Military Service, Stressful Events and Post-Trauma Symptoms in a Sample of North Vietnamese Older Adults

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Introduction

In enumerating the toll of wars, researchers commonly attend to casualties, or perhaps estimates of the material costs and infrastructural loss. Less appreciated, but no less important for post-war recovery and development, are lingering effects of war among survivors whose health and wellbeing over the long-term have been shaped by mortality, disability, dislocation, and interrupted family and career paths brought on by war. One of the ways that war's effects live on is through ill, and at times debilitating, psychological symptoms brought on by distressful events of war, even those experienced decades ago by soldiers and civilians. Additionally, severe episodes and periods of trauma, such as those brought on by extended combat duties, or witnessing aerial bombing campaigns, have been shown to exert lingering, negative impacts on various dimensions of physical health (Friedman and Schnurr 1995; Schnurr and Spiro 1999). Numerous studies of Indochinese refugees have identified a relationship between traumas endured in war, genocide and flight, and psychological morbidity (i.e., PTSD, Depression) that endures for many years after the end of hostilities and resettlement (Steel et al. 2002; Mollica et al. 1993). Notably, most of these studies have examined Vietnamese and other Southeast Asian refugees in border camps or in resettlement societies. The lasting impact of war-time service and trauma on survivors who remained in reunified Vietnam is largely unknown.

Arguably, no country's 20th century history has been as defined by war as Vietnam's (Lamb 2003). The vast scale and consequences of what Vietnamese refer to as the American War, are often conveyed in statistics – the most intense aerial bombing in history, estimated millions of fatalities, an exodus of over a million refugees, to name a few (Clodfelter 1995; Hirschman et al. 1995). While the experiences of American veterans who fought in the Second Indochina War have been widely studied, far less is known about how northern Vietnamese who witnessed or fought in the war have fared over the long-term in terms of health and wellbeing. Noting that each bomb displaced households and destroyed local infrastructure, each fatality created widows or orphans, each enlistment created careers and access to state benefits, and each disability created care-giving burden, it becomes clear that the war has a legacy being borne uniquely by Vietnam's elderly population at the present moment in time. Post-traumatic symptoms and associated physical and psychological health impairments, the focus of this paper, are just one possible (yet important and immediate) manifestation of war's impact on health and wellbeing.

In this paper we draw upon a pilot study of older adults currently residing in Vietnam's Red River Delta in order to document the experience of distressful events among veterans and civilians that occurred around the time of the Second Indochina War (1965-75), as well as the lasting impact of war-time stressors as revealed by their association with persistent post-trauma symptoms and self-reported health. In conducting this analysis, we contribute novel findings on the linkage between military service, traumatic events, and post-traumatic stress in a critical population – northern Vietnamese older adults who survived the Second Indochina War – whose post-war experiences have been largely absent from the scholarly record. Juxtaposition of this population with well-documented populations of U.S. veterans who served in overseas conflicts of the 20th century may be instructive on several levels. First, military service and war often remain hidden in life course approaches to the study of aging, despite the proportionately large segments of older adults (men in particular) who are veterans, and the documented adverse physical, psychological and socioeconomic consequences of war service (Ikin et al 2009). Second, by exploring experiences of northern Vietnamese older adults, an arguably understudied population, we will increase understanding of how context and culture mediate the relationship between combat distress and subsequent experience of post-traumatic symptoms. Finally, we provide documentation of the extent of distressful events endured during military service as remembered by older Vietnamese veterans, according to

characteristics of their military service, thus illuminating which types of military service are linked with distressful experiences that yield enduring symptoms.

Background

Research across disciplines has delineated the nature and mechanisms linking war-related stressors, trauma, health and functioning. Much of this research has been conducted among American veterans of 20th century wars, and has revealed that stress related to war, and manifest often years later in symptoms of PTSD, influences morbidity, mortality, psychological conditions and quality of life (Maguen et al 2009). For instance, Boscarino's analyses (2006a, 2006b, 2008) of Vietnam theatre veterans of the US military indicate that PTSD was a significant predictor of all cause, cardiovascular, cancer and external cause mortality 30 years after the conclusion of the war. In an analysis of WWII veterans, Elder and colleagues (1997; 2009) determined veteran status elevated the risk of physical decline and mortality, with risks incrementing according to whether service was performed overseas (versus on the homefront), in the Pacific theatre, and most decisively, involved combat. In their study linking older veteran's physical health, Schnurr and Spiro (1999) use path analytic methods to illustrate that PTSD is an important mechanism, potentially involving physiological, psychological and health behavioral dimensions, through which the experience of combat exposure influences later life physical health (Friedman and Schnurr 1995).

Analyzing the representative Vietnam Veterans Readjustment Study data, Zatzick and colleagues (1997) determined that, in addition to elevated psychological symptoms and mortality rates, Vietnam veterans suffering from PTSD also experienced diminished quality of life in multiple domains, specifically experiencing heightened odds of physical limitations, not working, compromised physical health, and diminished well-being. Studies of war's long term effects on veterans outside of the United States, such as Australian veterans of the Korean and Vietnam wars, likewise commonly find that veteran status equates with relatively poor health status and life satisfaction (Ikin et al. 2009). While this latter research broadens the base cross-nationally, it still commonly compares civilians and veterans who've returned from overseas duty, rather than veterans and civilians who jointly witnessed wars that occurred on 'the home front.' Furthermore, the veterans at the center of these analyses are almost exclusively from more developed settings, where the resources available to aid in readjustment are likely quite distinct from those available to veterans from less developed societies like Vietnam.

From existing literature it is apparent that only some individuals who endured combat and other war-related stressors experience lingering symptoms that signal PTSD. So far, existing literature has only hinted at the factors that influence whether PTSD-like symptoms will manifest in veterans and others who've witnessed war. Some research suggests it is the severity, duration and particular combination of trauma domains which influence persistent PTSD (Momartin et al. 2004). In a recent study delving deeper into American history, Costa and Kahn (2010) find a significant relationship between wartime stress (e.g. the fraction of one's company dying of wounds) and old age mortality among Civil War pensioners, with unit cohesion within companies moderating the impact of battlefield stress upon mortality among survivors of highly stressed units. The results of this analysis point to diverse ways of assessing battlefield stress, its significant impacts upon morbidity and mortality at later stages in the life course, and the importance of wartime context as it either buffers or accentuates war-related stressors.

It was only in 1980 that PTSD was invented as a diagnosis in the West for symptoms related to wartime and other conflict-related stressors, and scholars continue to debate is conceptual utility and diagnostic validity, especially across cultural settings (e.g., Summerfield 1999). It is not our intention to assert that undiagnosed PTSD is a public health problem in northern Vietnam. We heed the perspective

held by Summerfield and others and do not assert that problematic symptoms associated with war-time stressors are necessarily indicative of PTSD. Nonetheless, it is somewhat surprising that, given the war's decisive and encompassing damage to military and civilian lives and social and economic infrastructure, so little is known about the relationship between war, stress and health within the Vietnamese population. Vietnam's war toll from 1965-75, estimated to number approximately 1 million military and civilian casualties, represents, proportionately, 100 times that of the Americans (Hirschman, Preston and Vu 1995). So what, then, might we expect to be the level of war's lingering effects upon survivors' health and wellbeing? Some detailed ethnographic accounts notwithstanding (e.g., Luong 1992), at this juncture we know very little. As Merli (2000:12) has written, "the ramifications of this war for *Vietnamese* society are absent from public discourse… [and] social science literature," due to an absence of empirical data, and a longstanding dehumanization of the enemy in official and unofficial accounts of the American experience at war.

