Published in final edited form as:

Psychol Serv. 2010 May ; 7(2): 65–74. doi:10.1037/a0018479.

Personal, Medical, and Healthcare Utilization Among Homeless Veterans Served by Metropolitan and Nonmetropolitan Veteran Facilities

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Abstract

This study assessed differences in personal, medical, and health care utilization characteristics of homeless veterans living in metropolitan versus nonmetropolitan environments. Data were obtained from a Veterans Health Administration (VHA) network sample of homeless veterans. Chi-square tests were used to assess differences in demographics, military history, living situation, medical history, employment status, and health care utilization. Moderator analyses determined whether predictors of health care utilization varied by metropolitan status. Of 3,595 respondents, 60% were residing in metropolitan areas. Age, sex, and marital status were similar between metropolitan and nonmetropolitan homeless. Metropolitan homeless were less likely to receive public financial support or to be employed, to have at least one medical problem, one psychiatric problem, or current alcohol dependency, but more likely to be homeless longer. Of the 52% of the sample who used VHA care in the last 6 months, 53% were metropolitan versus 49% nonmetropolitan ($p = .01$). Metropolitan status predicted at least one VHA visit within the prior 6 months (OR:1.3, CI:1.1, 1.6). Significant differences occur in the personal, medical, and health care utilization characteristics of homeless veterans in metropolitan versus nonmetropolitan areas.

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Keywords

homelessness; rural health; veterans; health services research

Over 6% of the United States population has been homeless, and at any time, as many as 31 million people are—or are at imminent risk of being—homeless (Link et al., 1994). Homelessness is defined as the lack of a fixed, regular, and adequate nighttime residence (“Stewart B. McKinney Homeless Assistant Act”) and is associated with poor health and subsequent morbidity. Homelessness is not a permanent condition, and a vast majority of homeless move in and out of different living arrangements; as many as 90% of homeless are sheltered for periods of time (Kuhn & Culhane, 1998). However, past history of homelessness is a significant risk factor for being currently homeless and newly housed homeless are at high risk for being homeless again (Barrow, Herman, Cordova, & Struening, 1999).

The effects of medical and psychiatric disease tend to be more serious in homeless, who often lack access to primary health care (Barrow et al., 1999; Zerger, 2002). Compared to housed individuals, homeless have higher prevalence and incidence of medical and psychiatric morbidity and mortality (Barrow et al., 1999; Hwang et al., 1998). Furthermore, studies have consistently indicated that homeless persons report their health as poorer than the nonhomeless (Fischer, Shapiro, Breakey, Anthony, & Kramer, 1986; Robertson & Cousineau, 1986; Gelberg, Linn, Usatine, & Smith, 1990). In addition, length of time being homeless is associated with poorer health (North, Pollio, Smith, & Spitznagel, 1998).

Homelessness is particularly a problem for veterans. Over 23% of all homeless persons in the United States are veterans (Murphy, 2000). As many as 250,000 veterans are homeless on any night, and over 27% of veterans admitted to inpatient VHA facilities have ever been homeless (American Psychiatric Association [APA], 2001; Dougherty, 1999; Murphy, 2000). One large cross-sectional survey of 9,108 veterans found that over 35% had experienced some homelessness (Rosenheck & Seibyl, 1997). Homeless veterans differ from nonveteran homeless in that they are homeless for longer periods, typically older, more likely to be minorities, and more educated (Murphy, 2000). Almost half of homeless veterans have a significant mental illness, and 70% suffer from alcohol and/or substance use problems (APA, 2001; O’Toole, Gibbon, Hanusa, & Fine, 1999a).

Access to care may improve homeless health and potentially improve the social morbidity of homelessness, but geography may limit this access, particularly for homeless persons who lack resources to transport to health care services. As the largest health care system in the United States, the Veteran Health Administration (VHA) provides access to health care for eligible United States’ military veterans, including those who are homeless. Veteran homeless living in nonmetropolitan areas may have limited access to VHA health care as most VHA medical centers are located in urban metropolitan areas (Wray, Weiss, Christian, et al., 1999; Wray, Weiss, Menke, et al., 1999).

