Duty, Honor, Country, Disparity: Race/Ethnic Differences

In Self-Rated Health and Disability Among Veterans

Connor M. Sheehan[a]

Population Research Center, University of Texas at Austin

Robert A. Hummer

Population Research Center, University of Texas at Austin

Brenda L. Moore

Sociology Department, State University of New York at Buffalo

John C. Butler

IC2, University of Texas at Austin

Acknowledgements We thank the University of Texas Population Research Center (grant R24 HD42849) for administrative and computing support; the NICHD Ruth L. Kirschstein National Research Service Award (T32 HD007081-35) for training support; the Department of Veterans Affairs for making the data available to the public, and Dr. Pam Paxton for her helpful comments. This paper was presented at the Southern Demographic Association 2012 annual meeting in Williamsburg, Virginia. The contents of this manuscript are solely the responsibility of the authors and do not necessarily represent the official views of NICHD, IC2, the Department of Veteran Affairs or the University of Texas at Austin.

[a] Corresponding author. Department of Sociology and Population Research Center, University of Texas at Austin. Population Research Center, G1800, University of Texas at Austin, Austin, TX 78712-0544; E-mail: connor.sheehan@utexas.edu; Telephone (512) 471-5514; Fax: (512) 471-4886

Abstract

Given their unique occupational hazards and very sizable population, military veterans are an important population group for the study of health. Yet veterans are by no means homogeneous, and the degree to which there are racial and ethnic differences in veterans' health has largely been overlooked. In the general population, members of racial and ethnic minority groups on average self-report significantly worse health and higher rates of disability than Whites. However, minority group veterans have more favorable socioeconomic characteristics than their non-veteran peers and experience less institutionalized racism in the military context than do minority civilians outside of the military context. These favorable factors for minority veterans may result in narrow or even non-existent racial/ethnic health inequalities among veterans. Using the 2010 National Veterans Survey, we document race/ethnic differences in self-rated health and disability status among male veterans and examine reasons for the disparities we uncover. We find that Hispanic and Black veterans report significantly worse health and higher rates of disability than do White veterans. The poorer health of minority veterans is partially, but not fully, explained using controls for military experience, socioeconomic, and health behavior covariates.

Keywords:

Veteran Health, Health Disparities, Disability, Race/Ethnicity

Introduction

The military is the largest employer of men in the United States [1, 2]. In addition to the almost three million women and men currently appointed or enlisted, it is estimated that there are presently over 22 million U.S. veterans [3]. Because of the unique hazards associated with military service, veterans' health tends to be worse than comparably aged civilians [2, 4]. Even if they never actively serve in war, veterans are exposed to different physical, psychological, environmental, and organizational contexts compared to civilians. Moreover, after their service ends, veterans tend to receive different health benefits than civilians [5]. Given the substantial number of citizens who currently serve or previously served in the military, the large cohort of Vietnam veterans entering retirement age, the winding down of wars in Iraq and Afghanistan, and federal agencies reducing budget allocations to the armed forces[6], it is critically important to understand the health needs of veterans in general and sub-populations of veterans in particular. Understanding which veteran subpopulations are more or less healthy is crucial for the efficient allocation of scarce resources to an increasingly large and heterogeneous population.

The purpose of this paper is to first document racial/ethnic differences in health among veterans and, second, to shed light on the differences using statistical models that examine potential explanations. The documentation and examination of racial/ethnic differences in veteran health has largely been overlooked in related literature. Use of the newly released 2010 National Survey of Veterans allows us both document race/ethnic differences in veteran health and to examine sets of military experience, socioeconomic, and behavioral covariates that may be associated with the documented differences. We improve upon past research by: 1) clearly documenting racial/ethnic differences in health among a nationally representative sample of veterans rather than just a specific age cohort of veterans; and 2) testing a range of explanations that may be responsible for race/ethnic differences in veteran health.

Literature Review

The majority of research on veteran health compares veterans to civilians. This research indicates that the health of veterans may be disrupted by service [7], particularly those who were on active duty [2], were engaged in direct combat [8], or subsequently experienced PTSD [9, 10], tends to be worse than civilians. Other evidence indicates that veteran-civilian health differences are minimal at retirement, but that veterans may experience worse health relative to civilians as they age into late life [11]. One explanation that has been posed for the relative health disadvantage of veterans is that these individuals have engaged in risky health behaviors that have undermined their well-being. For example, some data indicate that the negative health outcomes experienced by veterans may be due to their higher rates of cigarette smoking [12]; other work has stressed the higher rate of alcohol use among White veterans in comparison to White civilians [13]. At the same time, other evidence suggests that veterans may be healthier than, or at least as healthy as, civilians. Military members are selected in part based upon their health and intelligence [14]. They are prohibited from using illegal drugs; and if they serve long enough (or are wounded) they are provided lifetime comprehensive medical benefits [5]. Likewise, the military teaches and stresses healthy behaviors such as exercise and skills such as personal responsibility and self-discipline that presumably last well into the retirement years and positively influence health [15]. For example, recent work on Vietnam veterans found little evidence of elevated mortality compared to their civilian peers [16].

Although the evidence comparing veteran and civilian health is somewhat mixed, an extensive literature documents race/ethnic health disparities in the general adult population. Blacks in particular have far worse health, more activity limitations, and higher mortality rates than do Whites. Controls for socioeconomic status reduce but do not eliminate such differences [17-19]. Likewise, U.S.-born Hispanics tend to report worse health than their White peers [20]. Although race/ethnic differences in the health of the general adult population have been extensively documented, less attention has been paid to race/ethnic health differences within the large sub-group of U.S. veterans.

However, two recent studies have given some attention to race/ethnic differences in health among veterans. Focusing on the association between rank and health, MacLean and Edwards show in their tables that Black veterans report worse self-rated health compared to Whites in the Panel Study of Income Dynamics, the 2001 National Survey of Veterans, and the Survey of Retired Military [21]. Their results were inconclusive regarding Hispanics, who reported worse health in some surveys and no difference in other surveys in comparison to Whites. The most recent and comprehensive examination of race/ethnic differences in veteran health was conducted by Teachman [2]. Using the National Longitudinal Survey of Youth (1979), Teachman analyzed the self-reported health of male veterans compared to non-veterans at age 40. Using a quasi-natural experiment, he compared men who took the physical examination required to join the military and passed but did not enroll with those who passed and subsequently enrolled in the military, because the two groups had similar levels of baseline physical health [2]. Teachman asserted that veterans have worse self-reported physical health relative to civilians, even after controlling for income, marital status, smoking, alcohol use, and body mass index. However, Teachman found little difference between Blacks and Whites in reaction to military service (i.e., whether they served on active duty or in the reserves). Teachman [2 p: 333] concludes: "The results failed to provide any support for the notion that there is a race differential in the link between military service and subsequent health. Blacks and Whites are indistinguishable in their reaction to military service, at least in terms of self-reported health." However, Teachman's primary objective was to analyze health differentials between veterans and civilians rather than to compare race/ethnic differences within the veteran population. Moreover, the fact that the health of relatively young Blacks and Whites were not differentially influenced by military service does not mean that there are not wide race/ethnic differences in the health of veterans, given the broader structuring of race/ethnic health differences in the United States [19]. We build on these recent studies by specifically focusing on racial/ethnic differences in health among *all* veterans, by including Hispanics and other racial groups in the analysis rather than just comparing Blacks and Whites, and by focusing on both self-rated health *and* disability.

