

HOME OWNERSHIP AND HOUSING COST BURDEN: A COMPARISON OF VETERANS AND NON-VETERANS

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Abstract

Past research has found that veterans are at modestly greater risk than non-veterans for homelessness. Most attempts to explain these findings have focused on sociodemographic risk factors such as age, race, and prevalent mental illness. Less attention has been given to a potential proximate explanation of homelessness, housing status (i.e., home ownership and housing cost burden). We used data from the 2006 American Community Survey to examine whether male veterans in age-race/ethnic groups at greatest risk of homelessness are also less likely to own a home than matched male non-veterans, and whether they have a greater likelihood of experiencing housing cost burdens that could put them at risk of homelessness. Compared to non-veterans, recently discharged veterans and veterans from the immediate post-Vietnam era, veteran cohorts at greatest relative risk of homelessness were significantly less likely than their non-veteran peers to own their home while other cohorts of veterans were significantly more likely to own their home. However, veterans of virtually all ethnic and age groups were significantly and substantially less likely than their non-veteran peers to experience severe housing cost burdens. These data suggest that housing status does not explain the increased risk of homelessness among selected veteran subgroups.

Introduction

There is increasing concern that veterans and especially younger veterans of the current conflicts in the Middle East may be at greater risk than non-veterans for homelessness. Most previous studies have found that veterans are at modestly greater risk for homelessness than non-veterans with substantial differences between age cohorts (Calsyn & Roades, 1994;

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Cunningham, Henry, & Lyons, 2007; Gamache, Rosenheck, & Tessler, 2001; Rosenheck, Frisman, & Chung, 1994; Rosenheck, Leda, Frisman, Lam, & Chung, 1996). While there is less risk of homelessness among World War II and Korean era veterans than among similarly aged non-veterans and Vietnam era veterans are at slightly greater risk than their non-veteran peers, veterans from the early period of the All Volunteer Force (AVF) (1973-1980) are at four-times greater risk for homelessness than non-veterans of similar age (Gamache et al., 2001; Rosenheck et al., 1996; Rosenheck et al., 1994).

These results are difficult to explain since veterans of all eras tend to be similar to, or better off than non-veterans in the general population in education, employment, and income (Cunningham et al., 2007; Rosenheck et al., 1994; Rosenheck et al., 1996; Tessler, Rosenheck, & Gamache, 2003), characteristics that should lower their risk of homelessness (Calsyn & Roades, 1994; Caton et al., 2000; Caton et al., 2005; Shinn, 2007; Shinn & Weitzman, 1996). Additionally, veterans have access to special benefits, such as Department of Veterans Affairs (VA) home loan guarantees, pensions, disability payments, and educational assistance as well as to specialized medical programs for homeless veterans and a wide variety of medical, psychiatric, and substance abuse services through the Veterans Health Administration (Justus, Burling, & Weingardt, 2006; Nyamathi et al., 2004; Rosenheck et al., 1996; Cunningham et al., 2007).

One potential explanation for these anomalous findings is that although veterans are better off than non-veterans in terms of general protective factors, they may be more likely than non-veterans to have other characteristics that put them at greater risk for homelessness, either due to the negative effects of their military service or because of selection factors associated with recruitment. It has been suggested that the negative effects of combat, for example Post Traumatic Stress Disorder, might increase the risk for homelessness (Goldin, 1982; Robertson, 1987) but data from national surveys and VA homeless programs show that veterans that served during peacetime following the Vietnam war are at greater risk of homelessness than those who served during the Vietnam era (Mares & Rosenheck, 2004; Rosenheck, Gallup, & Leda, 1991; Rosenheck & Koegel, 1993; Rosenheck et al., 1996).

Recruiting conditions appear to offer a better explanation for differences in the risk of homelessness across different veteran cohorts. The lack of differences between World War II and Korean era veterans and equivalently aged non-veterans in their risk for homelessness (Gamache et al., 2001; Rosenheck et al., 1994; Rosenheck et al., 1996) is likely due to the fact that during these service eras enlistees were more representative of the population of draft-eligible young men (Gamache et al., 2001) and enjoyed extensive VA benefits. In contrast, the Vietnam era draft drew on a relatively modest percentage of the large baby boom generation and there is some evidence that deferments and exemptions allowed better off men with more education to avoid service during this era (Angrist & Krueger, 1994; Cohaney, 1992; Small, 1999).