In the current paper, we attempt to extend knowledge beyond Western concepts and Western study samples using data recently collected among a northern Vietnamese cohort whose life course was significantly shaped by decades of war, in particular the Second Indochina War. This paper offers an initial, partial glimpse at how a young adulthood 'at war' impacts health and wellbeing in older adulthood, in particular the experience of psychic symptoms triggered by wartime stressors.

Northern Vietnamese, Military Service and Experiences of War

For northern Vietnamese of the Red River Delta, the toll of the Second Indochina War was felt across all social strata, by soldiers, militia members and civilians. Military service was a nearly universal rite of passage for young men in northern Vietnam (formerly North Vietnam) who came of age from the 1960s through the 1980s (Teerawichitchainan, 2009). North Vietnam's draft law, first introduced in 1960, subjected all men ages 18-27 to an annual draft and required draftees to serve in the Vietnam People's Army (VPA) for between 2 and 4 years. Especially during the escalation of the SIW, the draft was expanded to encompass men ages 16-45 and duration of service was extended indefinitely. For many, these years of service, often involving extensive combat stressors and with limited leave-taking, were of lengthy duration. Analyses of the Vietnam Longitudinal Survey suggest that nearly half of northern Vietnamese veterans who survived the war and lived through the mid-1990s spent over seven years serving in the VPA (Teerawichitchainan, 2009).

In addition to involvement in the regular armed forces, a substantial proportion of northern Vietnamese female and male youth were participated in the Youth Shock Brigades, while others of the general population were mobilized to serve in paramilitary forces. It was estimated that approximately 143,000 youths ages 15-20 were inducted into the brigades during 1965-1975 (Guillemot, 2009) and at least 1.6 million Vietnamese participated in the militias in the 1970s (Pike, 1986). It was not uncommon for these civilians to undertake serious and at times dangerous support and defense roles, and even assume combat duties. Whether as civilians or those engaged in some form of service, northern Vietnamese, if they were not directly engaged in the fighting, lived their lives within an arm's length of armed conflict, often for over one decade's time.

In discussing the SIW's impact on Vietnamese society, most commonly figures are cited, such as those enumerating tonnage of bombs or lives lost, which highlight damage and losses confined to the war period and years immediately following. Missing from the literature on war's aftermath are analyses of long-term effects, such as those on survivors' health and wellbeing. While some observers, and media portrayals, tend to dismiss such lasting effects on a society of victors, especially given Vietnam's recent liberalization and

economic boom, others note that for Vietnamese, especially those old enough to recollect the SIW, practically everyone lost at least one family member due to war, and "the war makes up a huge part of the consciousness of any Vietnamese person who lived through it" (Gustaffson 2009: xiii).

Although the toll of war was widely felt, and veterans' and civilians' sacrifices were recognized and honored in many ways, it may be argued that the extent and nature of the war's psychological toll is not well understood from the Vietnamese perspective. American veterans' post-war psychological problems, especially enduring PTSD, have been widely documented from myriad perspectives ranging from psychiatry to popular nonfiction. For reasons either cultural or political, it is relatively rare that Vietnamese veterans' psychological worlds, and the impacts of war, are revealed in scientific research. In the fictional account *The Sorrow of War,* written by Bao Ninh and briefly banned by the Vietnamese government, we see the perspective of a young man whose painful experiences on MIA duty in the Central Highlands result in emotional numbness and intrusive recollections that extend far beyond his period of service (Friedman 2005). Bao's novel, he himself served on a youth brigade which suffered heavy casualties, was one of the first public accounts to suggest that Vietnamese men and women also suffered psychologically by witnessing the horrors of war, and while the nation celebrated victory, characters like Bao Ninh's seemed to experience those victories as hollow and lacking in joy, "he and his friends had not felt that soaring, brilliant happiness he saw on film" (Ninh, 1991[1993]:107). With such an understanding as a starting point, we venture to sketch the patterns of trauma endured in war, occurrence of lasting post-trauma symptoms, and their associations with older adult health in northern Vietnamese survivors of the SIW.

Hypotheses

While our objectives are largely exploratory in nature, we formulate several hypotheses to guide our analyses. We hypothesize that particular aspects of service are more likely than others to have exposed young Vietnamese to events that would result in long-term psychic impacts, manifest in PTSD-like symptoms. Due to the direct and intense quality of fighting that typifies combatant roles, we hypothesize that combat veterans will be particularly likely to report post-traumatic stress symptoms persisting to the present time. Additionally, from a life course perspective, events may be more indelible and the odds of exposure to stressful events greater, the longer one was in service, without interruption, during the war years. Also from a life course perspective, the timing of service is likely to be decisive for long term mental health outcomes. While we might expect that service beginning at particularly early ages (i.e., in the teenage years, when one's coping resources may have been more weakly developed) would lend itself to lasting post-trauma symptoms, other research has indicated that it is not youth, per se, that leads to vulnerability, but rather the extent to which the service interrupted established family and career trajectories (Hogan 1986). Accordingly, we hypothesize that service members whose enlistment occurred in a more advanced life course stage (i.e., age 25 or older), and hence would have experienced that enlistment as more disruptive, will be more likely to report post-traumatic symptoms persisting to the present time. We also note that those drafted for service served for longer periods of time and beginning at later ages as compared to their volunteer counterparts.

Given the expansive geography of conflict, military service meant very different things 'on the ground' depending on the primary location in which soldiers served. While we lack the detailed data necessary to map the chronology of conflict, bombings and other major disruptive events in space, we hypothesize that soldiers who served abroad, especially those who served in Laos, are more likely to experience lasting post-traumatic stress symptoms than their counterparts who served in their own country. We expect this relationship to hold for several reasons. Foremost, many of those based in Laos were

positioned in volatile, heavily bombarded areas containing the Ho Chi Minh trail system. The intensity of bombardment and concentrated attacks in Southeastern Laos have been described as some of the most intense of the SIW (Lewy 1978), far more intense than the bombardment of northern Vietnam itself, with northern Vietnamese being deployed by the 10s of 1000s to stand in fight in intense American and RLA assaults. Northern Vietnamese soldiers deployed in Laos also would have witnessed the devastation visited on Laotian communities and civilians as a consequence of the covert operations in which they involved. Additionally, those deployed to Laos were involved in longstanding covert operations in violation of the Geneva accords, thus their clandestine service potentially failed to garner the prestige awarded to other PAVN soldiers operating on Vietnamese territory.

With respect to health in late adulthood, we hypothesize that enduring multiple traumas during wartime will be associated with poor self-assessed health among our respondents. However, we expect that the trauma and health relationship will be gendered. While few respondents report experiencing no traumatic events over the life course, given that older men were more likely to endure particularly distressing traumas in the line of duty, in particular involvement in killing and infliction of serious injury, we anticipate that their exposures to traumatic events in the life course will be more decisively negative for health in late adulthood.

Data and Methods

The analyses presented in this study are based on survey data from a recent follow-up to the Vietnam Longitudinal Survey (VLS), referred to here as the VLS Health and Aging Pilot Study. The VLS is a large probability survey of 1,855 households and nearly 4,500 adults in Vietnam's northern region of the Red River Delta. The project began with a baseline survey in 1995 and continued with annual follow-up surveys until 1998. The VLS was carried out in 10 communes in three Red River Delta provinces -- Ha Nam, Nam Dinh, and Ninh Binh –located approximately 60-100 kilometers south of Vietnam's capital city, Hanoi. The VLS study area, one of Vietnam's most populous regions, was widely affected by US bombing campaigns during the Vietnam War. Further information about the original VLS study design is available at:
http://csde.washington.edu/research/projects/hirschman/vietnam/docs/sample.pdf.