Hypotheses

There are several reasons to think that race/ethnic differences in veteran health will be minimal or even nonexistent. The military was one of the first American organizations to fully desegregate, and since then has attempted to foster a climate of equal opportunity [5]. Prior research [1, 22-26] highlights favorable marital profiles, occupational satisfaction, and socioeconomic status for minorities who serve in the military. Black and Hispanic males in the military also express greater job satisfaction and quality of life than do White males in the military [25]. After leaving the military, the picture becomes less clear regarding how military service influences the income of minorities, as post-military income appears contingent on pre-service education, historical context, and time since leaving the military [24, 27]. For example, Teachman and Tedrow find that the most educated White veterans earn *less* than their civilian peers, whereas the least educated Blacks earn more than their civilian counterparts. Moreover, unlike for Whites, Teachman and Tedrow conclude that the income of Blacks is not negatively affected by military service. The higher earnings of veteran Blacks may be due to the occupational selection in the military, as Blacks are more likely to choose occupations that have skills transferable to the civilian workforce [5]. Once in the civilian workforce previous work has illustrated that Blacks with administrative military experience were more likely to be called for an interview than Blacks with no military experience [28]. Because marital and socioeconomic resources and occupational characteristics are strong predictors of better health and longer life [29], the socioeconomic attainment of minority veterans may help to equalize their health compared to Whites.

Individuals are also selected into the military based upon good health and other positive characteristics [2]. Consequently, one might anticipate little variation in health between Blacks, Hispanics, and Whites upon entrance to the military. As Teachman asserts, those who enter the military must pass a baseline physical examination, indicating that the health of all individuals is reasonably comparable [2]. Such baseline health equity could help result in narrow or even nonexistent race/ethnic disparities in veteran health. An additional reason to hypothesize selection would minimize health

differences is that previous research finds that White military recruits are relatively less qualified compared to Whites who do not enlist, whereas Black recruits are more qualified compared to Blacks who do not enlist [14].

Finally, the military is often conceptualized as a "total institution," meaning that individual and group differences are curtailed in favor of a de-individuated environment and conformity to military norms [30]. According to this perspective, racial/ethnic differences in everything, including health, should be reduced among military veterans because group differences, such as by race/ethnicity, are diminished in the context of a total institution. Developed by Goffman, the conception of a total institution suggests that race/ethnic differences are minimized as identities and bodies are blended together in the military context to fit institutional demands [31]. Other work has stressed the "moral contract" set by the military, which sets the norms and values of the organization. If the military does not provide equal opportunities, the contract among all members is weakened [5].

On the other hand, it is well known that Black and Hispanic males tend to report significantly worse health than their White counterparts in the general U.S. population [18, 20, 32, 33]. Given such broader minority group disadvantages throughout the life course, a relatively equitable military context may not be powerful enough to result in narrow or nonexistent race/ethnic differences in the health of veterans. Moreover, the US military context, while promoting equity across race/ethnic groups in some ways, is not devoid of racial/ethnic biases and institutionalized discrimination. A recent systematic review, in fact, strongly asserts that there are biases and/or discrimination in several areas of military policy and practice [5]. Burk & Espinoza discuss how minorities in the military are underrepresented among the officer corps, have higher incarceration rates, are more at risk for PTSD, and may face more barriers to VA care than Whites [5]. Previous research has also illustrated increasing mortality disparities between officers and enlisted men, with officers now living 3-4 years longer than enlisted men [34]. As such, the military is not entirely immune from institutionalized discrimination nor is it immune from health disparities among its former members.

Overall, then, there are solid reasons to think that we will find no race/ethnic differences in veteran health or that we will find sizable race/ethnic difference in veteran health. As such, we assert the following two alternative hypotheses to structure the beginning of our analysis:

Hypothesis 1: There are no race/ethnic differences in self-rated health and disability among veterans.

Hypothesis #2: There are race/ethnic differences in self-rated health and disability among veterans: Black and Hispanic veterans exhibit worse health than their White counterparts.

Beyond the documentation of differences, it is important to assess the extent to which any race/ethnic differences in veteran health are impacted by military experience, socioeconomic, and behavioral factors. Indeed, the extent to which specific aspects of military service influence any race/ethnic differences in veteran health is an open question. From recruitment to retirement, minorities in the military may have different opportunities and challenges than do Whites. Blacks and Hispanics may also view the military differently than do Whites—and enlist for different reasons [14, 35]. Enlistment by branch also differs by race/ethnic group, for decades Blacks disproportionately served in the Army and more recently Hispanics have disproportionately served in the Marines [5]. Recent research has also indicated that PTSD among Iraq and Afghanistan veterans may vary by branch of service, with those in the Army and Marines having much higher levels compared to those who served in the Navy [36]. Because Blacks and Hispanics disproportionately serve in the Army and Marines, controlling for branch of service may help to explain health differences due to PTSD. Additionally, previous research has illustrated that Blacks and Hispanic Vietnam veterans reported higher levels of PTSD than did Whites [37], which may in part be due to higher levels of combat exposure for Blacks and lower levels of education for Hispanics [38]. More recently, in Iraq and Afghanistan Blacks and Hispanics were over represented in those who were evacuated for psychiatric reasons compared to all who served [39]. Finally, perceived exposure to environmental toxins has been demonstrated to be deleterious to health. So

controlling for exposure to environmental toxins during war may also help explain race/ethnic differences in health. Thus, controlling for differential military experiences across groups may help our understanding of race/ethnic differences in veteran health.

Hypothesis #3: Race/ethnic differences in health and disability among veterans are in part due to differential military experiences and exposures across groups.

Education and financial resources are crucial for health; they can be used flexibly in the face of an array of challenges to health [29]. If there are significant race/ethnic differences in income and education among veterans, controlling for these differences should help narrow observed health disparities. In the general U.S. population, Black and Hispanic males have lower levels of schooling and earn less income than comparably aged Whites [40, 41]; moreover, the Black-White and Hispanic-White wealth gaps widened considerably between 1984 and 2007 [42]. Despite the research showing that Black and Hispanic veterans have higher incomes than their non-military peers, they still have lower incomes compared to White veterans [24, 27]. Black veterans additionally, have lower levels of education than White veterans [27]. Therefore, controlling for these differences in socioeconomic status should result in narrower health differences across race/ethnic groups.

