Military Service, Combat Exposure, and Health in Retirement

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Abstract

Military service has traditionally been the domain of healthy, robust males, but service can also reflect risk preference and socioeconomic status. Service also raises the probability of exposure to violence through combat, a significant stressor, and it may represent other types of treatments as well, both positive and negative. We might expect to find an ambiguous relationship between military service and later-life health, and several recent studies support this. In this paper, we explore the relationship between combat exposure and health past age 50 in the Health and Retirement Study, a rich longitudinal panel including many male veterans that now asks about combat exposure in its core survey. Using regression analysis and an instrumental variables approach, we show that combat exposure harms mental health and emotional well-being and raises a biomarker of stress at older ages, but it appears often to have negligible effects on a wide array of physical health metrics.

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1 Introduction

For most of this first decade of the twenty-first century, U.S. armed forces have fought in the wars in Iraq and Afghanistan. After returning home, some service members have and others will leave the military and become combat veterans. According to some research, such veterans have had high rates of disability and unemployment during their civilian work lives (MacLean, 2010*b*). In this paper, we evaluate how the health of men who saw combat in wars from World War II to Vietnam has been affected by combat exposure. We assess whether veterans who saw combat had better or worse self-reported health when they were older than veterans who did not. In order to inform the broader research question of how health varies with military service, we also compare health across three groups: male veterans reporting combat exposure, male veterans who do not, and male nonveterans.

There are several reasons to believe that combat veterans may report worse health than non-combat veterans and than non-veterans. According to previous research such men suffer from mental health conditions, such as post-traumatic stress disorder and depression (Tanielian and Jaycox, 2008). They also suffer worse physical health, being, for example, more likely to report cardiovascular conditions (Johnson et al., 2010). According to other research, they may also be more likely to exhibit poor health behaviors, such as drinking and smoking (Institute of Medicine, 2006). Yet, these veterans may appear to have better or worse health due to selection. Combat veterans have tended to have lower socioeconomic attainment and cognitive ability than non-combat veterans (Gimbel and Booth, 1996; MacLean, 2010*a*), both of which have been associated with worse health (Williams and Collins, 1995).

Combat veterans may also be more likely than men who did not see combat to report having better health. They may be more likely to have access to relatively high-quality health care (Asch et al., 2004) through the Department of Veterans Affairs (VA). In addition, troops have traditionally been assigned to combat if they are healthier on average (Armed Forces Surveillance Center, 2007). Recent studies on health and military service have encountered

difficulty recovering any statistically significant association between the two (London and Wilmoth, 2006; Dobkin and Shabani, 2009), and we suspect it is because there are many countervailing influences.

We are optimistic that focusing on combat in particular rather than veteran status will help sharpen this picture. Examining the National Vietnam Veterans Readjustment Study (NVVRS), Rohlfs (2010) finds evidence that combat exposure raised the proclivity to commit violent acts and criminal behavior among white and especially black men. He did not examine health outcomes, likely because the NVVRS had already been fairly well mined in that regard, and the study was retrospective but not longitudinal. We know that in theory, the healthy warrior effect could fully offset any negative effects of combat. But we believe that mental health is likely to be negatively affected by combat on net even if physical health is not. This would represent an interesting departure from the standard finding of a positive correlation between the two.

In this paper, we assess the connection between combat exposure and health using new data from the Health and Retirement Survey (HRS). We were recently able to have several questions about military service added to the core HRS questionnaire starting with the 2008 wave. In previous waves, new respondents were asked whether they had served on active duty in the U.S. armed forces, what years they began and ended service, whether they had a service-connected disability, and if yes, what VA disability rating they were assigned. In the 2008 wave, all respondents with active-duty military service were also asked whether they had ever fired a weapon or been fired upon and what their rank was at separation. Although the combat exposure variable is a simple binary indicator, we find that it reveals an important new dimension of health inequality among men in older age.

It is well known that selection problems and omitted variables significantly complicate inference in the case of studies of military service (Angrist, 1990; Angrist and Krueger, 1994; Angrist, Imbens and Rubin, 1996; Small and Rosenbaum, 2008). The simple correlation between earnings and military service is likely to reflect ability bias at least in part, and

for similar reasons we expect that the correlation between older-age health and earnings may be biased (Dobkin and Shabani, 2009). To address these issues, we exploit the rich retrospective self-reports in the HRS to control for variables that are typically omitted in large-scale cross-sectional studies, and we also pursue an instrumental variables approach motivated by the work of Rohlfs (2010).

The sections that follow describe the portions of the rich HRS panel dataset that we utilize in greater detail, and then some theoretical considerations that motivate our empirical strategy. Then we present and discuss our results. The final section concludes and explores some policy implications. In related work, one of us (Edwards, 2010) has shown that the costs of caring for veterans of historical U.S. conflicts have been very high, as much as a third to a half of total war costs, and that wars raise total veterans' costs by perhaps a factor of 10 through extensive and intensive margins alike. We expect the current results to help guide policy in the areas of national security and budgeting to the extent they reveal new information about the lifelong costs of war.

2 Data

The Health and Retirement Study (HRS) is a panel dataset designed to be nationally representative of Americans aged 50 years and over starting in 1998. Parts of the panel, which is reinterviewed every two years, extend back to 1992, when two broad but separated original birth cohorts were first interviewed. Although never designed specifically to measure the characteristics of older veterans, the HRS currently includes almost 3,500 male veterans and 172 female veterans in its 2008 wave. Especially in the case of the former, these veterans belong to many birth cohorts, and like the nonveterans in the HRS, they are a very heterogeneous group.

The chief advantages of the HRS are the breadth of its coverage of socioeconomic status (SES) and health, and its panel nature. A shortcoming is its relatively small size, especially

compared to other studies of military service. These tend to examine Census or Social Security data (Angrist, 1990; Angrist and Krueger, 1994; Angrist, Imbens and Rubin, 1996; Small and Rosenbaum, 2008) or the National Health Interview Survey (Dobkin and Shabani, 2009) in order to draw power off of instrumental variables constructed from date of birth. The NVVRS is also a relatively small study, but it covers a much more homogeneous subpopulation of birth cohorts at high risk of being drafted during the Vietnam War.

The innovation of this paper over earlier efforts examining military service and the HRS, such as London and Wilmoth (2006), is that we are able to measure self-reported combat exposure, a key facet of service that is not universally experienced. After we suggested the idea to the HRS steering committee, they graciously agreed to insert the following question into the core questionnaire starting with the 2008 wave:

Did you ever fire a weapon against the enemy or come under enemy fire?

All respondents who indicated they had served in the active military of the U.S. were asked this question.[1] The top row of Table 1, which presents basic sample characteristics, shows that 943 of the 3,453 male veterans in the 2008 wave, or 27 percent, indicated that they had experienced combat of this nature. As a share of all males in the sample, combat exposure is about 14 percent.

Figure 1 plots the veteran rate and self-reported combat exposure we observe among males in the 2008 wave of the HRS by year and quarter of birth. Figure 2 shows the same for men measured in the 1980 Census and the 2001 National Survey of Veterans, the two best public datasets we have that measure veteran status and combat exposure more broadly. The latter asked over 20,000 veterans whether they had served in a combat or war zone, and whether they had been exposed to dead, dying, or wounded people. We combined average

[1]We recently discovered that the HRS "Leave-Behind Questionnaires" in the 2006 and 2008 waves, both called "Lifestyle or Psychosocial Questionnaires," also asked *Have you ever fired a weapon in combat or been fired upon in combat?* According to the HRS documentation, "in 2006 and 2008, the Leave-Behind Questionnaire was incorporated into the Enhanced Face-to-Face Interview and covered half of the full sample in 2006, and the other half in 2008." This would make these data similar to the biomarkers collected on half the HRS panel in 2006 and the other half in 2008 and obvious elements we need to explore in future revisions.

responses to those two questions by year and quarter of birth with veteran rates by year and quarter of birth in the 1980 Census public-use file provided by iPUMS, and the results are the two lower trajectories in Figure 2.