In collaboration with the original VLS creators, we conducted a pilot survey in June-July 2010 in one of the 10 original communes in order to address the current health and wellbeing of Vietnamese men and women who entered early adulthood during the Second Indochina War (i.e., those born in 1955 or earlier, and who were at least 20 years old by 1975) and are now entering late adulthood. The questionnaire of our pilot survey was designed to provide information for constructing life-course measures of war and military experiences and current measures of health outcomes, kinship and social network ties, and economic status. The questionnaire was also designed to probe the traits of originally surveyed adults who have died since the baseline VLS data collection. In particular, we attempted to locate and interview close family members of original VLS decedents about timing and cause of death in order to better understand attrition and potential selection bias common in studies of impacts of war.

The pilot study commune was selected based not only on practical matters such as permission from local authorities, but also the fact that it represents a typical rural community in this region that has undergone rapid economic development during Vietnam's transition from a collective to market economy. Compared to 1995 when the VLS was first conducted, the commune's population has grown by about 10 percent and its residents have recently enjoyed an improved infrastructure, including availability of

electricity, clean water, sanitary systems, paved roads, telephones, and a relatively well-equipped community health center.

The pilot survey consisted of two phases. First, we attempted to contact and interview 310 individuals age 55 and older who had been surveyed in the baseline VLS. We successfully interviewed 215 of the 310 original respondents (approximately 70 percent). Of the 95 attrition cases, 81 died during 1995-2010 and the rest moved away from the commune. Seventy-five percent of the decedents were nonveterans[1]. In the second phase, in order to reach our target sample size of at least 400 respondents, we randomly selected an additional 196 individuals age 55 and above who had not been interviewed in the 1995 VLS from the current household registration systems maintained by local authorities. A high response rate of nearly 97 percent for this study population is largely due to several years of amicable relationship between our host research institution in Vietnam and the commune residents. In total, we interviewed 405 respondents. When a respondent was too physically or mentally incapacitated to be interviewed, their spouse, adult children, or siblings who were knowledgeable about the respondent's life history were invited to provide factual information. Questions related to feelings and perceptions were not answered by the proxy. We conducted a total of 19 proxy interviews. Sixteen of them were females over age 70 and 18 cases were nonveterans.

Measurement of Focal Independent Variables

Many existing studies of war impacts on veterans compare those who served, by a number of conflict-related variables, and nonveterans. In the current study, we acknowledge the fact that not only veterans, but broad swaths of civilians, directly experienced traumatic events related to war. As elaborated above, a strict veteran-nonveteran dichotomy is not suitable for northern Vietnam in the 1960s and 1970s, given the sizable segment of nonveterans who engaged in militia activities which oftentimes resembled, or were in support of, formal military actions. Accordingly, as we conduct our analyses of war survivors, distress events, and trauma symptoms, we disaggregate the sample into four categories: combat veterans, noncombat veterans, militia nonveterans and nonmilitia nonveterans. We are also interested in life course and geographic dimensions of service. Thus, for those who served in the military, we delineate their age of enlistment, duration of service, draft status, and primary location of deployment. These variables are measured through categorical variables, which we describe in the next section of the paper.

Measurement of Dependent Variables:

To assess war-time distress events and recent experience of trauma-related symptoms, we rely upon a modified the segment of the World Health Organization's Composite International Diagnostic Interview (CIDI) designed to measure post-traumatic stress disorder. To address respondent burden and to focus on traumatic events typical to the experience of soldiers and civilians during the SIW period, we significantly shortened the CIDI instrument so that it addresses the event details and post-event distress and symptoms associated with six events known to induce trauma. Specifically, all surveyed older adults were asked whether they had experienced any of a series of five problematic psychic symptoms (i.e., upsetting memories or dreams; trouble feeling normal feelings like love or happiness; loss of interest in things formerly enjoyed; trouble sleeping/concentrating; or feeling jumpy/easily startled) in the past 12 month

[1] Of men and women in the 1995 VLS whom we attempted to re-interview in 2010, 74 percent of those who out-migrated, 75 percent of decedents, and 65 percent of those followed-up were nonveterans. Of men in the 1995 VLS, 25 per of outmigrants, 52 percent of decedents, and 33 percent of those followed-up were nonveterans.

that were triggered by experience of any of the following past wartime events: 1) Exposure to combat; 2) Killing or seriously injuring another person; 3) Being a civilian in a war zone; 4) Unexpected death of a loved one due to war; 5) Being exposed to toxic chemicals or substances; and 6) Witnessing mass killings or atrocities. As shown in Table 1, nearly all respondents (94 percent) had experienced one or more of the distressful events, with those who served in combat having experienced significantly more (mean = 4.5), on average, than nonmilitia nonveterans (mean = 1.7). However, only 38 percent of respondents reported experiencing any lingering symptoms related to these war-time stressors in the past 12 months.

[Table 1 about here]

To assess the validity of this dependent variable, we examined the extent of correlation between current trauma symptoms and reports of the extent of post-event distress (retrospectively reported) among those respondents who experienced the specific event in question. These assessments (not shown) revealed that, indeed, there was a significant positive correlation between degree of distress reported and the incidence of post-trauma symptoms in the past 12 months.

Our second set of multivariate analyses features self-assessed health as a dependent variable. This variable, recoded to indicate whether respondents rated their own health as poor or very poor, as opposed to fair, good, or very good, is based on responses to the question: "How would you rate your physical health at the present time? Would you say it is very good, good, fair, poor, or very poor?" Previous research demonstrates that self-rated health is a consistently well-rounded indicator of health status because it encompasses the many physical, psychological, and social aspects of one's current health status and takes into consideration changes in health over time (Benyamini et al., 2009). Additionally, self-assessed health has shown to correlate closely with physician assessments (Ferraro & Farmer, 1999). Respondents were asked in our pilot survey to assess whether their current health was very good, good, fair, poor, or very poor. In this study, we measure self-rated health as a dichotomous variable indicating whether the respondent assessed his/her current health status negatively (poor or very poor) or positively (fair, good, or very good). Approximately 48 percent of the pilot survey sample gave their health status a negative rating. This is comparable to an estimate based on the 2001-02 nationally-representative Vietnam National Health Survey, which shows that 47 percent of older adults reported their current health to be weak.

Other variables

In the full, multivariate models we incorporate several other variables that we interpret as potentially influencing the experience of post-trauma psychic symptoms, or mediating the relationship between distressful events and subsequent symptoms. Specifically, we include variables for respondent's gender; respondent's current age; respondent's highest years of schooling completed; the adequacy of the respondent's current income for making ends meet; the respondent's current marital status and number of living children; and the respondent's level of engagement with family members, friends and community activities or organizations. If ill psychic symptoms lingering from stressful events of the war are more likely when individuals lack material or social support resources, we expect that individuals with advanced levels of education and those who are currently married will be less likely to experience enduring symptoms related to wartime stressors. Models estimating self-reported health also incorporate three variables related to health behavior: whether the respondent currently smokes, drinks alcohol, and engages in physical activity on a daily basis.