The VHA is a unique system in which to examine the differences between metropolitan and nonmetropolitan homeless and how geography may influence access to care. Our objective was to compare homeless veterans served by VHA facilities in urban/metropolitan (metropolitan) versus nonmetropolitan settings on personal, medical, diagnostic, and health care utilization characteristics. In addition, we sought to determine which characteristics and environmental factors were associated with homeless veterans’ use of health care at VHA facilities.

Method

The VHA has designed and administered an interview-based questionnaire for currently or recently homeless veterans (Goldstein, Luther, Jacoby, Haas, & Gordon, 2008a; Kaspro, Rosenheck, Frisman, & DiLella, 1999; McGuire & Rosenheck, 2004; Rosenheck, Dausey, Frisman, & Kaspro, 2000). To be eligible for the survey, participants must have been presently or recently homeless military veterans identified and contacted in one of many settings, including community facilities for the homeless, VHA hospitals, VHA outpatient clinics, prisons, and community veterans' centers. Those volunteering to participate were evaluated using semistructured interviews conducted by health care providers associated with the VHA-sponsored Health Care for Homeless Veterans (HCHV) program. These interviews included questions on demographic information, military history, living situation, medical history, substance abuse, psychiatric status, and employment status. One question asked whether the veteran used a VHA health care facility during the 6 months prior to interview. Interviewer observations and clinical judgments were recorded concerning presence/absence of clinical psychiatric symptoms, needs for referral and treatment, and characteristics of the contact with the veteran. Electronic medical chart data, available for VHA-registered veterans, sometimes supplemented the self-reported information from veterans. Data from the interviews were collected and administered by the VHA Northeast Program Evaluation Center (NEPEC).

We utilized NEPEC data from consecutive interviews of participants ($n = 3,595$) identified by the HCHV outreach staff over a 24-month period (October 1, 2001 to September 30, 2003) from Veterans Integrated Services Network 4 (VISN 4), which includes Delaware, most of Pennsylvania, and parts of West Virginia, New York, New Jersey, and Ohio. Major VA health care facilities within this VISN include those in Pennsylvania (Coatesville, Philadelphia, Pittsburgh, Altoona, Butler, Wilkes-Barre, Erie, and Lebanon), Delaware (Wilmington), and West Virginia (Clarksburg).

The classification of respondents into the metropolitan/nonmetropolitan categories was based on the population density of the county in which the VHA facility responsible for contacting the homeless veteran is located (<http://www.census.gov/population/www/cen2000/atlas/data.html>). In the year 2000, population density for counties classified as nonmetropolitan ranged from 165 persons per square mile to 358 (including Harrison, Butler, Blair, Lebanon, Erie, and Luzerne counties respectively). Three of the four counties classified as metropolitan had very high population densities ranging from 1,174 to 11,233 (comprising New Castle, Allegheny, and Philadelphia counties respectively). The remaining county, Chester, had a population density of 573 which is nearly twice as high as the densest nonmetropolitan county but about half as much of the least dense metropolitan county. Chester was classified as metropolitan because of the proximity to the Coatesville VAMC and to the cities of Wilmington (25 miles) and Philadelphia (40 miles).

Our first aim was to examine the characteristics of homeless veterans based on metropolitan status. Continuous measures (e.g., age) are described as mean $\pm$ *SD* and categorical measures (e.g., gender) are described as n (% N). When continuous measures were normally distributed, the parametric t test was used to compare metropolitan and nonmetropolitan samples. If the distribution of the measure was non-normally distributed, then the nonparametric Kruskal-Wallis test was employed. Joint frequency distributions were tested for independence with Chi-Square tests. In order to test for the independent effect of metropolitan status on health care access, a logistic regression model was estimated where VHA facility use in the 6 months prior to interview (yes/no) was regressed on measures found to differ significantly between metropolitan and nonmetropolitan homeless veterans.

Moderator analyses were conducted to see if the effects of potential predictors of VHA facility use in the 6 months prior to interview varied according to metropolitan status. Steps in the procedure are as follows. First, VHA facility use was regressed on each measure for all homeless veterans interviewed in catchment locales classified as metropolitan. Second, the same models were estimated for homeless veterans interviewed in locales classified as nonmetropolitan. Lastly, a model was fitted for all homeless vets including a term for metropolitan status, a term for the measure of interest, and one for the interaction between the two. A significant interaction between metropolitan status and a measure of interest reveals that the effect of the latter on VHA facility use depends upon the locale in which the homeless veteran was interviewed.