Hypothesis #4: Race/ethnic differences in health and disability among veterans are in part due to socioeconomic factors.

Perhaps even more so than among civilians, smoking has taken a major toll on the health of veterans [12, 43]. White male servicemen are more likely to smoke than Black or other race servicemen [44]. Chisick, Poindexter, and York find that White male recruits are four times more likely to smoke than Black recruits [44]. On active service duty, Whites are twice as likely to smoke compared to Blacks. Because of the well-known negative consequences of smoking for health, the substantial gap between Whites and other groups in veteran smoking could also influence race/ethnic disparities in veteran health.

Hypothesis #5: Race/ethnic differences in health and disability may be influenced by differential smoking behavior: White veterans may exhibit more favorable health than Black or Hispanic veterans with controls for cigarette smoking.

Data & Methods

Data

Data come from the 2010 National Survey of Veterans (henceforth NSV). The 2010 NSV was commissioned by the U.S. Department of Veterans Affairs to better understand the demands of an increasingly diverse veteran population and guide the allocation of resources and services for veterans [45]. Several unique populations were surveyed: veterans, active duty service members, active duty spouses, veteran spouses, and surviving spouses. For the purpose of this analysis, we focus on the veteran survey. The survey was mailed to a national sample of veterans between fall of 2009 and spring of 2010. The response rate for veterans was 61%. The NVS has three major strengths. First, when the sampling weights are used, the results are generalizable to all veterans. The second major strength of the NVS is that, unlike other data sources, it contains detailed variables regarding the military service experiences of each respondent. A third strength is the substantial sample size.

For our analytic sample we exclude women and veterans who were under age 30 and over 85, because they comprised very small proportions of the sample (for an overview of the health of women in the military, please see [46]). However, we also ran models with the two age extremes in our sample and our substantive results remained the same. Our final analysis sample includes 6,327 male veterans aged 30 through 85.

Measures

We analyze four racial/ethnic groups: Hispanics, non-Hispanic Blacks, non-Hispanic Whites, and anyone who indicated belonging to any other race/ethnic group (henceforth Other Race). To operationalize health, we use three measures: self-rated health (SRH), Activities of Daily Living (ADLs), and Instrumental Activities of Daily Living (IADLs). SRH is a five-point scale where low values indicate better self-rated health and higher values indicate poorer rated health ("1" = "Excellent," "2" = "Very Good," "3" = "Good," "4" = "Fair," "5" = "Poor"). SRH has been used as a method to assess global personal health since the late 1950's [47] due to its remarkable power in predicting mortality [48, 49] both for the overall population and for race/ethnic subgroups [50]. For modeling, we coded SRH as "1" if the respondent indicated that their health was "Fair" or "Poor", and "0" if they indicated their health was any of the other "more healthy" categories.

Our two measures of disability include counts of ADLs and IADLs. For ADLs, respondents were asked if they needed assistance with personal hygiene, eating, transferring to a bed/chair, using the toilet, walking around the house, or getting dressed; we summed the number of ADLs that each respondent indicated needing assistance with. Likewise for IADLs, we summed the following number of activities that the respondent indicated needing assistance with: cooking, managing money, household chores, or using the telephone.

Our analysis includes measures of military service, socioeconomic status, and behavioral variables that are potentially important in understanding race/ethnic differences in veteran health. All of the models control for age in single years. As discussed above, one of the major strengths of the NVS is the information regarding military service, allowing us to assess whether differential military experiences help to explain race/ethnic differences in veteran health. We include military service branch as the following set of dummy variables: (1) Army (reference category), (2) Navy, (3) Marines, (4) Air Force, & (5) other/multiple branches served. To control for length of service, we include a continuous variable for continuous years served in the military. Because those who enlist at different ages may differ in terms of goals for the military and other educational or economic opportunities, we include a dummy variable to

indicate age at enlistment (1 = enlisted at age 22 or above, 0 if 21 or earlier). We also estimated models with age of enlistment as continuous and the substantive results remained similar. Engaging in combat and serving in a war zone can be particularly deleterious for health and we therefore use three variables to control for exposure to violence and war in the military context. The first dummy variable indicates whether or not each person served in a combat or war zone (1 = served in combat, 0 if otherwise); the second indicates whether or not each veteran was ever directly exposed to death (1= exposed to death, 0 if otherwise). Finally, we include a set of dummy variables to measure potential exposures to environmental toxins during service. Veterans who were (1) "definitely exposed" serve as the reference group compared to those who were (2) "probably exposed," (3) "probably not" exposed, (4) "definitely not" exposed, and (6) "unsure" / missing.

We use three variables to measure socioeconomic status. Marital status at the time of the survey is measured as: (1) married (reference category), (2) divorced, (3) widowed, (4) never married, and (5) missing. We code education as a similar set of dummy variables: (1) high school graduates (reference category), (2) those who didn't graduate high school, (3) those with some college, (4) college graduates, (5) those with a professional degree or higher, and (6) missing education. To additionally measure socioeconomic status, we include annual household income, with dummy variables for: (1) $0-$19,999, (2) $20,000-$39,999, (3) $40,000-$75,000, (4) missing, and (5) $75,000 or more per year (reference category).

We also include a set of smoking dummy variables. We code smoking as: (1) never smoker (reference category), (2) former smoker, (3) current someday, or (4) current every day smoker. Former smokers reported smoking over 100 cigarettes in their lifetime but not currently smoking, whereas current smokers are differentiated by whether they reported smoking every day or only on some days. Never smokers are those who reported smoking fewer than 100 cigarettes in their lifetime.

Analytic Strategy

To analyze race/ethnic differences in SRH and disabilities among veterans, we estimated two forms of regression models. We model SRH using logistic regression, which predicts the odds of veterans reporting "fair" or "poor" health relative to the other health categories. For the analysis of ADLs and IADLs, we use negative binomial models. We use negative binomial models instead of Poisson models for three reasons. First, the Poisson model assumes that the counts are independent [51, 52]; however in the case of disability this may not necessarily be accurate. Second, the negative binomial model is considered to be the most conservative and robust of any model estimated for count data [52]. Finally, both counts of limitations are over-dispersed (tested by a likelihood ratio test for alpha $p >$ .0001), indicating that statistically the negative binomial model is the appropriate choice for these circumstances.

