Accepted Manuscript
Version of Record at: https://doi.org/10.1177/0095327X241259080

Word count: 10,673
Page count: 41

Risk Factors for Homelessness among Post-9/11 Era Veterans

May 2024
Accepted for publication in *Armed Forces and Society* (ms# AFS-21-243.R1)

Abstract: This study examined the associations between a broad range of individual characteristics and homelessness among 49,323 post-9/11 era Veterans. Questions concerning the roles of premilitary, military and post military factors in Veteran's vulnerability to homelessness have persisted despite the considerable attention given to Veteran homelessness, and has highlighted the absence of longitudinal studies that could contribute to the empirical understanding of risk and protective factors among this population. The Veterans in this study group completed Millennium Cohort Study surveys during their military service and subsequently, when they transitioned back to civilian life. Among these Veterans, 1,071 (2.2%) reported becoming homeless after separating from the military. Results from multivariate models provide limited empirical support for direct links between aspects of military service and homelessness that are widely used to explain why Veterans become homeless. Instead, many risk factors for homelessness found here mirror risk factors among the general population. We also find a persistent association between sexual orientation and risk for homelessness, and decreased risk for homelessness among female Veterans. These findings challenge popular conceptions of why Veterans become homeless and contribute to understanding the dynamics of becoming homeless among this current Veteran cohort.

Keywords: Homelessness, Veteran, sexual orientation, combat, service member

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Acknowledgements: Metraux acknowledges institutional support from the National Center for Homelessness Among Veterans at the US Department of Veterans Affairs. In addition to the authors, the Millennium Cohort Study team includes Anna L. Baccetti, MPH; Wisam Z. Barkho, MS; Jennifer N. Belding, PhD; Satbir K. Boparai, MBA; Felicia R. Carey, PhD; Nathan C. Carnes, PhD; Sheila F Castaneda, PhD; Rebecca A. Consigli; Toni Rose Geronimo-Hara, MPH; Judith Harbertson, PhD, MPH; Beverly D. Sheppard; Yohannes Haile, MS; Lauren E. Jackson; Isabel G. Jacobson, MPH; Claire K. Kolaja, MPH; Cynthia A. LeardMann, MPH; Crystal L. Lewis, Ed.D; Jacqueline M. Peretti, MD; Erin L. Richard PhD, MPH; Anna C. Rivera, MPH; Rudolph P. Rull, PhD, MPH; Neika Sharifian, PhD; Karen Tannenbaum, MA; Daniel W. Trone, PhD; Javier Villalobos Jr., MS; Jennifer L. Walstrom; Yunnuo Zhu, MPH. The authors also appreciate contributions from the Deployment Health Research Department and Leidos, Inc. We greatly appreciate the contributions of the Millennium Cohort Study participants.

Disclosures: Authors disclose no conflicting interests.

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Accepted Manuscript
Version of Record at: https://doi.org/10.1177/0095327X241259080

duties. Report Number 21-73 was supported by the Military Operational Medicine Research Program, Defense Health Program, and Veterans Affairs under work unit no. 60002. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of the Army, Department of Defense, nor the U.S. Government. The study protocol was approved by the Naval Health Research Center Institutional Review Board in compliance with all applicable Federal regulations governing the protection of human subjects. Research data were derived from an approved Naval Health Research Center Institutional Review Board protocol, number NHRC.2000.0007.

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Veterans are overrepresented among the U.S. homeless population despite lower levels of poverty and unemployment and higher levels of educational attainment compared to non-Veterans (Fargo et al., 2012; Tsai & Rosenheck, 2015; Rosenheck et al., 1996). Through the U.S. Department of Veterans Affairs (VA), most Veterans have access to a comprehensive healthcare system (Longman, 2012) and sources of financial benefits and housing assistance that are unavailable to non-Veterans. However, homelessness among Veterans nonetheless persists, as does the public dismay at the injustice of homelessness occurring among those who have served in the military (Metraux & Moore, 2023a).

This enigmatic relationship between Veteran status and homelessness extends to include those who served in the post-9/11 era (also referred to as Gulf War era) and encompasses combat theaters in Iraq and Afghanistan. While media accounts have described a "tsunami of homelessness" occurring among these recent Veterans (Eckholm, 2007), research suggests rates of homelessness among this cohort are roughly consistent with those observed among older cohorts (Porter et al., 2018). More generally, military Veterans currently make up approximately six percent of the adult American population (Schaeffer 2023), a rate that is roughly congruent with their representation among the homeless population (de Sousa et al., 2023). While Veterans have been disproportionately represented among the homeless population in past years (Fargo et al., 2012), homelessness among Veterans has declined both in number and in proportion since 2007 in conjunction with major efforts by the VA to end homelessness among veterans (Metraux & Moore, 2023). In the 2023 nationwide point-in-time count of the homeless population, the number of homeless Veterans, increased from 2022 by 7 percent to 35,574 people, compared to a 12 percent increase in the overall homeless population (de Sousa et al., 2023).

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Several service-specific features, including post-traumatic stress disorder (PTSD), sexual trauma (particularly among women) during service, and other than honorable (OTH) discharges from military service, have been linked with a higher risk for homelessness. Yet the principal correlates of homelessness among this cohort, including race and ethnicity, adverse childhood experiences, poverty, trauma, absence of social support systems, and behavioral health diagnoses – are also present among non-Veterans (Metraux & Smith, 2019). Therefore, despite a substantial body of literature on Veteran homelessness in the United States (Tsai & Rosenheck 2015), understanding of aspects of military service as well as specific experiences during military service that may lead to Veteran homelessness remains unclear.

This present study investigated individual risk factors for homelessness among post-9/11-era Veterans. We analyzed longitudinal survey data from the Millennium Cohort Study (MCS), the largest and longest running military health study, to follow 49,323 post-9/11 era U.S. Veterans from the point in time they left military service. The term "homeless," as used in this study, is operationalized in the MCS as sleeping "in a shelter, on the streets, or in another non-residential setting because of having no other place to stay," and reflects criteria that are in the widely used federal definition of literal homelessness (US Department of Housing and Urban Development, 2011). The resulting assessment of links between demographic, military, and experiential measures and homelessness among the most recent population of Veterans provide a means to empirically evaluate commonly held perceptions of why Veterans become homeless.

A Brief Review of Veteran Homelessness

The dynamics and correlates of veteran homelessness remain poorly understood. With the rise of homelessness in the 1980s, Robertson's (1987) monograph first identified Veterans as an overrepresented subgroup and documented the high proportion of these Veterans who had served

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in the Vietnam War. While putative links between homelessness and sequelae of combat, including diagnoses of PTSD, gained resonance and popular acceptance during this time, Rosenheck et al. (1994) presented evidence that Veterans at greatest risk of homelessness were not those who served in Vietnam, but those who served in the early years of the post-Vietnam peacetime era of the mid-1970s through the mid-1980s. This period was marked by the transition to an all-volunteer military in a time when military service was unpopular and the military adopted reduced recruiting standards.

A similar knowledge gap exists with regards to veterans from the contemporary service era, who represent a diverse set of intersecting identities and experiences, including a large number who deployed in support of military operations in Afghanistan and Iraq. Research done during this era has shown that personal homelessness risk profiles among Veterans are very similar to non-Veterans, and continues to be inconclusive about the role of war and related factors on risk for homelessness (Balshem et al., 2011; Metraux & Smith, 2019). Factors commonly associated with increased risk of homelessness among both groups include non-Hispanic Black/African American race and ethnicity, having mental health or substance use diagnoses, and previous exposure to trauma. Research also points to a "Veteran paradox" where Veterans experience homelessness at higher rates than non-Veterans and are overrepresented among the homeless population (Fargo et al., 2012), despite having lower overall rates of poverty and higher average levels of education and employment than non-Veterans (Rosenheck et al., 1996).