Results

Table 2 provides a closer look at the veteran subsample, details of their service, and reported experience of post-traumatic symptoms, at any time and in the 12 months prior to the survey. The modal age of enlistment for the sampled veterans was 19-20, with 7.5 years of service on average, and service in the northern region of the country most common. However, enlistment age, duration and location of service are widely variable, and we observe a bivariate association between characteristics of service and lasting post-traumatic symptoms. Specifically, those who served as combatants, who entered service in their early 20s, who served for over five years, and whose primary location of service was abroad, in Laos or Cambodia, more frequently report more frequent post-traumatic stress symptoms at any point following the war and in the past year. Although these categories of veterans appear to face more severe post-trauma symptoms, the data in Table 2 also reveal that the average veteran, whether combatant or not, has faced and continues to face difficult symptoms in the wake of war-related stressors.

[Insert Table 2 about here]

Table 3 provides a detailed disaggregation of reported distress events related to war according to military service status. Table 3 reveals the widespread extent of exposure to war-related distress events in this cohort of older adults, irrespective of their veteran status. While veterans, and especially combat veterans, are more likely to have experienced multiple forms of war-related trauma, sizable segments of the civilian population, too, witnessed specific distress events which they associate with short-term and sometimes lasting symptoms. While we lack the requisite information, and are reluctant to apply the label of post-traumatic stress disorder (PTSD) in this social and cultural context, and based on a brief survey instrument, we base our assessment of post-event stress on respondent self-reports of specific symptoms (i.e., subjective judgments of troubled sleeping, upsetting memories/dreams; loss of interest in ones' occupation/hobbies; jumpiness, emotional detachment) linked to the aforementioned war-time occurrence.

The descriptive statistics in Table 3 also reveal that civilians who engaged in militia activities have experiences intermediate to those of nonveterans and veterans. Militia participants, while lacking the socially recognized status of veteran soldier, are more likely than other nonveterans to have witnessed atrocities and been exposed to toxic chemicals. Table 3 also suggests that those with lengthier periods of military service are more likely to have witnessed the enumerated stressors, however the relationship does not appear to be linear. In terms of age, a greater share of those whose service began in their early teens, likely those drafted at times of significant demand, faced combat and toxics exposure. Location of service also influences the nature of stressors, with those recruited to serve in southern Vietnam being most likely to have been in combat, while a greater share of those who served abroad witnessed atrocities and experienced exposure to toxic chemicals. While the bivariate analysis in Table 3 provides an incomplete picture, it also suggests that experience of distressful events did not and does not always eventuate in self-reported post-trauma symptoms, but rather an association between the event and subsequent symptoms is contingent on individual characteristics, potentially factors such as age at occurrence, time since occurrence, gender, and the like.

[Insert Table 3 about here]

In the multivariate analyses that follow, we investigate the predictors of lasting post-trauma symptoms among older adults who are survivors of the Second Indochina War. Our first set of analyses examines all older adults, irrespective of military service status, followed by an analysis that pinpoints service characteristics and associations with post-traumatic symptoms in the veteran subsample. In an unmodified form, the survey questions about war-time traumas and recent symptoms yielded a count outcome (number of symptoms experienced) with significant overdispersion, leading us to consider a

negative binomial regression modeling approach. However, due to uncertainty about the statistical independence of the measure (e.g., post-traumatic symptoms may cluster together in individual experience), we've opted to transform the count variable into a dichotomous outcome, indicating whether respondents reported experiencing any post-traumatic events in the past 12 months, or none. We are aware that this approach may mask the severity and multiplicity of symptoms in certain highly afflicted individuals, yet it seemed better suited to the task than ordinary least squares or regressions for count outcomes.

The results of logistic regression models predicting the experience of any post-trauma symptoms in the past 12 months in this cohort of northern Vietnamese older adults are shown in Table 4. Each of the five sets of models uses a distinct disaggregation of veterans as compared to nonveterans (the omitted category). While we cannot comment on the unique effect of these particular characteristics of military service, we do observe that the odds of post-trauma symptoms are highest for those who served in combat, whose primary location of service was in Laos/Cambodia, who served for lengthier periods, were enlisted in their early 20s, and who were drafted. We also note, as the second of the paired models in each set reveals, that the heightened odds of post-trauma symptoms observed in these groups is mediated to a great extent by the number of distress events that respondents report having experienced earlier in their life course. Once we have accounted for the number of trauma events respondents report, some individuals with particular types of service are, in fact, less likely to report having experienced post-trauma symptoms in the past year. For instance, controlling for the relatively greater number of stressor events in wartime that such individuals faced, as well as their socio-demographic traits, combat veterans and those who served primarily in southern Vietnam are less likely to report experiencing post-trauma symptoms in the past 12 months. One of several interpretations for this set of results is the development of greater physical and psychological resilience that such veterans may have mustered, in part in order to survive those same war-time stressors. On the other hand, such individuals, especially if their performance in war, and combat in particular, is central to their identity, may be less inclined to acknowledge lingering psychic difficulties.

[Insert Table 4 here]

Several individual traits, potentially those indicative of vulnerability or relatively weak resources for coping with stressors, are associated with post-trauma symptoms in the previous year. Specifically, women are more likely than men to report that they continue to experience some negative symptoms linked to war-time stressors in the past year. On the other hand, those with relatively high levels of education, and those who are currently married were less likely to report having experienced the negative post-trauma symptoms enumerated in the survey. We reason that each of these traits may be associated with resources, social relational or social structural, that may buffer individuals and assist their maintenance of psychological and cognitive resources for handling the painful and traumatic events experienced decades ago during wartime.

In Table 5, in order to simultaneously explore the various dimensions of war-time military service as they relate to exposure to traumatic events and experience of lingering post-trauma symptoms, we analyze the subsample of veterans. In discussing our results, we note that in this, the pilot phase of our study, the veteran subsample is reduced to quite small numbers (N=96). Thus, while many of our results do not obtain a level of statistical significance, we highlight those that are significant at the $p<=.10$ level, and suggest that greater statistical power would improve upon our ability to address our hypotheses and the salient dimensions of military service.

[Insert Table 5 about here]

From the first model we find that in this relatively small sample of veterans the only significant correlates of recent post-trauma symptoms include having been a combatant and having served abroad in Lao/Cambodia. Addition of the traumatic events count variable indicates that these military service positions are indicative of the extent to which veterans encountered numerous, severely distressful events. Referring back to Table 3, those who served in combat roles and who served in Lao/Cambodia were significantly more likely than other veterans to have witnessed mass atrocities and to have experienced, exposure to toxic chemicals (most likely chemical defoliants such as Agent Orange). Interestingly, the second model in Table 5 suggests that experience of post-war trauma symptoms is positively associated with participation in community organizations and activities. Lacking further detail on the nature of this participation, we posit that men may be more likely to engage in veterans associations and related community organizations if their military service was more enduring, more difficult, or more salient to their identity. Hence their greater closeness with or need for contact with fellow veterans would be manifest in their organizational participation. Had we employed a more extensive battery of questions we may have detected more clearly the unique and particularly traumatic events that soldiers in these lines of duty experienced, their psychological impacts, and their means of coping.

