE: Lived with an alcoholic	14,350	100.0%	92,774	100.0%
Yes	3,226	22.5%	21,625	23.3%
No	10,985	76.6%	70,407	75.9%
Don't know/refused	139	1.0%	742	0.8%
ACE: Lived with a depressed person	14,362	100.0%	92,824	100.0%
Yes	1,687	11.7%	15,744	17.0%
No	12,495	87.0%	75,926	81.8%
Don't know/refused	180	1.3%	1,154	1.2%

A State-level Approach to Veteran Homelessness and the Potential Role of State Capacity

Abstract

In 2009, the Department of Veterans Affairs created the End Veteran Homelessness initiative. This initiative was designed to partner with federal, state, and local stakeholders, with states playing a significant role. Given the program's partial success, this study applies state capacity theory to identify state-level determinants of reduced veteran homelessness. Utilizing 2007 to 2016 Department of Housing and Urban Development Point-in-Time homeless persons estimates and geographic information system (GIS) mapping, results from negative binomial regression models yield several key findings, and indicate the following: states better at managing their debt in proportion to their revenue will display a greater capacity to reduce their homeless veteran population; the availability of permanent supportive housing beds indicates a capacity to move veterans from unsheltered status through to a more permanent housing solution; states spending less per capita on criminal justice corrections and more on veteran programs demonstrate more success in sheltering their homeless veterans; costs of living indicators and veteran unemployment rates impact veteran housing stability. These findings suggest a state's capacity to manage resources, notably their ability to connect homeless veterans and available resources via robust relationships with community stakeholders, is key to enhancing homeless veteran outcomes.

Introduction

Reflecting a growing concern regarding homelessness in the U.S., Congress in 1987 passed the Stewart B. McKinney Homeless Assistance Act (U.S. Interagency Council on Homelessness, 2011: hereafter USICH), creating the U.S. Interagency Council on Homelessness⁴⁵ (USICH). In the following years, Congress passed additional pieces of legislation specifically targeting veteran homelessness, such as the Homeless Veterans Comprehensive Assistance Act of 2001 and the Veterans Housing and Employment Improvement Act of 2005. Despite these earlier efforts, at least one bill was introduced in Congress between 2010 and 2018 which intended to prevent, reduce, and end veteran homelessness. However, these bills eventually stalled out in committee or died (U.S. Congress n.d.).

Despite the mixed success of Congress, efforts to address veteran homelessness were renewed within the George W. Bush and Obama administrations. Both administrations aligned with the USICH, the Department of Veterans Affairs (VA), the U.S. Department of Housing and Urban Development (HUD), and state-level stakeholders to find and implement other solutions. Each administration also implemented intergovernmental programs designed to prevent and potentially end veteran homelessness, who at times, have been overrepresented in the homeless population (Fargo et al. 2011). President Bush and HUD created the Chronic Homelessness Initiative in 2001, which “encouraged states and localities to create 10-year plans to end chronic homelessness” (Eide 2020, 6). In addition to its *Opening Doors: Federal Strategic Plan to Prevent and End Homelessness*, a plan that included a goal of ending veteran homelessness in

⁴⁵ The USICH includes the Corporation for National and Community Service, General Services Administration, Office of Management and Budget, Social Security Administration, U.S. Postal Service, White House Office of Faith-Based and Community Initiatives, and all federal departments except the Departments of State and Treasury (USICH 2011).

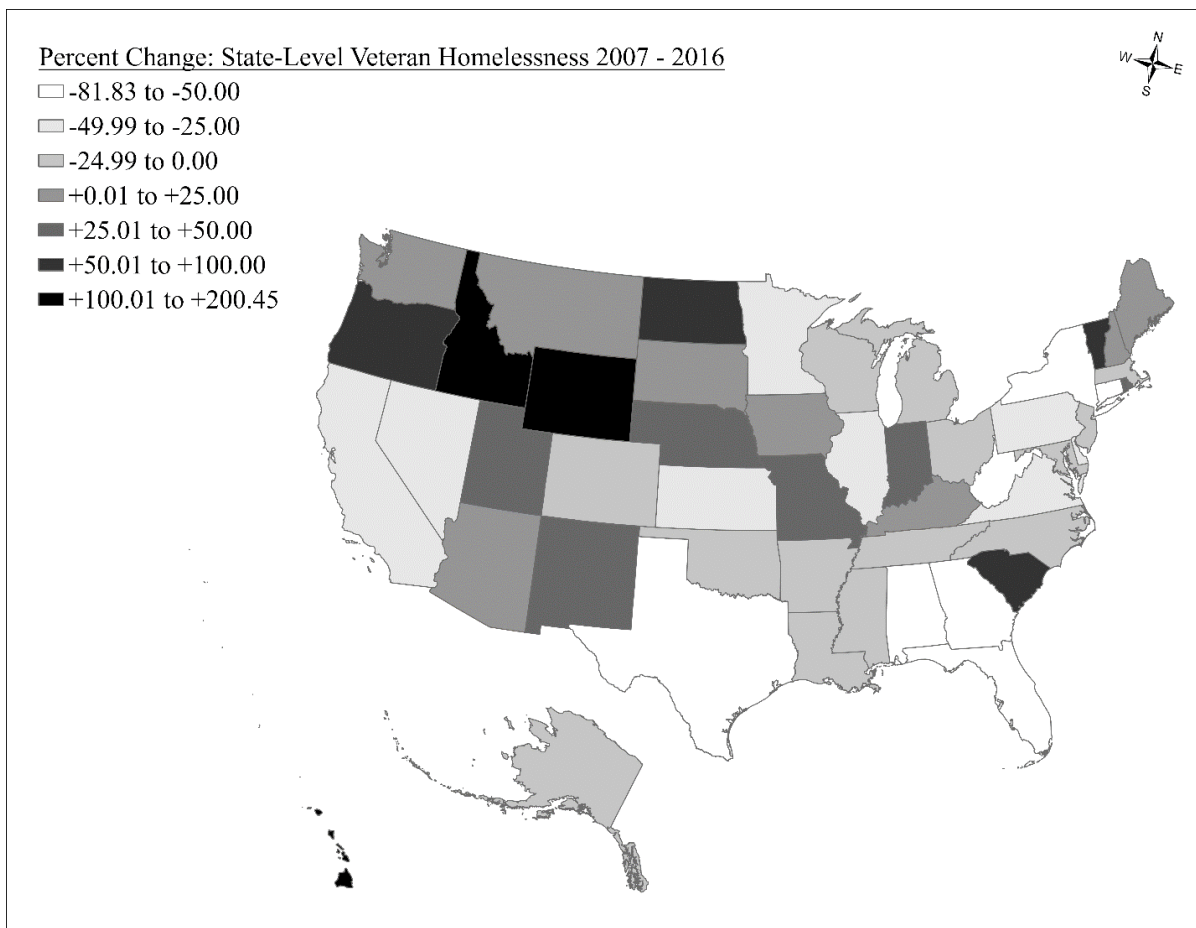
five years (USICH, 2010), the Obama administration also implemented the five-year End Veteran Homeless (EVH) initiative. According to HUD (2017) the EVH initiative was successful in reducing veteran homelessness during the EVH five-year plan, but efforts to prevent and end veteran homelessness have continued beyond 2020 towards an aspirational goal to end veteran homelessness.

The homelessness programs implemented by the Bush and Obama administrations share a common theme – federal initiatives that seek cooperation and coordination with state and local jurisdictions. Stakeholders at the federal, state, and local levels share similar perspectives on why ending homelessness matters – for everyone in the U.S. to have a platform from which they can pursue economic opportunity, improve their chances for success in school and their careers, to take care of their health, build strong families, and give back to their communities (USICH 2018). At the federal level, the VA set its own goal of ending veteran homelessness in 2009 based on the USICH’s periodically updated *Home, Together* strategic plan (e.g., USICH 2018). This plan set forth a series of goals to make homelessness, when it occurs, a rare, brief, and one-time experience, and includes housing solutions capable of sustaining success once achieved. Both the USICH and the VA emphasize cooperation with state and local stakeholders. According to the VA (2021), Virginia, Massachusetts, Delaware and 82 communities as of March 2021 have announced an end to veteran homelessness.

Advances in data collection on homeless persons help pave the way for these collaborative federal initiatives. The HUD produces an annual Point-in-Time (PIT) report detailing counts of persons in various states of homelessness and include counts of homeless

veterans.⁴⁶ Utilizing HUD PIT data with geographic information system (GIS) mapping, figure 1 depicts the percentage change in the estimated number of homeless veterans between 2007 and 2016. More importantly, examination of figure 1 reveals some states such as Texas and New York saw significant reductions in their homeless veteran populations, while others, such as Wyoming saw significant increases for the same time period. Additional examination can provide answers to which state-level factors significantly influence the reduction of veteran homelessness, potentially lending greater insight for continued efforts.

Figure 1: Percent Change of State-level Veteran Homelessness, 2007-2016



⁴⁶ These data are not without their methodological limitation (Tsai and Alarcón 2022). These limitations will be discussed further below.

Given the frequent failings of proposed legislation and the subsequent administrative emphasis on cooperation with state and local jurisdictions, this study asks what state-level factors are related to the reduction of veteran homelessness. As noted by the USICH (2018), achieving federal goals regarding homelessness⁴⁷ cannot be achieved through federal action alone. A few years prior, the USICH (2015, 16) expanded its strategies to include efforts to increase community and state capacity to end homelessness. While presidential administrations have increasingly relied on state and local partners, some states may have the capacity to deal with the veteran homelessness problem and implement federal programs such as the EVH initiative. Other states may lack this capacity. This study explores the potential role that state capacity may play in shaping veteran homelessness.

The End Veteran Homelessness Initiative

On November 3, 2009, VA Secretary Eric Shinseki announced a new VA initiative aimed at ending the cycle of veteran homelessness (Carden 2009). In his 2009 speech, Shinseki lamented that prior efforts to address veteran homelessness were “focused largely on getting veterans off of our streets,” noting that the EVH initiative tried to do something different – to increase emphasis on prevention and breaking the cycle of veteran homelessness (C-SPAN 2009). The new 5-year EVH initiative, set to begin in 2010 (U.S. Department of Veterans Affairs 2015, 7; hereafter VA), was designed to leverage the full range of VA benefits, including both physical and mental health care (C-SPAN 2009), and would include expanded collaborative efforts with public and private stakeholders, including the USICH, state VA directors, veteran service organizations, and other community members (Carden 2009). Shinseki emphasized a

⁴⁷ USICH goals include ending homeless among: Veterans, people with disabilities, families with children, unaccompanied youth, and all other individuals (USICH 2018, 6)

need for preventative strategies, including supportive efforts to assist with education, employment, treatment of depression and substance abuse, the prevention of suicide, and the provision of housing for vulnerable veterans (Carden 2009).

The EVH initiative was announced as a collaborative effort across federal, state, and local levels. However, the states' role in the EVH is of particular interest, as state governments and agencies (e.g., state-level departments of veterans affairs) can provide critical leadership for local communities, ensuring that federal benchmarks and program criteria are achieved (NAEH 2016). This means that state governments play a central role in efforts to end homelessness through various initiatives and special programs in partnership with the VA and stakeholders such as local housing authorities (NAEH 2016). Therefore, conditions favorable to ending veteran homelessness are expected to vary for each state and its capacity to respond.

States and Homeless Veterans

Considerable progress towards ending veteran homelessness was made by 2015, with efforts continuing to this day (Jordan 2013; Phillips and Kelsing 2014; Zoroya 2016). In turn, a goal of “functional zero” was conceptualized⁴⁸ (Tsai, Hoff, and Harpaz-Rotem 2017, 203). Publicly available reports (e.g., Cunningham, Urban Institute, and HUD 2012; Henry et al. 2021; Trutko et al. 2016) often consist of aggregated national-level evaluations that summarize the findings of publicly available veteran homelessness evaluations. Given the central role of state governments, this study asks what state-level factors contribute to the reduction of veteran homelessness. To date, research has been predominantly data-driven rather than being grounded in theory, namely public policy theory. As well, research has also been focused on individual-

⁴⁸ Tsai, Hoff, and Harpaz-Rotem posit that “functional zero” indicates that “all homeless individuals are provided immediate access to care and services” (2017, 203).

level factors instead of macro-level factors such as those existing at the state level. This study applies state capacity theory to identify state-level determinants of reduced veteran homelessness.

Economic Influences on Homelessness

Not limited to homeless veterans, HUD PIT data has been used in studies examining economic factors influencing both the general U.S. homeless population and homeless veterans. Using HUD PIT data in a cross-sectional study, Byrne et al. (2012) examine the influence of economic factors such as housing market measures, safety net measures such as Temporary Assistance to Needy Families (TANF) payments and Supplemental Security Income (SSI) recipients, and unemployment rates on sheltered and unsheltered homelessness at the Continuum of Care (CoC) level.⁴⁹ They find that poverty and costs associated with housing significantly contributed to overall homeless rates. In another study, Fargo et al. (2013) examined the influence of TANF, SSI, nonprofit agency counts, unemployment, income, and various measures associated with the cost of living. They report relatively similar findings in which housing adequacy, income, and unemployment are among the factors significantly impacting rates of homelessness. Fargo and colleagues find that, when controlling for poverty, the relationship between veteran status and the risk for homelessness greatly increases, “with veteran status associated with more than a two-fold increase for males and a three-fold increase for females in the odds of becoming homeless” (2011, 23). Lastly, Montgomery et al. (2015) find that increased safety net resources and VA medical expenditures held significant associations with the rate of unsheltered homeless veterans.

⁴⁹ The “CoC” will be discussed in greater detail below.

With the HUD PIT estimates available for a range of sub-populations, including veterans, it may be reasonable to expect that determinants of homelessness may vary among sub-populations, and that this is worthy of investigation in future research (Byrne et al. 2012). Despite these potential differences, research has demonstrated an emphasis on the examination of economic factors influencing both general homelessness and veteran homelessness. Given the significant influence of economic factors found in both the general homeless population and in the veteran homeless subpopulation, the examination of economic factors such as TANF, SSI, unemployment, income, and various measures associated with the cost of living are salient to examinations of factors contributing to veteran homelessness.

Veteran Homelessness

One of the earliest reports on veteran homelessness states that approximately one in 186 veterans in the U.S. were homeless at some point between October 1, 2008 and September 30, 2009 (Khadduri, Culhane, and Cortes 2011, i). At that time, nearly half of these homeless veterans on a given night were in four states (California, Florida, Texas, and New York), while 72% of the overall homeless veteran population, primarily disabled Caucasian men between the ages of 31 and 50 years, during the given period, were in dense urban areas (Khadduri, Culhane, and Cortes 2010, ii). The report details the most common living arrangements for veterans prior to entering a shelter, revealing the cyclical nature of veteran homelessness. By the following year, one out of 150 veterans in the U.S. were homeless during the same period (Khadduri, Culhane, and Cortes 2011, i). These early reports detailing the veteran subpopulation of homeless persons in the U.S. were a major step forward, as the 2007 Annual Homeless Assessment Report (AHAR) states that “sample data on this variable are not completely reliable because this information was missing for almost one-third of the adults” (Khadduri et al. 2008,

32). Such an issue foreshadows the complexities at hand, though research has focused on some common factors attributed to veteran homelessness.

Prior to the proliferation of VA homeless services, many homeless veterans were limited to an “institutional circuit” of shelters, jails, and mental health treatment settings (Kasprow et al. 2000, 1017). This institutional dilemma is also complicated by instances of substance abuse, which often introduces additional risk factors for loss of housing among veterans (Ghose et al. 2013; O’Connell, Kasprow, and Rosenheck 2012). While the nature of substance abuse may complicate housing status, a study by Tsai and Rosenheck (2013) found that criminal history, incarceration, and homelessness among veterans hold a clear association. Such a combination of interactions with the criminal justice system highlights the potential risk for a cycle of recidivism, substance abuse, and homelessness. Despite these complexities, HUD housing programs offer the potential to mitigate homelessness experiences.

The HUD has implemented several programs to prevent, reduce, and end homelessness. The multistage CoC is one such model. According to HUD, a CoC includes “prevention, outreach and assessment, emergency shelter, transitional housing, permanent supportive housing, and affordable housing, plus supportive services in all components” (2002, ix). These programs include two categories of housing beds – veteran designated beds and non-veteran designated beds. Veterans seeking such assistance have been found to use both categories of housing beds (Culhane et al. 2011). First, emergency shelter beds are defined as “any facility, the primary purpose of which is to provide a temporary shelter for the homeless in general or for specific populations of the homeless and which does not require occupants to sign leases or occupancy agreements” (HUD 2019a). Second, permanent supportive housing beds are defined as “community-based housing without a designated length of stay in which formerly homeless

individuals and families live as independently as possible,” with tenants that must be “on a lease (or sublease) for an initial term of at least one year that is renewable and is terminable only for cause” (HUD 2019b). Lastly, transitional housing beds “are designed to provide homeless individuals and families with the interim stability and support to successfully move to and maintain permanent housing,” and “may be used to cover the costs of up to 24 months of housing with accompanying supportive services” (HUD 2019b). These programs have inspired research to assess their effectiveness (e.g., Evans et al. 2019), often utilizing HUD PIT and HUD Housing Inventory Count Report (HIC) data. The effectiveness of these programs, notably permanent supportive housing, may be reflective of a state’s ability to ameliorate veteran homelessness beyond the short term.

Life after housing placement for homeless veterans remains tenuous; however, permanent supported housing has become a dominant service model for homeless veterans and others, with HUD-VASH⁵⁰ as one of the largest active programs of its kind (Tsai et al. 2013). In their research, Tsai et al. (2013) conclude that, though the HUD-VASH program is effective, greater efforts may be needed to improve program participants’ social lives, community integration, independence, and empowerment. Tsai and Rosenheck found “no differences in any measured outcomes between veterans with different criminal histories” after they enrolled in HUD-VASH (Tsai and Rosenheck 2013, 455). As well, they found that “homeless veterans, regardless of their criminal history, showed dramatic improvements in housing outcomes” while in supported housing (Tsai and Rosenheck 2013, 457). According to Lucas (2017), recent federal homeless funding has not reduced most homeless populations, which may lend further support for research

⁵⁰ HUD-VASH “offers homeless veterans a Section 8 voucher through HUD to subsidize their rent and VA case management services to support their housing tenure” (Tsai et al. 2013, 1040).

at the state level.⁵¹ O’Connell, Kasprow, and Rosenheck (2009) find that participants in the multistage program fared worse regarding substance abuse, quality of life, and social support; however, this group experienced greater improvements despite three times the average health care cost of the direct placement group. Montgomery et al. (2013) find that housing placement for homeless veterans with substance abuse issues is especially effective, more so than for those without substance abuse issues. Generally, this may suggest mixed results within the research when comparing housing placement outcomes for homeless veterans with substance abuse issues and those without. Given the range of risk-laden conditions faced by homeless veterans, efforts to monitor and evaluate support services remain vital to program success.

Through all the legislative successes and failures, the presidential initiatives, and the VA homelessness programs, veteran homelessness remains a salient public policy issue. The complex nature of veteran homelessness is one in which a one-time solution, such as putting a roof over someone’s head or giving them a job, may or may not provide a permanent housing solution. If a state’s capacity is to have an impact on veteran homelessness, its ability to both manage financial resources and influence salient economic and societal conditions would seem like a plausible starting point. Though collaborative programs like the EVH have helped to mitigate the problem, research provides further insight into the issue. Such research has studied the overarching state of veteran homelessness, the underlying causes of veteran homelessness, and the various housing and treatment innovations adopted by public institutions. Still, the homeless veteran experience persists, as do lingering knowledge gaps and questions.

⁵¹ Lucas (2017) examines veteran homeless according to two cohorts, sheltered and unsheltered homeless veterans.