Military Factors

Efforts to explain this paradox have led to closer scrutiny of military experiences and their impact on subsequent homelessness. As the post-9/11 conflicts were two of the longest in

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U.S. history, deployment experiences have emerged as a common narrative for explaining homelessness. The simplest proxy for wartime exposure is deployment, specifically whether a Veteran deployed to a war zone during the Afghanistan or Iraq conflicts. By 2015, just under two million Veterans deployed to one or both theaters of operations (VA Office of Public Health, 2017). Several studies that assessed the relationship between deployment and homelessness reported inconsistent results. In two reports on an analysis by the VA's Office of Inspector General assessing use of VA homeless services among 310,000 post-9/11 era Veterans, there was a substantially higher (albeit unadjusted) frequency of homelessness among deployed Veterans compared to their non-deployed contemporaries (2.1 percent to 1.4 percent) (Metraux et al., 2013; VA Office of the Inspector General, 2012). Edens et al. (2011), in contrast, found deployment to Iraq or Afghanistan to be associated with substantially lower risk of VA homeless services use among a large but singular group of Veterans who used VA specialty mental health services. Finally, Tsai et al. (2016) used data from the National Health and Resilience in Veterans Study (Pietrzak & Cook, 2013) to look at homelessness risk among the overall Veteran population, but the small number of post-9/11 Veterans (34 total, four of whom reported homelessness) in the survey precluded drawing any definitive conclusions about homelessness among this group.

Deployment is an imprecise measure, as service personnel will spend different lengths of time in various theaters and will have differing experiences. Only a minority will have direct exposure to combat. Two studies examined the association between direct combat exposures and homelessness. Ackerman, Porter and Sullivan (2020) observed a modest but significant association between witnessing death during deployments and increased risk for subsequent homelessness among Veterans enrolled in the MCS. Elbogen et al. (2013), analyzing data from

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the VA's National Post-Deployment Adjustment Survey, observed a significant, positive bivariate association between combat experience and homelessness that became non-significant upon accounting for other covariates. Other studies that examined homelessness specifically among deployed Veterans did not contain any measures that differentiated aspects of Veteran deployment experiences (Blackstock et al., 2012; Brignone et al., 2016; Fargo et al., 2017; Gundlapalli et al., 2015; Metraux et al., 2013; VA Office of the Inspector General, 2012).

PTSD is often considered a medicalized proxy for adverse wartime experience (Smith & True, 2014) and is often considered as a mediating factor in the association between Veteran combat experiences and subsequent homelessness. However, most service members who experienced combat did not report elevated PTSD symptoms meeting a diagnostic threshold (Donoho et al., 2017). Furthermore, studies on PTSD and homelessness have yielded inconsistent results. Four studies have examined homelessness among post-9/11 Veterans and reported findings related to PTSD. Two of these studies found modest associations between PTSD and homelessness risk (Blackstock et al., 2012; Metraux et al., 2013) while two others (Edens et al., 2011; Elbogen et al., 2013) reported no significant associations after adjustment for other factors.

Post-9/11 Veterans experiencing homelessness have a high burden of PTSD. One study of post-9/11 Veterans in VA supportive housing called attention to the contrast between the high prevalence of PTSD diagnoses (67 percent) found in this group compared with older cohorts of homeless Veterans (Tsai, Pietrzak, & Rosenheck, 2013). Another study involving interviews of post-9/11 Veterans who experienced homelessness identified PTSD as a key theme in the Veterans' accounts and documented how PTSD symptoms led to adverse circumstances, such as difficulties maintaining employment and family relations, which directly contributed to

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homelessness. Furthermore, these accounts showed how PTSD and homelessness interact to exacerbate one another (Metraux et al., 2017).

Homelessness risk among female Veterans is often seen as mediated by military sexual trauma (MST), which disproportionately affects female service members. The prevalence rate of MST among female Veterans is estimated at 38 percent, compared to four percent among male Veterans (Wilson, 2018), with several studies finding even higher MST prevalence rates among female Veterans who experience homelessness (Benda, 2006; Brignone et al., 2016; Hamilton et al., 2011). MST was also associated with other homelessness risk factors like mental health conditions and occupational problems (e.g., disabled/unemployed post-service) that could exacerbate risk for homelessness (Pavao et al., 2013; Millegan et al., 2015; Millegan et al., 2016). Washington et al. (2010) observed that MST was associated with a significantly higher risk of homelessness among both female and male post-9/11 Veterans. But as the prevalence of MST is significantly larger among servicewomen compared to servicemen (Wilson et al., 2018), MST and its sequelae are much more pervasive among women in homeless populations.

Another service-related feature of the post-9/11 era that may impact Veteran homelessness is the high level of "bad paper" discharges. The advocacy group Swords to Plowshares reported that 125,000 Veterans (6.5 percent of all post-9/11 Veterans) were ineligible for VA services due to other than honorable (OTH), bad conduct, or dishonorable discharges (Veterans Legal Clinic, 2016). The vast majority of OTH discharges were administrative discharges due to perceived misconduct. The U.S. Government Accountability Office (2017) found that 62 percent of service members who separated due to misconduct had PTSD or traumatic brain injury diagnoses (Brignone et al., 2017; Brooks-Holliday & Pedersen, 2017). A subsequent study by Phillips (2013) supported the contention that the increase in OTH

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discharges was due in part to the military's systematic discharge of personnel with medical or psychiatric conditions for punitive reasons. These discharges may also increase the risk for homelessness. Media headlines such as "'Bad Paper' Discharge Can Lead to Homelessness, Hopelessness" (Ismay, 2016) have been borne out by empirical research. A 2016 survey found 11 percent of Veterans who were homeless reported "negative discharges" that included other than honorable conditions, bad conduct, and dishonorable discharges (Wilder Research, 2016). Further, a study found over 20 percent of Veterans who became homeless over a five-year period had a negative discharge, even though they only comprised 5.6 percent of the study group (Gundlapalli et al., 2015).

Demographic Factors: Gender, Sexual Orientation, and Race and Ethnicity

Another distinguishing feature of the post-9/11 service era is the unprecedented number of women who have served, particularly in an increased range of occupations and with greater exposure to combat. This has led to a growth in the proportion of women among post-9/11 Veterans (National Center for Veterans Analysis and Statistics, 2016) and in the number of female Veterans in the homeless population (Metraux & Smith, 2019). However, studies have not found female Veterans in the post-9/11 cohort to be more likely than their male counterparts to use VA homeless services (Blackstock et al., 2012). Female Veterans were more likely than male Veterans to turn to non-VA, community-based homeless services for shelter and other assistance, especially when they are homeless with children or when their housing issues are linked to intimate partner violence (Byrne, Montgomery & Dichter, 2013). Existing research using VA data sources is therefore limited in its ability to define homelessness risk among women Veterans in the post-9/11 era.

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In 2011, the Department of Defense (DoD) repealed the "Don't Ask, Don't Tell and Don't Pursue" policy, ushering in new policies whereby service members could openly identify as lesbian, gay, or bisexual. The disparate health and behavioral health outcomes, stigma, and attenuated support systems associated with sexual minorities in the military (Grant & Muse, 2018; Goldbach & Castro, 2016) may adversely impact the post-service transition into the community and increase the risk for homelessness (Ecker et al., 2019; Flentje et al., 2016; Fraser et al., 2019).