In Table 6 we turn to a logistic regression analysis of self-reported health, with the experience of war-time traumas as the focal independent variables. Preliminary analyses indicated differential associations between traumatic events and poor self-rated health for men and women, hence we have estimated separate models for men and women. We first feature the trauma count variable as focal, and then analyze the incidence of particular trauma events that were relatively comment in men's and women's experiences of war. The results in Models A through G indicate that war-time traumatic events are significant predictors of poor older adult health. The most decisive of war-time traumas for poor self-reported health are being witness to atrocities, having seriously injured/killed another, and having been exposed to toxic chemicals. These results, along with the finding that having been a combatant in and of itself does not correlate significantly with poor health (Model B), suggest that it was a subset of combatant roles and actions that created physiological and psychological stress responses which are manifest in poor health decades later. Although their lives were also defined by war-time traumas, no statistically significant association between the count of traumas, or experience of specific trauma events, is observed for women.

[Insert Table Six about here]

Discussion and Conclusion

The experience of traumatic events during war defined a generation coming of age in 1960s and 1970s Vietnam. Many of the now elderly endured years in combatant roles, witnessing at close hand traumatic events that our brief pilot survey instrument can only begin to capture. Nonetheless, we find that the toll of war's traumas is perceptible in lingering post-trauma symptoms, and it appears to be imprinted upon in older adult health. The statistically significant association of war-time traumas with self-reported health among men is telling, given the robust results and the salience of self-reported health for tapping into various objective measures of health. Other studies have similarly identified involvement in violent acts that result in death or serious injury to be particularly salient for subsequent health status (Maguen et al. 2009). These lasting effects of war are particularly perceptible among men who witnessed combat exposure, and who fought in Laos/Cambodia.

While it is difficult to compare our findings to those for American veterans who served in Vietnam, there may be some contrasts and parallels to draw. For instance, while the incidence of enduring PTSD symptoms appears quite lower in our sampled population than, say those observed in the Vietnam

Veterans Readjustment Survey (Kulko et al. 1990), we are highly skeptical and hesitant to draw such comparisons given, not least the time difference separating these studies, but also the questionable comparability of results when a Western derived study methodology and psychological construct is applied to a socially and culturally distinct population. However, if we are to put some emphasis on the results which indicate quite a low incidence of post-trauma symptoms in northern Vietnam, we might look to the context and valorous social meaning attributed to many veterans' service. Summerfield (2000) has observed that the social meaning attached to atrocious experience is fundamental to an individual's cognitive processing of said events, and that significant psychological protection can be derived by identifying one's suffering with a legitimate, even heroic, national struggle for liberation. Such may be the case of northern Vietnamese veterans, in stark contrast to American veterans' often ambivalent sentiments following service in the Vietnam War.

In addition to our main findings, several others warrant further investigation as they indicate possible mediators between war, stress and subsequent health. In particular, the finding that combat veteran status is significantly associated with engagement in community organizations, an association that we believe may indicate participation in veterans' organizations. We wonder whether such organizational participation may have salutary impacts upon health. Other scholars have pointed to the role of veterans' organizations and the social support they encourage among 'brothers in arms' so as to aid one another during difficult post-war times (Friedman 2005). Pike (1986) has noted that, at least during the 1980s, the main veterans organization within Vietnam was one of the most powerful grassroots institutions in the country. In addition, previous analyses of the Vietnam Longitudinal Survey show that veterans are more likely than nonveterans to be members of the Vietnam Communist Party. Furthermore, the Vietnam Peoples Army continues to be well regarded in Vietnamese society. In the aggregate, maintaining ties to other veterans and a sense of belonging to the VPA institution may bring social relational resources that are beneficial to health and wellbeing. These suppositions are worth investigating further.

It is worth mentioning here that, in exploratory analyses not featured in this paper, we observed only very weak associations between forms of service, current post-trauma symptoms, and reported ill mental health. The association were nonsignificant for both men and women. We did not expect this to be the case, given the contrary findings in many studies of American veterans of the Vietnam War. We posit that perhaps there is a timing effect, such that many years later, plus the layering of subsequent periods of difficulty, trauma-symptom dose-effect relationships may be washed out. This is supported by other studies that observe progressive reduction in mental illness in Southeast Asian refugees with the passage of time (Steel et al. 2002). Additionally, the war had particularly disruptive impacts on certain groups that are not well represented in a population-based sample, such as those sickened by agent orange, orphaned at an early age, or with seriously debilitating injuries sustained in combat or bombing campaigns. A more complete enumeration of distress events and episodes, one that incorporates postwar disruptions and threats to livelihood, and with a broader sample, would assist in clarifying these questions. Although we chose an instrument for assessing mental health that had been validated with Vietnamese populations prior, the absence of an observed effect may derive from limited cross-cultural applicability of the instrument. The PTSD label and diagnosis is not readily transported culturally and linguistically, and the cultural lens through which dreams, sadness and other psychological phenomena are interpreted, as well as identities – gender, soldier, etc. – will influence distress experiences themselves, as well as tendencies to recall and disclose them. Several accounts, such as Gustaffson's work (2009) on illness among Vietnamese brought on by the 'haunting' of family members and others who died violently in war and without proper burial,

suggests that the lasting psychological and physical pains of war may have culturally distinct roots. We recognize the importance of viewing psychological and physical aspects associated with war from a Vietnamese cultural perspective and spiritual lens.

While we face several limitations related to data collection and challenges with interpretation, we maintain that such study has implications that are broad and that extend beyond the Vietnamese context. Extending our appreciation of military service in the life course, stress, and health to settings beyond the US is apropos, given the widespread waging of war, and the disproportionate concentration of recent armed conflict within developing and subsistence societies that lack resources for post-war recovery and services to victims (Summerfield 2000)

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Table 1 Sample Descriptive Statistics

	Total	
	%	N
Military Service Status		
Combat veteran	15.3	62
Noncombat veteran	11.6	47
Militia nonveteran	22.2	90
Nonmilitia nonveteran	50.9	206
Sex		
Male	46.4	188
Female	53.6	217
Age		
55 to 59	28.5	115
60 to 64	23.3	94
65 to 69	12.4	50
70 to 74	14.9	60
75-79	9.4	38
80+	11.4	46
Income Adequacy		
Income Inadequate to meet needs	66.6	270
Income Adequate to meet needs	33.3	135
Educational Attainment		
0-4 years	31.9	129
5-8 years	22.5	91
9 years	32.1	130
10 or more years	13.6	55
Number of Living Children		
0 to 3	21.6	87
4 to 6	49.6	200
7+	28.8	116
Marital Status		
Currently Married	25.9	105
Not currently married	74.1	300
Social Connections		
Participate in community organizations at least weekly	1.7	7
Visit with family members at least weekly	40.7	165
Visit with friends at least weekly	85.9	348
War-related stressors and symptoms		
Participated in combat	18.0	73
Experienced the unexpected death of a loved one due to war	68.6	278
Was a civilian in a war zone	87.4	354
Witnessed mass killings or atrocities	37.5	152
Killed or seriously injured another	8.6	35
Was exposed to toxic chemicals/substances	14.1	57
Experienced any of A-F above	94.1	381
Mean number of war-related stressors experienced (min = 0, max = 6)	2.3	405
Ever experienced any post-traumatic stress symptoms	84.2	341
Experienced post-traumatic stress symptom(s) in past 12 months	38.3	155