State Capacity

This study proposes that state capacity theory offers a viable framework to explain state-level efforts to reduce veteran homelessness. The definition of state capacity has evolved as theoretical research on the topic has expanded. Tilly (1985) referred to state capacity as the power of the state to acquire (or extract) resources, and perhaps more importantly, to mobilize resources as a means of sustaining itself. A basic conceptualization of resource availability might be limited to those resources currently in-hand, such as those currently residing within a state's coffers. However, "decisions to consume and invest imply a decision to borrow whenever output is less than investment and consumption" (Semmler and Sieveking 2000, 1122). Here, incurring debt allows for the acquisition and mobilization of resources towards state initiatives. So long as a state's debt is no greater than the net wealth of its territory, it will remain solvent, thus able to acquire resources, use those resources to drive growth, and pay for them later (Semmler and Sieveking 2000).

Additional definitions of state capacity, when aggregated, provide a more comprehensive conceptualization of state capacity. Skocpol (1985) suggests state capacity is the ability of a government to administer its territory effectively. Besley and Persson expand this definition to "capture the wider range of competencies that the state acquires in the development process, which includes the power to enforce contracts and support markets through regulation" (2010, 1). Recognizing that many forms of government exist and have existed, Tilly updates his definition as "coercion-wielding organizations that are distinct from households and kinship groups and exercise clear priority in some respects over all other organizations within substantial territories" (1990, 1). As such Tilly qualifies "city-states, empires, theocracies, and many other forms of government," but disqualifies entities such as lineages, firms, and churches (1990, 1-2).

In turn, research has responded with studies utilizing subnational jurisdictions as the unit of analysis, including the U.S. fifty states (e.g., Carley, Nicholson-Crotty, and Fisher 2015; Dahill-Brown and Lavery 2012; Jensen and Ramey 2020) and other subnational jurisdictions (e.g., Acemoglu, García-Jimeno, and Robinson 2015). Given these definitions, qualifications, and prior research, the United States' fifty states are suitable for state capacity theory.

Just as variants on the definition of state capacity exist, so too do variants in its operationalization. Savoia and Sen (2015) add that a state's ability to develop economically and politically vary just as political and economic theories of the state differ. Moreover, the authors note that views regarding the role of the state differ as it pertains to influencing societal outcomes within its jurisdiction. Despite this, Savoia and Sen (2015) enumerate a "plausible" list of state capacity categories – bureaucratic and administrative, legal, infrastructural, fiscal, and military. Savoia and Sen follow this list with a crucial statement – that their list is not and exhaustive list for state capacity theory. Other state capacity researchers (e.g., Chuaire, Scartascini, and Tommasi 2017; Hendrix 2010; Lin 2015) have echoed one or more of these categories, while others have highlighted the additional space in which state capacity theory may operate beyond that of Savoia and Sen's non-exhaustive list. Besley and Persson (2011) emphasize that a state's capacity to extract revenue is critical to economic development; therefore, other measures of state capacity, such as demographics, education levels, and cost of living may be plausible reflections of a state's capacity to raise revenue (Dahill-Brown and Leverly 2012). The evolving definition of state capacity, such as a state's ability to acquire resources, regulate markets, and influence societal outcomes, opens the door for the applicability of a variety of state-level economic and political measures.

With the door open for a variety of economic and political measures, the above categories may be utilized, encompassing measures from a variety of data sources. In turn, this also yields a variety of variable operationalizations; yet, as Chuaire, Scartascini, and Tommasi (2017) suggest, these variables may be used on more than one occasion within the research or otherwise examined for their validity and reliability. Common themes among variables testing state capacity within the veteran homelessness research include state revenue and expenditures as measures of state resource acquisition and utilization, as well as unemployment, VA compensation and pension expenditures, safety net programs, and cost of living measures that align well with a state's ability to influence societal outcomes. Fargo et al. (2013) and Byrne et al. (2012) include SSI, TANF, and unemployment measures. Both articles include various cost of living measures, yet there appears to be limited uniformity in the chosen cost of living measures. However, many of these oft-used measures have manifested in veteran homelessness research with little-to-no mention of state capacity despite their applicability, given the nature of these measures and the aggregate conceptualization of state capacity. Though no known study of veteran homelessness utilizes state capacity theory, overall, there appears to exist a notable paucity of theory-based research regarding the antecedents of veteran homelessness. This trend, and how it may potentially impact variable selection, will be discussed below.

Based on what may be found within the state capacity literature, and the distinct connection via statistically tested determinants, this study explores the potential role of state capacity in ameliorating veteran homelessness. To do so, I adopt a broad, aggregated interpretation of state capacity, to include the following aspects: State revenue and expenditures, the ability to influence markets and societal outcomes, infrastructure, as well as bureaucracy and administration. If state capacity is related to veteran homeless rates, it would be reasonable to

presume that states with more resources and better economic conditions have the capacity to provide more assistance to homeless veterans. Given the central role of states in collaborative veteran homelessness initiatives, this study seeks to address existing research gaps, potentially offering an opportunity for the VA, HUD, local and state-level policy makers, and other key stakeholders to enhance their understanding of factors significantly impacting veteran homelessness; in order to better understand what works and what does not. Therefore, this study asks:

RQ1: What state-level factors contribute to the reduction of veteran homelessness?

RQ2: How well might state capacity theory explain state-level influences on veteran homelessness?

To aid in answering these questions, this study offers the unique combination of a ten-year state-level analysis, a theory-driven approach via state capacity, negative binomial regression, and GIS mapping from which inferences may be drawn. Data spanning 2007 through 2016 were chosen to cover a span of a few years prior to the EVH five-year initiative and a few years after the five-year span. Based on this unique approach, further examination of veteran homelessness at the state level may enhance current insights regarding factors known to reduce veteran homelessness. Such insight would be instructive since, as mentioned above, state governments play a central role in recent federal efforts to end veteran homelessness.

Data and Variables

What state-level factors contribute to the reduction of veteran homelessness? What role might state capacity play in the improvement of homeless veteran policy implementation? As previously demonstrated, states play a central role in collaborative veteran homelessness

initiatives. Their capacity to effectively implement such collaborative initiatives is anticipated to be of interest to public and private stakeholders. Therefore, three hypotheses are generated regarding a state's capacity to address veteran homelessness:

H1: States with higher rates of veteran program spending will tend to demonstrate more success in sheltering their homeless veterans.

H2: States with a greater number of permanent supportive housing beds will tend to have fewer sheltered and unsheltered homeless veterans.

H3: States spending less per capita on criminal justice corrections will demonstrate more success in sheltering their homeless veterans.

H4: States that better manage their debt in proportion to their revenue will demonstrate a greater capacity to reduce their homeless veteran population.

To test these hypotheses, this study utilizes HUD homelessness estimations from the annual PIT and HIC estimations, the Veterans Supplement to the AHAR report, and state-level fixed effects data originating from a variety of publicly available sources. The unit of analysis for this study is an individual state for a given calendar year from 2007 to 2016, or state-year. Panel data were collected for all 50 states. The District of Columbia and U.S. territories are not included.

Dependent Variables

The HUD provides PIT estimated counts of total homeless persons as well as homeless veterans. However, these data are not absent limitations and questions regarding data collection methodologies (Tsai and Alarcón, 2022). In its PIT Count Methodology Guide, HUD states that the purpose of the guide is to explain “the minimum standards established by HUD of PIT counts

and is intended to help CoCs choose and implement methodologies for conducting sheltered and unsheltered PIT counts” (Dunton, Albanese, and D’Alanno 2014, 3). This indicates that a consistent data collection methodology is unlikely to be used across all CoCs. It is stated that these data are useful for policy and planning decisions, which “enable CoCs to adjust the types of services available according to need” (Dunton, Albanese, and D’Alanno 2014, 3). Although HUD’s intent pertains to the efficient use of limited resources, Schneider, Brisson, and Burnes (2018) explain that HUD PIT data are not without their criticisms regarding reliability and validity. On the other hand, Mast (2020, 217) outlines three approved methods for collecting data when using the night of count approach, which, according to HUD includes a random sampling approach said to be statistically reliable and valid. Acknowledging the expected variability in conditions and capacity among CoCs, HUD (Dunton, Albanese, and D’Alanno 2014, 11) states that some PIT data consists of estimates. Data are collected within the last ten days of January, which provides merely a snapshot in time (Schneider, Brisson, and Burnes 2018). Despite these challenges, Schneider, Brisson, and Burnes note that U.S. stakeholders continue to rely heavily on the HUD PIT data, and it remains the main source of data for research regarding homelessness (e.g., Byrne et al. 2012; Evans et al. 2019; Fargo et al. 2013; Montgomery et al. 2015).

The HUD homeless veteran estimates are reported in two categories: sheltered homeless veterans and unsheltered homeless veterans. As is the case in multiple prior studies (e.g., Byrne et al. 2012; Cebula and Alexander 2020; Lucas 2017), this study utilizes both housing status categories, or cohort, in its analyses of veteran homelessness. These two cohorts comprise this study’s dependent variables. Figures A2.1 and A2.2 (see appendix) display the histogram of

sheltered homeless veterans and unsheltered homeless veterans, respectively, from 2007 to 2016. As non-negative count data, these dependent variables are non-normally distributed.

Independent Variables

This study utilizes independent variables selected either for their alignment with state capacity or as control variables depicting state characteristics. Within these two groups, variables are organized into two subcategories – those specific to veterans and those of a general nature. Tables A.1 and A.2 (see Appendix) provide variable descriptions for all state capacity variables and for all control variables, respectively. These tables also provide the final scaling for all independent variables used in this study. The remainder of this section provides important variable information beyond that which is detailed in tables A.1 and A.2.

State Capacity Variables

The U.S. Census Bureau publishes an annual revenue and expenditures report for local area governments, including state-level data. These data are originally reported in thousands and include revenue and expenditure categories such as **corrections spending**, **judiciary spending**, total revenue, state debt, and **veteran programs spending**. I use a ratio of total state revenue divided by total state debt (the **revenue-to-debt ratio**) to indicate a state's ability to effectively manage its resources. Next, the HUD's annual HIC reports include data on shelter bed counts for three distinct programs – **emergency shelter beds**, **permanent supportive housing beds**, and **transitional housing beds**. These data include counts of veteran designated beds and general access, non-veteran designated beds. Veterans have been found to utilize both (Culhane et al. 2011). While state capacity includes the ability to regulate markets and influence societal

outcomes (Savoia and Sen 2015), remaining independent variables are classified as control variables for this study, depicting various state characteristics.

Control Variables

Based on the literature regarding state capacity (e.g., Besley and Persson 2011; Dahill-Brown and Leverly 2012) and that of veteran homelessness and homelessness in general (e.g., Byrne et al. 2012; Fargo et al. 2013; Montgomery et al. 2015), measures such as veteran unemployment, cost of living, TANF and SSI recipients, criminality trends, and state characteristics are worthy of inclusion. Additionally, several of this study's control variables require additional explanation beyond that which is provided in table A.2. Regarding veteran-oriented control variables, the Bureau of Labor Statistics (BLS) kindly provided state-level **veteran unemployment** rates upon request of the author. These data are published as a percentage of states' unemployed veteran population. As this data series has occasionally experienced missing data points, a multiple imputation technique via Amelia's bootstrapping-based algorithms was utilized. This technique "fills in data in such a way as to not change any relationships in the data but which enables the inclusion of all the observed data in the partially missing rows" (Honaker et al. 2017). This also allows for a strongly balanced dataset when conducting time-series regression and helps avoid listwise deletion common to analytic software.

Several measures of general state characteristics are also included. First, GuideStar (2015) provides the number of **veteran organizations** by state (GuideStar 2015). This cross-sectional data for 2015 was replicated for all other years included in this study. Next, the Bureau of Economic Analysis (BEA) publishes a uniform, annual, and aggregated measure encompassing an array of factors related to cost of living. This aggregated measure, **regional**

price parities (RPP), measures “the differences in price levels across states and metropolitan areas for a given year and are expressed as a percentage of the overall national price level” (BEA 2021). This measure includes data from the Consumer Price Index (applied as a 5-year rolling average) and American Community Survey (BEA 2021b). According to the BEA, “an important application of the RPPs is to control for price level differences across regions when measuring economic activity such as income levels”⁵² (BEA 2021b). Overall, the BEA methodology results in a two-stage, rolling average estimation process.⁵³ The comprehensive nature of RPP and the described methodology suggests a valid and reliable measure of state-level cost of living.

Second, the federal government provides states with flexible temporary assistance for needy families (TANF) block grants (CRS 2021), which are received by **TANF recipients**. Depending on the state of residency, supplemental security income (SSI) assistance is paid to **SSI recipients** either by the state, the federal government, or both (SSA 2021, 12). The Bureau of Justice Statistics (BJS) also reports the annual number of prisoners under the jurisdiction of state and federal correctional authorities, on December 31st (Carson 2020). While the number of **persons incarcerated** includes veteran and non-veterans, the BJS does not currently consider its count of veteran prisoners to be sufficiently reliable for empirical research. Next, The Federal Bureau of Investigation (2019) publishes annual state-level **property crime** and **violent crime** rates.

⁵² The BEA’s estimates of real personal income consist of the current-dollar estimates adjusted by the regional price parities and converted to constant dollars, which uses the Personal Consumer Expenditures price index (BEA 2021b).

⁵³ According to the BEA, “the first stage estimates annual multilateral price level indexes for CPI areas and for several consumption expenditure classes, such as apparel, food, and transportation;” then, for the second stage, “the price levels and expenditure weights are allocated from CPI areas to all counties in the United States. They are then recombined for regions, such as states and metropolitan areas, and merged with ACS data on rents” (BEA 2021b, 1). The final regional price parities are “calculated by stacking 5 years of the first-stage results, plus the annual rent indexes, and calculating the multilateral aggregate price index for all goods and services and rents” (BEA 2021b, 2).

Finally, the acquisition and distribution of resources by a state is inherently political (Lasswell, 1936). Thus, state government ideology and innovativeness may be linked to how a state manages its resources. The **state government ideology** measure is based on the updated 1960-2017 state government ideology series provided by Berry et al. (1998). For this measure, a higher score, ranging from zero to one hundred, equates to a more liberal state government. As noted by Berry et al. (1998), this measure is different than that of citizen ideology. A lower score equates to a more conservative state. As well, policy innovations adopted by a state are generally regarded to be resource-dependent; therefore, a state's level of **innovativeness** may be reliant on motivations to achieve policy goals and how resources are acquired (Hawkins 2011; Krause 2011). Boehmke et al. (2018) calculate a state's dynamic, three-year smoothed innovativeness score, representing the number of policies adopted by each state divided by the number of state-year adoption opportunities. This measure ranges from zero to one where a higher value indicates a more innovative state.

Results

This study examines factors contributing to the reduction of veteran homelessness. First, table A.3 of the appendix provides descriptive statistics for all variables within the study. These variables are scaled as described in the previous section. Second, negative binomial regression models, one for sheltered homeless veterans and one for unsheltered homeless veterans, provide aggregated state-level results. These pooled cross-sectional time-series analyses will shed light on the ability of state capacity to explain state-level factors leading to reduced veteran homelessness. Finally, GIS mapping provided disaggregated analyses of 1) the influence of

veteran unemployment on unsheltered veteran homelessness, and 2) the influence of regional price parities on sheltered veteran homelessness.

Negative Binomial Regression

When utilizing panel data consisting of counts, Davis and Wu note that “classical Gaussian models are inappropriate and it is necessary to consider non-linear models” (2009, 735), since neighboring observations are unlikely to be independent (Zeger 1988). Zeger notes that log linear models account for dependence and are necessary to obtain valid inferences about the relationships of interest. Negative binomial regression is a parameter-driven generalized linear model in which autocorrelation is introduced through a latent process (Zeger 1988). Negative binomial distribution is more flexible than the Poisson model, allowing for overdispersion (Davis and Wu 2009, 735-736). Given the nature of negative binomial regression, as well as the assumptions of OLS regression, O’Hara and Kotze (2010) strongly cautions against the log-transformation of count data to satisfy parametric test assumptions. Table 1 displays the results of the fixed-effects negative binomial regression models for sheltered and unsheltered homeless veterans.⁵⁴ Results for all cohorts include 500 observations among 50 states. It is important to note that an increase in homelessness is not a desired outcome for the VA and HUD. Therefore, interpretations of relationship directionality displayed in table 1 are worth careful consideration.

Prior to the potential inclusion of all three shelter bed programs into a single regression model, correlation analyses were conducted to test for any high state-level correlation between these programs. Based on these findings, correlations were found to be too high between the

⁵⁴ For all dependent variables, time-series Poisson models resulted in notably inflated significance for the predominance of independent variables tested, highlighting this model’s dilemma when dealing with overdispersion.

three programs. Thus, three separate negative binomial regression models were conducted, each containing one shelter bed program per model. Given hypothesis H2, permanent supportive housing is of specific interest to this study; therefore, table 1 displays the regression model that includes the permanent supportive housing beds measure. Regression models utilizing the emergency shelter bed and transitional housing bed measures are provided in tables A.4 and A.5 of the appendix, respectively.

With this study's hypotheses in mind, several significant associations stand out. Regarding state budget items, a ten million dollar increase in state veteran program spending is associated with nearly a 0.6% increase in a state's ability to shelter its homeless veterans. Second, an increase of 1,000 permanent supportive housing beds is associated with a 3% decrease in sheltered veterans and a 5% decrease in unsheltered veterans. A one million dollar decrease in corrections spending correlates to roughly a 32% decrease in sheltered veteran homelessness. Next, a one percent improvement in a state's revenue-to-debt ratio correlates to roughly a one percent reduction in sheltered homeless veterans and roughly a 2% reduction in the unsheltered homeless veteran population.

Regarding control variables, a few significant associations are also noteworthy. First, a one percent increase in a state's regional price parities increases the number of sheltered homeless veterans by roughly four percent, while the same one percent increase in RPP decreases the number of unsheltered homeless veterans by about one percent. For every additional 100,000 TANF recipients within a state, there is a correlating 0.43% decrease in a state's sheltered homeless veteran population. A one percent increase in in veteran unemployment has a greater impact on unsheltered veteran homelessness than on the sheltered cohort – a 7.7% increase compared to 1.3%, respectively. An increase of 100 veteran

organizations across the state correlates to increased veteran homelessness (9.8% and 11.5% respectively). Next, an interesting contrast in crime rates is observed. A reduction in reported property crimes by 100,000 correlates to a 53% decrease in unsheltered veteran homelessness, yet unsheltered veteran rates decrease by nearly 17% for every *increase* of 10,000 reported violent crimes. Finally, for both sheltered and unsheltered veterans, more liberal states tend to have fewer homeless veterans per capita.

Table 1: Fixed-effects Time-series Negative Binomial Regression by Veteran Cohort

Independent Variables	Sheltered			Unsheltered		
	IRR	SE	z	IRR	SE	z
<u>State Capacity</u>						
Veterans						
State veteran program spending	1.01	0.002	2.61*	1.00	0.004	0.49
Permanent supportive housing beds	0.97	0.009	-3.59***	0.95	0.015	-2.99**
General						
Corrections spending	1.32	0.131	2.83**	1.24	0.138	1.90
Judiciary spending	0.84	0.125	-1.18	1.44	0.269	1.93
State revenue-to-debt ratio	0.99	0.004	-2.28*	0.98	0.007	-3.31***
<u>State Characteristics</u>						
Veterans						
Veteran population	1.01	0.115	0.51	1.01	0.150	0.06
Veteran unemployment	1.01	0.005	2.43*	1.08	0.011	7.13***
Veteran organizations	1.10	0.026	3.90***	1.12	0.030	4.07***
VA compensation and pension	1.00	<0.001	-0.17	1.00	<0.001	0.46
General						
Regional price parity	1.04	0.010	4.31***	0.99	0.011	-0.81
SSI recipients	1.00	0.011	-0.25	0.99	0.136	-0.74
TANF recipients	1.00	0.001	-3.23**	1.00	0.002	-0.94
Persons incarcerated	1.00	0.005	0.86	0.98	0.005	-3.25***
Property Crime	1.03	0.064	0.45	1.53	0.140	4.64***
Violent Crime	0.94	0.040	-1.38	0.83	0.053	-2.87**
Drug overdoses	1.00	<0.001	-1.92	1.00	<0.001	-0.07
Education	1.00	0.004	-0.29	1.01	0.007	1.54
State population	1.36	0.229	1.85	1.51	0.241	2.59**
Innovativeness	1.01	0.009	0.63	1.02	0.018	1.02
State government ideology	1.00	0.001	-2.49*	0.99	0.002	-4.72***
Active-duty military personnel	1.00	0.002	1.79	1.00	0.003	1.26
Constant	<0.01	0.004	-2.40*	<0.01	0.012	-2.06*
Log Likelihood	-2635			-2338		
AIC	5313			4720		
Number of Observations/Groups	500	50		500	50	

Notes: IRR = incidence-rate ratio. *p<0.05; **p<0.01; ***p<0.001. The dependent variable for each model is the count of homeless veterans.