In both figures, combat exposure is highest among birth cohorts of the 1920s, for whom it averages nearly 40 percent, and the veteran share is similarly very high at 75 or 80 percent. Combat exposure drops significantly for cohorts born after about 1927, reflecting how the end of World War II coincided with that cohort's turning 18. For the HRS cohorts, military service does not appear to drop as dramatically after 1927, and this is also mostly true in the Census data shown in Figure 2. The small size of the HRS sample injects a considerable amount of volatility into the series, so it is difficult to say whether the HRS cohorts are appreciably different in their military service than comparable cohorts not in the study.

What stands out in both figures is the relatively sharp increase in combat exposure among birth cohorts of the late 1940s owing to the Vietnam War, a sharper increase than we see in military service. This pattern is implicit in the lower half of Table 1, which shows numbers of combat and noncombat veterans by service during conflicts, which we inferred from years of beginning and ending military service. Among surviving veterans of World War II in the HRS, the share reporting combat was about 45 percent. This fell to 28 percent during the Korean War before rising to 34 percent for veterans serving during the Vietnam War. Veterans of more recent conflicts in the HRS have higher rates of combat exposure still. If combat is a negative influence on outcomes, such a trend is worrisome.

The rest of Table 1 illustrates the differences between nonveterans, noncombat veterans, and combat veterans in terms of their socioeconomic characteristics. Because of the nature of the HRS and the timing of major wars, nonveterans in the 20008 wave are disproportionately younger. They are also more likely than veterans to be African American or Hispanic. Although nonveterans have less education than veterans of either type, they have higher household incomes. But household wealth is highest among noncombat veterans and similar among nonveterans and combat veterans. If there is a single message that emerges from Table

1, it is that multivariate regression techniques are appropriate with such a heterogeneous sample comprised of many birth cohorts.

Tables 2 and 3 cross-tabulate measures of health and healthy behavior with veteran status and combat exposure. Combat veterans appear often to be the least healthy of the three groups, but part of that is surely due to the significant difference in average age we saw in Table 1. The expected age at death in the second row of Table 2, a statistic we calculate based on current age and subjective survivorship expectations, is highest for combat veterans because they have reached older ages. In nearly every other category, they report worse health.

But it can also be true that veterans of either variety appear either healthier than nonveterans in the HRS or at least no less healthy, depending on the measure. This seems particularly true in the case of the mental health measures that appear toward the bottom of the table, but not all measures indicate a greater mental disease burden on nonveterans. The summary CESD score produces a metric of unhappiness that is similar for nonveterans and combat veterans, around 1.3, and lower for noncombat veterans.

Perhaps the clearest gradient is visible in doctor diagnoses of cancer, lung disease, and heart problems in the middle of Table 2. Here noncombat veterans appear more unhealthy than nonveterans, and combat veterans are unhealthier still. Much attention has recently been paid to the roles of military service in explaining smoking and mortality (Bedard and Deschênes, 2006), and these patterns are certainly consistent with such a link.

Table 3 shows patterns in healthy behaviors by veteran and combat status, and here the evidence of any link to smoking is decidedly less clear. Nonveterans in the HRS are more likely to be smoking currently, report virtually the same rates of ever having smoked, and smoke more on average than veterans of either type. But here again, age differences could easily be salient. As shown in the rest of the table, unconditional patterns in drinking, exercise, body mass, and preventive health measures across these three groups are similarly inconclusive. The latter are higher among veterans than nonveterans, but again may be

explained by advanced age.

By tabulating a vast array of childhood health characteristics across these three groups, Table 4 reveals the nearly unparalleled richness of the HRS dataset. In 2008, respondents were asked to rate their health in childhood, defined as before age 16, on a standard five-point Likert scale and as a series of yes or no answers to questions about 24 other conditions. Respondents had always been asked about their parents' education levels, which appear at the bottom of the table, and they were also asked about their parents' smoking behavior. Except in the case of common childhood diseases like chicken pox, the table captures one important aspect of the selectivity of military service: nonveterans were more likely to have been unhealthy as children. To be sure, few of these retrospective self-reports indicate high prevalence rates for anything that would appear to have disqualified individuals for military service. That many conditions including indicators of mental illness are reported to some extent by all three groups is probably more suggestive that we can use these data to control for preexisting conditions rather than model the determinants of military service. Separately, we ran three separate regressions of military service, combat exposure, and older-age health status on these childhood variables and found much the same story. Especially combat exposure and to some extent military service appear to be basically orthogonal to these early-life conditions, but older-age health is predicted by childhood health. To be sure, such results suggest we will not have not solved any omitted-variables bias problems by controlling for these variables in a regression of old-age health on military service. But the sheer breadth of measures in Table 4 also weakly implies there may not be one at all. It may also be the case that we still are not able to measure the ethereal concept of ability to an appropriate degree.

3 Theory

Our basic reduced-form regression equation models health for individual i at time t, H_{it}, as a linear function of proximate determinants:

$$H_{it} = \alpha_i + \beta C_i + \gamma V_i + B \cdot X_{it} + \epsilon_{it} \tag{1}$$

where C_i is a dummy for combat exposure; V_i is a dummy for veteran status; and X_{it} is a vector including time-varying covariates like age, income, wealth, and marital status, as well as fixed characteristics like race and education. Of primary interest are the coefficients β and γ and their sum; we want to know the marginal effect of combat exposure on veterans, the marginal effect of being a veteran on health, and we also want to know the net outcome relative to nonveterans, which is the sum of β and γ.

A primary obstacle to recovering unbiased and consistent estimates of β and γ is that we know there is selection into military service and probably also into combat. A vast literature in labor economics documents these issues (Angrist, 1990; Angrist and Krueger, 1994; Angrist, Imbens and Rubin, 1996). Several instrumental variables methods offer some hope for disentangling the causal effect of service and combat from the ordinary association, and we explore both. One method is to use quarter of birth as an instrument (Angrist and Krueger, 1994; Small and Rosenbaum, 2008), because birth cohorts attaining draftable age either right before or right after major turning points in armed conflicts typically have very different rates of military service. Another method is closely related; one can also use the veteran proportion and the combat-given-veteran proportion among narrowly defined birth cohorts as instruments for individual veteran status and combat exposure (Rohlfs, 2010). These techniques are neither fool-proof nor beyond criticism, but they are standard tools in the literature.

Unfortunately, a fixed-effects approach is not feasible given the data constraints even though the HRS is a panel. We have experimented in a companion research effort with fixed-

effects estimation of labor earnings as measured in restricted Social Security annual earnings records, which straddle the years of reported military service and thus combat exposure. But we do not observe health before and after military service; a fixed-effects approach would wash out time-invariant variables like veteran status and combat exposure. But in a future draft, we plan to experiment with a random effects model, a feasible specification, using the repeated observations of health during the HRS panel.