As a result of the well documented recruitment difficulties caused by the unpopularity of military service following the Vietnam War, veterans of the immediate post-Vietnam era (i.e., the early years of the All Volunteer Force [AVF]) tended to have poor employment prospects in the civilian economy and greater rates of mental illness than their non-veteran peers. In consequence they are at two to four times greater risk for homelessness as compared to non-veterans of similar age (Gamache et al., 2001; Mares & Rosenheck, 2004; Rosenheck et al., 1994; Tessler et al., 2003). Enlistees from this period had lower socioeconomic status, a lower likelihood of high school graduation, poorer intellectual aptitude test results and greater problems with substance abuse than their peers and were, perhaps for these reasons, at greater risk of homelessness after their military service (Bray, Marsden, Guess, Wheelless, & Pate, 1986; Cahalan, Cisn, Gardner, & Smith, 1972; Cooper, 1977; Gamache et al., 2001; Kim, Nestel, Phillips, & Borous, 1980; Laurence, Ramsberger, & Gribben, 1989; Polich, 1981; Rosenheck et al., 1994; U.S. Department of Defense, 1990). Given that incarceration may increase the risk of homelessness by weakening community and family ties as well as by limiting opportunities for employment and access to public housing (Kushel, Hahn, Evans, Bangsberg, & Moss, 2005; Travis, Solomon, & Waul, 2001), the greater criminal justice system involvement of veterans that served in the early AVF (Greenberg & Rosenheck, n.d.; Greenberg, et al., 2007) may have also increased the risk of homelessness for this cohort of veterans.

In later periods of the AVF, improvements in the quality of recruits due to increased military salaries, more experience and skill in recruiting, and a zero-tolerance policy toward drug use (Gamache et al., 2001; Rosenheck et al., 1996; Tessler et al., 2003; Bachman, Freedman-Doan, O'Malley, Johnston, & Segal, 1999; Dorn, 1996; Eitelberg, 1996; Hogan, Simon, & Warner, 2004) may explain the lowering of the relative risk of homelessness in these later cohorts (Gamache et al., 2001; Rosenheck et al., 1996) although they still seem to be at substantially greater risk than their non-veteran counterparts.

While these background characteristics are suggestive, they do not offer clear proximate explanations for differences in the relative risk of homelessness among veterans in different age cohorts. In this study we seek to compare the housing status of domiciled veterans and non-veterans in different racial/ethnic groups and age cohorts. We hypothesized that the risk of homelessness is increased, in part, by reduced home ownership and greater housing cost burden, i.e., having to pay a higher proportion of income for housing. We also hypothesized that those veteran cohorts with the greatest relative risk of homelessness (i.e., veterans of the early AVF) will be those with the lowest rates of home ownership and the greatest housing cost burden. Research clearly suggests that lack of affordable housing is a major risk factor for homelessness (Burt, 1991; Dolbeare, 1996; O'Flaherty, 1996; Mansur, Quigley, Raphael, & Smolensky, 2002; Quigley & Raphael, 2000) and by implication cohorts that have poorer housing resources may be at greater risk of homelessness than their non-veteran peers.

For this study, we used 2006 data from the American Community Survey (ACS), a nationally representative survey of income, housing status, and housing costs conducted annually by the U.S. Census Bureau, to examine whether male veterans in various age-race cohorts were more or less likely than matched male non-veterans to own a home; and secondly, regardless of whether they own their home or rented housing, whether they have a greater likelihood than male non-veterans of experiencing a severe housing cost burden that could put them at risk of becoming homeless. We hypothesized that male veterans in age-race cohorts at greatest risk of homelessness would be less likely to own a house and more likely to face severe housing cost burdens relative to their male non-veteran peers. More specifically, we

hypothesized that the youngest male veterans, those who are more likely to be facing adjustment difficulties in post-military civilian life, and male veterans who enlisted during the early AVF, would be less likely to own a home and more likely to face severe housing cost burdens.

