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Abstract

Introduction: Unsheltered homelessness is a strongly debated public issue. The study objective is to identify personal and community characteristics associated with unsheltered homelessness in veterans, and to test for interactions between these characteristics.

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Methods: In a 2018 national survey of U.S. veterans with homeless experiences, investigators assessed unsheltered time, psychosocial characteristics, and community measures of shelter access, weather, and rental affordability. Associations between these characteristics and unsheltered status were tested in July–August 2020. This study also tested whether the count of personal risk factors interacted with community characteristics in predicting unsheltered status.

Results: Among 5,406 veterans, 481 (8.9%) reported   7 nights unsheltered over 6 months. This group was more likely to report criminal justice history, poor social support, medical and drug problems, financial hardship, and being unmarried. Their communities had poorer shelter access and warmer temperatures. The likelihood of unsheltered experience rose with risk factor count from 2.0% (0–1), to 8.4% (2–3), to 24.2% (4–11). Interaction tests showed the increase was greater for communities with warmer weather and higher rents (p-values <0.05).

Conclusions: Among veterans experiencing homelessness, unsheltered experiences correlate with individual and community risk factors. Communities wishing to address unsheltered homelessness will need to consider action at both levels.

INTRODUCTION

Experiences of homelessness vary in visibility, from sleeping in public spaces to staying in shelters or others' homes. "Unsheltered" status, which includes sleeping outdoors, in vehicles, or in public areas such as train stations, characterizes about half the individuals experiencing homelessness in the U.S.[1]

Unsheltered homelessness spurs strong public debate as to what makes it more common in some places and for some people. To some, unsheltered homelessness reflects community shortfalls, including rental market failures and weak sheltering.[2] Indeed, unsheltered homelessness is more common in areas with fewer shelter beds, such as the U.S. West Coast.[1] Conversely, the epidemiology of addiction and mental health problems among people experiencing homelessness[3] leads others to emphasize these factors. Media treatments of homelessness, such as "Seattle is Dying," echo that theme.[4] Such stories are offered as evidence that initiatives focused on long-term housing interventions have failed.[5]

Despite debates, less is known about factors contributing to unsheltered homelessness. Prior large database analyses of homeless populations emphasize personal characteristics, and depend on existing records.[6,7] Studies profiling community factors, often based on interviews, highlight revolving door institutional exposures,[8] environmental risks,[9] bureaucratically burdened outreach,[10] and other factors.[11] Many involve local samples.[12,13]

This study seeks a statistical portrait of personal and community characteristics associated with unsheltered homelessness among veterans, based on a research survey of >5,000 veterans with experiences of homelessness (sheltered and unsheltered), including veterans who obtained housing after being homeless. Although cross-sectional data preclude direct causal inference, they may hint at factors contributing to unsheltered status, and descriptive data can direct attention to vulnerabilities that may require help after homelessness ends. Analyses proceed from a hypothesis that health and psychosocial vulnerabilities will be worse for those who had been unsheltered in the prior 6 months, compared with those who

had no recent unsheltered experience. Further tests explore whether community indicators such as shelter availability, rental prices, and weather are associated with unsheltered status.

METHODS

This paper used responses from a survey of veterans (*n*=5,766) who experienced homelessness and were receiving primary care at 26 Department of Veterans Affairs (VA) Medical Centers in 2018. The parent study compared primary care experiences among those who used a new kind of VA clinic designed for homeless-experienced veterans (Homeless Patient–Aligned Care Teams)[14] and those receiving non–Homeless Patient–Aligned Care at the same VA Medical Centers.

Study Sample

The sampled VA Medical Centers were those with the largest Homeless Patient–Aligned Care Teams at time of study. The sample included 3 in the Northeast, 10 in the South, 4 in the West, and 9 in the Midwest. As detailed elsewhere,[15] eligibility was based on 1 ICD-9-CM or ICD-10-CM diagnosis of homelessness or VA-specific administrative indicators of receipt of VA homeless services[16] and 2 VA primary care visits over the prior 30 months. Individuals were selected randomly for recruitment to a mail (or phone, if preferred) survey. They were recruited in 4 successive 4- to 6-week waves of approximately 3,658 people each, starting in March 2018. Each wave included: an introductory letter, a survey with $1 pre-incentive, a reminder card, and a second survey for non-responders. A contractor also telephoned non-responders up to 5 times. A $10 debit card was offered. Data collection ended October 1, 2018. All elements of informed consent were offered through the IRB-approved fact sheet, including a statement that the medical record would be checked (Appendix Figure 1).