GIS Mapping Analyses

Geographic information system (GIS) mapping analyses provide disaggregated, state-level insights into sheltered and unsheltered veteran homelessness trends. Beyond the state capacity variables found to be statistically significant in table 1, GIS mapping analyses may provide further insight for two meaningful relationships grounded in economic influences. Based on the significance of veteran unemployment and RPP in table 1, results suggest that sheltered veterans may be more likely to find employment than those who are unsheltered, yet the cost of living in some states may make it difficult for veterans to achieve more permanent housing status. This suggests that some homeless veterans must navigate a complex process from unsheltered homelessness, to sheltered homelessness, to a more permanent housing status. Thus, two maps have been generated to further explore meaningful disaggregated state-level trends. Figures 2 and 3 each use three types of visualizations to depict state-level calculations, including a choropleth technique utilizing a graduated grayscale shading method for each state⁵⁵, graduated circles, and numeric values. While these maps are not intended to provide direct support for the application of state capacity theory to veteran homelessness trends, they do offer meaningful, disaggregated state-level insights not readily apparent in table 1.

Figure 2 depicts three trends of interest regarding unsheltered veterans and veteran unemployment between 2007 and 2016. First, the state-level percent change in per capita unsheltered veterans is depicted using the graduated grayscale choropleth display. Next, the graduated white circles represent average veteran unemployment over the 10-year span. A larger white circle indicates a higher average veteran unemployment rate for a given state. Lastly,

⁵⁵ For both figures 2 and 3, a darker shade indicates a larger percent change in per capita shelter and unsheltered homeless veteran counts, respectively.

numeric values display the percent change in veteran unemployment for each state across the same period. Figure 2 shows that states experienced a relatively wide rate of change in their unsheltered homelessness, ranging from a 1% reduction to a 32.9% increase. Though some regional trends may be inferred, this study emphasizes state-level trends. Alabama, New Hampshire, and Texas experienced some of the greatest per capita declines in unsheltered veteran counts, though Alabama has a relatively high veteran unemployment rate that increased 0.9% over the 10-year span. States experiencing the highest per capita increases in unsheltered veteran counts are not isolated to one region of the country. New York, one of the most populous U.S. states displays a relatively large increase in unsheltered veterans and a relatively high average veteran unemployment rate; however, so does Mississippi for the same time span.

Figure 2: Unsheltered Veterans and Veteran Unemployment Statistics, 2007 - 2016

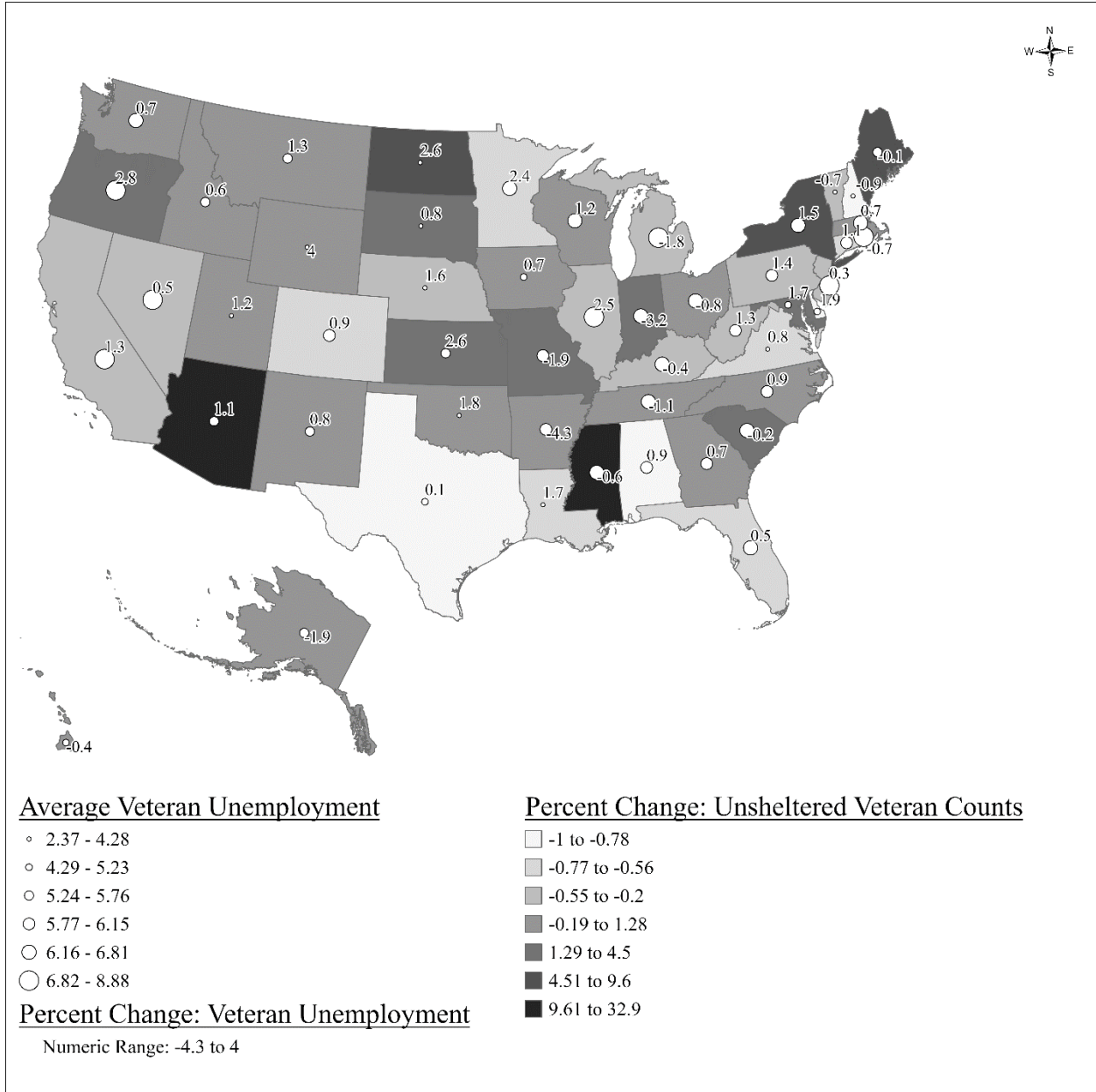
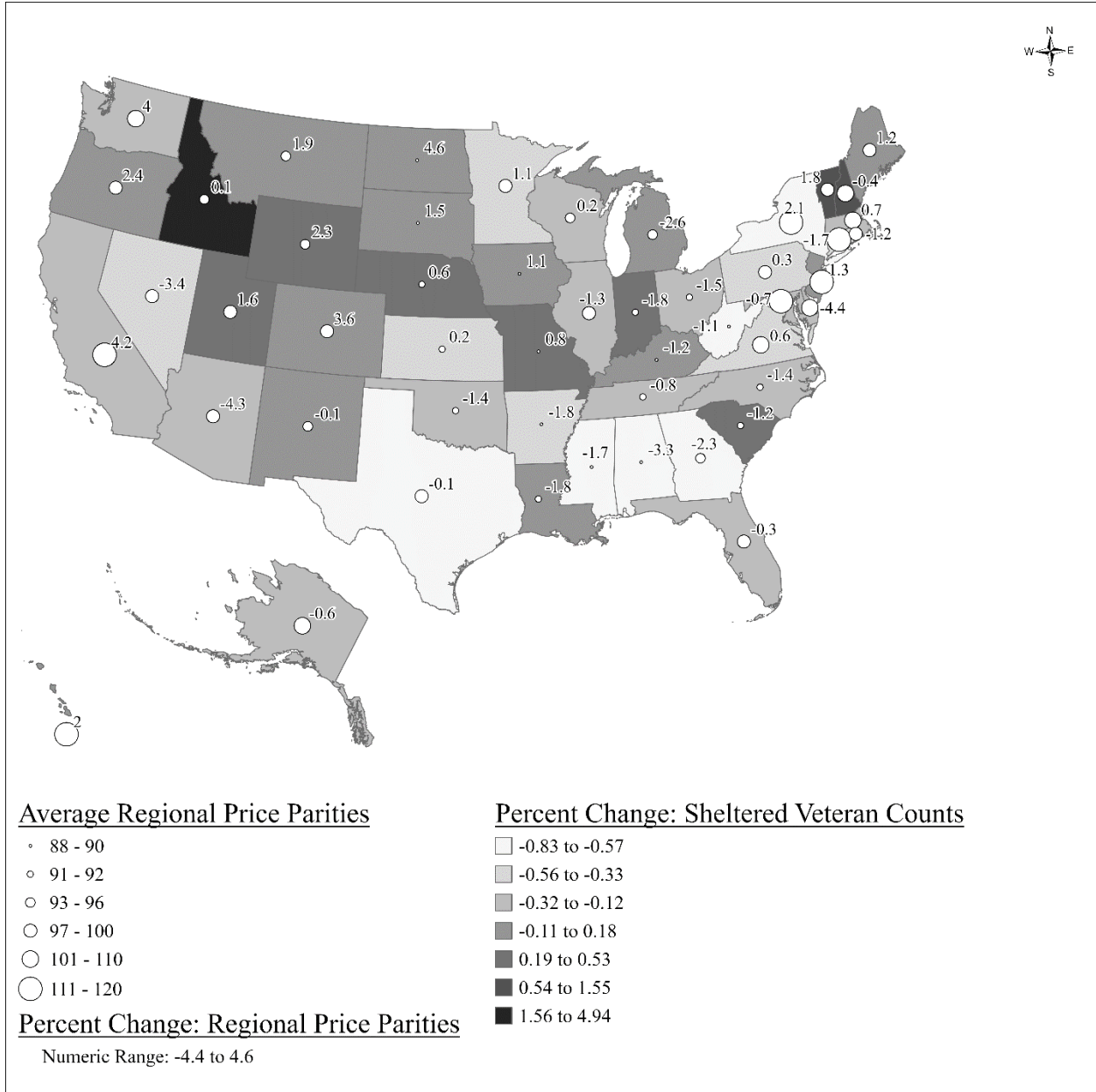


Figure 2 depicts three trends of interest regarding sheltered veterans and veteran unemployment between 2007 and 2016. The data displayed in figure 3 are akin to those seen in figure 2, substituting sheltered homeless veterans for unsheltered, and Regional Price Parities (RPP) for veteran unemployment. Here, four Southern states (Texas, Mississippi, Alabama, and Georgia), along with West Virginia and New York, show notable decreases in per capita

sheltered homeless veteran counts during the 10-year span. Among these, New York has among the highest RPP scores in the country and the sixth largest increase in RPP during the same span. Idaho, Vermont, and New Hampshire are among the states with the greatest increases in per capita sheltered homeless veterans, though Idaho's cost of living is noticeably lower than that of Vermont and New Hampshire.

Figures 2 and 3 demonstrate the state-by-state variability in statistical trends. At times, highly populous states share similar trends with less populated states. Further, such states may be in notably different regions of the country. This suggests that a state-by-state interpretation of such key relationships, grounded in economic influences, may provide additionally meaningful inferences alongside a state's capacity to address veteran homelessness.

Figure 3: Sheltered Veterans and Regional Price Parities Statistics, 2007 - 2016



Discussion and Conclusions

In terms of homelessness policy at large, the goal has been to reduce or even end homelessness. Figure 1 indicates that most states saw an overall reduction in veteran homelessness between 2007 and 2016, yet by 2020 “California, Hawaii, and Oregon had the highest rates of homelessness among all veterans, far exceeding the national rate of 21 of every 10,000 veterans” (Henry et al. 2021, 56). While a portion of this reduction may be attributed to the EVH, an improved understanding of a state’s capacity to significantly reduced veteran homelessness may allow stakeholders to expand efforts where effective, target areas for improvement, and revise resource allocations.

A key component of state capacity theory is the allocation and mobilization of financial resources (Tilly 1985). First, in partial support of hypothesis H1, states more likely to invest in veteran program spending are likely to see more sheltered homeless veterans. The limitations of this study do not indicate whether this is a relationship in which states spend more in response to an increased sheltered veteran population or a result in which such investments aid in moving unsheltered veterans to a sheltered status. If state veteran program spending has contributed to shifting unsheltered homeless veterans to a sheltered status, then some work still remains to achieve the EVH program goal for those classified as sheltered homeless veterans. Second, the permanent supportive housing bed program yielded statistically significant results for both sheltered and unsheltered homeless veterans. This may indicate a capacity to move veterans from unsheltered status through to a more permanent housing solution. The permanent supportive housing bed program has generally been regarded as a dominant service model (Tsai et al. 2013). The data utilized in this study appears to reflect this trend, which supports the aim of the EVH initiative. Thus, support for hypothesis H2 is found.

Third, the significant and positive association between corrections spending and sheltered veterans is supported by the “institutional circuit” of shelters, jails, substance abuse, and mental health treatment settings highlighted by Kasprow et al. (2000, 1017). These results may suggest that sheltered veterans are more likely to be caught up in the institutional circuit, requiring corrections expenditures to redress delinquent behaviors, while some unsheltered veterans have managed to avoid the circuit. This lends partial support for hypothesis H3. Further, property crime and incarceration rates appear to be significantly reduced as more homeless persons gain access to shelter. This lends further support for hypothesis H2, the applicability of state capacity theory, and (breaking) the cycle of deviant status (Doherty 2015; Kasprow et al. 2000) among homeless persons. Such results further highlight the endogenous dilemma of Kasprow et al.’s (2000) institutional circuit, one that the EVH has already committed to breaking among veterans. If the EVH program is to be successful in its preventative strategies, the number of homeless veterans able to avoid the institutional circuits should increase.

In terms of general state spending trends, table 1 indicates that states with an improved revenue-to-debt ratio demonstrate a significantly greater capacity to reduce its overall homeless veteran population. States boasting such desirable revenue-to-debt ratios are anticipated to have the capacity to acquire and mobilize resources towards state initiatives, including initiatives designed to ameliorate veteran homelessness. Such an inference is supportive of hypothesis H4 and lies at the core of state capacity theory. Although not definitive, this suggests that when state budgets are in fiscal straits, states may be compelled to tackle additional issues besides veteran homelessness.

While at least partial support for this study’s hypotheses may be found, additional relationships are worthy of consideration. The comprehensive nature of regional price parities

and the described methodology suggests a valid and reliable measure of state-level cost of living, with cost of living having been shown to be salient within the state capacity and homelessness literature. Recalling that state capacity includes the ability to regulate markets and influence societal outcomes, factors such as RPP and unemployment rates may be debatable as measures of state capacity and thus worthy of future consideration. Regardless, these measures appear to play cohort-specific roles in the veteran homelessness experience. Sheltered veterans may be more likely to find employment than those who are unsheltered, yet the cost of living in some states may make it difficult for veterans to achieve more permanent housing status.

Finally, the number of veteran organizations in a state are significant. While some of the more populous states (e.g., California, Texas, and Florida) are also geographically situated as strategic locations for military installations (Military OneSource 2021), a state's connection with its military-affiliated subpopulations (e.g., via advocacy) may suggest the competing and/or parallel influence of social capital (Green and Haines 2015). Figure 1 shows that collaborative efforts often get results. While it may be logical to infer that the veteran homelessness public policy issue may inspire a robust network of significant public *and* private resources, further theory-based research may be needed to flesh out the more nuanced differences between these two theories and their respective roles within the homeless veteran policy arena. In whole, the complex and dynamic nature of homelessness provides lingering questions, generating several limitations for this study.

Limitations

General Study Limitations

While this study's research design offers a unique approach to the examination of veteran homelessness at the state level, several limitations are apparent. First, the HUD PIT is not without its methodological concerns regarding consistency in data collection, reliability, and validity (Schneider, Brisson, and Burnes 2018; Tsai and Alarcón 2022). However, the HUD PIT datasets remain a primary source for researchers (Schneider, Brisson, and Burnes 2018). Second, the nesting of CoCs within states via multi-level modeling, accounting for more localized jurisdictions, has been used in a few notable studies (e.g., Byrne et al. 2012; Montgomery et al. 2015); however, this study emphasizes state-level determinants. As noted earlier, studies using OLS regression with log-transformed dependent variables are also readily found. Conversely, this study's emphasis on the state level offers the opportunity to utilize negative binomial regression.

Limitations regarding certain independent variables used may also be found. The U.S. Census Bureau's definition of "veteran services,"⁵⁶ as it applies to state veteran program spending, includes multiple types of veteran-oriented program spending, but lacks in specificity regarding the included programs. Pertaining to state corrections and judiciary expenditures, the observed relationships may be linked to a state's approach to law enforcement and criminal justice. A negative association between violent crime and unsheltered veteran homelessness is observed. For each of these associations, further research would be necessary to provide sufficient inferences. In another light, this study is likely limited due to some potential control

⁵⁶ "Cash bonuses to veterans and other financial grants not contingent on need, administration of bonus payments, veterans' information and guidance services, and other veterans' services not classified under Public welfare, Education, Hospitals, or other functions" (U.S. Census Bureau 2021).

variables for which data was not acquired. Whether these potential control variables include individual-level data or state-level data

Next, among the emergency shelter bed and transitional housing bed programs, the only significant association found was the emergency shelter bed counts and sheltered homeless veterans. Culhane et al. (2011) found that, among the “emergency shelter and transitional housing bed inventory that CoCs reported to HUD to the VA’s inventory of homeless residential beds and found that 5,836 beds for homeless veterans funded by the VA were not included in the HUD’s housing inventory. If additional discrepancies exist across multiple years of HUD Housing Inventory Count data, such discrepancies may exert some degree of influence on the final, published count data. Further study would be needed to estimate the extent to which such anomalies impact statistical analyses.

Lastly, the VA compensation and pension variable’s lack of significance, also the case in Montgomery et al. (2015), may speak to its viability as a determinant of veteran homelessness. VA compensation and pension expenditures encompass an array of programmatic spending (VA, 2005, 1), potentially washing out the effect of any funds allocated to veteran homelessness. Similarly, state veteran program spending and counts of statewide nonprofits encompass all active programs for their respective arenas, likely washing out their related effects as well. For the purposes of academic research, the disaggregation of these data into salient categories may prove meaningful to future research. Despite these limitations, inferences may be drawn regarding state-level efforts to reduce veteran homelessness.

A Discussion of Potential Study Limitations

Other than the above study limitations, a more in-depth discussion regarding the potential for additional study limitations may be of interest. As noted, there appears to exist a notable

paucity of theory-based research regarding the antecedents of veteran homelessness. One would not struggle to identify data-driven research on this same topic, whether that research utilizes an individual-level unit of analysis or a subnational unit of analysis (i.e., CoC-level or state-level). With the aim of examining the potential fitness of state capacity theory towards explaining state-level influences on veteran homelessness, this study tests several measures as potentially influential the homeless veteran policy issue. Given the scarcity of readily apparent theory-based homeless veteran research, it may be reasonable to anticipate some level of debate regarding the selection of appropriate measures when examining antecedents of veteran homelessness through a public policy lens.