Methods

Source of data and sample

The ACS is designed to take the place of the decennial census long-form survey, and to provide annual estimates of housing and socio-economic characteristics for the nation, all states, most areas with a population of 250,000 or more, and selected areas and population groups of 65,000 people or more. In 2006 the ACS included data from respondents for 1,263,185 households and 80,683 individuals in group quarters, such as college residence halls, skilled nursing facilities, and university dorms. Including themselves, household respondents provided information for 2,889,058 individuals in their households.

The data were constantly collected throughout 2006 using mail-out/mail-back questionnaires, Computer-Assisted Telephone Interviewing (CATI), and Computer-Assisted Personal Interviewing (CAPI). A unique national sample of addresses was sent an ACS questionnaire each month. Census Bureau personnel telephoned non-respondent households during the second month of collection if a phone number was available and conducted personal visits during the third and last month of data collection for a subsample of the remaining non-respondent households. The 2006 ACS achieved an overall survey response rate of 97.5% (U.S. Census Bureau, 2008), calculated as the initially weighted estimate of interviews divided by the initially weighted estimate of cases eligible to be interviewed. The survey data were weighted to account for the sampling design and non-response, i.e., the weights compensated for differences in sampling across areas, for differences between the full sample and the interviewed sample, and for differences between the sample and independent estimates of basic demographic characteristics (for further details on the ACS survey see the 2006 U.S. Census Bureau Design and Methodology and the 2006 Data Users Handbook at <http://www.census.gov/acs/www/>). The data for the 2006 ACS

sample are contained in two hierarchical files, one containing household level records and the other person level records, which are each associated with a specific household (with the exception of records for individuals living in group quarters). There were several steps to the preparation of these data for our use. First, we extracted several items from the household records and linked those data to the appropriate person level records. Next, we removed person level records for individuals who were under the age of 19 years, women, and individuals who were active duty personnel in the military from the sample, resulting in an analytic sample of 1,052,840 responses that represented slightly more than 106 million Americans. Women were removed from the sample due to their very low representation among several cohorts of veterans. Finally, we proportionally down-weighted the sample so that our statistical tests would not be overly sensitive to the large estimated population. A new weight measure was created by dividing the existing final weight by the average number of Americans represented by each case in the full sample (i.e., $299,398,485/2,969,741 = 100.82$). The downweighted analytic sample we used contained 1,056,770 cases.

Measures

Housing status and severe housing cost burden. A dichotomous measure of home ownership was created that indicated whether an individual lived in a home that was owned by the resident household. Two additional dichotomous measures indicated whether the individual was part of a household with a severe housing cost burden—one measure for individuals living in an owner-occupied unit and another for individuals living in a rented apartment or house. Severe housing cost burden for residents of an owner-occupied unit was defined as monthly housing cost that exceeded 50% of monthly household income (U.S. Department of Housing and Urban Development, 2005). Owner costs included: payments for debts on the property, such as mortgages and home equity loans; real estate taxes; condominium fees; insurance on the property, utility costs, and fuel. For owner-occupied mobile homes owner costs include land or site rent, registration fees, and license fees.

For households living in a rental unit, the household was considered to have a severe housing cost burden if their monthly gross rent (contract rent and cost of utilities) was more than 50% of total income.

Sociodemographic characteristics. Two sets of dichotomous measures were created to represent race/ethnicity (white, Black, Hispanic, Asian and Other) and age. Individuals who reported more than one racial or ethnic category were classified as “Other” with the exception of individuals who reported being white and Hispanic, who were classified as being Hispanic. Age was summarized in six categories: 19 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69, and 70 years and older. These age categories were constructed to represent the highest proportion possible of veterans who served in the following specific service periods: the World War II and Korean Eras (1955 and earlier), Interwar (1956-1965), Vietnam (1966-1975), early All Volunteer Force (1976-1985), mid-All Volunteer Force (1986-1995), and recent All Volunteer Force (1996-2006). We based this categorization on the assumption that veterans were typically 19 years of age on average when they enlisted and that the periods of enlistment for each era were as follows: World War II from 1940 to 1947, the Korean War from 1950 to 1955, the Vietnam era from 1964 to 1975, and the first two decades of the All Volunteer Force (AVF) following 1973 (early and middle period) plus the most recent 11 years, 1996-2006 (late AVF period). Although these age categories imperfectly match individuals to service eras, due to past experience with this technique (Greenberg & Rosenheck, n.d.; Greenberg, G., & Rosenheck, 2007; Greenberg, Rosenheck, & Desai, 2007), we believe it does properly classify most veterans.