Measures

Unsheltered status was based on number of nights spent, in the last 6 months, *outside or in some other place not meant for sleeping (like an abandoned building, bus station, or car)*. Response options were *no nights*, *between 1 and 6 nights*, and *7 nights*. This classification derived from prior research where 1 such nights were associated with higher drug use and greater mortality.[17] Individuals reporting no such nights were deemed "sheltered."

Most participant characteristics were derived from the survey. Exceptions include calculated age and race, where VA records were queried in the absence of survey response. Race/ethnicity was categorized as Black/non-Hispanic, White, Hispanic, or other. The survey queried marital status, education, employment, monthly income, difficulty affording basic needs, affirmation of being currently homeless, report of problems getting a job or housing because of criminal record, and report of a night in prison or jail in the past 12 months.

Alcohol or drug problems were based on the Two-Item Conjoint Scale,[18] which assesses having used alcohol or drugs *more than you meant to* and *felt you wanted to or needed to cut down* in the preceding year. Severe chronic pain was assessed with 1 item from the Brief Chronic Pain Questionnaire on pain lasting at least 3 months coupled with rating average past-week pain at 7 of 10.[19,20] Psychological distress was based on summing 4

depression/anxiety items from the Patient Health Questionnaire–4[21] and 2 items assessing psychotic symptoms on the Colorado Mental Health Symptom Index (summed range=0–24, α=0.84).[22] Psychological distress was dichotomized at 10 to indicate "severe," based on face validity: A score 10 would be attained if a person reported 5 of 6 queried symptoms *several days* a week, or if they reported 3 of 6 symptoms *more than half the days* a week and 1 symptom *one or two days*. The survey also queried 8 self-reported medical conditions queried on the Medical Expenditure Panel Survey.[23] A 6-item social support indicator was devised from combining: (1) 5 items from the emotional support and isolation scales of the NIH Patient-Reported Outcomes Measurement Information Set[24] and (2) self-reported capacity to borrow $20.

Three community indicators were assessed for the 26 communities where the VA care sites were located, based on characteristics that have emerged in prior studies focused on the count of persons homeless by community.[25,26] To summarize rental costs, a "housing wage" is the hourly wage a person in that community would need to earn, working full time, to afford an apartment at federal Fair Market Rent, spending no more than 30% of income on housing as computed by the National Low Income Housing Coalition.[27] Warmer climate has been associated with homelessness.[28] This study's indicator was average night-time low temperature in January[28] as obtained from the U.S. National Centers for Environmental Information. Finally, shelter bed accessibility was computed as the ratio between the number of shelter beds for single adults and the Point-in-Time count of single homeless adults in 2018's Annual Homelessness Assessment Report,[29] matching the year of the survey.

Although these measures are continuous, smoothed scatterplots showed they were not linearly associated with unsheltered status. Therefore, generalized additive models with penalized regression splines (using R package mgcv)[30] and graphing were utilized. The graphs were used to choose binary cut points where the probability for unsheltered status tended to be higher above the cut point and lower below. The resultant categorical indicators were warm weather (January night-time low of 30 degrees vs <30 degrees Fahrenheit), high housing wage ($22/hour vs <$22/hour), and ratio of shelter beds to adults homeless (0.65 vs <0.65).

Statistical Analysis

To assure 2 clearly distinct groups, analyses compared respondents with no unsheltered nights with respondents with 7 nights, removing those with 1–6 nights.[31] Secondary analyses restricted comparisons to those respondents reporting homelessness on the day of the survey. Bivariate comparisons used chi-square tests. Multivariable mixed effects logistic regression models included demographic indicators (i.e., race, age, sex, marital, and work status) and 3 community indicators for housing wage, weather, and shelter bed ratio. A priori, the following variables were included in the multivariable model regardless of significance in bivariate analyses: age, race/ethnicity and sex, as well as the 3 community characteristics, which were of high theoretical interest. Other personal characteristics were retained if bivariate comparisons achieved $p<0.05$ for the overall cohort and <0.10 among currently homeless individuals. When these analyses were repeated for respondents affirming current homelessness, just 11% of the sample (*n*=620) remained. Given the small

numbers involved and exploratory intent, for this iteration, variables were retained based on $p<0.10$ in bivariate comparisons.