We also use the rich retrospective life histories of individuals in the HRS to help us with omitted variable bias and potentially with causality. As shown in Table 4, we know parental education levels, which we suspect will have partially caused own education, socioeconomic status (SES), and occupation; and we also know a rich variety of characteristics about conditions during youth, with a special focus on health status and health behaviors like smoking. Formalizing the impacts of these parental inputs P_i and childhood health (endowments) H_{i0} leads us to a second regression equation with these extra controls:

$$H_{it} = \alpha_i + \beta C_i + \gamma V_i + B \cdot X_{it} + +\nu P_i + \delta H_{i0} + \epsilon_{it}. \tag{2}$$

If early life conditions determine older-age health and military service, and if there are no other omitted variables influencing the error term ϵ_{it}, then estimating equation (2) will recover unbiased estimates of the parameters.

4 Results

4.1 OLS with basic controls

The first pass is cross-sectional estimation of equation (1) in the $t = 2008$ wave of the HRS using its broad array of health outcome measures sequentially for H_{it}. The marginal effects β and γ are shown along with their standard errors and regression diagnostics in Tables 5A and 5B, with results for each dependent variable shown along the rows. Although findings

vary somewhat across the various health metrics, the basic results are that combat exposure is generally significant while veteran status is often not; and that combat exposure is always bad for health when it is significant.

In particular, Table 5A shows that self-assessed measures of health, arrayed toward the top, are never worse for noncombat veterans, but all are significantly worse for those who self-report combat. Among the biomarkers we consider, we find that combat is associated with an elevated pulse, a finding consistent with elevated stress. By contrast, blood pressure seems if anything to be lower among all veterans. Results of modeling blood hemoglobin and cholesterol (not shown) revealed no statistically significant association with military service or combat.

Doctor diagnoses of health conditions ever had indicate more diagnosed conditions for veterans and more still for combat veterans, as shown most clearly by the last regression in that panel that models total diagnoses. Veterans have had 0.131 more conditions, and combat veterans an additional 0.176 beyond that. Both are largely traceable to cancer, lung disease, and heart problems, but combat veterans are also diagnosed with emotional, psychiatric, or memory problems more than the other two groups.

Another clear message from the bottom of Table 5A is that combat veterans are more functionally disabled. This is true for each of the summary measures we consider, a mix of activities of daily living, instrumental activities, and other functional indexes. Noncombat veterans are if anything less functionally disabled than nonveterans, which is consistent with a protective "healthy warrior" effect.

Table 5B shows patterns in mental health and healthy behaviors. Results for the latter are mixed, with noncombat veterans apparently taking more risks with their health than nonveterans and combat veterans, except insofar as both types of veteran engage in preventive behaviors more than nonveterans. There is no clear evidence about smoking, but it is suggestive of a positive marginal effect of veteran status and of combat.

Patterns in mental health are probably the most stark. Veterans who self-reported combat

are significantly worse off in terms of mental health than either nonveterans or veterans who did not see combat. The largest individual effects of combat appear to be on restless sleep, feeling everything was an effort, not feeling happy, and feeling depressed, in that order. Overall, while noncombat veterans actually had a lower CESD index of unhappiness than nonveterans, combat veterans had an average index that was higher than that for noncombat veterans and probably also higher than that for nonveterans.

4.2 OLS with basic, youth, and parental controls

To be written. Basic story appears unchanged.

4.3 2SLS with basic controls

To be written. Estimation issues: ivprobits don't converge, so linear probability model with 2SLS is the fallback. Some results on physical health evaporate or switch signs, but results on pulse and mental health appear to remain strong.

5 Discussion

We find that combat exposure is negatively associated with mental health and with heart rate, while it is either not associated or even positively associated with measures of physical health including biomarkers and physicians' diagnoses. Combat exposure is also positively associated with smoking, a negative influence on health, but positively associated with exercise and if anything, negatively associated with body mass index. The composite picture that emerges is consistent with one of healthy warriors with "invisible wounds" (Tanielian and Jaycox, 2008).

Our results provide new insights into the effects of military service. While we are unable to disentangle the effects of all the elements of service, the new data in the HRS allows us to identify what we view as a very important channel running from service into health. Our

results suggest that combat exposure takes a significant toll on mental health, even if there appears to be no net effect on the quality of physical health or on expectations of longevity. These findings bear strong implications for the design of policies to care for veterans and provide new insights into the dynamics of health over the life cycle.

References

Angrist, Joshua D. 1990. "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records." *American Economic Review* 80(3):313–336.

Angrist, Joshua D. and Alan B. Krueger. 1994. "Why Do World War II Veterans Earn More than Nonveterans?" *Journal of Labor Economics* 12(1):74–97.

Angrist, Joshua D., Guido W. Imbens and Donald B. Rubin. 1996. "Identification of Causal Effects Using Instrumental Variables." *Journal of the American Statistical Association* 91(434):444–455.

Armed Forces Surveillance Center. 2007. "'Healthy Deployers': Nature and Trends of Health Care Utilization During the Year Prior to Deployment to OEF/OIF, Active Components, U.S. Armed Forces, January 2002–December 2006." *Medical Surveillance Monthly Report* 14(3):2–5.

Asch, Steven M., Elizabeth A. McGlynn, Mary M. Hogan, Rodney A. Hayward, Paul Shekelle, Lisa Rubenstein, Joan Keesey, John Adams and Eve A. Kerr. 2004. "Comparison of Quality of Care for Patients in the Veterans Health Administration and Patients in a National Sample." *Annals of Internal Medicine* 141(12):938–945.

Bedard, Kelly and Olivier Deschênes. 2006. "The Long-Term Impact of Military Service on Health: Evidence from World War II and Korean War Veterans." *American Economic Review* 96(1):176–194.

Dobkin, Carlos and Reza Shabani. 2009. "The Health Effects of Military Service: Evidence from the Vietnam Draft." *Economic Inquiry* 47(1):69–80.

Edwards, Ryan D. 2010. "U.S. War Costs: Two Parts Temporary, One Part Permanent." *NBER Working Paper* 16108.

Gimbel, Cynthia and Alan Booth. 1996. "Who Fought in Vietnam?" *Social Forces* 74:1137–1157.

Institute of Medicine. 2006. *Health Effects of Serving in the Gulf War*. Washington, DC: The National Academies Press.

Johnson, Anna M., Kathryn M. Rose, Glen H. Elder, Jr., Lloyd E. Chambless, Jay S. Kaufman and Gerardo Heiss. 2010. "Military Combat and Risk of Coronary Heart Disease and Ischemic Stroke in Aging Men: The Atherosclerosis Risk in Communities (ARIC) Study." *Annals of Epidemiology* 20(2):143–150.

London, Andrew S. and Janet M. Wilmoth. 2006. "Military Service and (Dis)Continuity in the Life Course: Evidence on Disadvantage and Mortality From the Health and Retirement Study and the Study of Assets and Health Dynamics Among the Oldest-Old." *Research on Aging* 28(1):135–159.

MacLean, Alair. 2010*a*. "The Stratification of Military Service and Combat Exposure, 1934–1994." *Social Science Research* .

MacLean, Alair. 2010*b*. "The Things They Carry: Combat, Disability, and Unemployment among US Men." *American Sociological Review* 75(4):563–585.