Analysis

There were two steps to our analysis. First, we determined the percentage of homeowners among male veterans and also among the male non-veteran population stratified by age and race/ethnicity. For each age-race/ethnic group we also estimated a relative risk ratio using a modified Poisson regression approach to calculate the likelihood of home ownership for male veterans as compared to male non-veterans. Next, for each age-race/ethnic group we estimated the percentage of veterans and the percentage of non-veterans that lived in a household with a severe housing cost burden. Again, modified Poisson regressions were used to determine whether male veterans were at greater risk of living in a household with a housing burden than male non-veterans. These analyses were conducted separately for homeowners and renters.

Although binary outcomes in cohort studies are often analyzed by the use of logistic regression to obtain odds ratios, it is preferable to estimate a relative risk ratio if the outcome is relatively common (i.e., an incidence of 10% or more) because of the increasing differential between relative risk ratios and odds ratios with increasing incidence rates, and there is a tendency to misinterpret odds ratios as if they were relative risk ratios (Greenland, 2004; McNutt, Wu, Xue, & Hafner, 2003; Zou, 2004). We used a “modified Poisson” approach (Zou, 2004) to estimate the relative risk and confidence intervals because log-binomial models failed to converge. All statistical modeling was done with the procedure PROC GENMOD of the SAS® software system (SAS Institute, Cary, NC) version 8.0. Robust error variances were estimated using the repeated statement and the subject identifier. We only presented and discussed results for a category (race/ethnicity by age cohort) of veterans or non-veterans in which there were at least 30 individuals that had the status of interest (i.e., owned a home or had a severe housing cost burden).

Results

Home ownership

The top two panels of Table 1 show the percentage of homeowners among age-race/ethnic categories of veterans and non-veterans. There was a substantial increase by age in the percentage of both male veterans and male non-veterans who were home-owners. Minorities, with the exception of some Asian and Hispanic groups, were much less likely than whites to own a home. Rates of home ownership among cohorts of Hispanic veterans were also only modestly lower than that of white veterans.

The bottom panel of Table 1 shows the likelihood of home ownership among age-race/ethnic categories of veterans as compared to non-veterans (i.e. the relative risk ratio of home ownership calculated with a modified Poisson regression). When all racial/ethnic groups are combined together, veterans in the 19 to 29 and the 40 to 49 aged cohorts (the youngest group and the immediate post-Vietnam era groups) were significantly less likely than their peers to own a home (risk ratios of .90 and .96 respectively). Veterans in the other four cohorts were significantly more likely than non-veterans to own a

Table 1. Percentage of Homeowners among Male Veterans and Non-Veterans as well as the Relative Risk Ratio of Being a Home Owner for Veterans as Compared