The analysis then considered whether variables independently associated with unsheltered status could serve as a summable set of risk factors, including the significant community and personal risk factors. Variables tested were based on $p<0.05$ in the all-respondent model or $p<0.10$ in the model among currently homeless respondents. To avoid imposing a strict linear assumption on this count in subsequent models, this entailed graphically depicting the model-predicted risk of unsheltered status in relation to risk count (maximum 11 among all respondents, 7 among currently homeless), and choosing cut points based on inflection points in the graphs. For the all-respondent sample, cut points were 0–2, 3–6, and 7–11 risk factors. For the currently homeless subsample, cut points were 0–1, 2–3, and 4–7 risk factors. All models adjusted for site as a random effect and primary care clinic type as a fixed effect.

To explore whether the association of personal risk factors with unsheltered status varied according to community factors, an interaction between the personal risk factor count and each community variable was tested. Specifically, the 3 community variables were removed from the risk count; then, the multivariable mixed effect model was iterated 3 separate times, each time including an interaction term (risk factor count X community factor) for each community variable (weather, shelter bed availability, rental affordability). Wald tests were used to assess statistical significance of the interactions. Interactions were illustrated by calculating model-predicted probability of unsheltered time for a hypothetical respondent from 1 site (randomly chosen), entering variations in community characteristics and a categorical indicator for greater or lesser number of personal risk factors.

To mitigate non-response bias, all models included weights based on the inverse of the propensity to respond.[32] Modeled response propensity was calculated from logit models employing 2 years of VA diagnostic and clinical records (Appendix Table 1). As described in a prior publication,[15] weighting variables included demographics, health diagnoses derived according to Elixhauser's method,[33] and utilization of VA inpatient and emergency services. Primary analyses are based on complete respondents. In sensitivity analysis, 100 imputed data sets were generated, and the all-respondent and currently homeless models were refit with these multiply imputed data sets.

RESULTS

The survey was sent to a target of 14,340 people, with 5,766 responses (40.2%, accounting for those who died prior to mailout). Differences between respondents and non-respondents were modest (Appendix Table 1), even when significant.

In the primary analysis of 5,406 respondents who reported either no unsheltered nights in the prior 6 months (n=4,925, which includes formerly homeless individuals) or 7 unsheltered nights (n=481 "unsheltered"), unsheltered people were more likely to be aged <65 years and unemployed (Table 1). They were more likely to report difficulty paying for basic needs, monthly income <$1,000, a criminal record that hindered housing or employment, a night

incarcerated in the prior year, severe chronic pain, greater psychological distress, lower social support, poor or fair general self-reported health, and alcohol and drug problems (all $p<0.05$). The magnitude of these differences was as high as 24% (for difficulty paying for basic needs).

Community differences also emerged. Unsheltered respondents more often came from communities with warmer weather (87% vs 76% for winter night-time temperature 30 degrees) and higher rent burden (32% vs 29% for affordable rental wage $22/hour), and from communities with lower shelter bed availability (56% vs 68% for ratio of beds to homeless individuals[29]), but these differences were modest. Among those affirming homelessness on the date of survey response (n=620), bivariate comparisons were broadly similar (Table 2).

In a multivariable-adjusted model including all respondents (Table 3), unsheltered status was associated with community characteristics of lower shelter bed availability (OR=1.66, 95% CI=1.17, 2.35) and warmer climate (OR=1.50, 95% CI=1.03, 2.21), but was not with higher-cost rentals (OR=1.08, 95% CI=0.77, 1.53). Significant personal characteristics included not having married (OR=1.24, 95% CI=1.00, 1.54), difficulty affording necessities (OR=2.01, 95% CI=1.73, 2.34), income <$1,000/month (OR=1.34, 95% CI=1.16, 1.55), a criminal record hindering housing or employment (OR=1.47, 95% CI=1.27, 1.72), a night in jail (OR=1.74, 95% CI=1.41, 2.16), psychological distress (OR=1.50, 95% CI=1.28, 1.75), low social support (OR=1.37, 95% CI=1.18, 1.58), a higher count of medical diagnoses (OR=1.09 per diagnosis, 95% CI=1.04, 1.15), and problematic drug use (OR=2.08, 95% CI=1.75, 2.47).