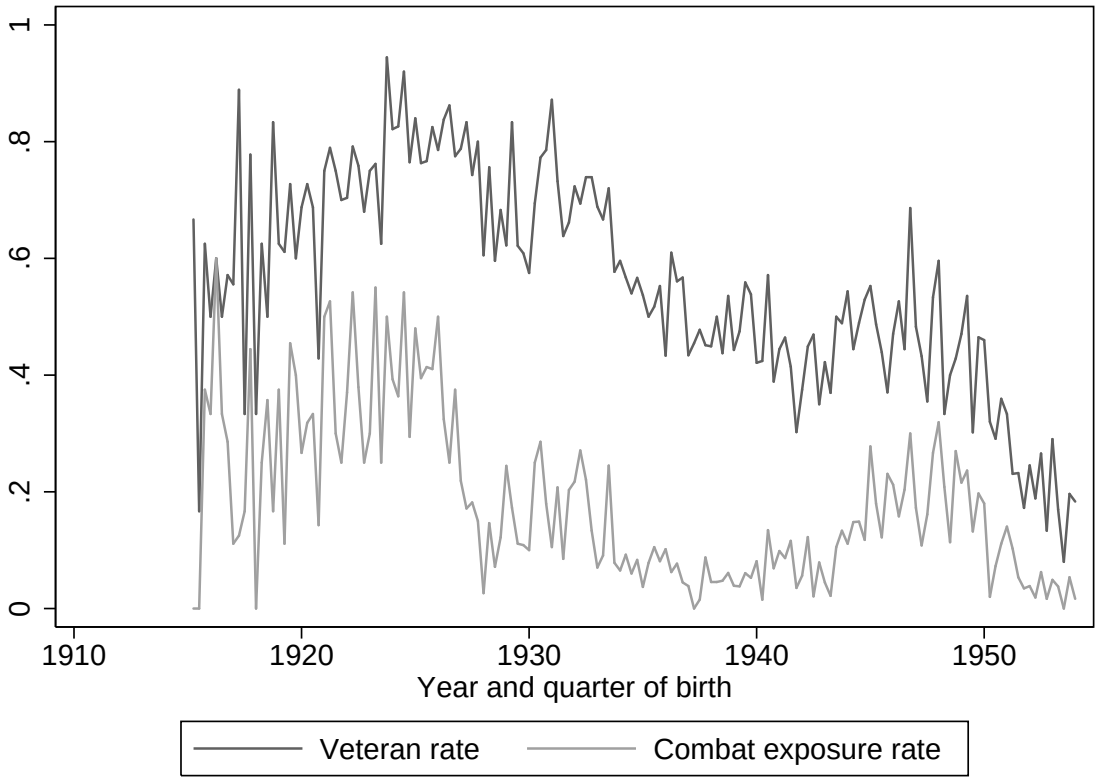
Rohlfs, Chris. 2010. "Does Combat Exposure Make You a More Violent or Criminal Person?" *Journal of Human Resources* 45(2):271–300.

Small, Dylan S. and Paul R. Rosenbaum. 2008. "War and Wages: The Strength of Instrumental Variables and Their Sensitivity to Unobserved Biases." *Journal of the American Statistical Association* 103(483):924–933.

Tanielian, Terri and Lisa H. Jaycox, eds. 2008. *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery.* Santa Monica: RAND Corporation.

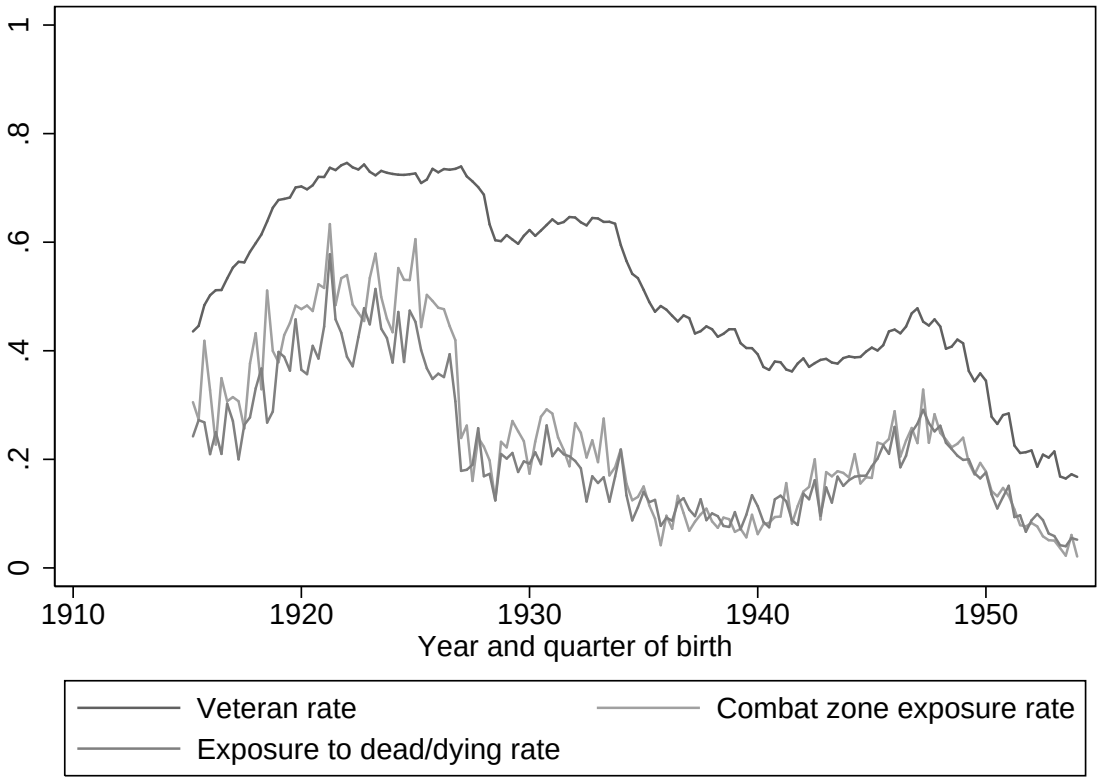
Williams, David R. and Chiquita Collins. 1995. "US Socioeconomic and Racial Differences in Health: Patterns and Explanations." *Annual Review of Sociology* 21:349–386.

Figure 1: Rates of veteran status and combat exposure by birth year and quarter among men in the 2008 wave of the HRS



Notes: Data are averages of veteran status and self-reported comabt exposure computed over men grouped by year and quarter of birth. The source is the 2008 wave of the Health and Retirement Study (HRS).

Figure 2: Rates of veteran status, combat exposure, and exposure to dead or dying people by birth year and quarter among men in the 1980 Census or the 2001 National Survey of Veterans



Notes: Data on veteran rates are averages of veteran status over men grouped by year and quarter of birth from the public use file of the 1980 Census, obtained from the iPUMS project. Data on male veterans' exposure to combat zone and to dead, dying, or wounded people by year and quarter of birth were obtained from the 2001 National Survey of Veterans and then multiplied with the veteran rate from the 1980 Census to produce the two series on rates of combat exposure and exposure to dead or dying by quarter of birth.

Table 1: Demographics and military service by veteran status and combat exposure, men over age 50 observed in HRS 2008

	Nonveterans	Noncombat veterans	Combat Veterans
Count	3,336	2,510	943
Age in 2008	66.8	71.8	73.7
Percent black	0.156	0.092	0.105
Percent Hispanic	0.138	0.040	0.037
Percent currently married	0.76	0.788	0.769
Percent never married	0.041	0.023	0.013
Average years of education	12.1	13.2	13.1
Percent < High school	0.290	0.126	0.146
Percent = High school	0.283	0.365	0.320
Percent > HS < College	0.169	0.237	0.302
Percent >= College	0.258	0.272	0.230
Average household income in 2007	$93,857	$72,383	$67,333
Average household total assets	$529,472	$610,599	$532,609
Average VA disability rating		0.008	0.038
Percent with positive rating		0.016	0.065
Count who served during:			
WWII		423	331
Korea		545	209
Vietnam		783	406
Gulf War I		27	19
Iraq and Afghanistan		1	2
Average years of service		3.8	5.8
Percent officer		0.092	0.139

Notes: Data are from the 2008 wave of the Health and Retirement Study (HRS), public release and the RAND contribution version J. The first column consists of males over 50 who are not veterans; the second column includes male veterans who did not self-report seeing combat; the third columns includes male veterans who did. Total assets include the value of housing and vehicles in addition to financial assets but omit defined benefit pension wealth. VA disability ratings in 2008 are constructed as ever-reported ratings. Service during wars and average years of service are based on beginning and ending years of military service. Percent officer is the share of veterans who reported being officers rather than enlisted or warrant officers.