Race/ Ethnicity	Age					
	19-29	30-39	40-49	50-59	60-69	70 and >
Percentage of Veteran Population Who Own a Home						
White	47.2%	66.8%	74.4%	84.0%	88.2%	85.7%
Black	31.5%	48.8%	58.0%	63.0%	69.8%	73.7%
Hispanic	42.4%	58.7%	68.6%	76.1%	79.6%	79.1%
Asian	45.6%	67.1%	74.0%	84.6%	83.6%	81.1%
Other	35.5%	51.9%	58.4%	67.4%	74.0%	76.3%
All Males	43.8%	62.9%	70.7%	80.9%	86.3%	84.7%
Percentage of Non-Veteran Population Who Own a Home						
White	54.9%	70.8%	80.6%	84.3%	86.5%	79.7%
Black	37.1%	43.3%	53.3%	59.6%	64.3%	62.9%
Hispanic	38.5%	45.5%	57.0%	62.7%	65.2%	63.5%
Asian	46.4%	56.3%	70.2%	73.6%	76.4%	68.3%
Other	42.5%	48.6%	61.5%	68.2%	67.0%	69.8%
All Males	48.6%	61.2%	73.6%	78.9%	81.3%	75.4%
Relative Risk Rate Ratio and Confidence Intervals (Without Risk Adjustment)						
White	.86 (.83-.89)	.94 (.93-.96)	.92 (.91-.93)	.99 (.99-1.00)	1.02 (1.01-1.03)	1.07 (1.07-1.08)
<i>p</i> -value	<.0001	<.0001	<.0001	.24	<.0001	<.0001
Black	.85 (.75-.96)	1.13 (1.06-1.20)	1.09 (1.05-1.13)	1.06 (1.03-1.09)	1.09 (1.05-1.13)	1.17 (1.13-1.22)
<i>p</i> -value	.0077	.0001	<.0001	.0005	<.0001	<.0001
Hispanic	1.10 (.99-1.22)	1.29 (1.21-1.37)	1.20 (1.15-1.26)	1.21 (1.17-1.26)	1.22 (1.17-1.27)	1.24 (1.20-1.29)
<i>p</i> -value	.065	<.0001	<.0001	<.0001	<.0001	<.0001
Asian	.98 (.80-1.20)	1.19 (1.08-1.32)	1.05 (.98-1.14)	1.15 (1.10-1.21)	1.09 (1.04-1.16)	1.19 (1.13-1.25)
<i>p</i> -value	.87	.0006	.17	<.0001	.0011	<.0001
Other	.84 (.70-1.00)	1.07 (.95-1.19)	.95 (.88-1.03)	.99 (.93-1.05)	1.10 (1.03-1.18)	1.09 (1.01-1.19)
<i>p</i> -value	.051	.26	.19	.68	.004	.029
All Males	.90 (.87-.93)	1.03 (1.01-1.05)	.96 (.95-.97)	1.03 (1.02-1.03)	1.06 (1.05-1.07)	1.12 (1.12-1.13)
<i>p</i> -value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

home. However, the differences between veterans and non-veterans in three of these four cohorts were fairly small with risk ratios ranging from 1.03 to 1.06.

The two oldest cohorts of white veterans (greater than age 60; risk ratios of 1.02 and 1.07) and veterans classified as “other” (risk ratios of 1.10 and 1.09) were significantly more likely than their peers to own a home. However, the three youngest groups of white veterans were significantly less likely than their peers to own a home (risk ratios of .86, .94, and .92).

In contrast to white veterans and veterans classified as “other,” almost all cohorts of Black, Hispanic, and Asian veterans were significantly more likely than their non-veteran peers to own a home. Hispanic veterans in particular, were much more likely than their peers to own a home (all but one cohort had risk ratios that ranged from 1.21 to 1.29). The risk ratios for home ownership of the 10 cohorts of Asian and Black veterans above 30 years of age ranged, somewhat more modestly, from 1.05 to 1.19. Among the four minority groups only the youngest cohort of Asian and Black veterans were less likely than their non-veteran peers to own a home (risk ratios of .98 and .85, the former of which was not significant).

Severe housing cost burden among home owners

The top two panels of Table 2 show the percentage of veterans and non-veterans in each age-race/ethnic category that were part of a home-owning household with severe housing cost burdens. The percentage of male veterans and male non-veterans that were part of a home-owning household with a severe housing cost burden increased slightly with age. Minority veterans and non-veterans were disadvantaged in that they were more likely than whites to experience severe housing cost burdens. Thus, the results from Tables 1 and 2 indicate that not only were members of most minority groups (among both veterans and non-veterans) less likely to own a home than whites, they were also more likely to experience a severe housing cost burden.

The lower panel of Table 2 shows the relative risk of residing in a home-owning household facing a severe housing cost burden among veterans as compared to non-veterans. The last row--in which all race/ethnic groups were combined--indicates that among homeowners, veterans in all six cohorts have a much lower risk than non-veterans of being part of a home-owning household with a severe housing cost burden with little variation by age cohort.