The Institutional Review Board of the VA Pittsburgh Health Care System approved this study.

Results

Of 3,595 respondents, 2,159 (60%) veterans were located in metropolitan areas. Significant differences between metropolitan and nonmetropolitan groups were found for race, military service period, employment, and financial support status (see Table 1). For the nonmetropolitan sample, a majority of veterans were white. In contrast, a majority of nonWhites (68% Black; 4% Other) composed the metropolitan sample. A larger proportion of Persian Gulf veterans and pre-Vietnam era homeless veterans were from the nonmetropolitan areas, whereas a larger proportion of Vietnam and post-Vietnam veterans were from metropolitan areas. Metropolitan homeless veterans were less likely to have a history of employment or receive public financial support but were slightly more likely to receive Department of Veteran Affairs (DVA) financial support. For the significant differences, all effect sizes were small with the exception of race, which had a medium effect size.

When asked where they slept the night before the interview, the difference between the metropolitan and nonmetropolitan homeless veterans was statistically significant (see Table 2). Notably, 52% of the nonmetropolitan sample members were sleeping in a shelter while only 44% of the metropolitan sample members were doing so. Correspondingly, 19% of the metropolitan sample members slept without shelter, while 11% of the nonmetropolitan sample did so. Metropolitan homeless were significantly more likely to be homeless for 6 to 12 months (16% vs. 11) and for a year or more (26% vs. 22). When compared with their nonmetropolitan counterparts, metropolitan homeless veterans were slightly—but significantly—less likely to have any of the following: a medical problem, a psychological problem, or a history of past or current alcohol dependence. Of the entire sample, 52% used VHA care in the last 6 months: 53% were metropolitan versus 49% nonmetropolitan status ($p = .0095$).

We evaluated whether metropolitan status has an independent effect on VHA facility use in the 6 months prior to interview (see Table 3) by regressing use on the set of homeless veteran characteristics (reviewed in Tables 1 & 2). Homeless veterans located in metropolitan areas were about 1.4 times more likely to have used a VHA facility in the 6 months prior to interview than homeless veterans located in nonmetropolitan areas. Other measures independently associated with greater odds of use of VHA health care included: military service period; receiving Department of Veteran Affairs (DVA) financial support; where the veteran slept the night prior to interview; having at least one medical and/or psychological problem; and both current and hospitalization for substance use disorders.

Table 4 presents the results of the moderator analyses which evaluate the degree of association between veteran characteristics and use of VHA facilities stratified by metropolitan status. The largest odds ratios were obtained for receiving/not receiving a DVA pension; those receiving a DVA pension were more likely to have utilized VHA health care services (OR = 2.9 for metropolitan; OR = 3.9 for nonmetropolitan). Likewise, sleeping in an institutional setting the night before the interview was associated with receiving VHA health care services for both groups (OR = 3.9 for metropolitan; OR = 4.1 for nonmetropolitan) and being hospitalized for drug dependency was associated with receiving VHA health care services (OR = 2.5 for metropolitan; and OR = 1.4 for nonmetropolitan).

Older veterans in the nonmetropolitan group were more likely to use VHA facilities, while age had no effect for metropolitan veterans. Vietnam veterans living in both metropolitan and nonmetropolitan areas were more likely than Pre-Vietnam, Post-Vietnam or Persian Gulf veterans to use VHA facilities, yet the effect was stronger among metropolitan veterans compared to nonmetropolitan veterans (interaction $p = 0.0019$). As for monthly income, nonmetropolitan veterans making more than \$500 a month were 70% more likely to use VHA facilities than their metropolitan counterparts. Veterans in the metropolitan group who were homeless for more than 1 year were more likely to use VHA services than were veterans who were homeless for less than 6 months or less, whereas veterans from the nonmetropolitan group who were homeless for greater than 1 year were less likely to use VHA services than were their shorter-term homeless (homeless less than 6 months) counterparts. For veterans with a history of alcohol or drug dependency, the odds ratios indicated a greater likelihood to use VHA facilities in both groups, with a stronger effect noted in the metropolitan group. While the overall significance of the metropolitan/nonmetropolitan status-by-race interaction is only of borderline significance ($p = .09$), among nonmetropolitan veterans, black veterans were *less* likely to use VHA facilities than Caucasian veterans.