Source: VLS Health and Aging Pilot Study

Table 2. Trauma Symptoms Incidence by Characteristics of Military Service, northern Vietnamese Veterans Age 55 and Older						
	Among Combat Veterans (%)	**Among Noncombat Veterans (%)**	**All Veterans (%)**	**Trauma Symptoms Ever (mean)**	**Trauma Symptoms last year (mean)**	**Total**
Combatant Status						
Combat	100	0	58.7	9.8	2.5	56.9
Noncombat	0	100	41.3	5	1.5	43.1
Age at Enlistment						
16 to 18	29	19.2	24.8	7	1.8	24.8
19 to 20	35.5	36.2	35.8	8.3	1.9	35.8
21 to 24	25.8	29.8	27.5	8.9	2.7	27.5
25+	9.7	14.9	11.9	5.6	1.8	11.9
Total Years of Service						
Less than 5	25.8	57.5	39.5	6.4	1.6	39.5
5 to 9	50	27.7	40.4	8.9	2.5	40.4
10 or more	24.2	14.9	20.2	8.4	2.3	20.2
Volunteer or Drafted						
Volunteer	35.5	34	34.9	7.6	2.3	34.9
Drafted	64.5	66	65.1	8	1.9	65.1
Primary Location of Service						
North	33.9	48.9	40.4	6.9	1.9	40.4
Central/Central Highlands	32.3	25.5	29.4	7.8	2	29.4
South	14.5	2.1	9.2	6.8	1.7	9.2
Lao or Cambodia	14.5	12.8	13.8	12.1	3.8	13.8
Total	--	--	--	7.8	2.1	109 (N)
Source: VLS Health and Aging Pilot Study						

Table Three. Specific Trauma Events, Distress and Symptoms by Military Service Characteristics, northern Vietnamese Age 55 and Older

	Service Status				Volunteer/Draft Status		Veteran: Duration of Service			Veteran: Age of Enlistment				Veteran: Primary Location of Service			
	Military - combat	Military - noncombat	Civilian Militia	Civilan Nonmilitia	Volunteer Enlisted	Drafted	LT 5 yrs	5-9 yrs	10+ yrs	16-18	19-20	21-24	25+	North	Central/ Central Highlands	South	Lao or Cambodia
% Experienced Combat	100	4.3	10	--	57.9	59.2	37.2	72.7	72.7	70.4	59	53.3	46.2	47.7	68.8	90	60
...resulting in severe distress	93.6	100	100	--	100	90.5	93.8	93.8	93.8	100	91.3	93.8	83.3	95.2	90.9	88.9	100
...mean # of post-trauma symptoms	2.4	4	2.7	--	2.4	2.5	2.6	2.6	2.1	1.7	3	3.1	1.3	2.5	2.4	1.2	3.6
Witnessed Atrocities/Mass Killing	75.8	42.6	43.3	22.3	71.1	56.3	53.5	61.4	77.3	66.7	59	66.7	46.2	43.2	71.9	80	86.7
...resulting in severe distress	68.1	80	87.2	87	55.6	82.5	69.6	70.4	76.5	61.1	78.3	80	50	89.5	60.9	50	76.9
...mean # of post-trauma symptoms	2.6	2.9	3.1	3.4	2.1	3	1.9	1.9	2	1.8	3.1	3.2	1.7	2.7	2.4	1.8	3.5
Seriously Injured/Killed Another	48.4	8.5	1.1	--	29	32.4	18.6	45.5	27.3	33.3	30.1	33.3	23.1	18.2	37.5	60	46.7
...resulting in severe distress	13.3	50	100	--	9.1	21.7	0	20	33.3	11.1	25	20	0	25	16.7	16.7	14.3
...mean # of post-trauma symptoms	0.43	2.5	5	--	0.4	0.8	0.5	0.5	1.5	0.2	1.1	0.8	0	1.1	0.1	0.8	0.9
Exposure to Toxic Chemicals	62.9	25.5	4.4	1	57.9	40.9	27.9	59.1	59.1	51.9	51.3	40	38.5	22.7	68.8	70	80
...resulting in severe distress	48.7	41.7	50	100	45.5	48.3	66.7	42.3	38.5	50	50	33.3	60	50	54.6	42.9	33.3
...mean # of post-trauma symptoms	0.97	1.42	1.75	1	1.5	0.8	1.1	1	1.2	1.1	1	0.9	2	1.9	0.9	0	1.3
Unexpected Death of Loved One Due to War	37.1	19.2	13.3	9.2	13.2	38	20.9	34.1	36.4	22.2	30.8	30	38.5	29.6	31.3	20	33.3
...resulting in severe distress	69.6	77.8	75	84.2	60	74.1	77.8	73.3	62.5	66.7	58.3	100	60	61.5	80	100	80
...mean # of post-trauma symptoms	3.4	2.9	3.2	3.6	3	3.3	2.8	3.5	3.5	3.3	3	4	2.6	2.7	3.3	5	4

Source: VLS Health and Aging Pilot Study

Table 4. Logistic Regression Analyses - Correlates of Post-trauma symptoms in the Past 12 month, northern Vietnamese Adults Age 55 and Older