In a multivariable-adjusted model restricted to currently homeless respondents (n=620), unsheltered status was associated with (all $p<0.05$): age 51–64 vs 50 years (OR=1.46, 95% CI=1.09, 1.96), a criminal record (OR=1.65, 95% CI=1.27, 2.16), and drug problems (OR=1.74, 95% CI=1.28, 2.36) (Table 3). Non-significant trends ($p<0.10$) were observed for: difficulty paying for basic needs, chronic pain, and distress. Iteration with imputed data sets did not change the magnitude or direction of associations, although some p-values shifted from just above 0.05 to just below, and vice versa.

Among all respondents, considering the summed count of personal and community risk factors (among a maximum of 11) (Figure 1), the predicted probability of unsheltered status was 2.08% (95% CI=0.51%, 3.65%) for 0–2 risk factors (n=1,202), 9.01% (95% CI=8.13%, 9.90%) for 3–6 factors (n=3,794), and 27.80% (95% CI=25.11%, 30.50%) for 7 risk factors (n=410).

Models separately tested for interaction between each community factor and the continuous count of personal risk factors (maximum of 9, after removing rental affordability and weather) in the all-respondent sample. These interactions (df 1 X 1) were significant for housing wage ($p<0.01$) and weather ($p=0.03$). To illustrate, the personal risk factor count was dichotomized at 5 of 9, with the following results.

In high-cost communities, a risk count of ≥5 of 9 (vs <5), was associated with a greater increase in the likelihood of unsheltered experience (27% vs 6%, Δ=21%) compared with low-cost ones (16% vs 5%, Δ=11%).

In warmer communities, a risk count of ≥5 of 9 (vs <5), was associated with a greater difference in the likelihood of unsheltered experience (27% vs 9%, Δ=18%) compared with low-temperature communities (19% vs 4%, Δ=15%).

Among respondents currently homeless, summing the 7 risks, the predicted probability of unsheltered status was 32.24% (95% CI=24.50%, 39.98%), 43.62% (95% CI=37.94%, 49.30%), and 62.37% (95% CI=55.37%, 69.36%) for 0–1, 2–3, and 4–7 risk factors, respectively (Appendix Figure 2). Interactions were not tested, given insufficient power.

DISCUSSION

Public responses to the visibility of homelessness vary between an emphasis on personal problems and community shortfalls.[2,34] These analyses asked: Among Veterans who have experienced homelessness, what distinguishes those who were recently unsheltered from those who were not? Several factors emerged, some of which likely predated the recent unsheltered experience, including: unmarried status, criminal justice problems, weak social support, medical diagnoses, drug (but not alcohol) problems, low income, and inability to afford basic needs. Two community-level characteristics, shelter bed availability and warmer temperatures, were independently associated with unsheltered status. This study is unique in modeling a statistical interaction between personal and factors related to locale. Where weather was warmer, or rents were higher, people who were unsheltered differed from those who were sheltered in a more pronounced way. The findings support a conceptual interpretation of unsheltered homelessness as reflecting the interaction of person and place.[35]

Findings of some differences between sheltered and unsheltered Veterans are not unexpected. Prior studies have found associations between unsheltered status and substance use, mental health disorders, and criminal justice problems.[12,13,28,36] In addition, unsheltered homelessness disproportionately affects people of color,[12,36] although that was not the case among this sample. The present study, which draws on a national sample, helps illustrate how the complex sociopolitical phenomena of unsheltered homelessness involves a measurable "stack" of personal- and community-level factors.

Limitations

Conceptual and methodologic limitations deserve mention. Conceptually, this study's measures are operationalized as characteristics of people or places, but often, they reflect both. For example, criminal justice measures, modeled individual characteristics, reflect community decisions.[37] Also, this study models unsheltered status as an "outcome" of measured variables, but does not capture a key issue: how the would-be shelter client assessed the viability of the sheltering options (i.e., the agency of the unsheltered person is left unexplored).[38]

Methodologically, this study considered individuals as the unit of analysis, which may reduce the impact of community characteristics.[35] Second, a veteran-only sample could affect generalizability. For example, the VA offers robust homeless services. Accordingly, unsheltered status among veterans might denote a population that was especially hard to enlist in services. Third, the 40.2% response rate, though high compared with mail/telephone surveys of veterans,[39] is lower than ideal. However, response propensity models using VA clinical data helped address that bias. Fourth, the secondary analyses of 620 currently homeless respondents (11.5% of the sample) had less statistical power. A stronger study design would collect validated research measures from a national sample of unsheltered individuals. Given the resources that will be required to undertake such work, the present study offers an advance, provided these limitations are understood.