Discussion

A comparison was made between homeless veterans living in counties with a high population density (metropolitan) to those living in counties with a lower population density (nonmetropolitan) on an extensive clinical interview regarding demographics, military history, homeless situation, financial resources, physical and mental health, and recent use of VHA health care services. The goals of the study were to determine how this difference might influence access to health care provided by the VHA, and specifically to determine whether living in a metropolitan versus nonmetropolitan area influences access. We found significant personal, medical, and health care utilization differences between metropolitan and nonmetropolitan homeless veterans. These differences were in military history, employment status, financial support, and proportion of individuals with substance dependence. In general, health status was slightly—but significantly—poorer in the nonmetropolitan than in the metropolitan subsamples.

While race did not reach statistical significance in the moderator analysis, it is worth noting that racial differences in VHA facility use were minimal among the metropolitan group, but that black homeless vets dwelling in nonmetropolitan counties were less likely to use the VHA than their white counterparts (OR = 0.768, $p = .023$). The differences associated with race may be a reflection of different access to treatment and/or quality of treatment that may be afforded minorities in rural areas. In rural VISN4, the proportion of minorities is lower than in urban areas. Lesser availability of minority health care providers and the largely nonminority status of many health care providers in nonmetropolitan areas may be associated with the lesser frequency of use of VHA services by minority veterans. There may be negative perceptions of health care providers, including homeless service providers, by

minorities in rural areas. This matter has not been adequately studied to address the question of whether these perceptions may account for the lower utilization of VHA health care services in nonmetropolitan veteran homeless compared to metropolitan counterparts.

Overall, the metropolitan and nonmetropolitan samples did differ in use of VHA health care services. Nonmetropolitan homeless veterans accessed care less than metropolitan homeless veterans, and different rates of access were associated with income status, and substance abuse history. Certainly, the ability to physically transport to health care services may be an important factor in the differences we found in veteran homeless' use of VHA health care services. Metropolitan homeless veterans likely have greater access to public transportation that could facilitate access to health care services.

We and others have consistently reported that a substantial proportion of homeless veterans have significant medical and psychiatric disorders (Goldstein et al., 2008a; Goldstein, Luther, Jacoby, Haas, & Gordon, 2008b). However, differences in homeless veterans' access to health care based on environmental status have not been evaluated. Prior studies involved homelessness largely in urban areas, limiting the ability to generalize the results to a significant homeless population living in non-urban settings. In addition to finding an overall difference in rate of access to VHA health care facilities between metropolitan and nonmetropolitan environments, we found that these differences appear to be associated with a number of personal and demographic characteristics, such as period of service and income status. We found that more homeless veterans in nonmetropolitan areas had current or past alcohol dependence than homeless veterans residing in metropolitan areas. The reverse was true for history of drug dependence. We were unable to evaluate the effect of geographic prevalence rates of alcohol and drugs of abuse among veteran homeless. Drugs of choice for veterans may differ from metropolitan to nonmetropolitan areas and differ between different cities or different rural communities. Furthermore, access to drug and alcohol treatment programs, both within and outside the VHA, likely differ based on geography. These factors may also influence health care access due to a primary drug or alcohol problem.

Homeless veterans in metropolitan or nonmetropolitan areas differed regarding several key characteristics of their homeless status, some of which may be indicators of what might be considered the "severity" of the homelessness. These characteristics involve instability and vulnerability associated with their living situation and length of homelessness. Homeless veterans in metropolitan areas were more likely to sleep in unsheltered environments, correspondingly less likely to obtain emergency shelter, and were more frequently homeless for periods longer than a year. The severity of homelessness and its impact on individuals' health may be assessed by defining stability and vulnerability of the current domicile and the duration of homelessness. Current homeless living arrangements (e.g., sheltered, unsheltered, doubled up status) may also influence process of care outcomes, including utilization of health services and response to medical treatments (Gallagher, Andersen, Koegel, & Gelberg, 1997; O'Toole, Gibbon, Hanusa, & Fine, 1999b; Smith et al., 2000; "Stewart B. McKinney Homeless Assistant Act"). O'Toole found that among a homeless sample, unsheltered homeless were less likely to attend primary care visits than those who resided in bridge housing or doubled-up living arrangements (O'Toole et al., 1999a).