In order to investigate the hypotheses we estimate four models for each dependent variable. For each dependent variable, we progressively add groups of variables to examine whether baseline racial/ethnic health differences are adjusted by specific group of control variables. The first model contains only race/ethnicity and age to establish baseline differences in health and to test Hypotheses #1 and #2. In the second model, we test Hypothesis #3 by including all of the military covariates. In the third model we included socioeconomic characteristics covariates to test Hypothesis #4. The final model adds smoking status to test Hypothesis #5.

Results

We begin by discussing the descriptive statistics in Table 1. For dummy variables we show the percentage of observations, whereas for continuous variables we show the mean values with standard deviations in parentheses. Whites comprise the majority of the sample (86.3%), followed by Blacks (6.2%), Hispanics (4.0%), and other races (3.5%). Blacks, Hispanics and members of other races have

worse distributions of SRH compared to Whites. Blacks have by far the highest percentage reporting "poor" health (16.7%), while Whites have the lowest (7.2%). Likewise, Blacks, Hispanics, and other race veterans all report on average higher counts of ADLs and IADLs than Whites. The mean number of ADLs and IADLs are particularly high for Blacks, who report .36 ADLs and .61 IADLs. In comparison, Whites report much lower average counts of limitations: .17 ADLs and .26 IADLs, respectively. Note that the worse reported health of minorities is counterintuitive at this point, considering that Whites in the sample are on average nontrivially older (65.7) on average than Blacks (59.6), Hispanics (59.2) and members of other races (60.9).

Table One about here

Important race/ethnic differences in military service are also apparent in Table 1. Although each race/ethnic group has the highest proportion of enrollment in the Army, rather than other branches, Blacks and Hispanics have higher levels of Army service than Whites. Notably, Blacks, Hispanics, and other races all report higher levels of exposure to war, death, and toxins compared to Whites. If these combat exposures lead to poor health, as some research contends [53], then controlling for these differences should help to narrow the observed racial/ethnic health disparities. Similar to previous research which depicts veteran income and education by race/ethnic group [22, 24]; Blacks and Hispanics have lower levels of income and educational attainment on average than Whites. For example, 26.8% of Whites have household incomes higher than $75,000, while only 15.9% of Blacks and 22.1% of Hispanics have household incomes higher than $75,000. Likewise, Whites (12.1%) have almost double the rates of graduate/professional degrees as Blacks (6.2%). Finally, White veterans have the highest levels of past smoking (52.2%), whereas Blacks report the highest levels of current someday (8.7%) and everyday (22.6%) smoking.

Table Two about Here

Turning to the logistic regressions predicting "fair" or "poor" health, Table 2 depicts the odds ratios associated with *worse* SRH in our four models. Model 1 exhibits overwhelming support for Hypothesis #2 rather than Hypothesis #1. Indeed, when we solely control for age, we find that Blacks have 189%, Hispanics have 58% and individuals of other races have 66% higher odds of reporting poor/fair health compared to Whites. The next three models examine which factors help to explain these significant differences.

The second model of Table 2 tests Hypothesis #3; more specifically, we examine if the differences in reported health are due to military service factors. We find some support for Hypothesis #3: race/ethnic differences in health narrow for each minority group relative to Whites when all of the military factors are controlled for statistically. But controlling for military factors alone does not eliminate the differences. For example, the odds ratios of reporting poor/fair health drop from 2.89 to 2.68 for Blacks compared to Whites, and remain statistically significant. For Hispanics, the odds of reporting poor/fair health decrease from 58% higher to 44% higher compared to Whites. The strongest reduction was among the other race group, whose odds of reporting poor/fair health relative to Whites decreases from 66% higher to 50% higher compared to Whites. We also find that those who served in the Navy, Marines and Air Force all are less likely to report poor/fair health than those who served in the Army. Enlisting later was protective of health. However this may be due to other opportunities that occurred before enlistment (most likely educational attainment). Exposure to death during combat seems to leave an indelible mark on long term health, as those who were exposed to death have 21% higher odds of reporting poor/fair health than those who were not. Of course, this variable may be picking up on other aspects of combat, such as being wounded, for which we have no information.

The third model of Table 3 tests Hypothesis #4. We find that controlling for socioeconomic factors substantially weakens the heightened odds of reporting poor/fair health for Blacks, Hispanics and other race groups compared to Whites. For Blacks the odds ratio of reporting poor/fair health compared to Whites decrease from 2.68 in Model 2 to 2.17 in Model 3, with the difference remaining statistically

significant. For Hispanics, controlling socioeconomic factors results in non-significant relationships in SRH with Whites. This provides strong support for Hypothesis #4. For the other race group, we find that the odds ratio of reporting poor/fair health compared to Whites decreases from 1.50 in Model 2 to 1.40 in Model 3 and, like Blacks, remains statistically significant. Therefore, we find partial support in the case of Blacks and other race groups for Hypothesis #4, and strong support for Hispanics. Education and income operate in the expected directions: higher levels of income and education are strongly associated with lower odds of reporting poor/fair health.

Model 4 of Table 2 controls for smoking to examine Hypothesis #5. Past research has emphasized that veterans' health is worse compared to civilians because of their elevated rates of smoking [12]. We find that controlling for smoking has only modest impact on the race/ethnic differences in SRH. Smoking exhibits the expected association with health: compared to never smokers, past smokers have 31% higher odds of reporting poor/fair health, current someday smokers have 87% higher odds of reporting poor/fair health and current everyday smokers have 117% higher odds of reporting poor/fair health. Overall, even when we statistically control for military variables, socioeconomic status, and smoking, Blacks, Hispanics, and other race veterans are still more likely to report poor/fair health than White veterans. We next investigate if similar findings hold when we examine counts of ADLs and IADLs.

Table Three about here

Table 3 shows the incident rate ratios of four models that predict the counts of ADLs and IADLs, respectively. Analogous to SRH, we find clear support for Hypothesis #2 rather than Hypothesis #1 for both ADLs and IADLs. For example, Blacks exhibit a 155% higher rate ratio for IADLs compared to Whites and a 127% higher rate ratio of ADLs compared to Whites.

Similar to the results for SRH, Model 2 of Table 3 show that disparities in health are mitigated but remain wide once we control for military experience factors. This is particularly true for IADLs,

where significant differences persist between race/ethnic groups net of military controls. After controlling for military factors and age Blacks report 112%, Hispanics report 115%, and other race groups report 90% higher rates of IADLs than Whites. Blacks also report 61% higher rates of ADLs than Whites, but controlling for military factors makes the difference between other race and Whites becomes non-significant. Therefore we gain only partial support for Hypothesis #3 for IADLs and strong support for other race groups and ADLs.