Table 2: Health status by veteran status and combat exposure, men over age 50 observed in HRS 2008

	Nonveterans	Noncombat veterans	Combat Veterans
Average self-reported health	2.94	2.83	3.03
(1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor)			
Expected age at death	85.6	88.4	88.7
Percent reporting:			
Fair or poor health	0.312	0.265	0.344
Health-related work limitations	0.284	0.295	0.404
Back problems	0.322	0.305	0.363
Percent reporting doctor diagnosis ever of:			
High blood pressure	0.599	0.627	0.646
Diabetes	0.247	0.236	0.255
Cancer	0.137	0.217	0.214
Lung disease	0.079	0.121	0.169
Heart problems	0.263	0.366	0.426
Stroke	0.093	0.118	0.154
Emotional/psych problems	0.130	0.115	0.187
Arthritis or rheumatism	0.532	0.592	0.628
Memory problems	0.054	0.048	0.087
Average of total diagnoses ever	2.08	2.39	2.67
Average number of responses indicating:			
Some+ difficulty on 5 ADLs	0.33	0.29	0.46
Some+ difficulty on 5 IADLs	0.28	0.25	0.40
Some+ difficulty on 5 mobility measures	0.92	0.97	1.31
Some+ difficulty on 4 large muscle activities	1.09	1.07	1.31
Some+ difficulty on 5 gross motor activities	0.45	0.45	0.67
Some+ difficulty on 3 fine motor activities	0.21	0.19	0.26
Percent reporting over the previous week:			
Feeling depressed	0.121	0.081	0.111
Everything was an effort	0.235	0.163	0.207
Sleep was restless	0.300	0.267	0.320
Feeling lonely	0.137	0.110	0.129
Feeling sad	0.144	0.112	0.132
Couldn't get going	0.172	0.164	0.223
Was happy	0.878	0.899	0.854
Enjoyed life	0.929	0.938	0.928
Average CESD score (net unhappiness)	1.30	1.06	1.34
Biomarkers, measured in 2006 or 2008			
Average pulse	70.0	68.0	68.7
Average systolic blood pressure	134.4	133.6	134.2
Average diastolic blood pressure	80.5	78.3	77.9

Notes: See notes to Table 1. ADLs are activities of daily living like walking across the room and dressing; IADLs are instrumental activities of daily living like using a map or calculator. Mobility measures include climbing stairs, walking a block, and others. Large muscle activities include sitting for 2 hours, stooping, kneeling, etc. Gross motor activities include walking, getting in or out of bed, etc. Fine motor activities include picking up a dime, eating, and dressing.

Table 3: Healthy behaviors by veteran status and combat exposure, men over age 50 observed in HRS 2008

	Nonveterans	Noncombat veterans	Combat Veterans
Percent smoking now	0.224	0.163	0.196
Percent ever smoked	0.984	0.994	0.981
Average cigarettes per day	3.5	2.6	3.3
Percent drinks alcohol ever	0.565	0.588	0.551
Percent drinks 2+ drinks per day	0.085	0.103	0.086
Average drinks per day	0.52	0.54	0.48
Percent reporting 3+ times per week:			
Vigorous exercise	0.469	0.453	0.373
Moderate exercise	0.823	0.805	0.752
Light exercise	0.834	0.840	0.796
Average body mass index (BMI)	28.2	28.0	27.4
Percent overweight (BMI >= 25)	0.742	0.742	0.684
Percent obese (BMI >= 30)	0.313	0.283	0.246
Percent reporting within last 2 years:			
Flu shot	0.568	0.709	0.756
Prostate exam	0.701	0.761	0.754

Notes: See notes to Table 1

Table 4: Self-reports of conditions before age 16 by veteran status and combat exposure, men over age 50 observed in HRS 2008

	Nonveterans	Noncombat veterans	Combat Veterans
Average self-reported health in childhood (1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor)	1.90	1.70	1.74
Percent reporting in childhood:			
Fair or poor health	0.081	0.040	0.042
Miss month+ of school due to health	0.114	0.106	0.114
Had measles	0.760	0.855	0.859
Had mumps	0.604	0.701	0.702
Had chicken pox	0.681	0.759	0.735
Difficulty seeing even with correction	0.047	0.042	0.033
Asthma	0.056	0.033	0.036
Diabetes	0.005	0.000	0.003
Respiratory disorder	0.093	0.077	0.073
Speech impairment	0.036	0.032	0.030
Allergic condition	0.060	0.054	0.042
Heart trouble	0.023	0.018	0.013
Chronic ear problems	0.072	0.076	0.067
Epilepsy or seizures	0.007	0.001	0.001
Severe headaches or migraines	0.041	0.035	0.037
Stomach problems	0.035	0.020	0.019
High blood pressure	0.005	0.002	0.001
Depression	0.020	0.016	0.016
Drug or alcohol problems	0.008	0.005	0.010
Any other emotional/psych problems	0.014	0.013	0.013
Head trauma, lost consciousness/memory	0.110	0.108	0.145
Disabled for 6 months+	0.045	0.032	0.042
Regularly smoked (1 cigarette most days)	0.251	0.282	0.314
Learning problems in school	0.049	0.024	0.026
Other important health problems	0.156	0.160	0.152
Parents smoked	0.663	0.678	0.701
Average years of education of mother	9.6	10.0	9.8
Average years of education of father	9.3	9.5	9.4

Notes: See notes to Table 1. Childhood is defined as occurring before age 16.