We found that being homeless for an extended period (at least 1 year) was positively associated with VHA use among metropolitan veterans but negatively associated among nonmetropolitan veterans. The nature and stability of homeless living arrangements and duration of homelessness are important metrics in assessing homeless severity as they both impact patient and process-of-care outcomes. Homeless veterans may move in and out of different living arrangements making it difficult for outreach workers to evaluate immediate service needs and complicating any analysis of the association between duration of living

arrangements and health-related outcomes. Future studies should examine veteran homeless severity and its influence on health care access.

Homeless veterans who access facilities in metropolitan locations made significantly more use of VHA services than those in nonmetropolitan settings and a slightly higher proportion of the metropolitan subsample received VA financial benefits than did the nonmetropolitan subsample. Having a history of some employment over the 3 years before the interview was associated with reduced VHA service utilization independent of living situation. These findings raise the questions of whether homeless veterans living in metropolitan environments are more disabled and less protected than those in nonmetropolitan environments. Employed homeless individuals are in better health than unemployed homeless, and/or they access their health care services elsewhere, presumably reducing urgent need for VHA services. The metropolitan group's lesser occurrence of employment, higher level of disability payments, and relatively high use of VHA facilities after one year of homelessness may indicate relatively greater disability. This view receives some support from the finding that, in general, individuals who received financial support from the VA were more likely to utilize its services, and from the fact that we identified a small group of individuals who slept in an institutional setting the night before the interview (metropolitan and nonmetropolitan) who made substantial use of the VHA system.

This study was limited by the data coming from a single survey that reflects data gathered largely from self-reported assessments. While the VHA uses an extensive electronic medical record system that includes patient diagnoses, treatments and access to VHA health care services, we were not able to link the NEPEC survey responses to this data resource. However, the survey procedures did not prohibit the interviewers from confirming respondents' self-report information by accessing the VHA electronic medical records. Unfortunately, the NEPEC health access variable did not account for number of health care visits, but only whether or not the homeless veteran had at least one visit in the last 6 months. We could not account for more than one visit in the last 6 months or what type of encounter occurred during the visit. It would be informative to have this information to confirm the type and quality of health care access and whether metropolitan and nonmetropolitan veterans have different quality of health care provided. Future studies could explore this. Finally, the interview process itself may have provided opportunities for care. In fact, the process of the interview indicates that these homeless veterans are in contact with VHA outreach personnel. Our data did not include information about whether homeless veterans in metropolitan and nonmetropolitan settings receive any non-VHA care, which types, or the quality of that care. In effect, a longitudinal evaluation covering the period of homelessness would be highly useful with regard to providing the bases for numerous results of the present study.

Our data suggests that there are characteristics of veterans that predict differential access to VHA health care. Metropolitan homeless veterans are geographically closer to many VHA facilities and services than nonmetropolitan homeless veterans. The VHA is in general a "hub and spoke" model of care—with large VHA facilities located in predominantly urban environments and community based outpatient clinics located in more rural environments. Beyond these two physical health care access points, the VHA has "outreach" programs to extend services beyond facilities—community-based care including home-based primary care is one example of this outreach. Other examples include telemedicine services and phone based services for veterans in remote areas. Unfortunately, homeless veterans in nonmetropolitan areas may lack access to telehealth or phone capabilities. Innovative programs to improve this access to VHA health care (e.g., providing phones or telehealth equipment to homeless veterans in remote communities), enhance the ease of linking veteran homeless to local non-VHA health care services, and expanding VHA homeless outreach

service capability in remote communities may be initial strategies to consider in order to reduce metropolitan and nonmetropolitan inequity in access to VHA and any health care services.

Conclusions

Despite these study limitations, we found significant differences in the personal, medical, and health care utilization characteristics of homeless veterans in metropolitan versus nonmetropolitan areas, and that some of these differences are associated with health care utilization. Interventions to increase access to care and target specific health conditions of the homeless should consider geographical location for resource allocations, particularly in nonmetropolitan environments.