For IADLs in model 3, Table 4, we find that controlling for socioeconomic factors weakens but does not eliminate the race/ethnic differences in ADLs and IADLs. Compared to Whites the increased rates of IADLs drops from 112% to 75% for Blacks, 115% to 73% for Hispanics and from 90% to 65% for other race groups, all of these differences remain highly statistically significant. Thus, similar to SRH for IADLs we again gain only partial support for Hypothesis #4. In the case of Blacks controlling for SES eliminates the difference in ADLs compared to Whites, giving us strong support for Hypothesis #4. Finally, controlling for smoking enhances the difference in IADLs for Hispanics and other races but weakens it for Blacks. Just like SRH when we control for military, socioeconomic, and smoking factors, Blacks report 73% higher rates of IADLs, Hispanics report 79% higher rates of IADLs and other races report 69% of IADLs. For ADLs these factors are controlled for there are no statistically significant race/ethnic differences.

Discussion

Veterans are a large and increasingly diverse population exposed to unique occupational climates and hazards which warrant special attention—especially in relation to health. We find significant race/ethnic differences in self-rated health and disability rates among male veterans. Even when we statistically control for military, socioeconomic status, and smoking covariates, Blacks, Hispanics, and other race/ethnic groups are more likely to report poor health and have higher levels of IADLs than

Whites. Therefore, we gain overwhelming support for Hypothesis #2 that minority veterans in general, and particularly Blacks, are less healthy than Whites.

In contrast to previous research, which found little difference in the effect of military service [2] by race/ethnic group, we find that the health disparities are partially (but not entirely) due to military factors. In support of Hypothesis #3 we find that when we control for military factors the differences in health are reduced, indicating that military factors are important in explain the race/ethnic health differences among veterans. The reductions could be due to each minority group having a higher likelihood of reporting exposure to combat and toxins and being more likely to serve in the Army and Marines than Whites. However, we tested additional interaction models analyzing race/ethnic differences and all the military covariates, and, like Teachman before us, we did not find any significant race/ethnic differences in reaction to our *specific* military covariates. Additionally important, compared to previous research which has shown Blacks report worse health than Whites, we find that the difference in reporting health withstands controls for military factors [21]. The military may be less of a "total institution" than previously indicated, especially in minimizing individual differences in health throughout the life course.

Our work comports with previous research which has documented increasing inequalities in health among veterans based on income [34], and rank [21, 34]. Indeed, although the disparities persist when we control for socioeconomic status, they are reduced significantly. As such we gain partial support for the Hypothesis #4 that socioeconomic differences are an important factor in the creation and maintenance of the reported differences. Therefore, while minorities may self-select into the military based on affirmative characteristics and have favorable income attainment, job satisfaction, and marital status compared to their civilian peers while in the military, the health inequalities may widen when they leave and their income become more like their civilian peers [22, 24]. One way to potentially mitigate such differences in health is to make sure that all veterans are given adequate job training and placement when they leave the military. It is important to recognize and acknowledge the substantial race/ethnic differences in the health of veterans, similar to the general US population, resource inequalities across

populations need to be addressed before health inequalities are eliminated. Finally, we find little evidence that smoking matters much in race/ethnic disparities in health.

Due to our cross-sectional data we can only speculate regarding the mechanism of minority veteran health disadvantage. We offer the following potential explanations. The differences in reported health seem to be a result of non-military civilian processes such as accumulated disadvantage, or lower socioeconomic status compared to Whites. Another explanation is that the civilian disadvantage from in utero to adolescence, may slowly resurface as Blacks, Hispanics, and other races progress through the life course [54].We suggest future researchers explore why such profound disparities in health among veterans are occurring. This area of research seems particularly ripe for longitudinal data and analysis.

There are some limitations to this investigation that readers should consider. We are missing important variables that have been associated with veteran and civilian health. First, the NVS did not include data regarding highest achieved rank. Veterans with higher rank have better health than their lower ranking peers [21, 34]. We attempted to minimize this by including time served, education, and age of enlistment. However, if promotion has remained more difficult for minorities than Whites [5] we could be *overestimating* the differences. Next, we also did not have any variables regarding alcohol consumption. Some have asserted that veterans have worse health than civilians due to their higher levels of alcohol consumption. It remains unclear how unclear how the exclusion of alcohol consumption influenced our analysis because there is no consensus whether or not there are race/ethnic in general and Black/White differences in particular in alcohol consumption among veterans [55]. Another major limitation is that our data source is cross sectional, which does not allow us to understand the health trajectories over time. However, we are unaware of any longitudinal survey of veterans that are generalizable to the entire veteran population. Finally, the veterans may have enrolled for different reasons during different periods (the draft versus the all-volunteer force, for example). However, we ran additional models controlling for period of service and the substantive results remained extremely similar.

Future research should seek to identify the causes of these observed race/ethnic differences in veteran health. This work should pay specific attention to the transition from military life to civilian life and how this may influence health trajectories. Differences in the effectiveness of veteran health care and utilization along race/ethnic lines should also be explored. Future research should also continue to compare race/ethnic differences in health in the civilian population to a comparable veteran population, with the particular focus on Hispanics. We implore researchers to investigate the health of women veterans, soldiers on active duty and other minority groups not covered in depth in this analysis. Our results indicate that the VA and other military organizations should pay specific attention and allocate additional resources to minority (particularly Black) veterans. Allocating focused attention to these groups may result in the most dramatic improvement of any subpopulation and more equitable health among such a deserving population.

References

1. Angrist, J.D. "Estimating the Labor Market Impact of Voluntary Military Service Using Social Security Data on Military Applicants." National Bureau of Economic Research, 1995.

2. Teachman, J. "Are Veterans Healthier? Military Service and Health at Age 40 in the All-Volunteer Era." Social Science Research 40, no. 1 (2011): 326-35.

3. Census, US. "National Security & Veterans Affairs: Veterans." (2012).

4. MacLean, A., and G.H. Elder Jr. "Military Service in the Life Course." Sociology 33, no. 1 (2007): 175.

5. Burk, James, and Evelyn Espinoza. "Race Relations within the Us Military." Annual Review of Sociology 38 (2012): 401-22.

6. Budget, Office of Management and. "Budget of the U.S. Government." edited by White House. D.C, 2012.

7. London, A.S., and J.M. Wilmoth. "Military Service and (Dis) Continuity in the Life Course." Research on Aging 28, no. 1 (2006): 135-59.

8. MacLean, A. "The Things They Carry Combat, Disability, and Unemployment among Us Men." American Sociological Review 75, no. 4 (2010): 563-85.

9. Kang, H.K., T.A. Bullman, and J.W. Taylor. "Risk of Selected Cardiovascular Diseases and Posttraumatic Stress Disorder among Former World War Ii Prisoners of War." Annals of Epidemiology 16, no. 5 (2006): 381-86.