Among the many perils of designing social inquiry, the potential for omitted variable bias presents a noteworthy dilemma for researchers, one in which the omission of measures relevant to the outcome variable may impact the study's rigor (King, Keohane, and Verba 1994). This may result in a less efficient research design. For example, the potential oversight of spurious relationships may diminish the relationship between the two included measures, which could explain away part or all of the observed relationship (King et al. 1994). Further, such an effect may negatively influence inferences drawn from the study's analyses (King et al. 1994). Lastly, King et al. (1994) note that "researchers can never conclusively reject the hypothesis that omitted variables have biased their analyses," therefore sufficient rigor to address the perils of omitted variable bias can result in more plausible arguments and the reduced uncertainty of causal inferences (1994, 182). With the principles of omitted variable bias and the state of theory-based homeless veteran research in mind, the following paragraphs offer brief discussion of potential state-level factors not incorporated as control variables in this study's models. Factors included

for consideration are derived from two key domains, existing data-driven homeless veteran research conducted at the subnational level and relevant theory-based research.

Existing homeless veteran research offers several studies utilizing a subnational unit of analysis. Four such articles have been identified for discussion, and each of these four articles boasts their own unique set of measures tested against one or more dependent variables. Perhaps the most notable measure not included in this study pertains to Medicaid expenditures. Two studies (Fargo et al. 2013; Montgomery et al. 2015) test subnational Medicaid expenditures against count data of homeless persons, and another study includes data regarding “federal Medicaid payments to state and local governments” (Grimes et al. 1997, 28). The U.S. Government Accountability Office notes that each year states must cover at least 40% of the nonfederal share of total Medicare expenditures and that the remaining 60% of the nonfederal share may be derived from local governments (U.S. Government Accountability Office, 2020, 10). Though the inclusion of Medicaid may (at times) be well-suited to such data-driven studies, data comprised of funding from two or more levels of government, if included, may present other methodological conundrums to a state-level study grounded in state capacity theory. Other notable variables found in these data-driven, subnational-level studies include Emergency Solutions Grants (Lucas 2017), climate or weather (Grimes et al. 1997; Lucas 2017), average volunteer hours per capita (Montgomery et al. 2015), lagged population growth (Lucas 2017), and percentage of households receiving Supplemental Nutrition Assistance Program (SNAP) assistance (Lucas 2017).

In terms of theory-based veteran homelessness research, brief searches of available databases⁵⁷ yield only a few instances of published research articles. Among these articles, no individual theory is shared among any two articles that were identified. Schaffer (2022) utilizes resource dependency theory to examine the role of social work in mitigating veteran homelessness. Tollett and Thomas (1995) utilize the homelessness-hopelessness theory to examine the influence of a selected nursing intervention via a quasi-experimental research design. Thompson and Bridier (2013) use the life-span perspective of human development theory to examine aging veterans transitioning from homelessness to a more permanent housing solution. Lastly, Beard (2013) examines U.S. federal-level veteran homelessness policy implementation (and responses) across time. None of these studies appear to have been conducted at the subnational level. As well, the overall lack of consistent theory selection appears to offer little footing from which a debate of variable selection, either for or against the inclusion of a particular variable utilized within one of these studies, may be mounted. As such, it may be reasonable to suggest the need for additional theory-based veteran homelessness policy research towards a conversation regarding suitable theories for utilization among researchers and practitioners.

Conclusions

What conclusions may be drawn regarding a state's capacity to reduce veteran homelessness? This study's results suggest a complex and dynamic veteran homelessness policy arena, one in which states manage an array of resources, including those allocated to homeless veteran initiatives like the End Veteran Homelessness initiative. Therefore, it is posited that a state's capacity to effectively manage its resources does matter when seeking to ameliorate

⁵⁷ Available databases include ProQuest, JSTOR, ERIC, and Google Scholar.

veteran homelessness. An improved understanding of a state's capacity to significantly reduced veteran homelessness may allow states to expand efforts where effective, target areas for improvement, and revise resource allocations.

Given this study's theory-driven approach, how well does state capacity hold up when applied to veteran homelessness? Based on this study's results, the presence of multiple significant associations between homeless veteran cohorts and state capacity measures suggests that state capacity theory may be a feasible starting point for increased theory-driven homeless veteran research. These measures of state capacity, along with those state characteristics holding significant associations, likely impact sheltered and unsheltered veterans differently. This may indicate an opportunity for veteran homelessness initiatives to enhance resource allocation along housing-based differences in needs. However, a state's ability to shift unsheltered veterans to sheltered status may come at significant cost to its bottom line. It appears that state capacity, as it pertains to homeless veterans, may hold up well.

This study's results suggest that a state's capacity to effectively manage its resources does matter. Such conditions appear unique to each state. Figure 1 suggests that collaborative homeless veteran initiatives can and often get results at the state level. This may signify a need for states to continue developing and enriching holistic, innovative collaborations like the EVH. Given an already complex network of policies and programs aimed at reducing veteran homelessness, an even more robust network of states and other stakeholders may carry collaborative efforts to new levels of achievement. The lessons learned from the EVH and expanded collaborative efforts may serve to inform similar efforts among non-veteran homelessness initiatives.

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Appendix

Figure A2.1: Histogram of Sheltered Homeless Veteran Counts, 2007 to 2016

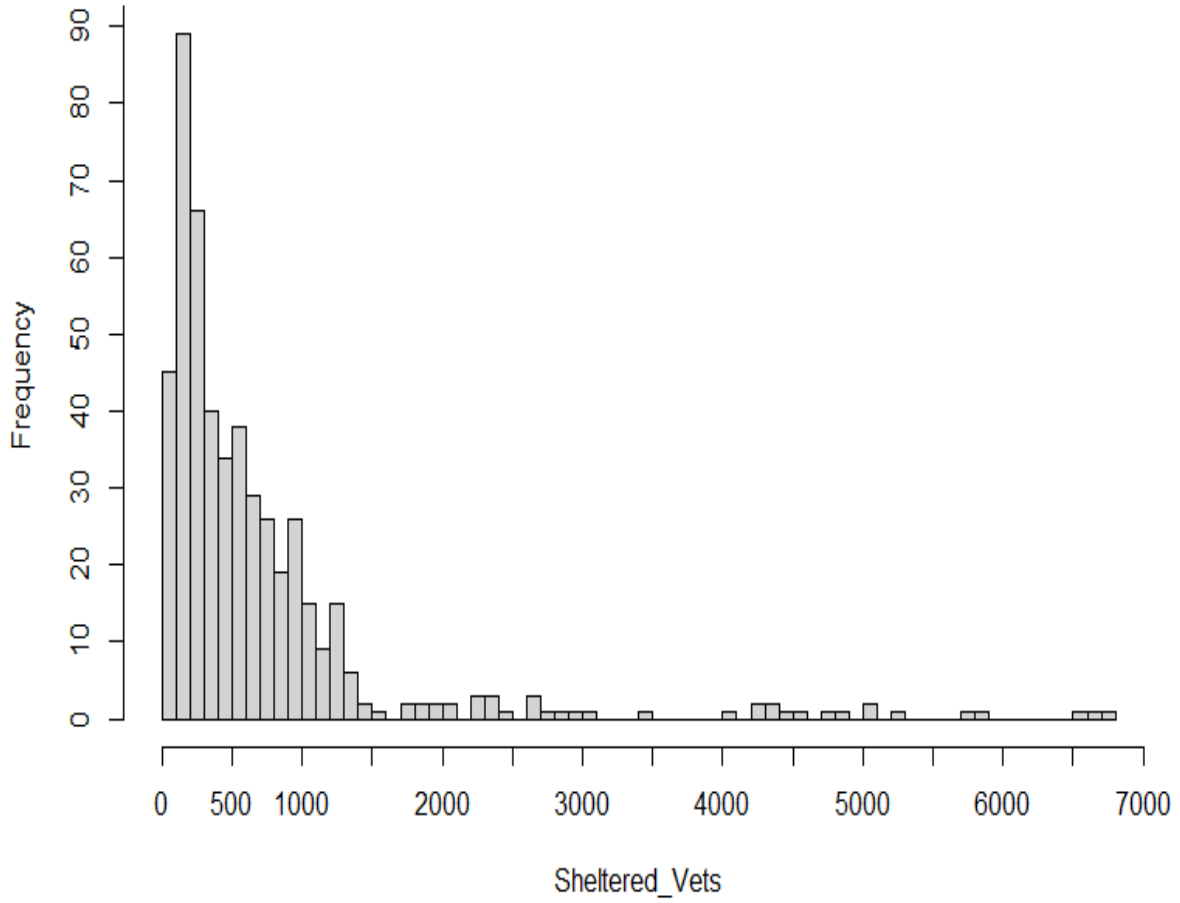


Figure A2.2: Histogram of Unsheltered Homeless Veteran Counts, 2007 to 2016

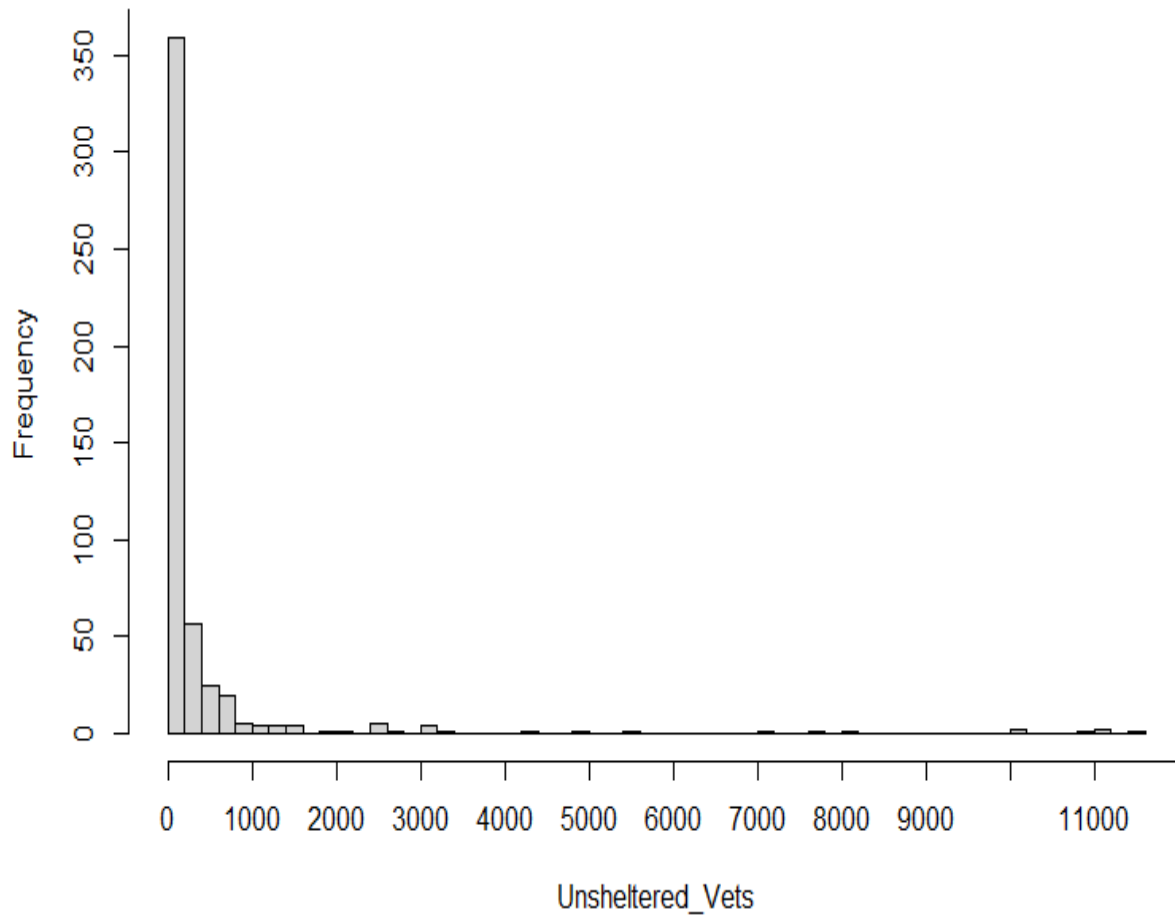


Table A.1: State Capacity Variable Descriptions

Variable	Data Source	Scale/Range	Description
Veterans			
Veteran program spending	U.S. Census Bureau	Per million	Dollars spent
Emergency shelter beds	HUD HIC	Per hundred	Count of veteran designated ES beds
Permanent supportive housing beds	HUD HIC	Each	Count of veteran designated PSH beds
Transitional housing beds	HUD HIC	Per hundred	Count of veteran designated TH beds
General			
Corrections spending	U.S. Census Bureau	Per million	Dollars spent
Judiciary spending	U.S. Census Bureau	Per million	Dollars spent
State revenue-to-debt ratio	U.S. Census Bureau	Per ten million	Total revenues in dollars divided by total dollars in debt

Table A.2: Control Variable Descriptions

Variable	Data Source	Scale/Range	Description
Veterans			
Veteran population ⁵⁸	VA	natural log	Natural log of state veteran population
Veteran unemployment	BLS	0-100	Percent of state's veteran population
Veteran organizations	GuideStar	Per hundred	Count of organizations
VA compensation and pension	VA GDX ⁵⁹	Per billion	Dollars spent
General			
Regional price parities	BEA	0-100	Percent of the overall national price level
SSI recipients	IRS	Per ten thousand	Count of supplemental security income recipients
TANF recipients	HHS	Per hundred thousand	Count of temporary assistance for needy families recipients, fiscal year
Person's incarcerated	BJS	Per thousand	Count of prisoners
Property crime	FBI	Per hundred thousand	Count of recorded crimes
Violent crime	FBI	Per ten thousand	Count of recorded crimes
Drug overdoses	CDC	Per million	Count of drug overdoses
Education	Ruggles et al.	0-100	Percent of state residents with a bachelor's degree or higher
State population ⁶⁰	U.S. Census Bureau	natural log	Natural log of in-state residents

⁵⁸ Given that states differ in many ways, this data is operationalized by calculating the data's natural log. The natural log is the logarithm to the base of the mathematical constant e , where e is an irrational and transcendental number approximately equal to 2.718 (Pituch and Stevens 2016, 441). In an equation, e is known, as well as the value of each element comprising the variable; therefore, for each element's value, e must be raised to the necessary power. The power by which e must be raised (for each element) becomes the newly operationalized value.

⁵⁹ VA compensation and pension expenditures include funds for the following programs: "veterans' compensation for service-connected disability; compensation for service-connected deaths for veterans' dependents; dependency and indemnity compensation for service-connected deaths; veterans' pension for nonservice-connected disabilities; pension to veterans' surviving spouse and children; and burial allowances for veterans" (VA, 2005, 1).

⁶⁰ Like the veteran population variable, state population is also operationalized by calculating the data's natural log.

Table A.2 (Cont.)

Variable	Data Source	Scale/Range	Description
Innovativeness	Boehmke et al.	0-100	The dynamic rate scores represent the number of policies adopted by each state divided by the number of state-year adoption opportunities
State government ideology	Berry et al. (1998) ⁶¹	0-100	0 = the most conservative value; 100 = the most liberal value (See footnote #4 for the formula provided by Berry et al. 1998)
Active-duty military personnel	DoD	Per thousand	Count of active-duty military personnel

⁶¹ For further information regarding the datasets, see <https://rcfording.com/state-ideology-data/>

Table A.3: Descriptive Statistics of Study Variables

Dependent Variable	Mean	sd	Min	Median	Max
Sheltered veterans	719.73	993.77	19.00	439.00	6799.00
Unsheltered veterans	444.99	1410.44	0.00	91.00	11541.00
Independent Variable	Mean	sd	Min	Median	Max
<u>State Capacity</u>					
Veterans					
State veteran program spending	21.30	91.78	0.00	4.84	887.96
Emergency shelter beds	4.57	8.58	0.37	2.33	77.02
Permanent supportive housing beds	5.12	7.88	0.07	2.45	56.42
Transitional housing beds	3.69	4.64	0.15	2.55	31.97
General					
Corrections spending	1.00	1.40	0.06	0.57	9.88
Judiciary spending	0.45	0.72	0.04	0.26	4.81
State revenue-to-debt ratio	5.03	12.89	0.08	2.02	103.13
Regional price parity	97.18	7.78	86.20	96.20	118.80
<u>State Characteristics</u>					
Veterans					
Veteran population (log)	12.60	0.93	10.70	12.73	14.57
Veteran unemployment	5.79	2.43	0.77	5.45	16.00
Veteran organizations	9.08	7.01	1.29	6.73	26.57
VA compensation and pension	82.11	103.71	0.01	54.40	728.23
General					
SSI recipients	15.97	21.62	0.58	10.34	130.44
TANF recipients	3.30	12.09	0.01	0.57	156.94
Persons incarcerated	27.42	33.34	1.42	19.52	174.28
Property Crime	1.77	2.02	0.09	1.25	11.09
Violent Crime	2.52	3.17	0.06	1.61	19.10
Drug overdoses	5098.38	5025.68	346.30	3848.15	26224.00
Education	28.50	5.78	12.00	28.00	43.00
State population (log)	15.16	1.01	13.17	15.30	17.49
Innovativeness	5.50	1.97	1.29	5.15	16.15
State government ideology	45.09	17.13	17.51	45.66	73.62
Active-duty military personnel	23.13	35.17	0.08	6.68	163.03

Table A.4: Time-series Negative Binomial Regression by Veteran Cohort – ES Beds

Independent Variables	Sheltered			Unsheltered		
	IRR	SE	z	IRR	SE	z
<u>State Capacity</u>						
Veterans						
State veteran program spending	1.00	0.002	2.11*	1.00	0.003	0.02
Transitional housing beds	1.03	0.016	1.88	0.98	0.024	-0.65
General						
Corrections spending	1.23	1.088	2.35*	1.08	0.110	0.73
Judiciary spending	0.76	0.110	-1.91	1.37	0.276	1.62
State revenue-to-debt ratio	0.99	0.004	-2.63**	0.98	0.007	-3.67***
<u>State Characteristics</u>						
Veterans						
Veteran population	0.97	0.107	-0.24	0.99	0.151	-0.04
Veteran unemployment	1.01	0.005	1.92	1.07	0.011	6.55***
Veteran organizations	1.08	0.026	3.04**	1.13	0.031	4.44***
VA compensation and pension	1.00	<0.001	0.00	1.00	<0.001	1.19
General						
Regional price parity	1.04	0.010	4.11***	0.99	0.011	-0.71
SSI recipients	0.99	0.011	-1.31	0.98	0.016	-1.31
TANF recipients	0.99	0.001	-2.68**	1.00	0.001	0.87
Persons incarcerated	1.01	0.004	2.81**	0.99	0.004	-1.59
Property Crime	1.02	0.063	0.32	1.55	0.136	5.08***
Violent Crime	0.97	0.040	-0.64	0.85	0.053	-2.63**
Drug overdoses	1.00	<0.001	-1.98*	1.00	<0.001	-0.73
Education	1.00	0.004	-0.70	1.01	0.007	1.20
State population	1.33	0.222	1.69	1.46	0.231	2.40*
Innovativeness	1.00	0.009	-0.26	1.01	0.018	0.76
State government ideology	1.00	0.001	-2.13*	0.99	0.002	-4.74***
Active-duty military personnel	1.00	0.002	1.69	1.01	0.003	1.76
Constant	0.008	0.020	-1.83	0.01	0.023	-1.77
Log Likelihood	-2640			-2345		
AIC	5325			4733		
Number of Observations/Groups	500	50		500	50	

Notes: IRR = incidence-rate ratio. *p<0.05; **p<0.01; ***p<0.001. The dependent variable for each model is the count of homeless veterans.