Table 5A: Simple regressions of old-age health on veteran status and combat exposure with basic demographic controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)						
Dependent variable	**Is a veteran**	**Reports combat exposure**	**(Pseudo) R^2**	**Sample size**	**Basic controls**	**Youth and parental controls**	**Model**
Self-assessments							
Self-reported health (1 = excellent, 5 = poor)	-0.055	0.159 **	0.1239	6788	yes	no	OLS
	(0.030)	(0.040)					
Fair or poor health (0/1)	-0.017	0.067 **	0.0919	6788	yes	no	probit
	(0.013)	(0.019)					
Work limitations (0/1)	-0.010	0.099 **	0.075	6200	yes	no	probit
	(0.014)	(0.020)					
Back problems (0/1)	-0.020	0.059 **	0.0132	6787	yes	no	probit
	(0.013)	(0.019)					
Expected remaining years of life	-0.023	-0.557 *	0.3783	5735	yes	no	OLS
	(0.195)	(0.265)					
Biomarkers							
Pulse (measured in 2006 or 2008)	-0.542	1.068 *	0.0474	5367	yes	no	OLS
	(0.366)	(0.495)					
Systolic blood pressure	-1.213 *	0.156	0.0232	5366	yes	no	OLS
	(0.613)	(0.829)					
Diastolic blood pressure	-0.675	0.094	0.06	5358	yes	no	OLS
	(0.354)	(0.479)					
Ever had doctor diagnoses:							
High blood pressure	0.009	0.004	0.0258	6779	yes	no	probit
	(0.014)	(0.019)					
Diabetes	-0.005	0.014	0.0138	6784	yes	no	probit
	(0.012)	(0.017)					
Cancer	0.038 **	-0.021	0.0597	6777	yes	no	probit
	(0.010)	(0.013)					
Lung disease	0.035 **	0.036 **	0.0533	6784	yes	no	probit
	(0.008)	(0.012)					
Heart problems	0.038 **	0.034	0.0675	6784	yes	no	probit
	(0.013)	(0.018)					
Stroke	0.005	0.018	0.0644	6787	yes	no	probit
	(0.008)	(0.011)					
Emotional/psych problems	0.008	0.079 **	0.0392	6785	yes	no	probit
	(0.010)	(0.015)					
Arthritis or rheumatism	0.009	0.017	0.0512	6785	yes	no	probit
	(0.014)	(0.019)					
Memory problems	-0.006	0.027 **	0.0747	6787	yes	no	probit
	(0.006)	(0.009)					
Total diagnoses ever	0.131 **	0.176 **	0.0388	6792	yes	no	tobit
	(0.040)	(0.054)					
Physical limitations							
Some+ difficulty on 1-5 ADLs	-0.049 *	0.121 **	0.0586	6789	yes	no	tobit
	(0.024)	(0.030)					
Some+ difficulty on 1-5 IADLs	-0.035	0.083 **	0.0753	6787	yes	no	tobit
	(0.022)	(0.028)					
Some+ difficulty on 1-5 mobility measures	-0.014	0.212 **	0.0478	6790	yes	no	tobit
	(0.038)	(0.050)					
Some+ difficulty on 1-4 large muscle activities	-0.056	0.208 **	0.0281	6790	yes	no	tobit
	(0.035)	(0.046)					
Some+ difficulty on 1-5 gross motor activities	-0.009	0.136 **	0.0604	6790	yes	no	tobit
	(0.028)	(0.035)					
Some+ difficulty on 1-3 fine motor activities	-0.026	0.043 *	0.0499	6789	yes	no	tobit
	(0.015)	(0.019)					

Notes: See notes to Table 1. Asterisks denote statistical significance at the 5% (*) and 1% (**) levels. Each row is a separate regression of the dependent variable listed for that row on the two independent variables listed (veteran status and combat exposure) and a set of basic controls. The latter include age in 2008, dummies for African American, Hispanic, married in 2008, never married, indicator variables for educational attainment, and log household income in 2007.

Table 5B: Simple regressions of old-age health on veteran status and combat exposure with basic demographic controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)						
Dependent variable	**Is a veteran**	**Reports combat exposure**	**(Pseudo) R^2**	**Sample size**	**Basic controls**	**Youth and parental controls**	**Model**
Mental health							
Feeling depressed (0/1)	-0.018 *	0.029 *	0.0674	6246	yes	no	probit
	(0.009)	(0.013)					
Everything was an effort	-0.027 *	0.048 **	0.0936	6245	yes	no	probit
	(0.012)	(0.017)					
Sleep was restless	-0.017	0.054 **	0.0201	6244	yes	no	probit
	(0.013)	(0.019)					
Feeling lonely	-0.016	0.014	0.0894	6244	yes	no	probit
	(0.009)	(0.013)					
Feeling sad	-0.014	0.020	0.0365	6243	yes	no	probit
	(0.010)	(0.014)					
Couldn't get going	-0.009	0.050 **	0.0428	6241	yes	no	probit
	(0.011)	(0.016)					
Was happy	0.008	-0.046 **	0.0236	6242	yes	no	probit
	(0.009)	(0.015)					
Enjoyed life	0.002	-0.010	0.0247	6243	yes	no	probit
	(0.007)	(0.011)					
CESD score (net unhappiness)	-0.138 **	0.250 **	0.0264	6249	yes	no	tobit
	(0.047)	(0.064)					
Healthy behaviors							
Smoke now (0/1)	0.019	0.050 **	0.1249	4663	yes	no	probit
	(0.013)	(0.019)					
Smoke ever (0/1)	0.012 **	-0.020 **	0.0384	4537	yes	no	probit
	(0.004)	(0.009)					
Cigarettes per day	0.340	0.850 **	0.0484	4655	yes	no	tobit
	(0.247)	(0.320)					
Drink now (0/1)	0.037 **	-0.021	0.0609	6793	yes	no	probit
	(0.014)	(0.019)					
Drink 2+ per day (0/1)	0.022 **	-0.012	0.024	6793	yes	no	probit
	(0.008)	(0.010)					
Drinks per day	0.073 **	-0.055	0.0198	6769	yes	no	tobit
	(0.027)	(0.036)					
Vigorous exercise (0/1)	0.022	-0.062 **	0.0682	6787	yes	no	probit
	(0.014)	(0.019)					
Moderate exercise (0/1)	-0.006	-0.034 *	0.0664	6791	yes	no	probit
	(0.011)	(0.015)					
Light exercise (0/1)	0.007	-0.023	0.09	6790	yes	no	probit
	(0.010)	(0.014)					
Body mass index (BMI)	0.256	-0.401 *	0.0551	6771	yes	no	OLS
	(0.140)	(0.189)					
BMI >= 25 (0/1)	0.031 *	-0.047 **	0.0316	6793	yes	no	probit
	(0.013)	(0.018)					
BMI >= 30	0.013	-0.028	0.0319	6793	yes	no	probit
	(0.013)	(0.017)					
Flu shot (0/1)	0.047 **	0.042 *	0.0949	6784	yes	no	probit
	(0.014)	(0.019)					
Prostate exam (0/1)	0.034 **	-0.013	0.0239	6732	yes	no	probit
	(0.013)	(0.018)					

Notes: See notes to Tables 1 and 5A.

Table 6A: Simple regressions of old-age health on veteran status and combat exposure with basic demographic controls and youth and parental controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)						
Dependent variable	**Is a veteran**	**Reports combat exposure**	**(Pseudo) R^2**	**Sample size**	**Basic controls**	**Youth and parental controls**	**Model**
Self-assessments							
Self-reported health (1 = excellent, 5 = poor)	-0.006	0.131 *	0.1421	3,833	yes	yes	OLS
	(0.040)	(0.051)					
Fair or poor health (0/1)	-0.016	0.054 *	0.0943	3,826	yes	yes	probit
	(0.018)	(0.024)					
Work limitations (0/1)	-0.006	0.102 **	0.0795	3,487	yes	yes	probit
	(0.019)	(0.027)					
Back problems (0/1)	-0.012	0.047 *	0.0256	3,836	yes	yes	probit
	(0.018)	(0.024)					
Expected remaining years of life	-0.264	-0.158	0.3947	3,504	yes	yes	OLS
	(0.253)	(0.328)					
Biomarkers							
Pulse (measured in 2006 or 2008)	-0.761	1.510 *	0.0535	3,202	yes	yes	OLS
	(0.482)	(0.622)					
Systolic blood pressure	-0.495	-0.382	0.0254	3,201	yes	yes	OLS
	(0.821)	(1.058)					
Diastolic blood pressure	-0.624	-0.368	0.0766	3,195	yes	yes	OLS
	(0.477)	(0.615)					
Ever had doctor diagnoses:							
High blood pressure	-0.020	0.010	0.0299	3,828	yes	yes	probit
	(0.019)	(0.024)					
Diabetes	0.002	0.003	0.0216	3,818	yes	yes	probit
	(0.017)	(0.022)					
Cancer	0.046 **	-0.024	0.0673	3,800	yes	yes	probit
	(0.014)	(0.017)					
Lung disease	0.036 **	0.047 **	0.1039	3,813	yes	yes	probit
	(0.011)	(0.016)					
Heart problems	0.034	-0.002	0.0866	3,823	yes	yes	probit
	(0.018)	(0.023)					
Stroke	-0.006	0.014	0.0613	3,832	yes	yes	probit
	(0.011)	(0.015)					
Emotional/psych problems	0.005	0.102 **	0.0944	3,824	yes	yes	probit
	(0.012)	(0.021)					
Arthritis or rheumatism	0.000	-0.004	0.0657	3,831	yes	yes	probit
	(0.020)	(0.026)					
Memory problems	0.007	0.012	0.0726	3,827	yes	yes	probit
	(0.008)	(0.010)					
Total diagnoses ever	0.095	0.131	0.0448	3,835	yes	yes	tobit
	(0.054)	(0.070)					
Physical limitations							
Some+ difficulty on 1-5 ADLs	-0.045	0.075 *	0.0564	3,825	yes	yes	tobit
	(0.028)	(0.034)					
Some+ difficulty on 1-5 IADLs	-0.018	0.076 **	0.0693	3,834	yes	yes	tobit
	(0.024)	(0.029)					
Some+ difficulty on 1-5 mobility measures	0.010	0.208 **	0.0467	3,835	yes	yes	tobit
	(0.051)	(0.064)					
Some+ difficulty on 1-4 large muscle activities	-0.043	0.206 **	0.0314	3,835	yes	yes	tobit
	(0.048)	(0.061)					
Some+ difficulty on 1-5 gross motor activities	-0.004	0.109 *	0.0549	3,835	yes	yes	tobit
	(0.035)	(0.043)					
Some+ difficulty on 1-3 fine motor activities	-0.024	-0.001	0.0464	3,835	yes	yes	tobit
	(0.019)	(0.024)					