10. Boscarino, J.A. "Posttraumatic Stress Disorder and Mortality among US Army Veterans 30 Years after Military Service." Annals of Epidemiology 16, no. 4 (2006): 248-56.

11. Wilmoth, J.M., A.S. London, and W.M. Parker. "Military Service and Men's Health Trajectories in Later Life." The Journals of Gerontology Series B: Psychological Sciences and Social Sciences 65, no. 6 (2010): 744-55.

12. Bedard, K., and O. Deschênes. "The Long-Term Impact of Military Service on Health: Evidence from World War II and Korean War Veterans." The American Economic Review (2006): 176-94.

13. Richards, M.S., J. Goldberg, M.B. Rodin, and R.J. Anderson. "Alcohol Consumption and Problem Drinking in White Male Veterans and Nonveterans." American Journal of Public Health 79, no. 8 (1989): 1011-15.

14. Teachman, J.D., V.R.A. Call, and M.W. Segal. "The Selectivity of Military Enlistment." Journal of Political and Military Sociology 21, no. 2 (1993): 287-309.

15. LaVerda, N., A. Vessey, and W.F. Waters. "Use of the Veterans History Project to Assess World War II Veterans Perceptions of Military Experiences and Health." Military Medicine 171, no. 11 (2006): 1076-82.

16. Conley, D., and J.A. Heerwig. "The Long-Term Effects of Military Conscription on Mortality: Estimates from the Vietnam-Era Draft Lottery." National Bureau of Economic Research, 2009.

17. Braveman, P.A., C. Cubbin, S. Egerter, D.R. Williams, and E. Pamuk. "Socioeconomic Disparities in Health in the United States: What the Patterns Tell Us." American Journal of Public Health 100, no. S186-S196 (2010).

18. Hummer, R.A., M.R. Benjamins, and R.G. Rogers, eds. Race/Ethnic Disparities in Health and Mortality among the Elderly: A Documentation and Examination of Social Factors. Edited by R. Bulatao N. Anderson, B. Cohen, Critical Perspectives on Racial and Ethnic Differences in Health in Late Life. Washington, DC: National Research Council, 2004.

19. Williams, D.R., and M. Sternthal. "Understanding Racial-Ethnic Disparities in Health Sociological Contributions." Journal of Health and Social Behavior 51, no. 1 suppl (2010): S15-S27.

20. Cho, Y., W.P. Frisbie, R.A. Hummer, and R.G. Rogers. "Nativity, Duration of Residence, and the Health of Hispanic Adults in the United States." International Migration Review 38, no. 1 (2004): 184-211.

21. MacLean, A., and R.D. Edwards. "The Pervasive Role of Rank in the Health of Us Veterans." Armed Forces & Society 36, no. 5 (2010): 765-85.

22. Teachman, J., and L. Tedrow. "Joining Up: Did Military Service in the Early All Volunteer Era Affect Subsequent Civilian Income?" Social Science Research 36, no. 4 (2007): 1447-74.

23. Lundquist, J.H. "When Race Makes No Difference: Marriage and the Military." Social Forces 83, no. 2 (2004): 731-57.

24. Phillips, R.L., P.J. Andrisani, T.N. Daymont, and C.L. Gilroy. "The Economic Returns to Military Service: Race-Ethnic Differences." Social Science Quarterly 73, no. 2 (1992): 340-59.

25. Lundquist, J.H. "Ethnic and Gender Satisfaction in the Military: The Effect of a Meritocratic Institution." American Sociological Review 73, no. 3 (2008): 477-96.

26. Noonan, M.E., and C.J. Mumola. Veterans in State and Federal Prison, 2004: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics Washington, DC, 2007.

27. Teachman, J.D., and V.R.A. Call. "The Effect of Military Service on Educational, Occupational, and Income Attainment." Social Science Research 25, no. 1 (1996): 1-31.

28. Kleykamp, Meredith. "A Great Place to Start? The Effect of Prior Military Service on Hiring." Armed Forces & Society 35, no. 2 (2009): 266-85.

29. Link, B.G., and J. Phelan. "Social Conditions as Fundamental Causes of Disease." Journal of Health and Social Behavior (1995): 80-94.

30. Moskos, C.C., and J.S. Butler. All That We Can Be: Black Leadership and Racial Integration the Army Way. New York, New York.: Basic Books, 1997.

31. Goffman, Erving. "On the Characteristics of Total Institutions." In The Prison, edited by D. Cressey, S. New York, New York.: Holt, Rinehart, and Winston, 1961.

32. Williams, D.R., H.W. Neighbors, and J.S. Jackson. "Racial/Ethnic Discrimination and Health: Findings from Community Studies." American Journal of Public Health 93, no. 2 (2003).

33. Subramanian, SV, D.J. Kim, and I. Kawachi. "Social Trust and Self-Rated Health in Us Communities: A Multilevel Analysis." Journal of Urban Health 79 (2002): 21-34.

34. Edwards, R. "Widening Health Inequalities among Us Military Retirees since 1974." Social Science & Medicine 67, no. 11 (2008): 1657-68.

35. Mare, R.D., and C. Winship. "The Paradox of Lessening Racial Inequality and Joblessness among Black Youth: Enrollment, Enlistment, and Employment, 1964-1981." American Sociological Review (1984): 39-55.

36. Baker, D.G., P. Heppner, N. Afari, S. Nunnink, M. Kilmer, A. Simmons, L. Harder, and B. Bosse. "Trauma Exposure, Branch of Service, and Physical Injury in Relation to Mental Health among Us Veterans Returning from Iraq and Afghanistan." Military Medicine 174, no. 8 (2009): 733-78.

37. Penk, W.E., R. Robinowitz, J. Black, M. Dolan, W. Bell, D. Dorsett, M. Ames, and L. Noriega. "Ethnicity: Post-Traumatic Stress Disorder (PTSD) Differences among Black, White, and

Hispanic Veterans Who Differ in Degrees of Exposure to Combat in Vietnam." Journal of Clinical Psychology 45, no. 5 (1989): 729-35.

38. Dohrenwend, B.P., J.B. Turner, N.A. Turse, R. Lewis-Fernandez, and T.J. Yager. "War-Related Posttraumatic Stress Disorder in Black, Hispanic, and Majority White Vietnam Veterans: The Roles of Exposure and Vulnerability." Journal of Traumatic Stress 21, no. 2 (2008): 133-41.

39. Rundell, James R. "Demographics of and Diagnoses in Operation Enduring Freedom and Operation Iraqi Freedom Personnel Who Were Psychiatrically Evacuated from the Theater of Operations." General hospital psychiatry (2006).

40. Western, B., and B. Pettit. "Black-White Wage Inequality, Employment Rates, and Incarceration." American Journal of Sociology 111, no. 2 (2005): 553-78.