Table A.5: Time-series Negative Binomial Regression by Veteran Cohort – TH Beds

Independent Variables	Sheltered			Unsheltered		
	IRR	SE	z	IRR	SE	z
<u>State Capacity</u>						
Veterans						
State veteran program spending	1.00	0.002	2.04*	1.00	0.004	-0.24
Transitional housing beds	1.03	0.016	1.88	0.99	0.024	-0.54
General						
Corrections spending	1.20	0.103	2.08*	1.01	0.108	0.14
Judiciary spending	0.78	0.110	-1.78	1.36	0.276	1.50
State revenue-to-debt ratio	0.99	0.004	-2.59**	0.98	0.007	-3.27***
<u>State Characteristics</u>						
Veterans						
Veteran population	0.94	0.101	-0.61	0.91	0.139	-0.64
Veteran unemployment	1.01	0.005	1.86	1.07	0.012	6.10***
Veteran organizations	1.07	0.026	2.66**	1.11	0.031	3.37***
VA compensation and pension	1.00	<0.001	0.11	1.00	<0.001	1.36
General						
Regional price parity	1.04	0.010	3.75***	0.98	0.011	-2.05*
SSI recipients	0.99	0.011	-1.17	0.97	0.017	-1.50
TANF recipients	1.00	0.001	-2.76**	1.00	0.002	0.83
Persons incarcerated	1.01	0.004	3.19***	1.00	0.004	-0.19
Property Crime	1.02	0.064	0.35	1.46	0.129	4.28***
Violent Crime	0.98	0.041	-0.45	0.88	0.558	-2.04*
Drug overdoses	1.00	<0.001	-1.82	1.00	<0.001	-0.33
Education	1.00	0.004	-0.76	1.01	0.008	1.40
State population	1.31	0.219	1.61	1.45	0.233	2.30*
Innovativeness	1.00	0.009	-0.30	1.02	0.018	0.96
Active-duty military personnel	1.00	0.002	1.51	1.01	0.003	2.11*
Constant	0.019	0.051	-1.51	0.07	0.185	-1.00
Log Likelihood	-2643			-2356		
AIC	5327			4753		
Number of Observations/Groups	500	50		500	50	

Notes: IRR = incidence-rate ratio. *p<0.05; **p<0.01; ***p<0.001. The dependent variable for each model is the count of homeless veterans.

Factors Related to Reintegration After Military Service: An Application of the Socio-Ecological Model

Abstract

In 2017, Elnitsky, Fisher, and Blevins (2017) concluded that there exists a clear need for theory-based veteran reintegration research utilizing an adapted ecological framework. This study utilizes their adapted socio-ecological model (SEM) of veteran reintegration. It identifies available individual-level factors influencing veteran perceptions of post-military service reintegration. Analyses are conducted using the 2011 Pew Research Center Veterans Survey of 1,853 U.S. military veterans. Findings suggest that veterans who report better reintegration experiences are less likely to have served in combat and experienced military-related trauma, are currently in better health, felt supported by military leadership in help-seeking, and report lower levels of family strain. Factors significantly contributing to veteran reintegration appear to exist across different levels of the SEM model and share linkages across these levels. Implications drawn from this research may provide further insight for key stakeholders to enhance program efficacy and social utility when seeking to connect veterans in need with available resources.

Introduction

While only a minority of veterans experience transitional difficulties (Albertson, Irving, and Best 2015), numerous federal, state, and non-governmental programs exist to support veterans in their transitions to civilian life (Morgan et al. 2020). Yet research has established the transition out of military service and subsequent reintegration to civilian life as a time when many veterans face challenges such as personal stress, relationship and employment difficulties, and uncertainty regarding the resumption of life roles as civilians (Elnitsky, Fisher, and Blevins 2017). In some cases, transitioning veterans may face an increased risk of psychological adjustment difficulties and other intrapersonal dilemmas (Romaniuk et al. 2020). The concept of veteran transition emphasizes movement into or across institutional systems, including the period or process during which a U.S. military service member⁶² moves from a military to civilian setting (Elnitsky, Fisher, and Blevins 2017; Rosenheck et al. 2003). In lieu of terms such as *transition* or *readjustment*,⁶³ Elnitsky, Fisher, and Blevins (2017) suggest *reintegration* as the most suitable for academic research.

In 2015, the Department of Veterans Affairs Office of Policy and Planning convened a day-long forum to inform stakeholders about national policy needs to advance the outcomes for veterans and their families as they reintegrate back to civilian life (Lazier, Gawne, and Williamson 2016, 49). The forum highlighted the importance of collaboration between researchers and policy makers, further research, and identifying emerging topics that will help inform national reintegration outcomes (Lazier, Gawne, and Williamson 2016). The 2015 forum

⁶² Hereafter referred to as “Service member” per Department of Defense (2020)

⁶³ The process of readapting to civilian life after deployment, often evoking images of Service members grappling with psychological or emotional issues (Elnitsky, Fisher, and Blevins 2017).

itself did not attempt to define a framework for veteran family reintegration, nor did it attempt to identify parameters of such a framework. However, “many participants agreed that a conceptual framework is an important first step for researchers and policy makers to analyze and develop an understanding of what key events have major implications on veteran reintegration outcomes” (Lazier, Gawne, and Williamson 2016, 50). Whether a direct result of this forum or otherwise, at least one research team has sought to address the need for a conceptual framework of veteran reintegration.

Based on a review of over 15 years of veteran reintegration literature, Elnitsky et al. (2017) offer two central contributions. First, Elnitsky and colleagues define veteran reintegration as “both a process and outcome of resuming roles in family, community, and workplace that may be influenced at different levels of an ecological system” (2017, 114). The second contribution of Elnitsky and colleagues is foreshadowed by their definition of veteran reintegration,⁶⁴ which suggests influences at different levels of an ecological system. They link findings from their study of 186 articles across 15 years to a social ecological systems model (SEM) as a theoretical foundation for future veteran reintegration research and they find that most of the veteran reintegration literature is “linked to individual-focused theories about transition, adjustment, functional classification, or post-traumatic growth” that focus largely on individual health problems and psychiatric morbidity (2017, 115). The authors posit that SEM, holding that individuals interact in *and* with their environment, can provide a useful framework for enhancing understanding of the linkages between psychosocial and environmental factors in veteran reintegration (Elnitsky et al. 2017).

⁶⁴ Referred to as military service members and veterans (MSMV) reintegration by Elnitsky et al. (2017, 114).

Elnitsky et al. (2017) conclude that there is a clear need for theory-based veteran reintegration research utilizing an adapted ecological framework. This study seeks to answer this call.⁶⁵ Given the definitions of transition, readjustment, and reintegration, with reintegration arguably being the most comprehensive definition of the three, these definitions suggest that some veterans may do well throughout the reintegration process, yet others may not. As a protected class, generally holding a highly deserving and politically influential social construction (Schneider and Ingram 1993), veterans are often the beneficiaries of favorable public policies; therefore, it would seem plausible for the Department of Veterans Affairs and other public institutions to value successful veteran reintegration as a return on public investments.

Background: Veteran Reintegration Statistics and Military-related Trauma

In many ways, the data support the supposition that some veterans may do well throughout the reintegration process while others may not. The U.S. Department of Veterans Affairs (VA) estimates that up to 20% of post-9/11 U.S. combat veterans who served in Iraq and Afghanistan have post-traumatic stress disorder (PTSD), with roughly 400,000 VA-enrolled veterans currently carrying a PTSD diagnosis (Spoont et al. 2013, 6). As well, the VA estimates that about 23 out of 100 female veterans reported sexual assault when in the military (U.S. Department of Veterans Affairs 2022; hereafter VA). There have been over 6,000 veteran suicides each year spanning 2008 to 2017, and in 2017 the suicide rate for veterans was 1.5 times higher than that of non-veteran adults when adjusting for population differences (VA 2019). Another VA statistic notes that veteran suicides increased nearly 26% from 2005 to 2016 (VA

⁶⁵ The limitations of testing a framework will be discussed further below.

2018, 3). The Bureau of Justice Statistics estimates that 43% of incarcerated veterans in 2011-2012 had four or more prior arrests (Bronson, Carson, Noonan, and Berzofsky 2015). The Department of Housing and Urban Development (HUD) estimates that over 37,000 veterans experienced homelessness on a given night in January 2018 (Henry et al. 2018, 54). These examples of veteran issues highlight the myriad of issues veterans face, often compounding; however, this is not a comprehensive list.

Though veterans may deal with a variety of issue, such issues may at times be traced back to one or more military-related traumatic experiences during military service. In a study seeking to develop a reliable and valid “Trauma History Screen” (THS), Carlson et al. describe military-related trauma as “seeing something horrible or being badly scared” during military service (2011, 22). Carlson et al. note that support for the convergent validity of the THS was found via high correlations ($r = 0.77$) between self-reported high magnitude stressor events on the THS and “Traumatic Life Events Questionnaire” for veterans (2011, 17). Sienkiewicz et al. note that military-related trauma includes combat, and “may be a particularly severe form of trauma, resulting in higher rates of negative outcomes, including PTSD, psychosocial impairment, and poorer physical health” (2020, 12). However, it has been shown that posttraumatic growth may be experienced by some veterans following combat exposure (Greenberg et al. 2021; Tsai et al. 2016). Further, research has shown that combat deployments are a salient factor when examining veteran reintegration (e.g., Currie, Day, and Kelloway 2011; Doyle and Peterson 2005; Sayer, Carlson, and Frazier 2014; Sayer et al. 2021).

Research has shown that some veterans may experience military-related trauma, whether combat related or not, and that some veterans may experience posttraumatic growth follow

These responses are limited to those who deployed to Iraq and Afghanistan in support of the War on Terror (Pew Research Center 2011). However, the data presented in this section highlight the mixed experiences veterans face during their military service. Among veterans who experienced some form of military-related trauma, some may experience challenges when returning to civilian life. Lastly, such data may lend some support for the ecological antecedents of veteran reintegration, as well as how the process unfolds for the individual veteran.

Veteran Reintegration and the Socio-Ecological Model

Schlossberg posits that “anticipated transitions are major life events we usually expect, such as graduating from high school or college, marrying, becoming a parent, starting a first job, changing careers, or retiring” (2011, 159). Here, Schlossberg suggests that transition occurs in various facets of life. When applied to Service members transitioning to civilian life, Elnitsky, Fisher, and Blevins suggest that “the term *transition* generally refers to either the time period or the process” during which a Service member moves from a military to civilian setting (2017, 5). However, Elnitsky, Fisher, and Blevins (2017) suggest that the term reintegration has gained favor among the scientific community for its emphasis on multiple domains of life (e.g., psychological, physical, social functioning). As noted by Elnitsky, Fisher, and Blevins (2017), existing research regarding military veterans offers several discordant definitions of reintegration.

The VA has defined reintegration as “the resumption of age, gender, and culturally appropriate roles in the family, community and workplace” (2009, 22). Though this and other definitions of veteran reintegration have not been limited to those who have been deployed, Currie, Day, and Kelloway define the process as “process of personnel transitioning back into

personal and organizational roles and society after having been deployed” (2011, 38). Despite the nuanced variations among definitions of veteran reintegration, a common theme emerges – that the process of reintegration is generally comprised of the individual, the individual’s environment, and the interactions between the two (Schkade and Schultz 1992).

Despite several attempts to define veteran reintegration within the research, Elnitsky, Fisher, and Blevins (2017) lament the lack of a unified definition of reintegration for Service members and veterans, noting that additional, overlapping terms such as readjustment, transition, and community integration have further complicated a more unified understanding of reintegration. Recognizing the lack of a clear, unified definition of the veteran reintegration phenomenon, Elnitsky et al. conducted a study of 186 academic publications⁶⁷ to formulate a definition of veteran reintegration as “both a process and outcome of resuming roles in family, community, and workplace which may be influenced at different levels of an ecological system” (2017, 10). Given that this definition is formulated from a review of over 180 studies of veteran reintegration, it is anticipated that many of the constructs tested as potential influences on veteran reintegration would be akin to those found within the SEM model.

Veteran Reintegration

Veteran population estimates from the VA project the total U.S. military veteran population in 2021 at just over 19 million individuals, a slight decline from the 20 million estimates for 2018 (VA 2021). Among this population of veterans, it is estimated that there are over 3.5 million post-9/11 veterans, most of whom are under the age of 40⁶⁸ (Perkins et al.

⁶⁷ Seventy-nine articles within the study included unambiguous definitions of reintegration (Elnitsky et al. 2017).

⁶⁸ It is worth noting that this statement was made in 2019 at the time of publishing.

2019). Veteran reintegration research regarding specific veteran subpopulations, namely, combat veterans (e.g., Currie, Day, and Kelloway 2011; Doyle and Peterson 2005; Sayer, Carlson, and Frazier 2014), veterans with PTSD (e.g., Cox et al. 2014; Fisher et al. 2015; Interian et al. 2012), and post-9/11 veterans (e.g., Ahern et al. 2015; Aronson et al. 2019; Sayer et al. 2015), or both, appears more readily available than those examining veteran reintegration at large. Among those examining veteran reintegration at large, Crocker et al. (2014, xi) found that roughly 44% of returning Service members and veterans report a range of difficulties pertaining to their reintegration, while Igielnik (2019) found that at least 26% of all veterans in the Pew Research Center's Veterans Survey said readjusting to civilian life was at least somewhat difficult.⁶⁹

Additional studies (e.g., Albertson, Irving, and Best 2015; Armenta et al. 2018; Tsai et al. 2015) report analogous estimations, that most combat veterans do not experience ongoing problems regarding reintegration. This, however, does not diminish the saliency of problems faced by combat veterans, including high rates of PTSD and suicide. While many combat veterans experience mental health problems, Tsai et al. (2015) find that many combat veterans experience post traumatic growth (as opposed to experiencing impediments to integration). Vogt et al. assert that “transitioning to civilian role functions can be particularly complex for veterans with mental and physical health problems, which often impose additional burdens on coping skills and functioning” (2018, 1). In a study using mediation analyses, Tsai et al. (2012) found that coping and social support are important in the social functioning and social integration of Iraq and Afghanistan veterans. To reiterate, this is not to say that most veterans experiencing reintegration issues is required to warrant public policy attention. Thousands of organizations

⁶⁹ Roughly 47% of post-9/11 veterans said it was very or somewhat difficult for them to readjust, this compared to about 21% of veterans whose service ended before 9/11 (Igielnik 2019).

have implemented programs to provide support for veterans transitioning out of military service⁷⁰ (Vogt et al. 2018). In a study of over 8,500 veterans and military dependents, respondents identified their most significant challenges during transition: 60% cited navigation of VA programs, benefits, and services, 55% cited the ability to find a job, 41% cited the adjustment to civilian culture, 40% cited the ability to address financial challenges, and 39% cited the ability to apply military-learned skills to civilian life (Zoi, Maury, and Fay 2015, i). Further, some of the most common challenges experienced by post-9/11 veterans include vocational, legal, financial, housing, health, and social and personal relationship issues (Perkins et al, 2019). However, the toughness mindset of military culture may amplify the reluctance and perceived stigma of help-seeking (Weiss, Coll, and Metal 2001).

In addition to the most common challenges experienced by veterans, rates of mental health concerns among veterans may often persist, with many veterans never seeking psychological help despite the availability of effective treatments (Hoge et al. 2004). Much research has examined the influence of barriers to veterans' mental health care utilization (Drapalski, Milford, Goldberg, Brown, and Dixon 2008; Johnson, Barrie, Possemato, and Wade et al. 2016), including the stigmatization of help-seeking (Calhoun et al. 2002; Shin, Rosen, Greenbaum, and Jain 2012; Blais and Renshaw 2013; Cornish, Thys, Vogel, and Wade 2014). Veterans more likely to seek mental health care displayed a sense of trust in the care providers (Nworah, Symes, Young, and Langford, 2014) and have a history of previous mental health care engagement (Blais and Renshaw, 2013). Veterans were also more likely to seek treatment with a supportive social network and preferred services (Nworah, Symes, Young, and Langford, 2014;

⁷⁰ Examples include the Veteran Transition program (Westwood et al. 2010), the Post-Deployment Readjustment Inventory (Katz et al. 2010), and the Transition Assistance Program (Faurer, Rogers-Broderson, and Bailie 2014).

Sayer et al., 2009). One study suggests that veterans often avoided treatment due to their values (e.g., pride in self-reliance), lack of PTSD-related knowledge, to avoid experiencing trauma-related memories and feelings, and to avoid the loss of autonomy (Sayer et al. 2009). Thus, it seems reasonable that many veterans may adopt help-seeking behaviors with a supportive social network, yet the military community culture may at times hinder help-seeking decisions. While veterans may sometimes stigmatize help-seeking, some veterans do seek help from veteran transition and/or reintegration programs; however, research suggests there may be a lack of recognition of the challenges faced by veterans and their families as they transition to civilian life (Sayer, Carlson, and Frazier 2014).

The Department of Veterans Affairs Office of Policy and Planning (OPP) has recognized the importance of linking multidisciplinary research and interdisciplinary policy analysis to better inform policies aimed at improved reintegration for veterans and families (Lazier, Gawne, and Williamson 2016). Further, the OPP has developed a policy research agenda identifying veteran family reintegration as a priority research area (Lazier, Gawne, and Williamson 2016). Along with federal programs, state-level reintegration programs include family integration alongside other areas of focus⁷¹ (Orazem et al. 2017). Thus, support for the salience of family to the veteran reintegration process is found among key stakeholders, including the VA and state governments, support that includes interest in further research. Yet veteran reintegration “refers to co-occurring psychological, social, health-related, and community-related modes of functioning with one’s immediate veteran friends, family, and larger social groups” (Elnitsky, Fisher, and Blevins 2017, 5). Based on their review of the veteran reintegration literature,

⁷¹ Other areas of focus for federal and state-level reintegration programs include benefits, health care, employment, and schooling (Orazem et al. 2017).

Elnitsky et al. find that reintegration is both a process and outcome that occurs over time, and that each environmental factor may be considered either a challenging or helpful factor to reintegration (2017, 114 - 116). With other co-occurring environmental factors contributing to the process of veteran reintegration across time, this suggests a multivariate paradigm, with veteran reintegration situated as the outcome variable.

Many programs exist with the mission of aiding returning Operation Enduring Freedom and Operation Iraqi Freedom active-duty personnel, veterans, and family members; however, more research is needed on specific effects of these programs on the different domains of health and quality of life (Institute of Medicine 2013, 471). Research also suggests that, at times, existing efforts have been criticized for being inadequately informed of veterans' greatest needs and concerns (Crocker et al. 2014; Vogt et al. 2018). Yet the vast majority of those struggling with reintegration report interest in community reintegration assistance⁷² (Sayer et al. 2010). The Institute of Medicine asserts that despite the numerous programs intended to support the needs of returning veterans, there is little evidence regarding their effectiveness (2013, 2). The Institute of Medicine reached this conclusion even though the VA offers a full continuum of mental (and physical) health services (Tehula et al. 2014). With so many programs available to support veteran reintegration, such programs may benefit from the expansion of theory-based research as proposed by Elnitsky et al. (2017) and their support for veteran reintegration research grounded in the SEM model. Overall, the definitions of reintegration by Schkade and Schultz (1992) and Elnitsky, Fisher, and Blevins (2017), the constructs commonly tested throughout veteran reintegration research, and the call for more theory-based veteran reintegration research utilizing

⁷² Sayer et al. (2010) found that 75% of respondents reported interest in educational material for self-help, 64% reported interest in techniques or exercises for self-help, and 62% reported interest in educational classes for reintegration problems.

the SEM model by Elnitsky et al. (2017) lend justification for the application of the SEM model to veteran reintegration research. Therefore, this study seeks to answer this call by Elnitsky and colleagues.

The Socio-Ecological Framework

A discussion of the SEM framework may reasonably begin with the seminal works by Urie Bronfenbrenner. Though his model evolved over time, Bronfenbrenner (1979) holds that behavior, to include development, is a joint function of the person and his or her environment where spheres of influence interact with one another. Further, he states that these behaviors occur “through consistency over time in the ways in which the person characteristically *varies* his or her behavior as a function of the different contexts, both proximal and remote, in which that person lives” (Bronfenbrenner 1979, 216). Elnitsky et al. explain that Bronfenbrenner’s ecological systems theory views individuals as interacting in and with their environment and asserts that a person is impacted by four levels of influence (2017, 115). From these core concepts, a four-level, hierarchical model forms the basis of the socio-ecological framework.