Table 2. Among Home Owners: Percentage of Male Veterans and Non-Veterans that are Part of a Household with a Severe Housing Cost Burden as well as the Relative Risk Ratio of Being Part of a Household with a Severe Housing Cost Burden for Veterans as Compared to non-Veterans

Race/ Ethnicity	Age					
	19-29	30-39	40-49	50-59	60-69	70 and >
Percentage of Veteran Population Who are Part of a Household with a Severe Housing Cost Burden						
White	5.1%	5.4%	5.4%	5.8%	6.9%	6.2%
Black	11.2%	8.0%	8.9%	10.7%	13.2%	14.5%
Hispanic		11.2%	8.6%	8.0%	10.9%	8.8%
Asian			10.5%	8.2%	13.3%	7.5%
Other			9.8%	10.3%	9.9%	11.3%
All Males	6.6%	6.4%	6.3%	6.5%	7.5%	6.7%
Percentage of Non-Veteran Population Who are Part of a Household with a Severe Housing Cost Burden						
White	6.1%	6.8%	6.9%	6.8%	8.1%	8.4%
Black	12.1%	12.0%	12.1%	12.8%	15.8%	18.0%
Hispanic	14.2%	18.5%	16.9%	14.7%	16.2%	15.7%
Asian	14.9%	13.3%	15.8%	13.9%	13.7%	17.9%
Other	9.9%	10.9%	12.1%	12.7%	11.3%	10.2%
All Males	8.4%	9.4%	8.8%	8.3%	9.6%	10.4%
Relative Risk Rate Ratio and Confidence Intervals (Without Risk Adjustment)						
White	.85 (.69-1.04)	.79 (.70-.88)	.79 (.73-.85)	.86 (.82-.91)	.86 (.81-.91)	.74 (.70-.78)
<i>p</i> -value	.12	<.0001	<.0001	<.0001	<.0001	<.0001
Black	.92 (.64-1.35)	.67 (.51-.87)	.74 (.62-.87)	.83 (.72-.95)	.83 (.72-.97)	.81 (.70-.93)
<i>p</i> -value	.69	.0025	.0005	.008	.016	.0035
Hispanic		.61 (.47-.78)	.51 (.40-.64)	.54 (.44-.67)	.67 (.55-.83)	.56 (.46-.69)
<i>p</i> -value		<.0001	<.0001	<.0001	.0002	<.0001
Asian			.66 (.44-.99)	.58 (.42-.82)	.96 (.72-1.29)	.42 (.32-.56)
<i>p</i> -value			.044	.0019	.82	<.0001
Other			.81 (.56-1.18)	.81 (.62-1.06)	.87 (.62-1.22)	1.12 (.75-1.66)
<i>p</i> -value			.28	.13	.43	.59
All Males			.71 (.67-.76)	.78 (.74-.82)	.78 (.74-.81)	.64 (.61-.68)
<i>p</i> -value	.78 (.66-.91)	.68 (.62-.74)	<.0001	<.0001	<.0001	<.0001

When veteran and non-veteran homeowners were disaggregated by race and ethnicity it was found that veterans in most age-race/ethnic categories were significantly less likely to live in a household with a severe housing cost burden. All cohorts of white and Black veterans older than 30 were significantly less likely than their peers to live in a household with a severe housing cost burden (risk ratios between .67 to .86). Hispanic and Asian veteran cohorts for whom we have adequate data were at even lower relative risk for experiencing a severe housing cost burden (risk ratios between .42 to .66). As with home ownership, Hispanic veterans were the best off compared to their non-veteran peers, thus seeming to benefit from military service. The youngest cohorts of white and Black veterans, Asian veterans from the interwar period, and all cohorts of veterans classified as "Other race", did not have risk ratios that significantly differed from 1.

Severe housing cost burden among renters

The top two panels of Table 3 show that there was a small but steady increase by age groups in the percentage of male veteran and non-veterans in rented homes who experienced severe housing cost burdens. With only a few exceptions, cohorts of minority veterans and non-veterans alike, were more likely than their white peers to be part of a household with a severe housing cost burden.