41. Williams, D.R. "The Health of Men: Structured Inequalities and Opportunities." Journal Information 93, no. 5 (2003).

42. Shapiro, T.M., T. Meschede, and L. Sullivan. "The Racial Wealth Gap Increases Fourfold." Waltham, MA: Institute on Assets and Social Policy, Brandeis University (2010).

43. Conway, T.L. "Tobacco Use and the United States Military: A Longstanding Problem." Tobacco Control 7, no. 3 (1998): 219-21.

44. Chisick, M.C., F.R. Poindexter, and A.K. York. "Comparing Tobacco Use among Incoming Recruits and Military Personnel on Active Duty in the United States." Tobacco Control 7, no. 3 (1998): 236-40.

45. Meslé, F., and J. Vallin. "Historical Trends in Mortality." In International Handbook of Adult Mortality, edited by Richard G. Rogers & Eileen M. Crimmins, 9-47. New York City: Springer, 2011.

46. Hoiberg, A., and J.F. White. "Health Status of Women in the Armed Forces." Armed Forces & Society 18, no. 4 (1992): 514-33.

47. Suchman, E.A., B.S. Phillips, and G.F. Streib. "An Analysis of the Validity of Health Questionnaires." Social Forces 36, no. 3 (1958): 223-32.

48. Jylhä, M. "What Is Self-Rated Health and Why Does It Predict Mortality? Towards a Unified Conceptual Model." Social Science & Medicine 69, no. 3 (2009): 307-16.

49. Idler, E.L., and Y. Benyamini. "Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies." Journal of Health and Social Behavior (1997): 21-37.

50. McGee, D.L., Y. Liao, G. Cao, and R.S. Cooper. "Self-Reported Health Status and Mortality in a Multiethnic US Cohort." American Journal of Epidemiology 149, no. 1 (1999): 41-46.

51. Cameron, A.C., and P.K. Trivedi. Regression Analysis of Count Data. Vol. 30. Cambridge, England: Cambridge University Press, 1998.

52. Hoffmann, J.P. Generalized Linear Models: Allyn & Bacon Boston, MA, 2003.

53. Benyamini, Y., and Z. Solomon. "Combat Stress Reactions, Posttraumatic Stress Disorder, Cumulative Life Stress, and Physical Health among Israeli Veterans Twenty Years after Exposure to Combat." Social Science & Medicine 61, no. 6 (2005): 1267-77.

54. Ben-Shlomo, Y., and D. Kuh. "A Life Course Approach to Chronic Disease Epidemiology: Conceptual Models, Empirical Challenges and Interdisciplinary Perspectives." International journal of Epidemiology 31, no. 2 (2002): 285-93.

55. Jha, A.K., M.G. Shlipak, W. Hosmer, C.D. Frances, and W.S. Browner. "Racial Differences in Mortality among Men Hospitalized in the Veterans Affairs Health Care System." Journal of the American Medical Association 285, no. 3 (2001): 297-303.

Table 1. Descriptive Statistics, of Health, Demographic, Military Experience, Socioeconomic Factors, and Health Behaviors, by Race/Ethnicity, Male Veterans aged 30-84, 2010.

	Black	Hispanic	Other	White	All
Self Rated Health					
Excellent	3.1%	6.8%	6.4%	7.5%	7.2%
Very Good	15.2%	25.3%	20.5%	27.5%	26.4%
Good	33.4%	31.7%	34.6%	36.8%	36.3%
Fair	31.6%	24.9%	25.0%	20.9%	21.9%
Poor	16.7%	11.2%	13.6%	7.2%	8.2%
Number of Functional Limitations					
Mean Number of ADLs (Standard Deviation)	0.36 (1.1)	0.24 (0.9)	0.25 (0.9)	0.17 (0.8)	0.19 (0.8)
Mean Number of IADLs (Standard Deviation)	0.61 (1.2)	0.48 (1.1)	0.52 (1.1)	0.26 (0.8)	0.30 (0.8)
Race/Ethnicity					
Black					6.2%
Hispanic					4.0%
Other Race					3.5%
White					86.3%
Mean Age (Standard Deviation)	59.6 (11.9)	59.2 (12.5)	60.9 (12.6)	65.7 (11.6)	64.9 (11.9)
Service Branch					
Army	57.4%	52.7%	39.0%	47.4%	48.1%
Navy	10.9%	15.5%	26.3%	23.0%	22.0%
Maries	11.4%	17.4%	10.1%	8.2%	8.8%
Air Force	16.4%	12.4%	18.0%	18.0%	17.6%
Other/Multiple	3.9%	1.9%	6.5%	3.3%	3.4%
Years of Service (Standard Deviation)	7.7 (7.6)	5.9 (6.5)	7.4 (8.3)	5.2 (6.2)	5.5 (6.5)
Age of Enlistment					
Enlisted 22 and Older	16.1%	18.1%	21.4%	17.2%	17.4%
Age of Enlistment Missing	3.2%	3.2%	1.4%	1.0%	1.3%
Combat Experience					
Served in active war	39.8%	44.6%	44.0%	33.8%	35.0%
Exposed to death	42.2%	44.3%	43.0%	33.0%	34.7%
Chemical Exposures During War					
Definitely Exposed	17.7%	16.0%	20.9%	12.1%	12.5%
Probably Exposed	20.0%	17.8%	19.5%	13.4%	14.6%
Probably Not Exposed	19.9%	20.6%	21.7%	26.0%	25.3%
Definitely Not Exposed	19.9%	23.4%	17.1%	29.3%	28.0%
Unsure/Missing	22.5%	22.2%	20.8%	19.2%	19.6%
Household Income					
$0-$19,999	25.5%	20.1%	14.6%	10.4%	11.9%
$20,000-$39,999	26.2%	21.7%	24.6%	25.4%	25.3%
$40,000-$74,999	27.0%	29.7%	31.4%	31.5%	31.1%
$75,000+	15.9%	22.1%	25.5%	26.8%	25.9%
Missing	5.4%	6.4%	4.1%	5.9%	5.8%
Educational Attainment					
Less than High School Degree	3.5%	7.8%	4.5%	5.8%	5.7%
High School Degree	29.0%	23.4%	20.9%	28.6%	27.9%
Some College	40.5%	35.1%	34.0%	27.6%	28.9%
College Degree	20.1%	24.4%	28.8%	25.2%	24.9%
Professional Degree	6.2%	8.8%	10.2%	12.1%	11.5%
Marital Status					
Married	60.1%	69.1%	67.9%	77.0%	75.1%
Divorced	26.5%	17.0%	19.3%	12.0%	13.3%
Widowed	3.8%	3.5%	2.8%	5.7%	5.4%
Never Married	8.4%	9.9%	8.6%	4.8%	5.3%
Missing	0.9%	0.3%	1.2%	0.2%	0.7%
Smoking					
Never Smoker	32.2%	42.7%	39.2%	31.0%	31.8%
Past Smoker	36.5%	38.1%	35.0%	52.2%	50.1%
Current Someday Smoker	8.7%	6.8%	4.5%	3.7%	4.2%
Current Everyday Smoker	22.6%	12.4%	21.3%	13.1%	13.9%

N = 6,327

Source: National Veteran Survey, 2010.