Among racial and ethnic groups, non-Hispanic Black and Hispanic individuals were observed to have elevated risk of becoming and remaining homeless in a study that examined lifetime risk among a nationally representative sample (Fusaro et al., 2018). These inequities have been tied more generally to discrimination in housing and systemic limitations in economic mobility, structural racism, and to unequal treatment in and access to homeless services (Olivet et al., 2020); these observations also extend to Veteran populations (Fargo et al., 2012; Montgomery et al., 2020).

To summarize, for post-9/11 era Veterans, risk for homelessness involves a range of factors that are shared with non-Veterans, as well as additional potential factors that are specific to military service. While the role of service-related factors and dynamics (particularly those related to combat) take on an outsized presence in popular understanding of Veteran homelessness, the empirical evidence on this is less clear. Despite the attention that Veteran homelessness has received in both the research literature and the media, many assumptions about Veteran-specific factors and their associations with homelessness rest on a tenuous base of empirical support. This led Tsai and Rosenheck (2015) to conclude in their review that "more studies simultaneously addressing premilitary, military, and postmilitary risk factors for Veteran

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homelessness are needed" (177). In addition, most studies looking at Veteran homelessness were based on VA data sources and thus circumscribe Veterans who are either ineligible for or do not use VA services. To address these limitations, the present study, a longitudinal analysis using data from the MCS, represents a comprehensive examination of service-related, demographic and general risk factors for homelessness among a diverse sample of post-9/11 era Veterans regardless of VA use. With a focus on the most recent generation of Veterans, the present analysis examines multiple putative factors for homelessness above and beyond more general risk factors common with non-Veterans.

Methods

Study Population

The MCS was designed to prospectively measure the health of service members during and after their military careers (Gray et al., 2002; Ryan et al., 2007). Enrollment of the first panel began in 2001 with additional panels enrolled in 2004, 2007, and 2011 resulting in over 200,000 participants. Among these panels, approximately 24% of the invited sample enrolled into the Millennium Cohort Study and the response rate to the follow-up surveys is approximately 60% among eligible participants (i.e., alive and have not withdrawn) (Kolaja et al., 2023; Pinder et al., 2012). At enrollment, study participants are recruited from a nationally distributed random sample of actively serving military personnel. Informed consent was obtained at enrollment and participants completed a baseline survey assessing mental, physical, and social well-being and are subsequently requested to complete follow-up surveys approximately every three to five years. In 2014, two questions assessing homelessness were added to the survey.

As this current study examined risk factors for homelessness among Veteran respondents, all participants who were separated from the military at the time they completed the 2014 survey

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were considered for inclusion in this analysis (n=57,485; 39,883 panel members who still in service were excluded from this study). Additionally, participants who did not complete a baseline survey before they separated from the military were excluded (n=8,162). This yielded a final study population of 49,323. Supplementary Table 1 lists descriptive differences in demographic and military factors between the 49,323 participants included in these analyses and the 8,162 participants excluded because they did not complete an MCS survey while serving.

The study was approved by the Naval Health Research Center IRB (protocol number NHRC.2000.0007).

Measures and Statistical Analysis

Homelessness was assessed on the 2014 survey with the following question: "Have you found it necessary to sleep in a shelter, on the streets, or in another non-residential setting because of having no other place to stay? (Please refer to instances during or after military service time)." Those that endorsed the item were asked to indicate the dates of their most recent homelessness situation.

Unless otherwise noted, potential correlates for homelessness were assessed at the last survey completed prior to separation from the military. *Sex*, *race/ethnicity*, *service branch*, *military occupation*, and *pay grade* (junior enlisted, senior enlisted, and officer to include warrant officers) were obtained from military records maintained by the Defense Manpower Data Center (DMDC). DMDC information on race and ethnicity was self-reported by service members and categorized for this analysis as Other (which includes Hispanic, Asian/Pacific Islander, American/Alaskan Indian and other), non-Hispanic Black, and non-Hispanic White individuals. *Marital status* and *educational attainment* were self-reported. *Sexual orientation* was first assessed on the 2014 survey and was categorized as heterosexual, gay/lesbian/bisexual, or

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prefer not to answer. *Eligible time* was calculated as the number of years between the date of separation from the military and the 2014 survey completion (i.e., length of follow-up time).

Separation variables include *discharge status/component* and *age at separation*. Discharge status/component was determined using separation records from DMDC and categorized into National Guard/Reserves, active duty-honorable, active duty-general, or active duty-other than honorable. Discharge status and component were combined because Reserve and National Guard separation records were not detailed enough to be used to distinguish quality of separation. Age at separation was categorized as less than 30, 30-39, or 40 or more years old.

Mental health factors (including *major depression*/*PTSD*, *manic-depression*, and *schizophrenia*) were based on self-report diagnosis or screening criteria. Major depression was assessed with the eight-item depression module of the Patient Health Questionnaire (PHQ) (Spitzer et al., 1999; Spitzer et al., 1994) and PTSD was assessed with the PTSD Checklist-Civilian (Blanchard et al., 1996). Responses from the screeners for depression and PTSD symptoms were categorized as neither condition, depression only, PTSD only, and both PTSD and depression. Participants self-reported whether they had received diagnoses by a health care provider of manic-depression, schizophrenia, and hepatitis. Self-reported general health was based on an item from the Veterans Rand 36-Item Health Survey: "In general, would you say your health is…" Problem drinking was assessed using the PHQ alcohol misuse subscale, where endorsement of any of the items indicated problem drinking. Body mass index (BMI; kg/m^2) was calculated based on self-reported height and weight and categorized as under/normal weight (BMI <25), overweight (BMI 25-29.9) and obese (BMI >=30). Social support was determined with the question "In the last 4 weeks, how much have your family or friends supported you?"

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Self-reported combat exposures were combined with administrative deployment date records to categorize participants as “not deployed”, “deployed without combat”, and “deployed with combat” (Porter et al., 2018). Childhood traumatic exposures (i.e., neglect, physical abuse, sexual abuse, and verbal abuse) were assessed on the 2014 survey using 4 modified items from the Juvenile Victimization Questionnaire Adverse Childhood Experience Questionnaire and were summed (range: 0 to 4) (Hamby et al., 2005). Disabling injury, financial problems, moved more than once, unplanned pregnancy, physical assault, sexual assault, and sexual harassment were assessed with a modified version from the Holmes and Rahe Stress Scale (Holmes & Rahe, 1967). MST could not be directly ascertained from survey data, as the survey asked about experiencing "forced sexual relations or sexual assault" ever on the baseline survey or in the last three years on follow-up surveys with a yes/no response option.

Statistical Analysis

Descriptive statistics presented as frequencies or means with standard deviations were calculated for each predictor by homelessness. Bivariate associations between predictors of interest and homelessness were calculated using logistic regression. These covariates were then incorporated into multivariate logistic regression models to generate adjusted odds ratios. Models stratified by sex were also examined for factors that had an adjusted interaction with sex with a *p*-value less than .20. All analyses were conducted using SAS/STAT software, version 9.4 (SAS Institute, Inc., Cary, NC, USA).

Missing Data

Each survey item had less than 2.5 percent missing when assessed. However, not all items were assessed on every questionnaire. These items had substantially greater proportions of missing data, but because these data are missing completely at random due to the survey wave

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being the mechanism of missingness, observed associations will not be expected to be biased due to missing data (Kolaja et al., 2021). Multiple imputation was used to address missing data. Results were calculated in 100 imputed datasets and were combined using Rubin's rules. Categorical and ordinal variables were imputed using discriminant functions to ensure that imputed values were valid integers.