When the five racial/ethnic groups are combined, veterans in all six cohorts were found to be at lower relative risk than their peers of being renters with severe housing cost burdens (see last row of Table 3). Veterans in the youngest two cohorts had noticeably lower risk ratios than veterans in the four oldest cohorts (.57 and .63 versus .70 to .83), but all the ratios were substantially less than 1.0.

When veteran and non-veteran renters were disaggregated by race and ethnicity, white and Black veterans (in all but the oldest cohort of Blacks) were found to be significantly less likely than their non-veteran peers to be renters with severe housing cost burden. Among Hispanic veterans, three cohorts had a risk ratio that was significantly lower than 1.

Discussion

This study compared veterans and non-veterans in matching age and race/ethnic cohorts on the likelihood of owning a home and/or being part of a household that experienced severe housing-cost burden. This analysis was

Table 3. Among Renters: Percentage of Male Veterans and Non-Veterans that are Part of a Household with a Severe Housing Cost Burden as well as the Relative Risk Ratio of Being Part of a Household with a Severe Housing Cost Burden for Veterans as Compared to non-Veterans

Race/ Ethnicity	Age					
	19-29	30-39	40-49	50-59	60-69	70 and >
Percentage of Veteran Population Who are Part of a Household with a Severe Housing Cost Burden						
White	10.5%	7.8%	9.5%	12.8%	13.1%	19.4%
Black	8.5%	8.5%	13.7%	16.6%	19.7%	21.2%
Hispanic	9.6%	9.1%	14.7%	14.6%	18.1%	19.5%
Asian						
Other			16.2%	19.6%		
All Males	10.1%	8.6%	11.0%	13.9%	14.4%	19.6%
Percentage of Non-Veteran Population Who are Part of a Household with a Severe Housing Cost Burden						
White	18.8%	10.8%	13.0%	14.6%	17.9%	24.2%
Black	22.6%	17.1%	20.3%	21.4%	27.3%	24.3%
Hispanic	15.3%	16.0%	16.5%	17.9%	22.2%	30.4%
Asian	24.5%	12.3%	18.2%	19.5%	22.3%	24.7%
Other	19.7%	16.4%	18.7%	18.4%	15.8%	23.6%
All Males	18.7%	13.5%	15.5%	16.8%	20.7%	25.5%
Relative Risk Rate Ratio and Confidence Intervals (Without Risk Adjustment)						
White	.56 (.48-.66)	.72 (.62-.84)	.73 (.64-.83)	.87 (.79-.97)	.73 (.65-.82)	.80 (.73-.88)
<i>p</i> -value	<.0001	<.0001	<.0001	.0084	<.0001	<.0001
Black	.37 (.26-.53)	.50 (.38-.66)	.67 (.56-.80)	.78 (.66-.91)	.72 (.59-.88)	.87 (.70-1.08)
<i>p</i> -value	<.0001	<.0001	<.0001	.0015	.0014	.21
Hispanic	.63 (.43-.93)	.57 (.39-.83)	.89 (.65-1.22)	.82 (.60-1.11)	.82 (.59-1.14)	.64 (.49-.85)
<i>p</i> -value	.019	.0036	.47	.20	.23	.0017
Asian						
<i>p</i> -value						
Other			.87 (.60-1.26)	1.06 (.76-1.49)		
<i>p</i> -value			.45	.72		
All Males	.54 (.47-.62)	.63 (.56-.71)	.71 (.65-.78)	.83 (.77-.90)	.70 (.64-.76)	.77 (.71-.83)
<i>p</i> -value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

used to investigate the hypothesis that male veterans in age-race cohorts at greatest risk of homelessness will be less likely to own a house and more likely to face severe housing cost burdens relative to their male non-veteran peers. Our findings did not confirm our hypothesis in that they do not suggest that those cohorts of veterans at greatest risk for homelessness relative to their non-veteran peers face high risk housing situations. Two cohorts of veterans were found to be slightly to modestly less likely to own a home and these two cohorts did coincide with the two cohorts of veterans at higher relative risk of homelessness, but whether a renter or home-owner, all six veteran age cohorts were found to be much less likely than their non-veteran peers to experience severe housing cost burdens.