Bronfenbrenner (1979) explains that his ecological model may serve as the foundation for future research, originally formulated as a hierarchy of four levels moving from the most proximal to the individual to the most distal – microsystems, mesosystems, exosystems, and macrosystems. A microsystem includes a pattern of activities, roles, and interpersonal relations experienced by the individual and shared with others who are proximal (Bronfenbrenner 1979). The microsystem may be thought of as a combination of intrapersonal and interpersonal contexts (e.g., Golden 2012), which may at times be modeled as their own levels. The (institutional level) mesosystem, conceptualized as a system of microsystems, consist of the linkages and processes

taking place between two or more settings containing the individual (Bronfenbrenner 1979). The (community-level) exosystem encompasses the linkage and processes taking place between two or more settings, at least one of which does not ordinarily contain the individual, but in which events occur that influence processes within the immediate setting that does contain the individual (Bronfenbrenner 1979). Finally, the macrosystem, the most distal and expansive region of the environment, consists of the overarching pattern of micro-, meso-, and exosystems inherent to a given culture, subculture, or other broader social contexts, such as public policy (Bronfenbrenner 1979). Originally formulated as a model of human development, SEM has been adapted to suit that of a framework. A framework⁷³ “provides a common vocabulary to help analysts communicate across disciplines, from different substantive policy areas, and from different parts of the world” (Jenkins-Smith et al. 2014, 189). Thus, the SEM framework has been adapted for application to various fields of study, including veteran reintegration.

SEM Framework Applied to Veteran Reintegration

Based on their review of 15 years of veteran reintegration research, comprising 186 articles, Elnitsky et al. (2017) arrive at a definition of veteran reintegration that explains both the process and outcome of reintegration as that which is influenced by intrapersonal, interpersonal, community, and societal factors interacting across the veteran’s ecological system. Their review of the literature yields two key findings – that most of the veteran reintegration research focuses on the influence of individual-level factors and yet existing theoretical contributions to the study of veteran reintegration rarely explains the phenomenon’s processes or link the outcomes to key factors at multiple levels (Elnitsky et al. 2017). In turn, Elnitsky et al. (2017) posit an ecological

⁷³ Jenkins-Smith et al. note that a framework “supports multiple theories, which are narrower in scope and emphasize a smaller set of questions, variables, and relationships (2014, 189).

model of Service member and veteran reintegration based on their extensive review of salient literature. Figure 2 displays the authors' model as shown in their 2017 article. This model provides more than a justification for the application of the SEM framework to veteran reintegration research, it also provides a road map of some of the most salient factors found to influence veteran reintegration throughout existing literature. Therefore, it is anticipated that studies of veteran reintegration would endeavor to examine the relationships such constructs hold with reintegration outcomes, though the number of model constructs available for testing may be limited by the selected data.

Figure 2: Ecological Model of Service Member and Veteran Reintegration

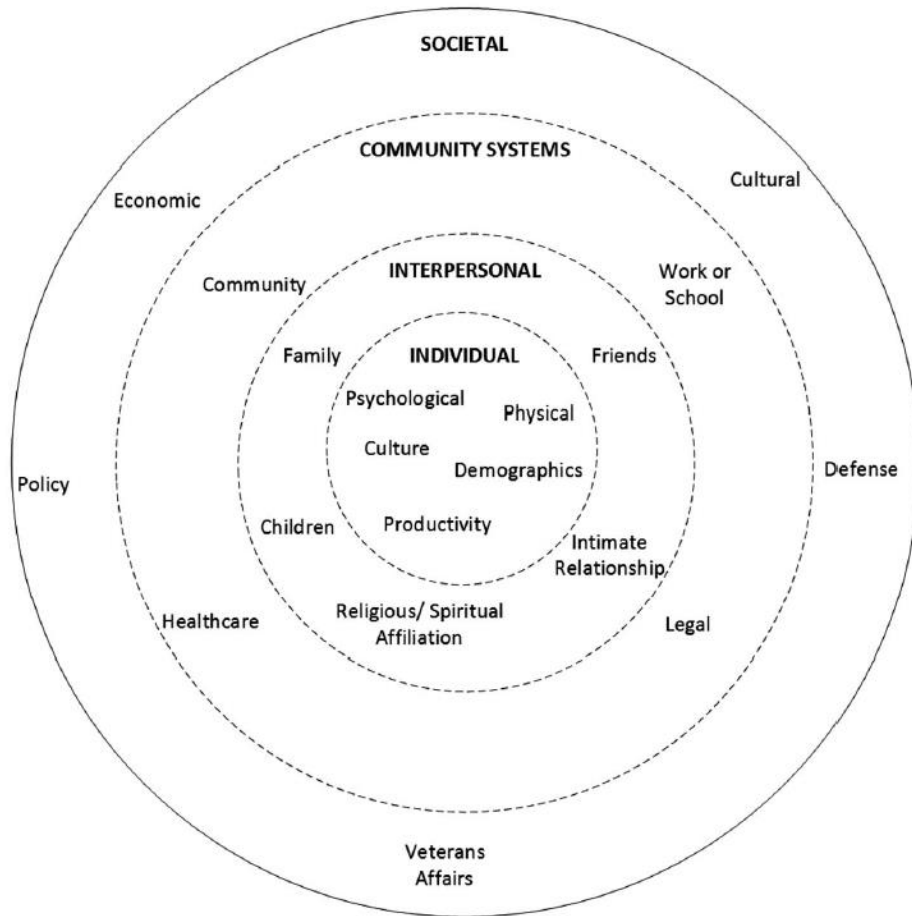


Figure 1. Ecological model of military service member and veteran reintegration. Upper case words = Levels of the adapted ecological model. Sentence case words = Domains/factors within each level of the model. Dashed lines indicate the ability of factors within the system to interact across levels of the model.

Source: Elnitsky et al. (2017, 115).

Elnitsky et al. (2017) offer brief descriptions of the model’s key factors according to the ecological level to which each has been assigned. The authors summarize each factor according to common methods in which a given factor is formulated and applied throughout the existing literature; however, this signifies variance in each study’s research design, data, variable operationalization, and analyses. First, Elnitsky and colleagues highlight five key individual-level factors influencing veteran reintegration – psychological health, physical health, adaptation

from military to civilian culture, academic and/or occupational productivity, and demographics. Second, the authors note several key interpersonal relationships likely to impact veteran reintegration, including those with family, friends, intimate partners, and potential religious or spiritual affiliations. Next, Elnitsky et al. (2017) indicate several key institutions at the community level commonly examined within the research for their influence on veteran reintegration – health care systems, vocational rehabilitation and higher education, the criminal justice system, and the social, cultural, and geographic characteristics of the veteran’s community. Finally, the authors include societal-level factors commonly of interest to veteran reintegration research, including the VA, the Department of Defense, public policy, and economic factors. While the key factors listed in this model are derived from 186 articles spanning 15 years of veteran reintegration research, it is unlikely that this model offers an exhaustive list of relevant factors, and Elnitsky et al. note these are merely “recommendations for future work” based on their review of the literature (2017, 116).

Lazier, Gawne, and Williamson found that, at the time, ongoing research and analysis of veteran reintegration is “generally confined to specific areas, such as health care, employment disability, or education” (2016, 49). As well, the authors note that there is a limited number of working theories in the literature to support a multidisciplinary framework of veteran reintegration, which the authors say can present challenges for policy makers, service providers, and stakeholders in the development of programs aimed at enhancing veteran reintegration outcomes (Lazier, Gawne, and Williamson 2016). Despite what is known, practical efforts to promote the health and well-being of veterans have been criticized for being inadequately informed of veterans’ key needs (Vogt et al. 2018).

Elnitsky, Fisher, and Blevins (2017) assert that empirical research grounded in the SEM framework will greatly aid in the development of a unified definition of veteran reintegration, including a comprehensive theoretical explanation for the challenges and facilitators of reintegration. However, Elnitsky, Fisher, and Blevins are not alone in their support for the use of the SEM framework, with additional research applying the SEM model as a means of explaining veteran reintegration (e.g., Bagby et al. 2015; Blair, Lester, and Mogil 2013, Lubens and Bruckner 2018.). The Pew Research Center (2011) methodology report does not state that its Veterans Survey was designed around an ecological model; however, Jenkins-Smith et al. state that “frameworks are not directly testable but provide guidance toward specific areas of descriptive and explanatory inquiry” (2014, 189). Further, King, Keohane, and Verba assert that “we should be willing to take whatever information we can acquire so long as it helps us learn about the veracity of our theory”⁷⁴ (1994, 31). Therefore, this study seeks to answer the call of Elnitsky et al. (2017) with a modest contribution toward specific areas of inquiry provided within the 2011 Pew Research Center Veterans Survey. To better understand veteran perceptions of reintegration after military service, through the lens of an adapted model of Bronfenbrenner’s SEM framework, this study asks:

RQ1: Within the confines of the 2011 Pew Research Center Veterans Survey data, what ecological influences contribute to veteran reintegration?

RQ2: To what extent do these ecological influences correlate with one another across ecological levels?

⁷⁴ King, Keohane, and Verba further note that researchers should collect information on as many observable implications of the selected theory as possible (1994). Yet this would not seem to suggest that *all* constructs of a theory must be available, in the form of measures, for testing to apply the selected theory to research regarding specific areas of inquiry.

Based on the socio-ecological model of veteran reintegration proposed by Elnitsky et al. (2017), the following hypotheses are posited:

Hypothesis H1a: Veterans who have experienced greater satisfaction with family life will tend to report a better reintegration process.

Hypothesis H1b: Veterans who have experienced less family strain will tend to report a better reintegration process.

Hypothesis H2: Dating back to their military service, veterans who had military leaders that made the veteran feel comfortable about seeking help when faced with mental/emotional issues will tend to report a greater reintegration experience.

Hypothesis H3a: Veterans exposed to combat during their time in service are less likely to report better reintegration experiences than non-combat veterans.

Hypothesis H3b: Veterans who were exposed to military trauma report are less likely to report better reintegration experiences.

Hypothesis H3c: Veterans who have been in poor health are less likely to report better reintegration experiences.

Given that Bronfenbrenner's ecological systems theory, adapted for veteran reintegration by Elnitsky and colleagues, views individuals as interacting in and with their environment across four levels of influence, there may be some moderate to strong correlation with independent variables across different levels of the SEM model. Considering the SEM model of veteran reintegration design, such correlations are of interest to this study, potentially lending additional support for inferences regarding the applicability of the SEM model of veteran reintegration proposed by Elnitsky et al. (2017). The following section describes the data and methods to

address this study's research questions and test its hypotheses using a variety of statistical techniques.

Data and Methods

Data

This study conducts secondary analyses of the 2011 Pew Research Center Veterans Survey to better understand factors contributing to a veteran's reintegration following military service. As previously noted, the scope of a framework does not readily permit a comprehensive testing of the selected framework, yet it may provide guidance towards specific areas of inquiry (Jenkins Smith et al. 2014). Following the assertion by King, Keohane, and Verba (1994) that researchers should collect information on as many observable implications of the selected theory as possible, this study incorporates measures derived from the 2011 Pew Research Center Veterans Survey suitable for the application of the SEM model of veteran reintegration. The unit of analysis for this study is the individual U.S. military veteran. Interviews conducted consist of 1,853 veterans from a randomly sampled survey pool of 3,673 veterans (a 50% response rate) between July 28, 2011, and September 4 of the same year (Pew Research Center 2011). Of the veterans who responded, 1,134 had separated from military service prior to September 11, 2001 (Pew Research Center 2011). Among the 1,853 respondents, 1,639 were interviewed via telephone and 214 were conducted using the internet.

Dependent Variable

The dependent variable for this study is derived from the 2011 Pew Research Center Veterans Survey question 36, an ordinal measure that asked respondents if their re-adjustment to

civilian life was very easy, somewhat easy, somewhat difficult, or very difficult. Tabulated response rates for each of the response categories are as follows – 757 respondents answered “very easy,” 584 answered “somewhat easy,” 377 responded “somewhat difficult,” 127 answered “very difficult,” and 8 declined to respond. Figure A.1 of the appendix provides a graphical depiction of this distribution.

Independent Variables

Independent variables for this study were selected from survey questions within the Pew Research Center Veterans Survey that demonstrated some reasonable degree of conformity to constructs within the SEM model of veteran reintegration posited by Elnitsky et al. (2017). Though the Veterans Survey methodology (Pew Research Center 2011) does not indicate that the survey was grounded in the SEM model, many of the survey’s questions do at least bear face validity to the adapted SEM model proposed by Elnitsky et al. (2017), whether as viable measures of theory constructs or as proxies of such. These selected measures were then assigned to one of four levels with the SEM model – intrapersonal, interpersonal, community, and societal. Table A.1 of the appendix provides descriptions of the intrapersonal level independent variables tested, while table A.2, also of the appendix, provides independent variable descriptions for those categorized at the interpersonal, community, and societal levels.

Tables A.1 and A.2 provide the core information regarding selected independent variables; however, a few variables require additional detail regarding their operationalization. First, the **years on active duty** variable is constructed from a two-part survey question asking respondents how many years and months they served on active duty. To properly construct this variable, knowledge of the Pew Research Center’s methodology for the Veterans Survey was

required. Certain types of non-responses were coded as either “98,” “99,” or “NA” by Pew Research Center. If a veteran gave no response at all, a value of “NA” may have been recorded for both the year and month. However, if a veteran only provided one numerical response, for either years or months, an “NA” may have also been recorded for whichever of the two did not receive a specified number from the respondent. Therefore, responses providing at least one numerical value (for either years or months) were recoded so that a value of “0” replaced a value of “NA” for the other time category in which no response was provided. Any response containing a “98” or “99” were treated in the aggregate as a non-answer, as were instances in which an “NA” was recorded for *both* years and months. Responses treated as sufficient answered were then calculated with the following formula: **Years on active duty** = $(m/12) + y$, where *m* equals the number of months reported and *y* equals number of years reported.

Next, it is important to discuss the inherent limitations of the variable regarding race/ethnicity, based on Pew Research Center’s survey design. Question 56 of the Veterans Survey as respondents to select which of four possible responses best describe their race – White (or Caucasian), Black or African American, Asian or Asian American, or some other race. These options provide a conundrum regarding latent data, as it presents the possibility that many respondents not falling into the three specified racial identities would have little other choice than to select the generic “some other race” response. Given these limitations, this study adheres to an operationalization of its race variable according to the possible responses offered by Pew Research Center. This operationalization has been employed in at least one prior study utilizing the Veterans Survey (e.g., Button 2020). As done by Button (2020), this variable is factorized using “White” as the reference category. The Veterans Survey does ask each respondent whether

they identify as Hispanic, Latino, or Spanish (e.g., Mexican, Puerto Rican, or Cuban).

Respondents could answer either “yes” if they identified as one of these ethnicities or “no” if not.

Next, the military community “tends to be organized according to factors such as rank, job specialty, unit, and place of residence” (Burrell, Durand, and Fortado 2003, 8). Used within this study as a community-level proxy for affiliation within the military community, **commission type** variable commands elaboration regarding its operationalization as an ordinal measure and as a measure falling into the community level of the SEM model. Officer ranks in the U.S. military include commissioned officers, warrant officers, and noncommissioned officers, with the commissioned ranks being the highest in the U.S. military (U.S. Department of Defense n.d.; hereafter “DoD”). The DoD (n.d.) differentiates commissioned officers from warrant officers by two key dimensions – their duties and the nature of their commissions – where warrant officers are specialists and experts in certain military aspects and commissioned officers are generalists. With the top half of the ordinal scale comprise of the officer ranks, the lower half is comprised of non-commissioned personnel. These non-commissioned servicemembers enlist in the Armed Forces and have their own rank and pay structure separate from that of the officer ranks. Generally, non-commissioned servicemembers enter service assigned to one of the four lowest ranks – E1 through E4. Based on time in service and merit, these lower-enlisted servicemembers may be promoted into the non-commissioned officer ranks (E5 through E9).⁷⁵ This distinction finalizes the four-tier ordinal operationalization of the commission type variable and provides a valid and reliable measure of military rank. There has existed a long-standing custom in military service that officers shall not fraternize or associate with enlisted personnel, dating back through

⁷⁵ Based on the preference of a military unit’s leadership, the E4 Corporal rank may be utilized, which is considered an NCO and outranks an E4 Specialist that falls into the lower-enlisted ranks.

the 1621 Code of Articles of King Gustavus Adolphus of Sweden (Thompson 1986, 5). As this norm evolved, the policies prohibiting fraternization by officers with enlisted members have been grounded in the preservation of military discipline rather than social equality (Thompson 1986, 6). Further, “wrongful fraternization may be charged as a violation of Article 134” of the U.S. Uniformed Code of Military Justice, “because it violates military custom against fraternization” (McDevitt 1985, 551). Given the hierarchical nature of the military and policies limiting social fraternization among various tiers of commission types (e.g., Department of the Army 2017; Naval Justice School 2015), this measure is representative of the affiliations servicemembers hold within the military community, and in many cases, as veterans.

Results

What ecological influences contribute to veteran reintegration? To further our understanding of such relationships, this study tests constructs of the SEM model of veteran reintegration, those available within the Pew Research Center Veterans Survey, for their influence on self-reported veteran reintegration outcomes. Analyses include a combination of descriptive statistics and frequency table data (see Tables A.3 and A.4 of the appendix, respectively) for all variables shown in table 1, ordinal logistic regression, and a radar plot depicting group mean responses along two dimensions – exposure to combat and exposure to military trauma.

Based on the ordinal operationalization of self-reported reintegration within the Veterans Survey, ordinal logistic regression models provide an appropriate statistical technique for this study. A logistic regression model hypothesizes that the logit of the response, the natural log of the odds of success, is typically linearly related to the set of predictors (Chatterjee and Simonoff,

2013). This is an ideal model for either categorical or ordinal measures. As well, logistic regression model parameters provide the basis for clinically meaningful estimates of effect, to include a dependent variable not normally distributed (Hosmer, Lemeshow, and Sturdivant 2013). Parameters are estimated using maximum log-likelihood, which implies that the resultant estimated probabilities of success are the maximum likelihood estimates of the conditional probabilities of success given the observed values of the predictors (Simonoff, 2018).

Given the use of the 2011 Pew Research Center dataset, survey-provided weights were used. The Veterans Survey includes a two-stage weighting design, with the first stage comprised of four steps: re-contact propensity correction, correction for listed-sample overrepresentation, within household selection correction, and the multiplication of the three corrections to create a base-weight that was truncated 2.5% at the top and bottom (Pew Research Center 2011). The second stage utilizes an iterative proportionate fitting post-stratification sample balancing, which “uses least-squares curve fitting algorithms to obtain a unique weight for each case that minimizes the root mean square error” (Pew Research Center 2011, 11). Pew Research Center selected the July 2010 Current Population Survey by the U.S. Census Bureau as the demographic data source to base its survey weights upon. With the survey weights incorporated into the regression analysis using the “survey” package version 4.1-4 in R, table 1 displays the ordinal logistic regression results for veterans’ self-reported reintegration. Independent variables tested in this analysis are categorized according to the four SEM levels used by Elnitsky et al. (2017).

Table 1: Ordinal Logistic Regression of Veteran Self-reported Reintegration

	OR	SE	t	Pr(> t)
<i>Intrapersonal</i>				
Combat veteran	0.51	0.18	-3.70	0.0002
General health	1.55	0.11	3.81	0.0001
Years on Active duty	0.99	0.01	-1.08	0.2794
Service helped growth/maturity	1.24	0.19	1.14	0.2535
Service helped confidence	0.92	0.16	-0.54	0.5867
Service-related trauma	0.29	0.18	-6.91	0.0000
Race: African American	1.17	0.33	0.49	0.6236
Race: Asian American	6.13	1.75	1.04	0.3004
Race: Other	1.23	0.46	0.46	0.6448
Hispanic	1.35	0.34	0.86	0.3878
Gender	1.74	0.30	1.84	0.0658
Education	1.14	0.07	1.95	0.0510
Income	1.11	0.04	2.30	0.0215
Age	1.04	0.01	6.12	0.0000
<i>Interpersonal</i>				
Service helped teach teamwork	0.62	0.16	-2.95	0.0032
Partner status: Married	1.25	0.33	0.69	0.4889
Partner status: Living with partner	2.85	0.54	1.94	0.0528
Partner status: Divorced	1.82	0.38	1.59	0.1180
Partner status: Separated	2.07	0.63	1.15	0.2512
Partner status: Widowed	2.23	0.43	1.86	0.0631
Satisfied with family life	1.12	0.14	0.86	0.3912
Religiosity	1.00	0.05	-0.10	0.9222
<i>Community Systems</i>				
Commission type	0.95	0.10	-0.50	0.6168
Service helped prepare for a job or career	1.16	0.09	1.74	0.0817
Military leadership supported help-seeking	1.32	0.10	2.72	0.0066
<i>Societal</i>				
Helpful government	1.15	0.18	0.79	0.4280
Received VA benefits	0.95	0.06	-0.80	0.4222
Public understands problems of military service	1.30	0.12	2.11	0.0347

Table 1 (Cont.)