Notes: See notes to Table 1. Asterisks denote statistical significance at the 5% (*) and 1% (**) levels. Each row is a separate regression of the dependent variable listed for that row on the two independent variables listed (veteran status and combat exposure), a set of basic controls, and controls for youth and parental characteristcs. Basic controls include age in 2008, dummies for African American, Hispanic, married in 2008, never married, indicator variables for educational attainment, and log household income in 2007. Youth and parental controls include the variables shown in Table 4, except without father's education, which is dropped due to poorer sample coverage and low significance, and also including Census Division of birth.

Table 6B: Simple regressions of old-age health on veteran status and combat exposure with basic demographic controls and youth and parental controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)						
Dependent variable	**Is a veteran**	**Reports combat exposure**	**(Pseudo) R^2**	**Sample size**	**Basic controls**	**Youth and parental controls**	**Model**
Mental health							
Feeling depressed (0/1)	-0.024 *	0.056 **	0.0980	3,835	yes	yes	probit
	(0.012)	(0.019)					
Everything was an effort	-0.025	0.042 *	0.1032	3,836	yes	yes	probit
	(0.016)	(0.022)					
Sleep was restless	-0.025	0.051 *	0.0388	3,835	yes	yes	probit
	(0.018)	(0.024)					
Feeling lonely	-0.009	0.019	0.1078	3,833	yes	yes	probit
	(0.013)	(0.018)					
Feeling sad	-0.004	0.011	0.0651	3,816	yes	yes	probit
	(0.013)	(0.018)					
Couldn't get going	-0.004	0.053 **	0.0572	3,832	yes	yes	probit
	(0.015)	(0.021)					
Was happy	-0.011	-0.051 **	0.0487	3,815	yes	yes	probit
	(0.013)	(0.019)					
Enjoyed life	-0.001	-0.007	0.0490	3,815	yes	yes	probit
	(0.010)	(0.013)					
CESD score (net unhappiness)	-0.112	0.276 **	0.0362	3,836	yes	yes	tobit
	(0.063)	(0.081)					
Healthy behaviors							
Smoke now (0/1)	0.018	0.043	0.1337	2,680	yes	yes	probit
	(0.018)	(0.025)					
Smoke ever (0/1)	0.011 *	-0.016	0.1558	2,099	yes	yes	probit
	(0.006)	(0.012)					
Cigarettes per day	0.360	0.679	0.0518	2,678	yes	yes	tobit
	(0.341)	(0.429)					
Drink now (0/1)	0.052 **	-0.016	0.0656	3,836	yes	yes	probit
	(0.020)	(0.026)					
Drink 2+ per day (0/1)	0.029 **	0.002	0.0608	3,819	yes	yes	probit
	(0.010)	(0.013)					
Drinks per day	0.099 **	-0.043	0.0269	3,826	yes	yes	tobit
	(0.036)	(0.047)					
Vigorous exercise (0/1)	-0.001	-0.044	0.0682	3,834	yes	yes	probit
	(0.020)	(0.025)					
Moderate exercise (0/1)	-0.019	-0.038	0.0604	3,827	yes	yes	probit
	(0.015)	(0.020)					
Light exercise (0/1)	0.001	0.002	0.0783	3,835	yes	yes	probit
	(0.014)	(0.017)					
Body mass index (BMI)	0.183	-0.125	0.0608	3,827	yes	yes	OLS
	(0.188)	(0.244)					
BMI >= 25 (0/1)	0.030	-0.053 *	0.0377	3,822	yes	yes	probit
	(0.017)	(0.023)					
BMI >= 30	-0.005	-0.001	0.0372	3,836	yes	yes	probit
	(0.018)	(0.024)					
Flu shot (0/1)	0.020	0.059 *	0.1056	3,834	yes	yes	probit
	(0.019)	(0.025)					
Prostate exam (0/1)	0.033	-0.012	0.0365	3,818	yes	yes	probit
	(0.018)	(0.023)					

Notes: See notes to Tables 1 and 6A.