Table 2. Odds Ratios From Logistic Regression Models Predicting "Fair" or "Poor" Self-Rated Health, Among Male Veterans.

	Model 1	Model 2	Model 3	Model 4
Race/Ethnicity				
(REF = White)				
Black	2.89 ***	2.68 ***	2.17 ***	2.18 ***
Hispanic	1.58 **	1.44 *	1.28	1.42 *
Other Race	1.66 **	1.50 *	1.40 *	1.42 *
Age (Continuous)	1.02 ***	1.03 ***	1.02 ***	1.03 ***
Branch of Service				
(REF = Army)				
Navy		0.65 ***	0.71 ***	0.71 ***
Marines		0.77 *	0.85	0.84
Air Force		0.74 **	0.88	0.88
Other/Multiple Branches		0.79	0.85	0.85
Years Served		0.99	1.01	1.01 †
Age of Enlistment				
Enlisted Age 22 and Older		0.59 ***	0.78 **	0.80 *
Enlistment Date Missing		2.56 ***	1.82 *	1.73 †
Combat Experience				
Served in Combat/War Zone		1.00	0.97	0.99
Exposed to Death		1.21 *	1.27 **	1.26 *
Environmental Hazards				
(REF = Definitely Exposed)				
Probably Exposed		0.70 **	0.67 **	0.68 **
Probably Not Exposed		0.37 ***	0.38 ***	0.39 ***
Definitely Not Exposed		0.32 ***	0.30 ***	0.32 ***
Unsure/Missing		0.63 ***	0.57 ***	0.58 ***
Annual Household Income				
(REF = $75,000)				
$0-$19,999			4.87 ***	4.29 ***
$20,000-$39,999			2.82 ***	2.65 ***
$40,000-$75,000			1.90 ***	1.81 ***
Missing			2.18 ***	2.07 ***
Educational Attainment				
(REF = High School Degree)				
Less Than High School Degree			1.72 ***	1.68 ***
Some College			0.84 *	0.86 †
College Degree			0.66 ***	0.70 ***
Professional Degree			0.47 ***	0.52 ***
Missing			0.68	0.72
Marital Status				
(REF = Married)				
Divorced			0.96	0.92
Widowed			0.84	0.82
Never Married			1.07	1.02
Missing			2.09	1.67
Smoking Status				
(REF - Never Smoker)				
Past Smoker				1.31 ***
Current Someday Smoker				1.87 ***
Current Everyday Smoker				2.17 ***
N		6,327		
LL[1]	-3770	-3586	-3365	-3331

† p < 0.1 * p <0.05 ** p <0.01 *** p < 0.001

Source: National Veterans Survey 2010

[1] Calculated against unweighted model

Table 3. Incident Rate Ratios From Negative Binomial Models Predicting Number of IADLs and ADLs, Among Male Veterans.

	IADLs				ADL			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Race/Ethnicity								
(REF = White)								
Black	2.55 ***	2.12 ***	1.75 ***	1.73 ***	2.27 ***	1.61 *	1.30	1.30
Hispanic	2.29 ***	2.15 ***	1.73 **	1.79 **	1.44	1.31	0.82	0.84
Other Race	2.29 ***	1.90 ***	1.65 **	1.69 **	1.89 *	1.60	1.25	1.30
Age (Continuous)	1.01 *	1.01 **	1.01 **	1.01 **	1.02 ***	1.03 ***	1.03 ***	1.03 ***
Branch of Service								
(REF = Army)								
Navy		0.81 †	0.90	0.92		0.60 **	0.69 *	0.69 *
Marines		0.76 †	0.84	0.86		0.71	0.81	0.82
Air Force		0.73 *	0.83	0.85		0.55 **	0.67 *	0.66 *
Other/Multiple Branches		1.06	1.16	1.17		1.25	1.28	1.27
Years Served		0.99	1.00	1.01		1.00	1.02 †	1.02 †
Age of Enlistment								
Enlisted Age 22 and Older		0.72 **	0.88	0.89		0.57 **	0.71 †	0.71 †
Enlistment Date Missing		1.66 *	1.41 **	1.42		1.43	1.41	1.43
Combat Experience								
Served in Combat/War Zone		0.90	0.90	0.92		0.73 †	0.72 *	0.73 †
Exposed to Death		1.52 ***	1.53 ***	1.53 ***		1.83 *	1.88 **	1.85 **
Environmental Hazards								
(REF = Definitely Exposed)								
Probably Exposed		0.84	0.82	0.84		0.85	0.84	0.85
Probably Not Exposed		0.40 ***	0.42 ***	0.44 ***		0.49 **	0.55 *	0.56 *
Definitely Not Exposed		0.32 ***	0.33 ***	0.34 ***		0.48 **	0.51 *	0.53 *
Unsure/Missing		0.65 **	0.61 ***	0.62 ***		0.97	0.87	0.88
Annual Household Income								
(REF = $75,000)								
$0-$19,999			3.65 ***	3.46 ***			5.96 ***	5.92 ***
$20,000-$39,999			2.62 ***	2.56 ***			2.75 ***	2.73 ***
$40,000-$75,000			1.67 **	1.65 **			1.47 †	1.45
Missing			1.91 **	1.88 **			2.05 *	2.05 *
Educational Attainment								
(REF = High School Degree)								
Less Than High School Degree			1.44 *	1.44			1.47	1.48
Some College			1.07	1.08			1.12	1.13
College Degree			0.85	0.88			1.28	1.32
Professional Degree			0.70 †	0.73			0.57 †	0.59
Missing			1.87	2.00			0.66	0.64
Marital Status								
(REF = Married)								
Divorced			1.00	0.98			0.71	0.97
Widowed			0.80	0.79			0.42 **	0.40 **
Never Married			0.98	0.95			0.71	0.74
Missing			0.62	0.52			2.97	2.36
Smoking Status								
(REF - Never Smoker)								
Past Smoker				1.10				1.20
Current Someday Smoker				1.55 *				1.50
Current Everyday Smoker				1.34 *				1.08
N				6,327				
LL[1]	-3969	-3871	-3794	-3789	-2483	-2448	-2402	-2401

† p < 0.1 * p <0.05 ** p <0.01 *** p < 0.001

Source: National Veterans Survey 2010

[1] Calculated against unweight model