	Any post-trauma symptom(s) in Past 12 months		Any post-trauma symptom(s) in Past 12 months		Any post-trauma symptom(s) in Past 12 months		Any post-trauma symptom(s) in Past 12 months		Any post-trauma symptom(s) in Past 12 months	
Variables	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se	Coeff/se
Nonmilitia, Nonveteran (ref)	--	--								
	--	--								
Combat veteran	1.268***	-1.118**								
	(0.385)	(0.552)								
Noncombat veteran	0.820**	0.422								
	(0.417)	(0.452)								
Militia, Nonveteran	0.311	-0.109								
	(0.287)	(0.309)								
Primary region of service: North VN (ref: nonveterans)			0.913**	0.221						
			(0.401)	(0.448)						
Primary region of service: Central/Central Highlands (ref: nonveterans)			1.020**	-0.617						
			(0.448)	(0.564)						
Primary region of service: South VN (ref: nonveterans)			0.0858	-1.881**						
			(0.773)	(0.900)						
Primary region of service: Lao or Cambodia (ref: nonveterans)			2.794***	1.278						
			(0.732)	(0.792)						
Years of Service: Less than 5 (ref: nonveterans)					0.788**	0.0783				
					(0.397)	(0.441)				
Years of Service: 5-9 (ref: nonveterans)					1.063***	-0.469				
					(0.407)	(0.521)				
Years of Service: 10 or more (ref: nonveterans)					1.098**	-0.279				
					(0.529)	(0.604)				
Age of enlistment: 16 to 18 (ref: nonveterans)							0.413	-1.038*		
							(0.480)	(0.563)		
Age of enlistment: 19 to 20 (ref: nonveterans)							0.834**	-0.356		
							(0.425)	(0.516)		
Age of enlistment: 21 to 24 (ref: nonveterans)							1.391***	0.302		
							(0.463)	(0.543)		
Age of enlistment: 25 and older (ref: nonveterans)							1.372**	0.873		
							(0.649)	(0.722)		
Status: Volunteer (ref: nonveterans)									0.899**	-0.194
									(0.416)	(0.486)
Status: Draftee (ref: nonveterans)									0.980***	-0.113
									(0.355)	(0.422)
Count of War-time trauma events		0.977***		0.815***		0.795***		0.818***		0.764***
		(0.153)		(0.133)		(0.128)		(0.129)		(0.123)
Age 60 to 64 (ref: 55-59)	0.373	0.0534	0.544*	0.157	0.416	0.0722	0.516	0.101	0.448	0.0460
	(0.322)	(0.348)	(0.329)	(0.355)	(0.319)	(0.347)	(0.321)	(0.348)	(0.320)	(0.347)
Age 65 to 69 (ref: 55-59)	0.455	0.121	0.527	-0.0604	0.524	0.0560	0.565	-0.0233	0.565	0.0274
	(0.389)	(0.419)	(0.396)	(0.427)	(0.385)	(0.415)	(0.385)	(0.419)	(0.386)	(0.414)
Age 70 to 74 (ref: 55-59)	0.385	-0.0897	0.563	-0.00439	0.420	-0.0419	0.413	-0.196	0.445	-0.0632
	(0.387)	(0.418)	(0.392)	(0.424)	(0.386)	(0.416)	(0.397)	(0.431)	(0.384)	(0.416)
Age 75 to 79 (ref: 55-59)	0.685	0.146	0.980**	0.292	0.751*	0.208	0.767*	0.169	0.760*	0.238
	(0.456)	(0.492)	(0.463)	(0.502)	(0.452)	(0.490)	(0.460)	(0.502)	(0.459)	(0.494)
Age 80+ (ref: 55-59)	0.148	-0.300	0.378	-0.207	0.225	-0.294	0.313	-0.282	0.257	-0.302
	(0.470)	(0.509)	(0.472)	(0.505)	(0.465)	(0.500)	(0.467)	(0.504)	(0.466)	(0.499)
Female (ref - Male)	0.675**	0.956***	0.707**	0.998***	0.643**	0.903***	0.664**	0.959***	0.641**	0.907***
	(0.312)	(0.342)	(0.311)	(0.335)	(0.310)	(0.335)	(0.312)	(0.339)	(0.311)	(0.334)
Income is Adequate to Meet Needs (ref - Inadequate)	-0.107	-0.136	-0.0763	-0.0831	-0.110	-0.108	-0.0855	-0.0636	-0.109	-0.107
	(0.238)	(0.257)	(0.243)	(0.260)	(0.238)	(0.254)	(0.239)	(0.256)	(0.238)	(0.253)
Educational attainment: 0-4 years (ref - 9 years)	-0.517	-0.591	-0.743**	-0.671*	-0.593*	-0.578	-0.672*	-0.587	-0.612*	-0.536
	(0.354)	(0.379)	(0.354)	(0.374)	(0.347)	(0.369)	(0.348)	(0.371)	(0.344)	(0.365)
Educational attainment: 5-8 years (ref - 9 years)	-0.698**	-0.673*	-0.804**	-0.762**	-0.716**	-0.682**	-0.801**	-0.780**	-0.731**	-0.660*
	(0.321)	(0.344)	(0.327)	(0.352)	(0.320)	(0.344)	(0.324)	(0.351)	(0.318)	(0.342)
Educational attainment: 10+ years (ref - 9 years)	-0.941**	-1.181***	-1.079***	-1.205***	-1.006***	-1.091***	-1.023***	-1.094***	-0.999***	-1.076***
	(0.380)	(0.425)	(0.394)	(0.430)	(0.384)	(0.420)	(0.379)	(0.419)	(0.377)	(0.415)
Total Living Children	-0.0197	0.0315	0.00414	0.0168	-0.0113	0.0120	-0.0179	0.00729	-0.0138	0.0121
	(0.0515)	(0.0553)	(0.0526)	(0.0552)	(0.0516)	(0.0542)	(0.0517)	(0.0542)	(0.0514)	(0.0539)
R Engages in Community Orgs/activities at least monthly (ref: Less than monthly)	0.189	0.501*	0.158	0.371	0.217	0.374	0.242	0.459*	0.222	0.372
	(0.238)	(0.263)	(0.239)	(0.259)	(0.237)	(0.255)	(0.242)	(0.262)	(0.236)	(0.254)
R Visits with Family at least weekly (ref: Less than weekly)	-0.0729	-0.304	-0.107	-0.311	-0.0531	-0.286	-0.0455	-0.262	-0.0553	-0.271
	(0.228)	(0.246)	(0.233)	(0.248)	(0.228)	(0.244)	(0.229)	(0.244)	(0.227)	(0.242)
R Visits with Friends at least weekly (ref: Less than weekly)	-0.122	-0.462	-0.0403	-0.367	-0.128	-0.408	-0.152	-0.443	-0.136	-0.386
	(0.334)	(0.357)	(0.342)	(0.358)	(0.335)	(0.353)	(0.336)	(0.357)	(0.334)	(0.352)
Currently Married (ref - not currently married)	-0.489*	-0.747**	-0.587**	-0.720**	-0.511*	-0.671**	-0.546*	-0.739**	-0.508*	-0.658**
	(0.284)	(0.303)	(0.287)	(0.300)	(0.283)	(0.297)	(0.285)	(0.301)	(0.283)	(0.296)
Constant	-0.498	-1.991***	-0.570	-1.732***	-0.421	-1.600**	-0.372	-1.604**	-0.413	-1.586**
	(0.605)	(0.693)	(0.607)	(0.671)	(0.595)	(0.662)	(0.595)	(0.665)	(0.595)	(0.660)
Observations	401	401	401	401	401	401	401	401	401	401
R-squared										

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: VLS Health and Aging Pilot Study

Table 5. OLS Regression Analyses: Predictors of Post-trauma Symptoms and Trauma Event Count among Veterans

Variables	Post-trauma symptoms in last 12 months (count) Coeff/se	Coeff/se
Combat veteran (ref - Noncombat)	1.346*	-1.309
	(0.702)	(1.088)
Primary region of service: North VN (ref)		
Primary region of service: Central/Central Highlands	-0.443	-0.971
	(0.663)	(0.749)
Primary region of service: South VN	-0.869	-2.010
	(1.046)	(1.258)
Primary region of service: Lao or Cambodia	2.040**	1.209
	(0.915)	(1.000)
Years of Service: Less than 5	--	--
	--	--
Years of Service: 5-9	0.156	0.250
	(0.623)	(0.683)
Years of Service: 10 or more	-0.414	-0.283
	(0.864)	(0.984)
Age of enlistment: 16 to 18	--	--
	--	--
Age of enlistment: 19 to 20	0.334	0.566
	(0.708)	(0.767)
Age of enlistment: 21 to 24	1.106	1.398
	(0.859)	(0.939)
Age of enlistment: 25 and older	0.471	1.303
	(1.370)	(1.453)
Status: Draftee (ref - Volunteer)	-0.371	-0.151
	(0.610)	(0.685)
Age 60 to 64 (ref: 55-59)	-0.437	-0.618
	(0.641)	(0.715)
Age 65 to 69 (ref: 55-59)	-1.455	-1.774*
	(0.960)	(1.063)
Age 70 to 74 (ref: 55-59)	0.809	0.300
	(1.197)	(1.289)
Age 75 to 79 (ref: 55-59)		
Age 80+ (ref: 55-59)	-0.899	0.476
	(1.893)	(2.160)
Respondent is Female	0.499	0.587
	(1.226)	(1.295)
Income is adequate to meet needs	-0.223	-0.244
	(0.637)	(0.734)
Educational attainment: 0-4 years (ref - 9 years)	-1.123	-1.092
	(1.409)	(1.613)
Educational attainment: 5-8 years (ref - 9 years)	-0.0138	-0.176
	(0.723)	(0.797)
Educational attainment: 10+ years (ref - 9 years)	-0.348	-0.763
	(0.664)	(0.739)
Total Living Children	-0.185	-0.0851
	(0.182)	(0.206)
R Engages in Community Orgs/activities at least monthly (ref: Less than monthly)	0.693	1.395*
	(0.613)	(0.748)
R Visits with Family at least weekly (ref: Less than weekly)	0.181	0.0886
	(0.540)	(0.596)
R Visits with Friends at least weekly (ref: Less than weekly)	-0.709	-2.530
	(1.701)	(1.866)
Currently Married (ref - not currently married)	-2.024	-2.513
	(1.535)	(1.644)
Count of War-time trauma events		1.254***
		(0.365)
Constant	2.272	0.803
	(2.760)	(3.085)
Observations	96	96
R-squared		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: VLS Health and Aging Pilot Study

Table 6. Logistic Regression Coefficients: Self-Reported Poor Health among Vietnamese Older Adults Age 55 and Older.