Results

Of the 49,323 participants in the study group, we considered 1,071 (2.2 percent) to have experienced homelessness following separation from the military. This included 674 (63 percent) who provided a date for onset of homelessness that came after their reported military discharge date and 397 who provided no date for onset of homelessness. An additional 166 respondents gave a date for onset of homelessness that preceded their military discharge date, and were not included among those in the study group who were considered to have experienced homelessness. We also conducted the same analyses where we only considered the 674 observations who reported a specific post-service onset date as having experienced homelessness (see Supplementary Table 2), which yielded similar results to the results reported in this section based upon the more expansive homeless criteria.

Demographic and Military Characteristics

Distributions of demographic and military characteristics of the sample are listed in Table 1. The study population was largely male and non-Hispanic White, and almost half were 40 years or older when they separated from the military. In addition, a plurality of participants served in the Army, were senior enlisted, and were active duty. Almost one third had been deployed during the post 9/11 period.

[Insert Table 1]

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Results from bivariate and fully adjusted models are presented in Table 2. In bivariate analyses, most demographic and military characteristics were associated with homelessness, with the notable exception of sex. However, in the fully-adjusted model, female Veterans were significantly less likely than males to experience homelessness (AOR: 0.79). Several demographic characteristics were more likely to experience homelessness across both models, including non-Hispanic Black race and ethnicity (AOR: 1.74; as compared to non-Hispanic White) and identifying as gay/lesbian/bisexual (AOR: 1.57; prefer not to answer: AOR: 1.64; as compared to heterosexual Veterans). Similarly, pay grade (junior enlisted: AOR: 2.24; senior enlisted: AOR: 1.43; as compared to officers), educational attainment (high school or lower: AOR: 1.43 as compared to Associate's degree or higher) remained significantly associated with homelessness across both models. Conversely, in the multivariate model, marital status, military occupation and service branch were not significantly associated with homelessness.

[Insert Table 2]

Separation Characteristics

In the bivariate analyses (Table 2), active duty service with general/other than honorable discharge increased the odds of experiencing homelessness while older age at separation decreased the odds of experiencing homelessness. In the multivariate model, active duty with general discharge (AOR: 2.78) or other-than-honorable (AOR: 5.18) discharge were more likely to experience homelessness, compared to those who were honorably discharged after active duty service. Additionally, those between 30-39 years old when they separated from the military (AOR: 1.26) were more likely to experience homelessness compared to those younger than 30.

Mental, Physical Health and Social Factors

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Screening positive for major depression/PTSD or endorsements of previous diagnoses of manic-depression, and schizophrenia were associated with homelessness in bivariate analyses. Similar bivariate associations were observed for alcohol problems, worse general health, and lack of social support, but not for other measures of physical health such as overweight or obese BMI and hepatitis diagnosis.

In the multivariate model, diagnosis for manic-depressive disorder (AOR: 1.71) and screening positive for PTSD, with or without depression, (PTSD only: AOR: 1.28; and both PTSD and depression: AOR: 1.44) were associated with homelessness. Those who reported lower levels of family or friend support were more likely to be homeless (Not at all: AOR: 2.12; A little bit: AOR: 2.55; Moderately: AOR: 1.35; compared to reference group reporting high levels of support).

Life Stressors

At the bivariate level, those deployed without combat experience were less likely to experience homelessness than non-deployed participants (OR: 0.83). Those who reported childhood traumas, disabling injury, financial problems, having moved residence more than once, having an unplanned pregnancy, being physically or sexual assaulted, or sexual harassment were more likely to experience homelessness (compared to reporting not having experienced these events). In the multivariate model, having experienced a disabling injury (AOR: 1.24), physical assault (AOR: 1.47), and childhood trauma (AOR for every additional reported trauma: 1.25) were associated with homelessness.

Stratification by Sex

Effect estimates stratified by sex differed at $p < .20$ for the following factors: education attainment (interaction p-value = 0.06), military occupation (interaction p-value = 0.02), age at

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separation (interaction p-value = 0.05), BMI (interaction p-value = 0.09), and number of childhood traumatic exposures (interaction p-value = 0.03). A list of effect estimates for bivariate and multivariate models stratified by sex for the five interactions identified are provided in Supplementary Table 3.

Discussion

This analysis, the most comprehensive longitudinal examination to date of post-9/11 era Veteran homelessness, concurrently examined multiple pre-military and military risk factors. Furthermore, the study was unique in that it was conducted in a representative sample of all service members - regardless of VA access and utilization. While many characteristics of interest had significant bivariate associations with self-disclosed homelessness, many of these observed associations were attenuated in multivariate models. Those characteristics with risks that remained elevated in the multivariate models reinforce three related conclusions. First, the direct links between aspects of military service and homelessness that are widely used to explain why Veterans become homeless had less empirical support than in previous Veteran studies. Second, characteristics that represent risk factors for Veterans mirrored the general population, namely the disproportionate homelessness risk faced by non-Hispanic Black and low-income Veterans. Finally, risk factors such as sexual orientation and findings that contradict previous research (i.e., lower risk among female Veterans) emerged as novel findings on homelessness risk among the post-9/11 Veterans in this study.

Military-Specific Risk Factors

Our findings do not provide evidence that combat experience is a risk factor for homelessness. This study's two combat-related measures - combat deployment and combat specialist military occupation - showed neither bivariate nor multivariate relationships with

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homelessness. This adds to the body of research that does not corroborate the popular concept that homelessness among Veterans often represents an adverse outcome rooted primarily in battlefield experience. The differences between our results and this popular notion of homelessness can likely be attributed to the wide range of covariates in the current analyses, whose impacts superseded and mitigated those of military service covariates in the models. In addition, prior research that focused on older Veterans such as those from the Vietnam era may not be generalizable to the contemporary all-volunteer force.

The one separation-related factor that had a strong association with homelessness risk in our findings was military misconduct as indicated by an OTH discharge. While received by only a small number of Veterans in the study group (0.3 percent), OTH discharge was associated with a greater than fourfold risk for homelessness in the adjusted model. This finding, consistent with previously cited literature, suggests that stigma related to such a discharge type and reduced access to VA and other Veteran supports contributes toward a greater likelihood of homelessness. Targeted outreach to this small subgroup of Veterans that disproportionately experiences homelessness may be an impactful approach for prevention.

While there were substantially higher levels of reported sexual assault and sexual trauma among the Veterans reporting homelessness, these experiences were not associated with elevated risk in the multivariate model nor in models stratified by gender. However, having experienced physical assault and disabling illness or injury were associated with increased odds of homelessness. Given the high rates of experienced violence within the homeless population overall to include the homeless Veteran population, this disparity between types of traumatic events could be more a reflection of the traumatic experience of homelessness itself, rather than an expression of military-specific experiences.

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Sex and Sexual Orientation

Compared to Veterans who indicated heterosexual orientation, those who indicated lesbian, gay or bisexual orientation and those who declined to indicate their sexual orientation were more likely to experience homelessness in both bivariate and multivariate models. To our knowledge, this is the first study to indicate that self-identification as gay, lesbian, or bisexual was associated with increased homelessness risk among Veterans and reveals a post-service vulnerability for a group that has struggled against discrimination and stigma both within both military and civilian society.