We specifically expected that given the difficult recruiting conditions during the early years of the AVF and the military's lack of experience in volunteer recruitment, and because younger more recently discharged veterans are more likely to face adjustment difficulties in post-military civilian life, veterans from these two cohorts would be worse off than their non-veteran peers with respect to housing status. Although as noted above, the youngest cohort of veterans and veterans that served in the early years of the AVF were somewhat less likely than their non-veteran peers to own a home, both cohorts of veterans (whether renters or homeowners) were substantially less likely than their non-veteran peers to experience severe housing cost burdens.

Results disaggregated by race and ethnicity also failed to confirm our hypothesis. Previous studies have found that although the risk of homelessness for both minority veterans and minority non-veterans was higher than among whites, white veterans were generally at a higher relative risk of homelessness than their non-veteran peers while Black veterans are less likely to be homeless as compared to their non-veteran peers (Gamache et al., 2001; Rosenheck et al., 1994). The present study found that although minority veterans in cohorts older than 30 were significantly more likely than their peers to own a home, among white veterans only those older than 60 were more likely to own a home, a finding that is weakly consistent with our hypothesis. In contrast to home ownership, almost all veteran cohorts in all race/ethnic groups had a significantly and substantially lower risk for experiencing severe housing cost burden than their non-veteran peers. Since veterans in the

cohorts at greatest relative risk for homelessness were not at greater relative risk for being in households with severe housing cost burdens, these data add to, rather than resolve, the paradox that in spite of their numerous advantages, veterans in some age-race/ethnic groups are substantially more likely to be homeless than their non-veteran peers.

While the data on housing presented in this study do not show patterns of relative disadvantage among veteran cohorts at high relative risk for homelessness, disadvantages in these high-risk cohorts have been found in previous studies of the prevalence of mental illness (Rosenheck et al., 1994) and in criminal justice involvement (Greenberg & Rosenheck, n.d.; Greenberg, Rosenheck, & Desai, 2007). Veterans of the early AVF in particular have been found to have substantially higher rates of mental illness and criminal justice system involvement than their non-veteran peers, paralleling their risk of homelessness (Greenberg & Rosenheck, n.d.; Greenberg, et al., 2007; Rosenheck et al., 1994). However as shown here, they are not at high risk of experiencing high housing cost burdens.

One possible interpretation of these findings would be that the greater relative risk of homelessness among veterans as compared to non-veterans is simply not explained by economic factors, such as housing or employment status. Past survey research found that veterans as a whole and particularly veterans who served during the early AVF, were not at significantly greater risk of non-employment than their non-veteran peers (Greenberg & Rosenheck, 2007), just as in this study they were not at greater risk of experiencing high housing cost burdens. Additionally, as mentioned in the beginning of this study, veterans have greater access than non-veterans to various programs that facilitate access to housing through the VA, such as its Home Loan Guarantee program. The greater relative risk of veterans for homelessness may thus be better explained by the fact that veterans from some cohorts may have greater behavioral risks than their non-veteran peers, as indicated by greater risk of mental illnesses and of incarceration, presumably due to pre-military vulnerabilities.

Several potential limitations of our study deserve comment. Although the age categories were constructed to represent the highest proportion possible of veterans who served in each specific service periods, the specified age categories

do not perfectly identify service in these eras. In addition our method assumes that vulnerabilities that yield greater risk of homelessness in some cohorts than in others can be identified by comparing risk factors among cohorts in the general population. This associational method only weakly demonstrates causal relationships because it rests on the ecological fallacy, i.e., that causal relationships at the individual levels can be discerned from associations between higher risk burdens and outcomes at the population level.

Conclusion

Although some cohorts of veterans, especially those who served in the early years of the AVF, are at greater risk of homelessness than their non-veteran peers these high risk veterans do not have higher risk of experiencing severe housing cost burdens. Rather the opposite appears to be true. Thus, the greater risk of homelessness among some veteran cohorts does not seem to be explained by housing vulnerability. Rather, the greater risk of this cohort and veterans overall for homelessness may reflect behavioral vulnerabilities for mental illnesses and criminal justice involvement that reflect pre-military vulnerabilities.

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