Acknowledgments

This project was funded by infrastructure support funding from the VISN 4 Mental Illness Research, Education, and Clinical Center (MIRECC, Director: D. Oslin; Pittsburgh Site Director: G. Haas), VA Pittsburgh Healthcare System. The authors wish to acknowledge the assistance of Robert Rosenheck, PhD (Director, NEPEC) for access to this data and Margaret Krumm for editorial assistance in preparation of this article.

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Table 1

Demographic Characteristics of Homeless Veterans by Metropolitan Status

Characteristic	Total (<i>N</i> = 3,595)	Metropolitan status		Analyses <i>p</i>
		Metropolitan (<i>N</i> = 2,159)	Nonmetropolitan (<i>N</i> = 1,436)	
Age	48.4 ± 9.4	48.3 ± 8.8	48.6 ± 10.3	0.4370
Male gender	3,477 (96.7)	2,094 (97.0)	1,383 (96.3)	0.2623
Race				<.0001
White	1,647 (45.8)	662 (30.7)	985 (68.6)	
Black	1,899 (52.8)	1,466 (67.9)	433 (30.2)	
Other	49 (1.4)	31 (1.4)	18 (1.3)	
Married	158 (4.4)	84 (3.9)	74 (5.2)	0.0705
Military service period				0.0166
Pre-Vietnam	330 (9.2)	178 (8.3)	152 (10.6)	
Vietnam Era	1,689 (47.1)	1,032 (48.0)	657 (45.8)	
Post-Vietnam	1,350 (37.6)	825 (38.3)	525 (36.6)	
Persian Gulf	218 (6.1)	117 (5.4)	101 (7.0)	
Received combat fire	683 (19.4)	412 (19.5)	271 (19.4)	0.9605
Employed (past 3 years)	1,825 (51.0)	1,020 (47.6)	805 (56.3)	<.0001
Financial support				
Department of Veteran Affairs	856 (23.9)	542 (25.2)	314 (22.0)	0.0273
Public	1,047 (29.3)	586 (27.3)	461 (32.4)	0.0012
Monthly income ≥\$500	1,487 (42.0)	924 (43.4)	563 (39.9)	0.0383

Note. Data are presented as *n* (% column *N*).

Table 2**Housing and Medical Characteristics of Homeless Veterans by Metropolitan Status**

Characteristic	Total (<i>N</i> = 3,595)	Metropolitan status		Analyses <i>p</i>
		Metropolitan (<i>N</i> = 2,159)	Nonmetropolitan (<i>N</i> = 1,436)	
Where slept last night				<.0001
Shelter	1,665 (47.4)	925 (44.3)	740 (51.8)	
Outdoors	548 (15.6)	395 (18.9)	153 (10.7)	
Institution	433 (12.3)	240 (11.5)	193 (13.5)	
Other	869 (24.7)	526 (25.2)	343 (24.0)	
Time homeless				<.0001
<6 months	2,029 (61.6)	1,179 (58.2)	850 (67.0)	
<1 year	463 (14.1)	329 (16.2)	134 (10.6)	
≥1 year	801 (24.3)	517 (25.5)	284 (22.4)	
Health problems				
Any medical problem	3,041 (84.7)	1,762 (81.8)	1,279 (89.1)	<.0001
Any psychological problem	2,531 (71.3)	1,473 (69.1)	1,058 (74.7)	0.0003
Alcohol dependency				
Current	1,395 (38.9)	780 (36.2)	615 (42.9)	<.0001
Past	2,335 (65.1)	1,344 (62.5)	991 (69.1)	<.0001
Hospitalized for	1,941 (54.2)	1,122 (52.3)	819 (57.2)	0.0037
Drug dependency				
Current	1,187 (33.2)	755 (35.1)	432 (30.2)	0.0020
Past	1,944 (54.2)	1,242 (57.7)	702 (49.0)	<.0001
Hospitalized for	1,694 (47.3)	1,100 (51.2)	594 (41.5)	<.0001
Used VHA (past 6 months)	1,848 (51.7)	1,148 (53.4)	700 (49.0)	0.0095

Note. Data are presented as *n* (% column *N*). VHA = Veterans Health Administration.