Our findings do not support increased vulnerability of female Veterans to homelessness as was found in some recent research (Byrne, Montgomery & Dichter, 2013). Descriptive findings on Table 1 showed roughly equal proportions of women (around 31 percent) among the subgroups of Veterans that did and did not report homelessness. Accounting for multiple covariates, women were less likely to experience homelessness, though we are unaware of any other study in the literature that has a similar finding. This anomalous finding may be due to other research studies on Veteran homelessness typically drawing exclusively from VA populations, and women are much less likely than male Veterans to use VA services (Evans et al., 2019). This indicates that assertions of how women are the "fastest growing demographic among homeless Veterans" (Casura, 2017) would be due more to the increasing representation of women in the military and Veteran population than to differential homelessness risk associated with gender.

Race/Ethnicity and Socioeconomic Status

The elevated risk for homelessness among Black Veterans corroborates the large body of research that documents the stark racial disparity found in the homeless population and likely

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stems from the racism and racial discrimination that exists both in the housing market and society at large (Carter, 2011; Crone, Metraux & Sbrocco, 2021; Los Angeles Homeless Services Authority 2018; Moses, 2019). There is no evidence that this racial disparity in risk for homelessness originates in the military.

Socio-economic status was consistently associated with increased homelessness risk across models. This factor was operationalized into two variables: pay grade and educational attainment. The observed association between military pay grade and experiencing homelessness suggests a higher vulnerability among those in lower ranks as they reenter a civilian society at an economic disadvantage. This vulnerability may be more acute among minority Veterans as they are more disproportionately represented among the lower military ranks than in senior leadership positions (Department of Defense Board on Diversity and Inclusion, 2020). Similarly, lower educational attainment among Veterans was associated with higher risk for homelessness.

Other Factors

Among the array of behavioral and mental health measures assessed in the study population, only diagnosis of manic depression and screening for depression/PTSD were statistically significant predictors in the multivariate model. Focusing on Veterans with these risk factors could be beneficial for future prevention strategies. Because the MCS data has limited information on substance use, our findings related to this specific risk factor – one of the most significant and consistent risk factors in studies on risk factors for Veteran homelessness – are limited.

With respect to childhood traumatic experiences, those who experienced at least one type of childhood trauma were significantly more likely to experience later homelessness. Consistent with other research, the findings here show a significant, positive, and cumulative impact of

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adverse childhood experiences and homelessness for Veterans, a finding that builds upon prior research on adverse childhood experience among service members (Montgomery et al., 2013) and among people experiencing homelessness (Roos et al., 2013).

Finally, we observed that those with the lowest amount of perceived support from friends and family had higher risk for homelessness, consistent with general homelessness literature. These findings underscore the powerful mitigating effects of positive social and familial support systems on homelessness risk for former service members (O'Connell & Rosenheck, 2016), and presumably for non-Veterans as well.

Strengths and Limitations

This analysis had notable limitations. First, our measure of homelessness relied on one survey question with a follow-up question, with no additional means of validating this response. This prevented the authors from further exploring the circumstances of the homelessness episode(s) or assessing other forms of housing instability related to homelessness. The timing of homelessness in relation to separation date from the military was also unclear. Because the survey only inquired about the most recent homeless episode, there was limited ability to assess the duration between military separation and onset of homelessness. As previously described, many who indicated homelessness did not report on the timing of their homelessness. The exclusion of these observations from the analyses did not, however, substantively alter the study results (see Supplementary Table 2).

Second, it is possible that situations of housing instability and other instances of extended institutional stays (i.e., hospitalizations, incarceration) may increase the likelihood that study group members are lost to follow-up and thus result in underreporting of homeless participants among the study group. While the extent to which this occurred in the MCS cannot be

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determined, Litmann et al. (2010) reported that non-response, at least in the first follow up assessment of the MCS, should not bias prospective analyses.

Finally, as we have already mentioned, we were unable to measure substance use beyond self-reported alcohol use, and distinguish MST from sexual trauma experienced outside of military service. While substance abuse is frequently linked to risk for homelessness in other studies, the role of MST as a precursor to homelessness has been far less widely assessed and should be examined in future studies of homelessness among Veterans.

Despite these limitations, among the main strengths was the longitudinal follow-up of participants with the initial ascertainment of exposures and experiences occurring during military service prior to homeless experiences. Additionally, the study was conducted among a large, representative sample of service members and as such has increased generalizability compared to studies examining specific populations like VA enrollees (Gray et al., 2002) and included an expanded set of variables not previously studied in this population, such as sexual orientation. Notably, this population contains individuals who are not eligible for VA services, such as those with other than honorable discharges. Finally, the large sample size allowed for gender-stratified models to be run in which both the male and female models were sensitive to small effects.

Conclusion

This longitudinal analysis of correlates of homelessness among a cohort of post-9/11 Veterans is unique in its ability to prospectively follow a large population (in this case Veterans) and how it incorporates a wide array of potential risk factors. Ultimately, in comparing those in the cohort who reported experiencing homelessness with the others, we find many differences in population characteristics, but few of these differences remain significant after multivariate analysis. Many of the results contribute to ongoing bodies of research about the roles of various

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military and non-military factors in veteran homelessness, and at least one finding, on the association between sexual preference and homelessness risk, represents a novel finding.

However, these findings leave many questions unanswered as to the role that military service plays in subsequent homelessness. We find no associations between deployment to Iraq or Afghanistan, or more specifically with combat roles, and homelessness. We do find significant relationships between screening positive for PTSD and/or depression and homelessness, but cannot ascertain whether this relationship stems from military experience or insufficient mental health care and other supports following service. Similarly, the relationship between bad conduct discharges and homelessness, by now well established, likely involves a combination of predisposing factors, military correlates, and circumstances encountered upon reentering civilian life. These factors combine with other, more general factors with which we find a persistent link to homelessness, including race, family support, sexual orientation, and socioeconomic status, to form a complex set of circumstances. This sets an agenda for further research into how these factors relate with homelessness, how they qualitatively play out in individual lives, and what role the military can play in ameliorating these associations.

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Tables

Table 1: Descriptive statistics of **demographic, military and separation factors, mental, physical and social health, and life experiences[a] among Millennium Cohort Study participants by homeless status (n=49,323)**

	Homeless[b]	
	No (n=48,252)	**Yes (n=1,071)**
Sex		
Male	33,471 (69.4)	737 (68.8)
Female	14,781 (30.6)	334 (31.2)
Race and Ethnicity		
Non-Hispanic Black	4,806 (10.0)	171 (16.0)
Non-Hispanic White	35,928 (74.5)	723 (67.5)
Other[c]	7,486 (15.5)	177 (16.5)
Education		
High School degree or lower	6,630 (13.7)	245 (22.9)
Some college	17,422 (36.1)	485 (45.3)
Associate's or higher	24,195 (50.1)	341 (31.8)
Marital Status		
Single, never married	11,848 (24.6)	376 (35.1)
Currently Married	29,944 (62.1)	510 (47.6)
Divorced, separated, widowed	6,459 (13.4)	185 (17.3)
Sexual Orientation		
Heterosexual	45,170 (93.6)	933 (87.1)
Gay/Lesbian/Bisexual	1,735 (3.6)	83 (7.8)
Prefer not to answer	1,146 (2.4)	49 (4.6)
Service branch		
Army	22,418 (46.5)	541 (50.5)
Navy/Coast Guard	9,209 (19.1)	195 (18.2)
Marines	3,719 (7.7)	127 (11.9)
Air Force	12,906 (26.8)	208 (19.4)
Occupation		
Other	17,047 (35.3)	390 (36.4)
Combat specialist	7,204 (14.9)	169 (15.8)
Healthcare	5,301 (11.0)	94 (8.8)
Admin and supply	13,773 (28.5)	257 (24.0)
Grade		
E1-E4	14,660 (30.4)	573 (53.5)
E5-E9	22,221 (46.1)	398 (37.2)
Officers	11,371 (23.6)	100 (9.3)
Follow up time (continuous) Mean, SD	6.4 (3.6)	6.2 (3.6)
Discharge status/component		
AD honorable	23,363 (48.4)	531 (49.6)