Table 7A: Two-stage least squares regressions of old-age health on veteran status and combat exposure with basic demographic controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)								First stage F's	
Dependent variable	**Is a veteran**	**Reports combat exposure**	**Sample size**	**Basic controls**	**Youth and parental controls**	**Veteran and combat instruments**	**Model**	**p-value on overid test**	**on veteran**	**on combat**
Self-assessments										
Self-reported health (1 = excellent, 5 = poor)	0.019	0.051	6,788	yes	no	yes	2SLS	0.6293	128.40	62.31
	(0.194)	(0.193)								
Fair or poor health (0/1)	0.041	0.029	6,788	yes	no	yes	2SLS	0.2335	128.40	62.31
	(0.080)	(0.080)								
Work limitations (0/1)	-0.014	0.063	6,200	yes	no	yes	2SLS	0.2494	112.42	52.12
	(0.113)	(0.097)								
Back problems (0/1)	0.032	-0.104	6,787	yes	no	yes	2SLS	0.8807	128.41	62.31
	(0.085)	(0.086)								
Expected remaining years of life	-8.570 **	2.012	5,735	yes	no	yes	2SLS	0.1986	104.98	53.16
	(1.997)	(1.480)								
Biomarkers										
Pulse (measured in 2006 or 2008)	-3.127	5.117 *	5,367	yes	no	yes	2SLS	0.0333	107.30	54.06
	(2.301)	(2.319)								
Systolic blood pressure	7.918 *	-9.168 *	5,366	yes	no	yes	2SLS	0.3153	107.29	54.03
	(3.921)	(3.955)								
Diastolic blood pressure	-0.215	0.575	5,358	yes	no	yes	2SLS	0.2048	107.37	53.88
	(2.212)	(2.232)								
Ever had doctor diagnoses:										
High blood pressure	0.453 **	-0.347 **	6,779	yes	no	yes	2SLS	0.4611	128.29	61.63
	(0.096)	(0.096)								
Diabetes	0.369 **	-0.365 **	6,784	yes	no	yes	2SLS	0.3226	128.73	62.41
	(0.085)	(0.085)								
Cancer	0.313 **	-0.266 **	6,777	yes	no	yes	2SLS	0.6686	128.67	62.50
	(0.072)	(0.072)								
Lung disease	0.205 **	-0.166 **	6,784	yes	no	yes	2SLS	0.7883	128.27	61.97
	(0.058)	(0.058)								
Heart problems	0.196 *	-0.140	6,784	yes	no	yes	2SLS	0.8500	128.52	62.33
	(0.084)	(0.084)								
Stroke	0.064	0.015	6,787	yes	no	yes	2SLS	0.6149	128.37	62.14
	(0.057)	(0.057)								
Emotional/psych problems	-0.044	0.164 **	6,785	yes	no	yes	2SLS	0.7453	128.40	62.11
	(0.061)	(0.062)								
Arthritis or rheumatism	0.552 **	-0.502 **	6,785	yes	no	yes	2SLS	0.5199	128.74	62.13
	(0.099)	(0.100)								
Memory problems	-0.083 *	0.115 **	6,792	yes	no	yes	2SLS	0.6479	128.53	62.16
	(0.042)	(0.043)								
Total diagnoses ever	2.110 **	-1.617 **	6,792	yes	no	yes	2SLS	0.3143	128.64	62.36
	(0.307)	(0.308)								
Physical limitations										
Some+ difficulty on 1-5 ADLs	-0.998 **	0.881 **	6,789	yes	no	yes	2SLS	0.1632	128.56	62.41
	(0.180)	(0.181)								
Some+ difficulty on 1-5 IADLs	-1.251 **	1.098 **	6,787	yes	no	yes	2SLS	0.7418	128.45	62.52
	(0.182)	(0.183)								
Some+ difficulty on 1-5 mobility measures	-0.964 **	0.787 **	6,790	yes	no	yes	2SLS	0.7423	128.55	62.36
	(0.260)	(0.262)								
Some+ difficulty on 1-4 large muscle activities	-0.162	0.095	6,790	yes	no	yes	2SLS	0.4929	128.55	62.36
	(0.218)	(0.220)								
Some+ difficulty on 1-5 gross motor activities	-1.169 **	1.030 **	6,790	yes	no	yes	2SLS	0.3886	128.55	62.36
	(0.209)	(0.211)								
Some+ difficulty on 1-3 fine motor activities	-0.381 **	0.312 **	6,789	yes	no	yes	2SLS	0.7850	128.56	62.41
	(0.102)	(0.103)								

Notes: See notes to Table 1. Asterisks denote statistical significance at the 5% (*) and 1% (**) levels. Each row is a separate two-stage least squares (maximum likelihood) regression of the dependent variable listed for that row on the two independent variables listed (veteran status and combat exposure), both of which are instrumented, and a set of basic controls. The latter include age in 2008, dummies for African American, Hispanic, married in 2008, never married, indicator variables for educational attainment, and log household income in 2007. Instruments comprise three variables derived from public Census data and the 2001 National Survey of Veterans, each of which is shown graphically in Figure 2. See the notes to Figure 2 for details on the construction of the instruments.

Table 7B: Two-stage least squares regressions of old-age health on veteran status and combat exposure with basic demographic controls, men over age 50 observed in HRS 2008

	Independent variables (marginal effects & standard errors)								First stage F's	
Dependent variable	Is a veteran	Reports combat exposure	Sample size	Basic controls	Youth and parental controls	Veteran and combat instruments	Model	p-value on overid test	on veteran	on combat
Mental health										
Feeling depressed (0/1)	-0.164 **	0.269 **	6,246	yes	yes	yes	2SLS	0.6040	115.67	56.55
	(0.060)	(0.059)								
Everything was an effort	-0.204 **	0.167 *	6,245	yes	yes	yes	2SLS	0.2415	115.68	56.62
	(0.076)	(0.074)								
Sleep was restless	-0.080	0.013	6,244	yes	yes	yes	2SLS	0.1030	115.65	56.05
	(0.087)	(0.086)								
Feeling lonely	-0.276 **	0.215 **	6,244	yes	yes	yes	2SLS	0.1859	115.29	56.56
	(0.066)	(0.065)								
Feeling sad	-0.214 **	0.236 **	6,243	yes	yes	yes	2SLS	0.1754	115.33	56.35
	(0.067)	(0.066)								
Couldn't get going	-0.111	0.243 **	6,241	yes	yes	yes	2SLS	0.1206	115.26	55.79
	(0.074)	(0.073)								
Was happy	0.269 **	-0.323 **	6,242	yes	yes	yes	2SLS	0.0765	115.13	56.79
	(0.066)	(0.065)								
Enjoyed life	0.110 *	-0.146 **	6,243	yes	yes	yes	2SLS	0.2983	115.39	56.68
	(0.050)	(0.049)								
CESD score (net unhappiness)	-1.414 **	1.603 **	6,249	yes	yes	yes	2SLS	0.2118	115.52	56.63
	(0.351)	(0.345)								
Healthy behaviors										
Smoke now (0/1)	-0.196 *	0.135	4,663	yes	yes	yes	2SLS	0.0619	89.58	47.09
	(0.090)	(0.077)								
Smoke ever (0/1)	0.009	-0.046 *	4,665	yes	yes	yes	2SLS	0.7062	89.57	46.90
	(0.026)	(0.022)								
Cigarettes per day	-3.887 *	3.366 *	4,655	yes	yes	yes	2SLS	0.3151	89.52	46.95
	(1.896)	(1.628)								
Drink now (0/1)	0.062	-0.073	6,793	yes	yes	yes	2SLS	0.9504	128.61	62.37
	(0.087)	(0.088)								
Drink 2+ per day (0/1)	0.079	-0.101	6,793	yes	yes	yes	2SLS	0.0069	128.61	62.37
	(0.053)	(0.053)								
Drinks per day	-0.046	-0.239	6,769	yes	yes	yes	2SLS	0.6393	128.43	62.12
	(0.211)	(0.212)								
Vigorous exercise (0/1)	0.188 *	-0.413 **	6,787	yes	yes	yes	2SLS	0.4654	128.44	62.64
	(0.090)	(0.090)								
Moderate exercise (0/1)	0.272 **	-0.326 **	6,791	yes	yes	yes	2SLS	0.9303	128.45	62.08
	(0.074)	(0.075)								
Light exercise (0/1)	0.372 **	-0.401 **	6,790	yes	yes	yes	2SLS	0.0513	129.02	62.57
	(0.073)	(0.073)								
Body mass index (BMI)	3.211 **	-4.247 **	6,771	yes	yes	yes	2SLS	0.1445	128.25	62.50
	(0.940)	(0.944)								
BMI >= 25 (0/1)	0.351 **	-0.371 **	6,793	yes	yes	yes	2SLS	0.3326	128.61	62.37
	(0.084)	(0.085)								
BMI >= 30	0.189 *	-0.381 **	6,793	yes	yes	yes	2SLS	0.2119	128.61	62.37
	(0.085)	(0.085)								
Flu shot (0/1)	0.449 **	-0.387 **	6,784	yes	yes	yes	2SLS	0.1400	127.88	62.26
	(0.090)	(0.090)								
Prostate exam (0/1)	0.543 **	-0.503 **	6,732	yes	yes	yes	2SLS	0.1219	128.58	63.05
	(0.094)	(0.092)								

Notes: See notes to Tables 1 and 7A.