	<i>b</i>	<i>SE</i>	<i>t</i>	Pr(> t)
Very difficult Somewhat difficult	0.75	0.70	1.07	0.2866
Somewhat difficult Somewhat easy	3.11	0.70	4.43	0.0000
Somewhat easy Very easy	4.86	0.72	6.77	0.0000
Number of observations	1363			

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. The dependent variable is a veteran's self-reported quality of readjustment to civilian life.

Results for the ordinal logistic regression models, including the odds ratios,⁷⁶ yield several associations of interest. First, several intrapersonal variables demonstrate statistically significant associations with veteran reintegration. Combat veterans are nearly half as likely to report a positive reintegration experience than their peers who have not been exposed to combat. Veterans who report better overall health are roughly one and a half times as likely to feel positively about their reintegration. Next, veterans reporting a service-related trauma are approximately 71% less likely to believe they have experienced a positive reintegration than those who report no service-related trauma. Finally, older veterans and those reporting higher education and income demonstrate a positive and significant association with reintegration.

Among the measures tested that are classified under the three outermost levels of the SEM model, three additional associations of interest are observed, one from each of the three outermost layers. It is noteworthy that the interpersonal-level variable regarding satisfaction with

⁷⁶ “An odds ratio (OR) is a measure of association between an exposure and an outcome” (Szumilas 2010, 227). The odds ration “represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure” (Szumilas 2010, 227).

family life was not found to be statistically significant in this model.⁷⁷ First, veterans believing that their military service helped teach them how to work together with other people were about 38% less likely to view their reintegration experience as a positive one. Shifting to measures falling under the community systems level, those who felt their superiors made them feel comfortable about seeking help for service-related mental/emotional issues were roughly 32% more likely to perceive a positive reintegration for themselves. Finally, among three measures tested as societal level factors, only one demonstrated a significant association with veteran reintegration. Veterans who expressed a belief that the American people understand the problems that those in the military face were 30% more likely to view their reintegration experience positively.

Veteran Reintegration and Family Dynamics: Further Analysis

Studies have shown that familial and social support are important in the social functioning and social integration of military veterans (Elnitsky and Kilmer 2017; Resnik et al. 2012; Sayers 2011; Tsai et al. 2012). Given that satisfaction with family life was found not to be statistically significant in table 1, further investigation of familial influence on veteran reintegration is anticipated to provide greater insights regarding hypotheses H1a and H1b. In addition to the Pew Research Center's measure of satisfaction with family life, the Veterans Survey include four other measures related to veteran perceptions of family dynamics – how one or more military deployments impacted a veteran's relationship with his or her spouse, how the same deployment(s) impacted the veteran's relationship with his or her children, whether a veteran experienced strains in family relations since leaving military service, and how a veteran

⁷⁷ Satisfaction with family life was found to be statistically significant in an unweighted ordinal logistic regression of the data.

would rate the job the military did in meeting the needs of his or her family while currently serving. The Pew Research Center's measure of veteran satisfaction with family life received 1,834 valid responses, among the 1,853 valid survey responses comprising the study sample (Pew Research Center 2011). In contrast, the additional four measures of family dynamics had notably lower response rates. Table A.5 of the appendix provides response rates and descriptive statistics for the four additional familial variables. Beyond that of a veteran's overall satisfaction with family life, further analysis of these four additional aspects of family life may elicit more nuanced inferences regarding familial influences on veteran reintegration.

The examination of these four additional familial variables using four separate ordinal logistic regression models. For each of the four models, one of the additional familial variables replaced the original independent variable pertaining to a veteran's satisfaction with his or her family life. Table 2 displays the ordinal logistic regression results for the only statistically significant familial variable, when substituted for a veteran's satisfaction with his or her family life – whether a veteran has experienced strains in family relations since the veteran's discharge from service. With listwise deletion, this regression analysis was limited to 583 observations.

Table 2: Ordinal Logistic Regression of Veteran Reintegration – Family Strain

<i>Intrapersonal</i>				
Combat veteran	0.72	0.31	-1.05	0.2942
General health	1.78	0.17	3.48	0.0005
Years on Active duty	0.95	0.02	-2.38	0.0172
Service helped growth/maturity	0.84	0.26	-0.69	0.4884
Service helped confidence	1.05	0.28	0.17	0.8650
Service-related trauma	0.51	0.28	-2.41	0.0158
Race: African American	0.90	0.33	-0.34	0.7352
Race: Asian American	6.46	1.56	1.20	0.2306
Race: Other	0.62	0.51	-0.93	0.3523
Hispanic	1.21	0.38	0.50	0.6137
Gender	0.95	0.31	-0.15	0.8802
Education	1.05	0.11	0.41	0.6801
Income	1.04	0.07	0.59	0.5577
Age	1.06	0.02	3.51	0.0004
<i>Interpersonal</i>				
Service helped teach teamwork	0.58	0.24	-2.28	0.0225
Partner status: Married	1.52	0.36	1.17	0.2423
Partner status: Living with partner	1.15	0.54	0.26	0.7912
Partner status: Divorced	1.37	0.50	0.62	0.5331
Partner status: Separated	2.55	0.69	1.35	0.1776
Partner status: Widowed	4.85	0.72	2.18	0.2925
Veteran Experienced Family Strain	0.31	0.30	-3.99	0.0001
Religiosity	1.06	0.09	0.63	0.5300
<i>Community Systems</i>				
Commission type	1.17	0.17	0.94	0.3454
Service helped prepare for a job or career	1.65	0.14	3.70	0.0002
Military leadership supported help-seeking	1.13	0.17	0.70	0.4853
<i>Societal</i>				
Helpful government	1.81	0.29	2.07	0.0384
Received VA benefits	0.97	0.09	-0.28	0.7828
Public understands problems of military service	1.18	0.18	0.95	0.3411

Table 2 (Cont.)

	<i>b</i>	<i>SE</i>	<i>t</i>	Pr(> <i>t</i>)
Very difficult Somewhat difficult	0.56	1.09	-0.05	0.9585
Somewhat difficult Somewhat easy	2.54	1.10	2.31	0.0206
Somewhat easy Very easy	4.97	1.09	4.56	0.0000
Number of observations	583			

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. The dependent variable is a veteran's self-reported quality of readjustment to civilian life.

When seeking to examine respondents' views on numerous measures in a succinct manner, Saary (2008) posits the use of a radar⁷⁸ plot to provide a graphical display regarding responses from multiple groups. In a different light, Mosley and Mayer (1999) note that radar plots are useful for comparing performance on multiple dimensions simultaneously or for comparing cases with multiple performance dimensions. Saary highlights the ability of a radar plot to present data in a way that would enhance the patterns found among groups, supplementing text-based presentation (2008, 312). Generally, radar plots use a circular graphing method with a series of spokes or rays projecting from a central point, with each spoke or ray representing a different variable label (Saary 2008, 312). Values of each measure are translated into the length of each spoke. Depending on the data, each spoke may or may not be of the same minimum and maximum value range(s). Mosley and Mayer (1999) posit that this approach is highly intuitive, even to those who may not be experts in a particular field.

The R package “fmsb”⁷⁹ provides the “radarchart” function capable of generating a radar plot. This study hypothesizes the influence of several factors on veteran reintegration, including

⁷⁸ The use of the term “radar” is derived from the resemblance to a radar screen (Mosley and Mayer 1999).

⁷⁹ Version 0.7.3.

satisfaction with family life, family strain, perceived comfort level with seeking help from one's military leadership, exposure to combat, exposure to military trauma, and general health. A veteran's satisfaction with family life was *not* found to be statistically significant in table 1, yet family strain was found to be statistically significant in table 2. Given the ability of a radar plot to present data in a way that would enhance the patterns found among groups, four subgroups of veteran respondents were generated based on two criteria – exposure to combat and exposure to military trauma. Mean response values to five measures of interest, for each of the four groups,⁸⁰ are shown in figure 3. For each of these five measures, the center point of the graph represents a response value of zero, the minimum response value. Maximum response values for each measure are shown at the outer extent of the spoke. Maximum values represent excellent health, military service was useful when working with others, comfort when seeking help from military leadership, being very satisfied with family life, and a response of “yes” to experiencing family strain.

When examining results shown in figure 3, notable patterns among groups appear. First, veterans reporting exposure to military trauma, on average, report lower levels of general health than veterans who were not exposed to military trauma. Second, a comparison of mean response rates for one's satisfaction with family life and reported family strain again depicts a notable trend among the four groups. Mean response values regarding family strain vary to a much greater degree than that of one's satisfaction with family life. On average, the two groups of veterans indicating exposure to military trauma reported higher rates of family strain, and mean values are highest among those also exposed to combat. Lastly, teamwork is a core facet of U.S.

⁸⁰ Combat veterans with military trauma, combat veterans without military trauma, noncombat veterans with military trauma, and noncombat veterans without military trauma.

military operations (Salas et al. 1995). As well, the ability of military leadership to develop a unit's teamwork capacity is critical to overall efficacy (Lindsay, Day, and Halpin 2011). Such constructs are ingrained in U.S. military culture, which can have a profound influence on many U.S. military veterans (Weiss and Coll 2011; Wilson 2008). Mean response values regarding comfort with seeking help from one's military leadership vary to a much greater degree than that of military service's usefulness when working with others. While both measures imply perceptions of teamwork and cohesion, those exposed to military trauma were notably less comfortable with the notion of seeking help from their military leadership. Given the literature regarding military trauma and help-seeking (e.g., Campbell and Raja 2005; Rosen et al. 2011; Weiss and Coll 2011) and the potential connection between military trauma and help-seeking shown in figure 3, it may be reasonable to infer some degree of practical significance (e.g., Kirk 1996). Overall, figure 3 appears to suggest that exposure to military trauma appears to have a notable impact on these salient measures compared to exposure to combat.

Figure 3: Radar Plot of Select Measures by Veteran Status and Military Trauma Exposure



Finally, ecological systems theory posits that behavior, to include development, is a joint function of the person and his or her environment where these spheres of influence interact with one another (Bronfenbrenner 1979). Bronfenbrenner adds that behaviors occur “through consistency over time in the ways in which the person characteristically *varies* his or her behavior as a function of the different contexts, both proximal and remote, in which that person lives” (1979, 216). Therefore, it is important to examine the interactions of various influences across different spheres of the SEM model. Table 3 provides correlations between all statistically significant independent variables from table 1, along with the family strain variable found to be statistically significant in table 2. Among the variables in table 3, 73.3% of all possible correlations are statistically significant. Among the interpersonal variable, the family strain variable holds statistically significant correlations with two of the intrapersonal level variables, and as well with both the lone community level variable and the lone societal level variable included in table 3. This is also the case for the variable regarding veteran perceptions of how useful military service was in learning how to work with other people. For the lone community level variable in table 3, how supportive veteran’s military leadership was regarding help-seeking holds statistically significant correlation with two intrapersonal variables, both interpersonal variables, and the lone societal level variable. Lastly, the lone societal level variable, the degree to which veterans believe the public understands problems associated with military service, holds a statistically significant correlation with all other independent variables in table 3.

Table 3: Correlation Matrix of Statistically Significant Independent Variables

Combat Veteran	General Health	Trauma	Education	Income	Age	Service Helped Teach Teamwork	Military Leadership Supported Help-seeking	Public Understands Problems of Military Service	
0.12	-0.34	0.34	-0.10	-0.09	-0.09	-0.04	-0.22	-0.10	Family Strain
	-0.40	0.30	0.07	0.05	-0.09	0.08	-0.30	-0.80	Combat Veteran
		-0.19	0.16	0.23	-0.03	0.10	0.19	0.05	General Health
			0.06	0.02	-0.11	0.01	-0.24	-0.14	Trauma
				0.42	0.01	0.02	0.00	-0.06	Education
					-0.50	0.04	0.07	-0.09	Income
						-0.01	0.03	0.17	Age
							0.18	0.06	Service Helped Teach Teamwork
								0.15	Military Leadership Supported Help-seeking

Discussion and Conclusions

Elnitsky et al. (2017) posited that there is a clear need for theory-based veteran reintegration research utilizing an adapted ecological framework. This study seeks to answer Elnitsky and colleagues' call via constructs available for testing within the Pew Research Center Veterans Survey data. Therefore, this study asks: What ecological influences contribute to veteran reintegration? As well, how well might these influences correlate across levels of the ecological model? To further our understanding of such relationships, this study's analyses are derived from the 2011 Pew Research Center Veterans Survey, using the SEM model of veteran reintegration as a theoretical foundation. Results from this study's analyses appear to lend some degree of support for the ecological system model's applicability to veteran reintegration.⁸¹

Anticipating the significance of family to the veteran reintegration process, hypothesis H1a posits that veterans reporting greater satisfaction with family life will tend to experience a better reintegration process. While the Veteran Survey's self-reported measure of satisfaction with family life did not return a statistically significant association with the dependent variable when utilizing survey weights, the family strain measure derived from survey question 43f did. Despite the notably lower response rate for the family strain measure, table 2 results suggest that veterans experiencing family strain since leaving military service are likely to experience a more challenging reintegration experience. This may offer partial support for hypothesis H1b. When

⁸¹ Though veteran inclinations towards teamwork are not a focal point of this research, the negative directionality of the relationship between veteran reintegration and perceptions regarding the military's usefulness in teaching veterans how to work together with other people is noteworthy. While this directionality was generally unexpected, a study regarding the role of community reintegration found three key challenges when returning home, as described by veterans: "lack of respect for civilians, holding themselves to a higher standard than civilians, and not fitting into the civilian world" (Demers 2011, 170). If these veteran perceptions of working with others may be commonly found throughout existing literature, such a trend may aid in explaining the unexpected directionality of the relationship in this study.

asked if they have experienced familial strains, veterans exposed to military trauma displayed a notable trend of higher mean response values, as seen in figure 3. This trend was not discernable in the context of a veteran's satisfaction with family life, suggesting there may be some distinction between family strain and satisfaction with family life in the minds of U.S. military veterans. These results suggest some measure of additional support for hypothesis H1b, though continued examination of the connection between family and veteran reintegration may yield further insights regarding the nature of this relationship.

As noted previously, the culture that exists within the military community includes, among many other attributes, shared values such as pride in self-reliance (Sayer et al. 2009) and the need to sustain a mindset of toughness (Weiss, Coll, and Metal 2001). When considering these values, hypothesis H2 predicts that greater reintegration experiences will typically be reported among those who had leadership in the military community that made the Service member (now a veteran) feel comfortable about seeking help when faced with mental/emotional issues. Results from this study suggest a significant and positive link between a veteran's access to supportive leaderships when faced with mental/emotional issues from his or her military superiors and the veteran's ability to successfully reintegrate after separation from service. Based on these findings, and in alignment with existing literature, support for hypothesis H2 is found.

Hypothesis H3a, H3b, and H3c state that: As seen in prior research, veterans who report better reintegration experiences are less likely to have served in combat, military-related trauma, or poor health. According to this study's results, and in alignment with prior research, respondents from the Pew Research Center's Veterans Survey demonstrated that reintegration was significantly more challenging for those who served in combat, reported military-related

trauma, and those who have been in poor health. This lends a reasonable degree of support for hypothesis H3a, H3b, and H3c. Further, the results suggest that, as veterans age, many are likely to experience improved reintegration outcomes. Though for many, military service, notably combat (Levy and Sidel 2009), can take a lasting toll on a veterans mental and physical health (Resnik et al. 2012; Wisco et al. 2014). As well, it may be the case that greater income, in the context of tangible resources, aids in ameliorating the challenges of reintegration.

Ecological systems theory posits that behavior, to include development, is a joint function of the person and his or her environment where these spheres of influence interact with one another (Bronfenbrenner 1979). Therefore, the extent to which factors existing in different spheres of influence correlate with one another may lend further support for the SEM model of veteran reintegration proposed by Elnitsky and colleagues. Given the SEM model design, such correlations are of interest to this study, potentially lending additional support for inferences regarding the applicability of the SEM model of veteran reintegration proposed by Elnitsky et al. (2017). Table 3 displays the statistically significant variables across the different levels of the SEM model and shows that just over 73% of all included correlations were found to be statistically significant. With independent variables from all levels sharing significant correlations with variables from all other levels, it may be reasonable to find additional support for the applicability of the SEM model of veteran reintegration proposed by Elnitsky and colleagues. With veteran reintegration seemingly a complex and dynamic process, questions and knowledge gaps persist, generating several limitations for this study.

Limitations

This study's research design offers a cross-sectional response to the call of Elnitsky et al. (2017) for more theory-based veteran reintegration research grounded in the SEM model. However, this study's research design has its limitations. First, a key limitation of this study is its use of the Pew Research Center Veterans Survey. The survey, while able to test influences at all levels of SEM, was not likely designed according to the SEM model. This may result in some independent variables serving more of a proxy role. Next, some constructs suggested in the SEM model offered by Elnitsky et al. are not available for testing as independent variable measures. The authors note that constructs presented within their SEM model of veteran reintegration are merely "recommendations for future work" based on their review of the literature (2017, 116). Further, Jenkins-Smith et al. (2014) note that frameworks (e.g., the SEM framework) are not directly testable, though a framework may be a guide towards specific areas of inquiry. This is further supported by King, Keohane, and Verba (1994), who state that researchers should collect information on as many observable implications of the selected theory as possible, which suggest that the testing of *all* constructs within a theory is not mandatory for its application. Still, the possibility of one or more omitted variables is a noteworthy limitation. Next, this study aligns the SEM model with the Pew Research Center's Veterans Survey. The survey's corresponding methodology document (Pew Research Center 2011) offers no discernable indication that the survey was designed with the SEM model in mind; thus, considerations for some degree of measurement error is warranted, given that a high degree of correspondence between a measure and the concept it is *thought* to measure is desirable (Johnson et al. 2015, 91). Finally, it is noteworthy that the cross-sectional nature of survey does not permit testing of the "time" element of SEM.

Another key limitation of this study includes the use of the independent variable regarding veteran family strain experiences. While the limited number of responses to this survey question is not ideal, it is not necessarily a disqualifying attribute from which inferences may be drawn. Radar plot results seen in figure 3 suggest a discernable trend of higher mean response rates among those who experienced military trauma when asked about familial strains. Finally, the categorical nature of several of the survey questions used in the study may result in some degree of measurement error, as respondents may perceive and interpret the provided values differently (Johnson et al. 2015, 90). Despite these limitations, inferences from this study's sample population may be drawn regarding various spheres of influence on veteran reintegration through the lens of Elnitsky et al.'s adapted SEM theory model.

Conclusions

What conclusions may be drawn regarding influences on veteran reintegration? This study's results suggest a complex array of influences regarding U.S. military veterans' reintegration outcomes. If the SEM model were to achieve wider support among the scientific community as a viable framework for use in veteran reintegration research, it is anticipated that the potential for more unified study and design of veteran reintegration interventions among key stakeholders may yield improved reintegration outcomes for veterans. The 2015 forum held by the Department of Veterans Affairs Office of Policy and Planning signifies a clear interest in establishing a consensus conceptual framework of veteran reintegration for researchers, practitioners, policy makers, and other stakeholders from which to model future research and policies. At least one such framework has been proposed by Elnitsky et al. (2017), and in turn the authors call for additional research utilizing the adapted SEM model of veteran reintegration, to

further stakeholders' understanding of veteran needs during reintegration and to aid in determining the fitness of the adapted SEM model as a suitable, consensus framework.