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AD General	375 (0.8)	39 (3.6)
AD Other than honorable	168 (0.3)	31 (2.9)
Reserve/National Guard	21,738 (45.1)	441 (41.2)
Age at separation		
<30	14,949 (31.0)	473 (44.2)
30-39	10,292 (21.3)	288 (26.9)
40 or more	23,011 (47.7)	310 (28.9)
PTSD/Depression screening[d]		
Neither	42,429 (87.9)	758 (70.8)
Depression only	841 (1.7)	37 (3.5)
PTSD only	1,973 (4.1)	99 (9.2)
PTSD and depression	1,826 (3.8)	134 (12.5)
Alcohol problems[e]		
No	32,746 (67.9)	635 (59.3)
Yes	5,619 (11.7)	216 (20.2)
Diagnosis of manic-depression		
No	47,215 (97.9)	1,017 (95.0)
Yes	510 (1.1)	39 (3.6)
Diagnosis of schizophrenia		
No	47,475 (98.4)	1,040 (97.1)
Yes	264 (0.6)	12 (1.1)
General health[f]		
Poor	700 (1.5)	48 (4.5)
Fair	5,630 (11.7)	203 (19.0)
Good	17,481 (36.2)	422 (39.4)
Very good	17,071 (35.4)	281 (26.2)
Excellent	6,611 (13.7)	92 (8.6)
Diagnosis of hepatitis		
No	46,539 (96.5)	1,021 (95.3)
Yes	1,097 (2.3)	28 (2.6)
BMI		
Under/normal weight	15,776 (32.7)	354 (33.1)
Over weight	23,332 (48.4)	499 (46.6)
Obese	8,040 (16.7)	198 (18.5)
Friends and family supportiveness[g]		
Not at all	293 (0.6)	19 (1.8)
A little bit	1,279 (2.7)	77 (7.2)
Moderately	2,257 (4.7)	70 (6.5)
Quite a bit	4,528 (9.4)	76 (7.1)
Extremely	3,584 (7.4)	58 (5.4)
Deployment and combat[h]		
Not deployed	14,472 (30.0)	371 (34.6)

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Deployed without combat	3,127 (6.5)	60 (5.6)
Deployed with combat	9,459 (19.6)	209 (19.5)
Number of childhood traumatic experiences[i] (continuous) Mean, SD	0.8 (1.1)	1.4 (1.4)
Experienced disabling illness/injury[j]		
No	41,390 (85.8)	845 (78.9)
Yes	6,326 (13.1)	212 (19.8)
Experienced financial problems[j]		
No	41,490 (86.0)	855 (79.8)
Yes	6,331 (13.1)	205 (19.1)
Moved more than once[j]		
No	8,167 (16.9)	122 (11.4)
Yes	13,810 (28.6)	352 (32.9)
Had an unplanned pregnancy[j]		
No	23,485 (48.7)	525 (49.0)
Yes	3,194 (6.6)	102 (9.5)
Experienced physical assault[j]		
No	43,553 (90.3)	848 (79.2)
Yes	4,179 (8.7)	205 (19.1)
Experienced sexual assault[j]		
No	43,855 (90.9)	907 (84.7)
Yes	3,952 (8.2)	154 (14.4)
Experienced sexual harassment[j]		
No	42,194 (87.5)	868 (81.1)
Yes	5,630 (11.7)	191 (17.8)

Percent's may not equal 100 because of missing values.

[a]All were assessed items were assessed at the survey completed before separating from the military except for sexual orientation, childhood trauma, and homelessness which were assessed at the 2014-2016 survey.
[b]Self-reported homelessness in response to "Have you found it necessary to sleep in a shelter, on the streets, or in another non-residential setting because of having no other place to stay? (Please refer to instances during or after military service time)".
[c]Other races and ethnicities include American Indian, Asian or Pacific Islander, Hispanic and Multiracial.
[d]Depression was assessed using the Patient Health Questionnaire-8 and post-traumatic stress disorder (PTSD) was assessed using the PTSD Checklist–Civilian Version.
[e]Alcohol problems was assessed using the PHQ alcohol misuse subscale.
[f]General health Self-reported on an item from the Veterans Rand 36-Item Health Survey: "In general, would you say your health is:"
[g]Friends and family supportiveness determined with the question "In the last 4 weeks, how much have your family or friends supported you?"
[h]Deployment, if deployment date was within 3 years of Time 1, was determined using administrative date information; combat was assessed by 5 combat-related items.
[i]Childhood traumatic exposures (neglect, physical abuse, sexual abuse, and verbal abuse) were assessed using 4 modified items from the Juvenile Victimization Questionnaire Adverse Childhood Experience Questionnaire and were summed.

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[j]Disabling injury, financial problems, moved more than once, unplanned pregnancy, physical assault, sexual assault, and sexual harassment were assessed with a modified version from the Holmes and Rahe Stress Scale.

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Table 2: Unadjusted and adjusted odds ratios[a] between demographic, military and separation factors, mental, physical and social health, and life experiences[b] and homelessness[c] among Millennium Cohort Study participants (n=49,323)

	Bivariate Model[a]	Multivariate Model[a]
Female Sex (Ref: Male)	1.03 [0.96, 1.10]	**0.79 [0.66, 0.94]**
Race/Ethnicity (Ref: Non-Hispanic White)		
Non-Hispanic Black	**1.77 [1.49, 2.09]**	**1.74 [1.45, 2.08]**
Other[d]	1.17 [1.00, 1.39]	1.15 [0.97, 1.37]
Education (Ref: Associate's or higher)		
High School degree or lower	**2.62 [2.22, 3.10]**	**1.43 [1.17, 1.76]**
Some college	**1.97 [1.72, 2.27]**	1.18 [1.00, 1.40]
Marital Status (Ref: Single, never married)		
Currently Married	**0.54 [0.47, 0.61]**	0.87 [0.74, 1.02]
Divorced, separated, widowed	0.90 [0.75, 1.08]	0.98 [0.80, 1.19]
Sexual Orientation (Ref: Heterosexual)		
Gay/Lesbian/Bisexual	**2.32 [1.84, 2.91]**	**1.57 [1.23, 2.01]**
Prefer not to answer	**2.07 [1.55, 2.78]**	**1.64 [1.20, 2.23]**
Service branch (Ref: Air Force)		
Army	**1.50 [1.37, 1.63]**	0.94 [0.79, 1.13]
Navy/Coast Guard	**1.31 [1.19, 1.45]**	0.94 [0.76, 1.15]
Marines	**2.12 [1.89, 2.38]**	1.19 [0.99, 1.42]
Occupation (Ref: other)		
Combat specialist	1.02 [0.86, 1.21]	1.19 [0.99, 1.42]
Healthcare	**0.83 [0.67, 1.01]**	1.01 [0.81, 1.26]
Admin and supply	**0.85 [0.73, 0.98]**	0.88 [0.75, 1.02]
Grade (ref: Officers)		
E1-E4	**4.44 [3.99, 4.96]**	**2.24 [1.69, 2.95]**
E5-E9	**2.04 [1.82, 2.28]**	**1.43 [1.11, 1.83]**
Follow up time		
1 year increase	0.98 [0.97, 1.01]	0.99 [0.98, 1.01]
Discharge status/component (Ref: AD honorable)		
AD General	**4.97 [3.51, 7.03]**	**2.78 [1.92, 4.02]**
AD Other than honorable	**10.15 [6.83, 15.09]**	**5.18 [3.35, 8.01]**
Reserve/National Guard	0.95 [0.84, 1.08]	1.00 [0.86, 1.15]
Age at separation (ref: <30)		
30-39	**0.88 [0.82, 0.95]**	**1.26 [1.05, 1.50]**
40 or more	**0.43 [0.40, 0.45]**	0.95 [0.75, 1.20]
PTSD/Depression screening[e] (ref: Neither)		
Depression only	**2.57 [1.85, 3.58]**	1.26 [0.89, 1.80]
PTSD only	**2.77 [2.25, 3.41]**	**1.28 [1.02, 1.62]**
PTSD and depression	**4.04 [3.35, 4.86]**	**1.44 [1.15, 1.82]**