Table 3

Odds Ratios (OR) and p Values From Logistic Regression Model of Any Use of Veterans Health Administration Services (Past 6 Months) Regressed on Characteristics of Homeless Veterans

Characteristic	OR	p
Metropolitan city	1.357	0.0008
Age	1.009	0.3083
Race (ref: white)		0.2327
Black	0.857	0.1029
Other	1.094	0.7985
Married	1.269	0.2554
Military service period (ref: Pre-Vietnam)		0.0288
Vietnam	1.610	0.0141
Post-Vietnam	1.418	0.1553
Persian Gulf	1.753	0.1041
Received combat fire	0.964	0.7428
Employed (past 3 years)	0.868	0.1318
Financial support		
Department of Veteran Affairs	2.816	<.0001
Public	1.102	0.3366
Monthly income ≥\$500	1.117	0.2495
Where slept last night (ref: shelter)		<.0001
Institution	3.567	<.0001
Outdoors	1.224	0.0761
Other	1.577	<.0001
Time homeless (ref: <6 months)		0.2778
<1 year	1.212	0.1095
≥1 year	1.042	0.6775
Health problems		
Any medical problem	1.945	<.0001
Any psychological problem	1.857	<.0001
Alcohol dependency		
Current	0.768	0.0237
Past	1.035	0.8070
Hospitalized for	1.430	0.0097
Drug dependency		
Current	0.784	0.0570
Past	1.134	0.4547
Hospitalized for	2.259	<.0001

Table 4

Odds Ratios (OR) and p Values From Within-Sample Main Effects Models and Interaction Model of Any Use of VHA Services (Past 6 Months) Regressed on Characteristics of Homeless Veterans by Metropolitan Status

Characteristic	Metropolitan		Nonmetropolitan		Interaction p
	OR	p	OR	p	
Age	0.996	0.3977	1.013	0.0161	0.0201
Male gender	0.664	0.1162	0.620	0.0947	0.8597
Race (ref: white)		0.2626		0.0749	0.0869
Black	1.039	0.6821	0.768	0.0229	
Other	1.894	0.1033	0.960	0.9315	
Married	1.177	0.4740	1.237	0.3750	0.8802
Military service period (ref: Vietnam)		<.0001		0.0002	0.0019
Pre-Vietnam	0.372	<.0001	0.752	0.1143	
Post-Vietnam	0.777	0.0073	0.619	<.0001	
Persian Gulf	0.782	0.2097	0.556	0.0070	
Received combat fire	1.220	0.0725	1.234	0.1220	0.9481
Employed (past 3 years)	0.695	<.0001	0.612	<.0001	0.3592
Financial support					
Department of Veteran Affairs	2.876	<.0001	3.859	<.0001	0.0990
Public	1.000	1.0000	1.338	0.0106	0.0522
Monthly income $\geq$ \$500	1.312	0.0020	2.048	<.0001	0.0017
Where slept last night (ref: shelter)		<.0001		<.0001	0.7868
Outdoors	1.226	0.0908	1.513	0.0203	
Institution	3.847	<.0001	4.158	<.0001	
Other	1.558	<.0001	1.719	<.0001	
Time homeless (ref: <6 months)		0.0062		0.0119	0.0002
<1 year	1.202	0.1413	1.047	0.8054	
$\geq$ 1 year	1.394	0.0019	0.667	0.0041	
Health problems					
Any medical problem	2.544	<.0001	2.144	<.0001	0.4247
Any psychological problem	2.176	<.0001	2.140	<.0001	0.9176
Alcohol dependency					

Characteristic	Metropolitan		Nonmetropolitan		Interaction <i>p</i>
	OR	<i>p</i>	OR	<i>p</i>	
Current	0.996	0.9648	1.138	0.2269	0.3403
Past	1.840	<.0001	1.251	0.0513	0.0083
Hospitalized for	1.859	<.0001	1.489	0.0002	0.1097
Drug dependency					
Current	1.311	0.0030	1.167	0.1813	0.4285
Past	2.281	<.0001	1.271	0.0237	<.0001
Hospitalized for	2.494	<.0001	1.442	0.0007	<.0001