Given this study's theory-driven approach, how well does the adapted SEM model offered by Elnitsky et al. (2017) hold up when applied to veteran reintegration via the Pew Research Center's Veterans Survey? Based on this study's results, a combination of results suggests that the adapted SEM model for veteran reintegration is a feasible framework upon which additional veteran reintegration research may be grounded – that at least one independent variable from each level of the SEM model was found to be statistically significant to veteran reintegration among tables 1 and 2, and because independent variables were found to hold statistically significant correlations with one another across all levels of the SEM model. However, given that this study relies on the 2011 Pew Research Center's Veterans Survey, a survey unlike to have been designed around the SEM model adapted for veteran reintegration by Elnitsky et al. (2017), it seems reasonable to suggest that future research continue to answer the call by Elnitsky and colleagues – to continue developing the body of theory-based research as a means of better defining the fitness of the SEM model adapted to veteran reintegration.

As noted by Lazier, Gawne, and Williamson, even if a conceptual framework of veteran reintegration were to take hold, researchers, policy makers, and other key stakeholders would need to take additional steps to “address gaps in data, in particular, the veteran family” (2016, 54). This study supports a combined set of conclusions posited by Elnitsky et al. and Lazier, Gawne, and Williamson. Based on the results of this study and others, broader policy-level inferences suggest 1) the need for a unified definition of veteran reintegration for application in future research as a means of advancing the science on reintegration, and 2) innovative

collaboration between researchers and policy makers (e.g., the 2015 Department of Veterans Affairs Office of Policy and Planning forum) to “drive a more robust, veteran-focused dialogue around the myriad of policy issues affecting the lives of veterans and their families” (Lazier, Gawne, and Williamson 2016, 54).

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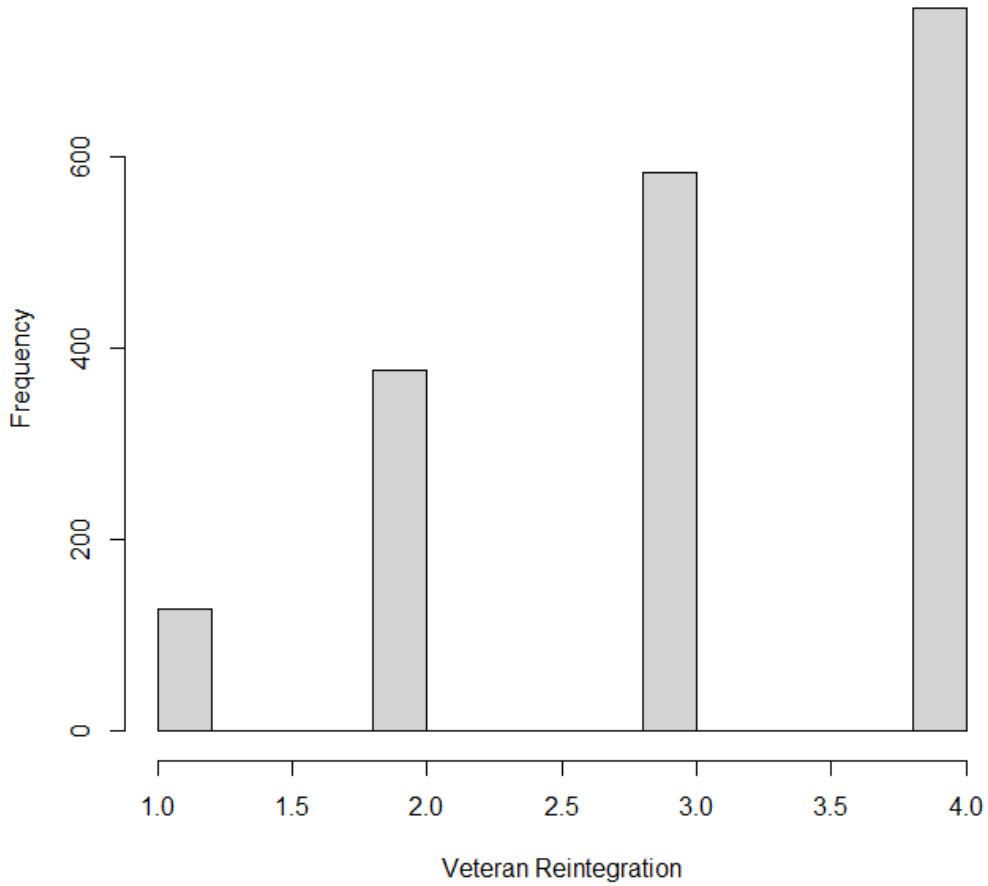
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Appendix

Figure A.1: Histogram of Veterans' Self-reported Reintegration to Civilian Life



Note: Lower self-reported response values indicate greater reintegration difficulty while higher response values indicate greater ease of reintegration.

Table A.1: Intrapersonal Independent Variable Descriptions

Variable	Survey Question	Range	Operationalization
Combat veteran	31	0-1	0=No did not serve, 1=Yes, served in combat zone or war zone
General health	42	0-3	0=Poor, 1=Only fair, 2=Good, 3=Excellent
Years on active duty	13	0-44	number of months provided divided by twelve, plus years provided
Service helped growth and maturity	27d	0-3	3=Very useful, 2=Fairly useful, 1=Not too useful, 0=Not at all useful
Service helped confidence	27b	0-3	3=Very useful, 2=Fairly useful, 1=Not too useful, 0=Not at all useful
Service-related trauma	44	0-1	0=No, 1=Yes
Race (factorized)	5601	1-4	1=White, 2=African American, 3=Asian American, 4=Other race
Hispanic	55	0-1	0=None of the following, 1=Hispanic, Latino, or Spanish origin, such as Mexican, Puerto Rican or Cuban
Gender	observed	0-1	0=Female, 1=Male
Education	54	1-7	1=None, or grade 1-8, 2=High school incomplete, 3=High school graduate or GED, 4=Technical, trade, or vocational school after high school, 5=Some college, or associates degree, 6=College graduate (4-year degree), Post-graduate training, up to a doctorate
Income	68	1-9	1=Less than \$10,000, 2=10 to under \$20,000, 3=20 to under \$30,000, 4=30 to under \$40,000, 5=40 to under \$50,000, 6=50 to under \$75,000, 7=75 to under \$100,000, 8=100 to under \$150,000, 9=\$150,000 or more
Age	53	19-96	Respondent provided number

Table A.2: Interpersonal, Community, and Societal Independent Variable Descriptions

Variable	Survey Question	Range	Operationalization
Interpersonal			
Service helped teach how to work together with other people	27a	0-3	3=Very useful, 2=Fairly useful, 1=Not too useful, 0=Not at all useful
Intimate partner status (factorized)	17a	1-6	1=Never married, 2=Married, 3=Living with partner, 4=Divorced, 5=Separated, 6=Widowed
Satisfied with Family Life	2a	0-3	3=Very Satisfied, 2=Somewhat satisfied, 1=Somewhat dissatisfied, 0=Very dissatisfied
Religiosity	60	0-5	0=Never, 1=Seldom, 2=A few times a year, 3=Once or twice a month, 4=Once a week, 5=More than once a week
Community			
Commission type	14	1-4	1=Enlisted, 2=Noncommissioned officer, 3= Warrant officer, 4=Commissioned officer
Service helped prepare for a job or career	27c	0-3	3=Very useful, 2=Fairly useful, 1=Not too useful, 0=Not at all useful
Military leadership supported help-seeking	46	0-2	2=Comfortable, 1=Neither/both, 0=Uncomfortable
Societal			
Helpful government	39	0-1	0=No, 1=Yes
Received VA benefits	38	0-1	0=No, 1=Yes
Public understands problems of military service	29b	0-3	1=Not well at all, 2=Not too well, 3=Fairly well, 4=Very well

Table A.3 Descriptive Statistics of Study Variables

Variable	<i>n</i>	Mean	sd	Min	Median	Max
<i>Dependent variables</i>						
Veteran Reintegration		3.07	0.94	1.00	3.00	4.00
<i>Intrapersonal variables</i>						
Combat veteran		0.50	0.50	0.00	0.00	1.00
General health		1.90	0.81	0.00	2.00	3.00
Years on active duty		7.71	8.23	0.08	4.00	43.92
Service helped growth and maturity		2.67	0.65	0.00	3.00	3.00
Service helped confidence		2.60	0.72	0.00	3.00	3.00
Service-related trauma		0.36	0.48	0.00	0.00	1.00
Education		4.91	1.52	1.00	5.00	7.00
Income		5.43	2.16	1.00	6.00	9.00
Age		57.23	17.89	19.00	60.00	96.00
<i>Interpersonal variables</i>						
Service helped teach how to work together with other people		2.62	0.68	0.00	3.00	3.00
Satisfied with Family Life		2.62	0.72	0.00	3.00	3.00
Religiosity		2.52	1.64	0.00	3.00	5.00
<i>Community variables</i>						
Commission type		1.87	1.01	1.00	2.00	4.00
Service helped prepare for a job or career		2.03	1.08	0.00	2.00	3.00
Military leadership supported help-seeking		1.41	0.84	0.00	2.00	2.00
<i>Societal variables</i>						
Helpful government		0.67	0.47	0.00	1.00	1.00
Received VA benefits		1.74	1.48	0.00	3.00	3.00
Public understands problems of service		0.90	0.76	0.00	1.00	3.00
Variable						
	<i>n</i>	Mean	sd	Min	Median	Max
Deployment(s) impacted relationship with spouse	775	1.81	0.76	1.00	2.00	3.00
Deployment(s) impacted relationship with kids	573	1.82	0.75	1.00	2.00	3.00
Military helped family while in service	1031	2.96	0.87	0.00	3.00	4.00
Family strain experienced as a veteran	709	0.47	0.50	0.00	0.00	1.00

Table A.4: Frequency Table of Categorical Independent Variables

Variable	<i>n</i>	Percent
Gender	1853	100
Male	1659	89.5
Female	194	10.5
Race	1817	100.0
White	1575	86.7
African American	151	8.3
Asian American	6	0.3
Other	85	4.7
Hispanic	1843	100.0
Hispanic, Latino, or Spanish origin, such as Mexican, Puerto Rican or Cuban	112	93.9
None of the above	1731	6.1
Intimate partner status	1850	100.0
Married	1285	69.5
Living with Partner	74	4.0
Divorced	174	9.4
Separated	44	2.4
Widowed	121	6.5
Never Married	152	8.2

Table A.5: Descriptive Statistics of Additional Familial Variables

Variable	<i>n</i>	Mean	sd	Min	Median	Max
Deployment(s) impacted relationship with spouse	775	1.81	0.76	1.00	2.00	3.00
Deployment(s) impacted relationship with children	573	1.82	0.75	1.00	2.00	3.00
Military helped family while in service	1,031	1.47	0.50	1.00	1.00	2.00
Family strain experienced as a veteran	709	2.96	0.87	1.00	3.00	4.00

Conclusion

This dissertation examined life after U.S. military service – veterans’ mental health, homelessness, and reintegration – through a public policy lens. Overall, the three papers in this dissertation, from a public policy perspective, contribute to understandings of life after service for U.S. military veterans pertaining to the ability of state veterans’ mental health programs to effectively address veterans’ mental health, state capacity to address veteran homelessness, and factors associated with veteran reintegration outcomes.

The first paper demonstrates that targeted state-level veterans’ mental health programs do provide positive contributions. This effect was not observed when examining other state-level veterans’ programs – those *not* primarily focused on veterans’ mental health. However, the data suggest that the moderating effect of veteran status on a state’s ability to address mental health among U.S. military veterans may be influenced by one or more factors (e.g., combat exposure) for which data is not available within the 2019 Centers for Disease Control and Prevention’s Behavioral Risk Factors Surveillance Survey. Further, and in line with veterans’ stigmatization of help-seeking, veterans will typically be less forthcoming than nonveterans to questions regarding one’s mental health status. Do the often-higher response rates from U.S. military veterans suggest that veterans may be more open about specific events, such as adverse childhood experiences and drinking habits? As well, might veterans be less willing to admit such experiences impact the veteran’s mental health or that help should be sought? Further research may be needed to address these lingering questions. At least in terms of the 2019 BRFSS data, this trend may suggest a possible connection to prior research regarding the stigmatization of help-seeking among many veterans.

From a practical perspective, this article suggests that targeted state veterans' mental health policies and programs, those in addition to those of the federal Department of Veterans Affairs may demonstrate positive contributions to veterans' mental health outcomes. This study's results, along with additional research, may offer practitioners and policymakers additional insights regarding the efficacy of state veterans' mental health programs – what works well and what may be less efficacious – not only for veterans, but also for taxpayers that often fund such programs. With many veterans still facing mental health challenges, many questions remain. Thus, continued examination of veterans' mental health outcomes compared to their nonveteran counterparts may play an important role, alongside clinical innovations, in the development of more efficacious mental health programs for U.S. military veterans. So long as the stigmatization of help-seeking remains prevalent among U.S. military veterans – even if many are often more willing to self-report adverse experiences – the development of a comprehensive understanding of the state of veterans' mental health programs may remain somewhat elusive.

The second paper applies state capacity theory to identify state-level determinants of reduced veteran homelessness utilizing 2007 to 2016 Department of Housing and Urban Development Point-in-Time homeless persons estimates. This study's key findings indicate that: states better at managing their debt in proportion to their revenue will display a greater capacity to reduce their homeless veteran population; the availability of permanent supportive housing beds indicates a capacity to move veterans from unsheltered status through to a more permanent housing solution; states spending less per capita on criminal justice corrections and more on veteran programs demonstrate more success in sheltering their homeless veterans; costs of living indicators and veteran unemployment rates impact veteran housing stability.

Practical implications of this study suggest a complex and dynamic veteran homelessness policy arena, one in which states manage an array of resources, including those allocated to homeless veteran initiatives like the End Veteran Homelessness initiative (EVH). Therefore, it is posited that a state's capacity to effectively manage its resources does matter when seeking to ameliorate veteran homelessness. An improved understanding of a state's capacity to significantly reduced veteran homelessness may allow states to expand efforts where effective, target areas for improvement, and revise resource allocations. Based on this study's results, the presence of multiple significant associations between homeless veteran cohorts and state capacity measures suggests that state capacity theory may be a feasible starting point for increased theory-driven homeless veteran research. These measures of state capacity, along with those state characteristics holding significant associations, likely impact sheltered and unsheltered veterans differently. Such conditions appear unique to each state. If it is the case that collaborative homeless veteran initiatives can and often get results at the state level, this may indicate an opportunity for veteran homelessness initiatives to enhance resource allocation along housing-based differences in needs. However, a state's ability to shift unsheltered veterans to sheltered status may come at significant cost to its bottom line. This may signify a need for states to continue developing and enriching holistic, innovative collaborations like the EVH. Inferences from this study suggest that a state's capacity to manage resources, notably their ability to connect homeless veterans and available resources via robust relationships with community stakeholders, is key to enhancing homeless veteran outcomes.

This dissertation's third paper, seeking to provide a modest contribution to the call of Elnitsky et al. (2017) for theory-based veteran reintegration research utilizing an adapted ecological framework. This study utilizes Elnitsky and colleagues' adapted socio-ecological

model (SEM) of veteran reintegration to identify individual-level factors⁸² influencing veteran perceptions of post-military service reintegration. Findings suggest that veterans who report better reintegration experiences are less likely to have served in combat and experienced military-related trauma, are currently in poor health, felt supported by military leadership in help-seeking, and report lower levels of family strain. Factors significantly contributing to veteran reintegration appear to exist across different levels of the SEM model and share linkages across these levels. Based on this study's combined results, the adapted SEM model for veteran reintegration appears to be a feasible framework upon which additional veteran reintegration research may be grounded. However, given that this study relies on the 2011 Pew Research Center's Veterans Survey, a survey unlike to have been designed around the SEM model adapted for veteran reintegration by Elnitsky et al. (2017), it seems reasonable to suggest that future research continue to answer the call by Elnitsky and colleagues – to continue developing the body of theory-based research as a means of better defining the fitness of the SEM model adapted to veteran reintegration. If the SEM model were to achieve wider support among the scientific community as a viable framework for use in veteran reintegration research, it is anticipated that the potential for more unified study and design of veteran reintegration interventions among key stakeholders may yield improved reintegration outcomes for veterans.

From a practical public policy approach, as noted by Lazier, Gawne, and Williamson, even if a conceptual framework of veteran reintegration were to take hold, researchers, policy makers, clinical practitioners, and other key stakeholders would need to take additional steps to “address gaps in data, in particular, the veteran family” (2016, 54). This study supports a

⁸² Analyses for this study are centered on specific areas of inquiry provided within the 2011 Pew Research Center Veterans Survey.

combined set of conclusions posited by Elnitsky et al. and Lazier, Gawne, and Williamson.

Based on the results of this study and others, broader policy-level inferences suggest:

- The need for a unified definition of veteran reintegration for application in future research as a means of advancing the science on reintegration.
- Encourage innovative collaboration between researchers and policy makers, to support enhanced dialogue regarding the many policy issues impacting veterans and their families (Lazier, Gawne, and Williamson 2016).

As noted in this dissertation's introduction, much of the available literature regarding veterans' mental health is centered at the national level. Therefore, two chapters within this dissertation examined the ability of state-level policies and programs to aid ameliorating veterans' mental health.⁸³ These chapters provide an opportunity, when much of the existing literature is centered at the national level, to examine the efficacy of state-level veterans' mental health policies and programs. Inferences drawn from these studies may contribute to a better understanding of what among these state-level policies and programs works; and perhaps, what the federal government may learn from states as laboratories of public policy (Volden 2006).

In the aggregate, these three articles contribute to understandings of mental health challenges faced by U.S. military veterans after service. These articles explore the influence of military service as it relates to the efficacy of state-level veteran-specific mental health programs, states' ability to address veteran homelessness, and veteran reintegration outcomes. Implications from this research may be twofold, offering:

⁸³ The other chapter, regarding veteran reintegration, utilizes national survey data that do not include veterans' state of residency.

- Additional support for topics of future research based on lingering questions and knowledge gaps.
- Further insight for key stakeholders, such as clinical practitioners and public policy decision makers, in terms of programmatic design and enhanced efficacy

Also, inferences drawn from this research may further illuminate trends in the stigmatization of help-seeking among U.S. military veterans, which may find some measure of utility among public policy decision makers and clinical practitioners when designing policies programs tailored to veterans' mental health needs. However, results from this dissertation's three chapters may suggest a common theme – that U.S. military veterans' mental health needs will likely vary from one veteran to the next.

This dissertation demonstrates that states do play a role in veterans' mental health care policy. Given that veterans continue to demonstrate ongoing mental health challenges, despite efforts by the Department of Veterans Affairs, it does not seem feasible that a single institution currently possesses the programmatic capacity to resolve all mental health challenges for each U.S. military veteran. Therefore, it would seem reasonable to conclude that continued program efficiency with enhanced flexibility for individual veteran needs, particularly at the state level, may enhance veteran mental health outcomes and provide for an improved return on investment for taxpayers. Overall, implications drawn from this research may provide further insight for key stakeholders to enhance program efficacy and social utility when seeking to connect veterans in need with available resources. In short, the ability to provide veterans with more of what they need and less of what they do not would seem to provide an enhanced social utility for all.

Appendix



To: Eric D Button
BELL 4188

From: Chair, Douglas James Adams
IRB Expedited Review

Date: 06/04/2020

Action: **Review Not Required**

Action Date: 06/04/2020

Protocol #: 2005267548

Study Title: Assessing Five Key Indicators of VA Benefit Service Efficacy via Social Cognitive Theory and the IAD Framework

Please keep this form for your records. Investigators are required to notify the IRB if any changes are made to the referenced study that may change the status of this determination. Please contact your IRB Administrator if you have any questions regarding this determination or future changes to this determination.