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Alcohol problems[f] (ref: No)	**1.94 [1.66, 2.26]**	1.10 [0.93, 1.30]
Diagnosis of manic-depression (ref: No)	**3.46 [2.48, 4.81]**	**1.71 [1.14, 2.54]**
Diagnosis of schizophrenia (ref: No)	**2.14 [1.22, 3.73]**	0.84 [0.43, 1.64]
General Health[g] (ref: excellent)		
Poor	**4.98 [3.51, 7.07]**	1.41 [0.94, 2.11]
Fair	**2.57 [2.00, 3.29]**	1.07 [0.81, 1.42]
Good	**1.73 [1.38, 2.17]**	1.05 [0.82, 1.34]
Very good	**1.18 [0.93, 1.50]**	0.98 [0.77, 1.25]
Diagnosis of hepatitis (ref: No)	1.20 [0.82, 1.74]	1.23 [0.82, 1.84]
BMI (ref: Under/normal weight)		
Overweight	0.96 [0.83, 1.10]	1.05 [0.91, 1.22]
Obese	1.10 [0.92, 1.31]	1.03 [0.85, 1.25]
Friends and family supportiveness[h] (ref: Extremely)		
Not at all	**4.27 [3.10, 5.88]**	**2.12 [1.48, 3.04]**
A little bit	**4.06 [3.25, 5.09]**	**2.55 [1.99, 3.26]**
Moderately	**1.71 [1.34, 2.19]**	**1.35 [1.05, 1.73]**
Quite a bit	0.99 [0.79, 1.23]	0.94 [0.75, 1.18]
Deployment and combat[i] (ref: Not deployed)		
Deployed without combat	**0.83 [0.73, 0.93]**	1.09 [0.86, 1.39]
Deployed with combat	0.98 [0.92, 1.06]	0.94 [0.81, 1.08]
Number of childhood traumatic exposures[j] (0-4)	**1.48 [1.41, 1.55]**	**1.25 [1.19, 1.32]**
Experienced disabling illness/injury[k] (ref: No)	**1.66 [1.43, 1.94]**	**1.24 [1.04, 1.46]**
Experienced financial problems[k] (ref: No)	**1.58 [1.36, 1.85]**	1.16 [0.98, 1.38]
Moved more than once[k] (ref: No)	**1.73 [1.45, 2.06]**	1.11 [0.88, 1.40]
Had an unplanned pregnancy[k] (ref: No)	**1.55 [1.25, 1.92]**	0.83 [0.65, 1.06]
Experienced physical assault[k] (ref: No)	**2.56 [2.19, 2.99]**	**1.47 [1.23, 1.75]**
Experienced sexual assault[k] (ref: No)	**1.88 [1.58, 2.23]**	1.01 [0.80, 1.26]
Experienced sexual harassment[k] (ref: No)	**1.66 [1.42, 1.94]**	1.10 [0.89, 1.34]

[a] Odds ratio values in bivariate and multivariate results that are in bold exceed threshold of statistical significance at $p<0.05$.
[b]All were assessed items were assessed at the survey completed before separating from the military except for sexual orientation, childhood trauma, and homelessness which were assessed at the 2014-2016 survey.
[c]Self-reported homelessness in response to "Have you found it necessary to sleep in a shelter, on the streets, or in another non-residential setting because of having no other place to stay? (Please refer to instances during or after military service time)".
[d]Other races and ethnicities include American Indian, Asian or Pacific Islander, Hispanic and Multiracial.
[e]Depression was assessed using the Patient Health Questionnaire-8 and post-traumatic stress disorder (PTSD) was assessed using the PTSD Checklist–Civilian Version.
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[h]Friends and family supportiveness determined with the question "In the last 4 weeks, how much have your family or friends supported you?"
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[j]Childhood traumatic exposures (neglect, physical abuse, sexual abuse, and verbal abuse) were assessed using 4 modified items from the Juvenile Victimization Questionnaire Adverse Childhood Experience Questionnaire and were summed.
[k]Disabling injury, financial problems, moved more than once, unplanned pregnancy, physical assault, sexual assault, and sexual harassment were assessed with a modified version from the Holmes and Rahe Stress Scale.

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Accepted Manuscript
Version of Record at: https://doi.org/10.1177/0095327X241259080

Supplementary Table 1 – Descriptive statistics of demographic and military characteristics among Millennium Cohort Study participants by inclusion in homelessness study

	Included n=49,323 Column %	Separated at baseline n=8,162 Column %	p-value
Sex			0.473
Male	69.4	69.8	
Female	30.6	30.3	
Age at separation			<.0001
<30	31.3	55.9	
30-39	21.5	18.8	
40 or more	47.3	25.4	
Race and Ethnicity			<.0001
Black Non-Hispanic	10.1	8.8	
Other	15.5	11.9	
White Non-Hispanic	74.4	79.4	
Education			<.0001
High School degree or lower	13.9	16.8	
Some college	36.3	40.0	
Associate's or higher	50.0	43.2	
Marital Status			<.0001
Single, never married	24.8	29.2	
Currently Married	61.7	57.0	
Divorced, separated, widowed	13.5	13.8	
Component			0.022
Active duty	57.4	58.7	
Reserve/National Guard	42.6	41.3	
Service branch			<.0001
Army	46.6	44.0	
Navy/Coast Guard	19.1	18.7	
Marines	7.8	16.6	
Air Force	26.6	20.7	
Occupation			<.0001
Combat specialist	16.5	21.4	
Healthcare	12.3	10.5	
Admin and supply	31.4	27.4	
Other	39.8	40.7	
Grade			<.0001
E1-E4	30.9	48.1	
E5-E9	45.9	34.2	
Officers	23.3	17.6	

Accepted Manuscript
Version of Record at: https://doi.org/10.1177/0095327X241259080

Supplemental Table 2: Adjusted odds ratios between demographic, military and separation factors, mental, physical and social health, and life experiences[a] and homelessness[b] among Millennium Cohort Study participants, excluding participants who experienced homelessness and did not report an onset date (n=48,926 of which 674 reported homelessness with a date after military separation)