VARIABLES	Male Respondents							Female Respondents			
	Model A coeff/se	Model B coeff/se	Model C coeff/se	Model D coeff/se	Model E coeff/se	Model F coeff/se	Model G coeff/se	Model H coeff/se	Model I coeff/se	Model J coeff/se	Model K coeff/se
Count of war-time trauma events (0-6)	0.283**							0.108			
	(0.112)							(0.200)			
Participated in combat		0.507									
		(0.371)									
Experienced Unexpected Death of Loved One in War			0.273						-0.00662		
			(0.417)						(0.513)		
Was a Civilian in a Warzone				0.661						0.384	
				(0.622)						(0.457)	
Witnesses Atrocities or Mass Killing					1.018***						-0.291
					(0.380)						(0.375)
Seriously Injured or Killed Another Person						1.142**					
						(0.454)					
Was Exposed to Toxic Chemicals							0.869**				
							(0.399)				
Age 60 to 64 (ref: 55-59)	-0.154	-0.0226	0.112	0.0975	0.0951	-0.0860	-0.125	0.959**	0.980**	0.944**	1.001**
	(0.495)	(0.487)	(0.474)	(0.477)	(0.486)	(0.486)	(0.493)	(0.478)	(0.477)	(0.479)	(0.478)
Age 65 to 69 (ref: 55-59)	0.174	0.238	0.376	0.414	0.411	0.196	0.226	0.122	0.178	0.171	0.285
	(0.606)	(0.603)	(0.591)	(0.585)	(0.607)	(0.604)	(0.604)	(0.531)	(0.524)	(0.522)	(0.541)
Age 70 to 74 (ref: 55-59)	-0.140	-0.0262	0.0435	0.0405	-0.117	-0.0527	0.0226	-0.357	-0.317	-0.344	-0.222
	(0.611)	(0.598)	(0.586)	(0.589)	(0.607)	(0.600)	(0.598)	(0.469)	(0.464)	(0.465)	(0.479)
Age 75 to 79 (ref: 55-59)	0.360	0.400	0.400	0.385	0.400	0.327	0.482	-0.0609	-0.0116	-0.0548	0.112
	(0.677)	(0.660)	(0.655)	(0.659)	(0.674)	(0.671)	(0.664)	(0.663)	(0.659)	(0.659)	(0.682)
Age 80+ (ref: 55-59)	-0.183	-0.224	-0.124	-0.0910	-0.257	-0.0223	-0.0852	-0.0414	-0.00565	0.0147	0.0861
	(0.694)	(0.701)	(0.695)	(0.692)	(0.699)	(0.702)	(0.700)	(0.574)	(0.580)	(0.573)	(0.583)
Incomeis Adequate to Meet Needs (ref: Inadequate)	-1.035***	-0.973**	-0.993***	-1.028***	-0.982**	-1.025***	-1.021***	-0.537*	-0.531	-0.503	-0.529
	(0.387)	(0.381)	(0.379)	(0.381)	(0.388)	(0.385)	(0.383)	(0.326)	(0.325)	(0.327)	(0.325)
Attained Secondary Education (ref - lt secondary)	-0.00632	-0.0315	-0.0371	-0.00794	0.0830	-0.133	-0.0302	-2.286***	-2.321***	-2.286***	-2.340***
	(0.489)	(0.482)	(0.481)	(0.483)	(0.498)	(0.486)	(0.488)	(0.857)	(0.858)	(0.859)	(0.856)
Total kids: 4-6 (ref: 0-3 kids)	0.284	0.267	0.275	0.258	0.465	0.192	0.342	0.241	0.245	0.245	0.267
	(0.521)	(0.516)	(0.515)	(0.515)	(0.526)	(0.517)	(0.520)	(0.422)	(0.422)	(0.422)	(0.423)
Total kids: 7 or moer (ref: 0-3 kids)	1.221**	1.137*	1.108*	1.125*	1.419**	1.135*	1.238**	-0.0733	-0.100	-0.0578	-0.110
	(0.602)	(0.592)	(0.591)	(0.590)	(0.621)	(0.590)	(0.601)	(0.450)	(0.447)	(0.451)	(0.447)
Engages in Community Orgs/Activities at least monthly (ref - lt monthly)	-0.632*	-0.682*	-0.627*	-0.616*	-0.854**	-0.678*	-0.606*	-0.458	-0.483	-0.452	-0.477
	(0.368)	(0.364)	(0.363)	(0.364)	(0.381)	(0.368)	(0.367)	(0.354)	(0.352)	(0.354)	(0.352)
Visits with nonresident family at least weekly (ref - lt weekly)	-0.224	-0.130	-0.129	-0.208	-0.175	-0.171	-0.207	-0.141	-0.124	-0.175	-0.128
	(0.373)	(0.367)	(0.364)	(0.372)	(0.371)	(0.372)	(0.372)	(0.326)	(0.324)	(0.330)	(0.324)
Socializes with friends at least weekly (ref - lt weekly)	-0.199	-0.101	0.00623	-0.0396	-0.339	-0.231	-0.0727	-0.902**	-0.871*	-0.911**	-0.832*
	(0.676)	(0.672)	(0.664)	(0.660)	(0.687)	(0.673)	(0.669)	(0.455)	(0.454)	(0.456)	(0.455)
Currently married (ref- not currently married)	0.114	0.140	0.145	0.144	-0.0424	0.168	0.138	-0.278	-0.273	-0.274	-0.264
	(0.605)	(0.604)	(0.607)	(0.605)	(0.605)	(0.619)	(0.613)	(0.360)	(0.360)	(0.360)	(0.360)
Is currently a smoker	-0.131	-0.186	-0.151	-0.115	-0.0794	-0.107	-0.156	-0.473	-0.259	-0.259	-0.195
	(0.398)	(0.394)	(0.391)	(0.389)	(0.399)	(0.396)	(0.396)	(1.503)	(1.451)	(1.452)	(1.469)
Currently consumes alcohol	-1.131***	-1.112***	-1.085***	-1.133***	-1.187***	-1.026***	-1.119***	0.274	0.257	0.359	0.369
	(0.360)	(0.354)	(0.355)	(0.356)	(0.365)	(0.359)	(0.358)	(1.254)	(1.257)	(1.278)	(1.270)
Currently engages in physical activity daily	0.422	0.474	0.530	0.499	0.519	0.444	0.466	-0.168	-0.165	-0.170	-0.147
	(0.370)	(0.365)	(0.363)	(0.364)	(0.374)	(0.367)	(0.368)	(0.330)	(0.330)	(0.331)	(0.332)
Constant	-0.122	0.312	0.206	-0.216	0.208	0.438	0.174	1.561**	1.706***	1.404*	1.672***
	(1.097)	(1.081)	(1.083)	(1.160)	(1.096)	(1.092)	(1.086)	(0.690)	(0.645)	(0.728)	(0.640)
Observations	185	185	185	185	185	185	185	210	210	210	210

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: VLS Health and Aging Pilot Study