	Multivariate Model
Sex (Ref: Male)	**0.65 [0.52, 0.81]**
Race/Ethnicity (Ref: Non-Hispanic White)	
Non-Hispanic Black	**2.30 [1.85, 2.85]**
Other	1.19 [0.95, 1.48]
Education (Ref: Associate's or higher)	
High School degree or lower	**1.84 [1.42, 2.38]**
Some college	**1.47 [1.18, 1.83]**
Marital Status (Ref: Single, never married)	
Currently Married	0.82 [0.67, 1.00]
Divorced, separated, widowed	1.04 [0.82, 1.33]
Sexual Orientation (Ref: Heterosexual)	
Gay/Lesbian/Bisexual	**1.79 [1.35, 2.39]**
Prefer not to answer	**1.91 [1.32, 2.75]**
Service branch (Ref: Air Force)	
Army	1.15 [0.90, 1.47]
Navy/Coast Guard	1.16 [0.88, 1.54]
Marines	1.37 [0.99, 1.89]
Occupation (Ref: other)	
Combat specialist	1.08 [0.86, 1.35]
Healthcare	0.82 [0.61, 1.10]
Admin and supply	**0.74 [0.60, 0.90]**
Grade (ref: Officers)	
E1-E4	**3.60 [2.30, 5.64]**
E5-E9	**1.94 [1.26, 2.97]**
Follow up time	
1 year increase	1.00 [0.97, 1.02]
Discharge status/component (Ref: AD honorable)	
AD General	**3.12 [2.07, 4.68]**
AD Other than honorable	**6.39 [4.06, 10.05]**
Reserve/National Guard	1.01 [0.84, 1.21]
Age at separation (ref: <30)	
30-39	**1.38 [1.11, 1.71]**
40 or more	0.73 [0.54, 1.00]
PTSD/Depression screening[c] (ref: Neither)	
Depression only	1.42 [0.95, 2.13]
PTSD only	**1.39 [1.06, 1.82]**
PTSD and depression	**1.64 [1.25, 2.14]**

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Alcohol problems[d] (ref: No)	1.02 [0.83, 1.25]
Diagnosis of manic-depression (ref: No)	**1.86 [1.18, 2.91]**
Diagnosis of schizophrenia (ref: No)	0.96 [0.46, 2.04]
General Health[e] (ref: excellent)	
Poor	1.55 [0.93, 2.56]
Fair	1.20 [0.83, 1.75]
Good	1.13 [0.81, 1.58]
Very good	1.11 [0.79, 1.57]
Diagnosis of hepatitis (ref: No)	1.13 [0.65, 1.94]
BMI (ref: Under/normal weight)	
Over weight	0.91 [0.76, 1.09]
Obese	0.80 [0.62, 1.02]
Friends and family supportiveness[f] (ref: Extremely)	
Not at all	**2.43 [1.56, 3.78]**
A little bit	**2.99 [2.16, 4.13]**
Moderately	**1.48 [1.07, 2.05]**
Quite a bit	1.03 [0.77, 1.39]
Deployment and combat[g] (ref: Not deployed)	
Deployed without combat	1.05 [0.76, 1.45]
Deployed with combat	0.89 [0.74, 1.07]
Number of childhood traumatic exposures[h] (0-4)	**1.35 [1.27, 1.44]**
Experienced disabling illness/injury[i] (ref: No)	**1.28 [1.04, 1.58]**
Experienced financial problems[i] (ref: No)	**1.36 [1.11, 1.68]**
Moved more than once[i] (ref: No)	1.11 [0.83, 1.48]
Had an unplanned pregnancy[i] (ref: No)	0.91 [0.68, 1.21]
Experienced physical assault[i] (ref: No)	**1.39 [1.11, 1.73]**
Experienced sexual assault[i] (ref: No)	1.02 [0.77, 1.36]
Experienced sexual harassment[i] (ref: No)	1.00 [0.77, 1.30]

[a]All were assessed items were assessed at the survey completed before separating from the military except for sexual orientation, childhood trauma, and homelessness which were assessed at the 2014-2016 survey.
[b]Self-reported homelessness in response to "Have you found it necessary to sleep in a shelter, on the streets, or in another non-residential setting because of having no other place to stay? (Please refer to instances during or after military service time)".
[c]Depression was assessed using the Patient Health Questionnaire-8 and posttraumatic stress disorder (PTSD) was assessed using the PTSD Checklist–Civilian Version.
[d]Alcohol problems was assessed using the PHQ alcohol misuse subscale.
[e]General health Self-reported on an item from the Veterans Rand 36-Item Health Survey: "In general, would you say your health is:"
[f]Friends and family supportiveness determined with the question "In the last 4 weeks, how much have your family or friends supported you?"
[g]Deployment, if deployment date was within 3 years of Time 1, was determined using administrative date information; combat was assessed by 5 combat-related items.
[h]Childhood traumatic exposures (neglect, physical abuse, sexual abuse, and verbal abuse) were assessed using 4 modified items from the Juvenile Victimization Questionnaire Adverse Childhood Experience Questionnaire and were summed.
[i]Disabling injury, financial problems, moved more than once, unplanned pregnancy, physical assault, sexual assault, and sexual harassment were assessed with a modified version from the Holmes and Rahe Stress Scale.

Accepted Manuscript
Version of Record at: https://doi.org/10.1177/0095327X241259080

Supplemental Table 3: Unadjusted and adjusted odds ratios between demographic, military and separation factors, mental health, and life experiences[a] and homelessness[b] among Millennium Cohort Study participants, stratified by gender (men=34,208 and women=15,115)

	Bivariate		Multivariate Model	
	Men	**Women**	**Men**	**Women**
Education (ref: Associate's or higher)				
High school degree or lower	**2.47 [2.03, 3.01]**	**3.10 [2.27, 4.23]**	1.26 [0.99, 1.60]	**2.05 [1.39, 3.01]**
Some college	**1.87 [1.57, 2.21]**	**2.23 [1.74, 2.85]**	1.05 [0.86, 1.28]	**1.59 [1.18, 2.15]**
Occupation (ref: other)				
Combat specialist	0.98 [0.82, 1.19]	1.38 [0.90, 2.12]	1.10 [0.90, 1.35]	1.54 [0.99, 2.42]
Healthcare	1.06 [0.80, 1.39]	**0.65 [0.47, 0.91]**	1.20 [0.90, 1.60]	0.87 [0.62, 1.22]
Admin and supply	**0.75 [0.63, 0.91]**	0.98 [0.76, 1.26]	**0.77 [0.64, 0.94]**	1.07 [0.82, 1.39]
Age at separation (ref: <30)				
30-39	**0.89 [0.81, 0.98]**	**0.82 [0.71, 0.94]**	**1.26 [1.01, 1.56]**	1.23 [0.89, 1.69]
40 or more	**0.36 [0.33, 0.39]**	**0.63 [0.55, 0.72]**	0.83 [0.62, 1.10]	1.30 [0.87, 1.94]
BMI (ref: Under/Normal)				
Overweight	0.83 [0.70, 0.99]	**1.21 [0.95, 1.54]**	1.02 [0.85, 1.22]	1.12 [0.87, 1.44]
Obese	0.89 [0.72, 1.11]	**1.72 [1.26, 2.34]**	0.90 [0.71, 1.14]	**1.44 [1.03, 2.02]**
Number of childhood traumatic exposures[c] (0-4; by 1 unit)	**1.56 [1.47, 1.65]**	**1.41 [1.30, 1.52]**	**1.30 [1.22, 1.38]**	**1.16 [1.06, 1.26]**

[a]All were assessed items were assessed at the survey completed before separating from the military except for sexual orientation, childhood trauma, and homelessness which were assessed at the 2014-2016 survey.
[b]Self-reported homelessness in response to "Have you found it necessary to sleep in a shelter, on the streets, or in another non-residential setting because of having no other place to stay? (Please refer to instances during or after military service time)".
[c]Childhood traumatic exposures (neglect, physical abuse, sexual abuse, and verbal abuse) were assessed using 4 modified items from the Juvenile Victimization Questionnaire Adverse Childhood Experience Questionnaire and were summed.