CONCLUSIONS

These findings have practical implications. First, in this study, the collective medical and psychosocial vulnerabilities of people with unsheltered experience were substantial. Many are not expected to remit after housing is re-established.[40] For that reason, supportive housing interventions based on a Housing First approach should offer robust clinical supports. But that particular requirement is one where fidelity has tended to be lower, in the U.S. and Canada.[41,42]

Second, criminal justice history has a complex inter-relationship with homelessness. Some behaviors charged as criminal or civil offenses are likely best remediated by reconsidering which offenses merit charges, or offering programs to expeditiously resolve them. Conversely, criminal justice history may reflect risks that raise concerns for landlords. These could be mitigated through therapeutic programs, provided communities pay for them.

Finally, when communities and stakeholders engage in debate on homelessness, narratives that emphasize the personal problems of unsheltered populations, especially addiction, are unduly narrow. Unsheltered homelessness emerges from a cumulative stack of personal and community risks. For metropolitan communities, lower shelter bed availability and warmer temperatures are associated with more people in the streets. Adverse rental markets tend to keep the "most vulnerable" unsheltered. Although the weather can't be changed, rental markets and shelter access could be, over time.

Supplementary Material

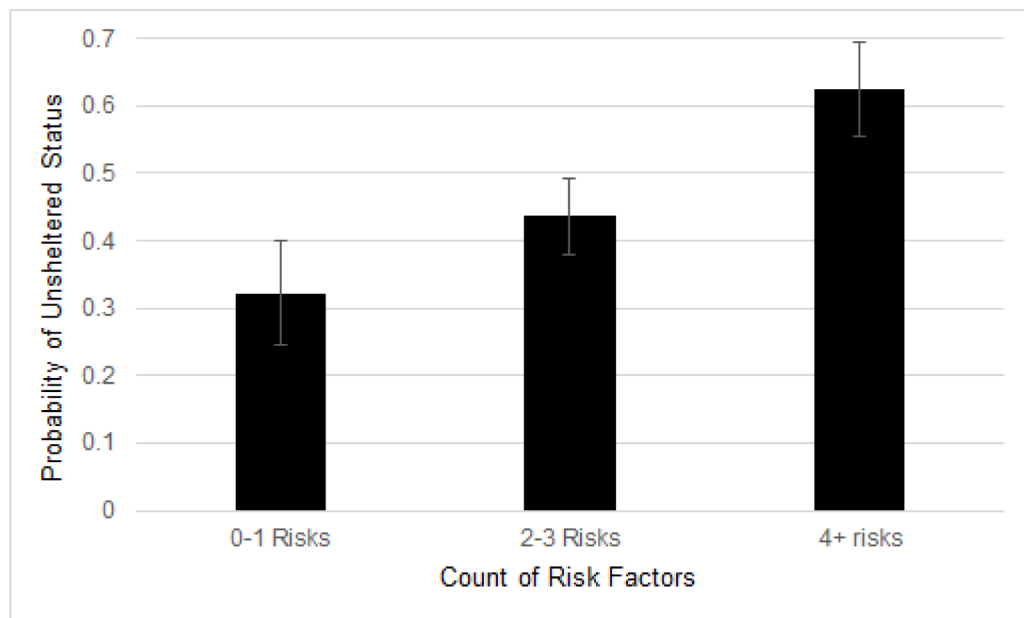Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

Appendix

Appendix

Appendix Figure 2.

Predicted probability of unsheltered status based on risk factor count, currently homeless respondents.

Notes: Figure shows the predicted probability of being unsheltered for currently homeless respondents varying in their number of risk factors, categorized as 0–1, 2–3, or 4–7. Risk factors associated with unsheltered status at p<0.10 in bivariate analyses included 7 self-reported variables from the survey. These were: age 51–64 years, *Other* race, difficulty paying for basic necessities, a criminal record that impeded housing or employment (from the perspective of the respondent), chronic pain, high psychological distress, and self-report of a drug problem. Estimates were obtained from a mixed effect logistic regression of unsheltered status that included site as a random effect (Table 3).

Appendix Table 1.

Comparison of Respondents and Non-Respondents

Characteristics	Overall cohort N=14,340	Respondents N=5,766	Non-respondents N=8,574	*p*-value[a]
	N (%)	**N (%)**	**N (%)**	
Demographics				
Age, mean (SD)	55.7 (12.3)	58.3 (10.9)	54.0 (13.2)	**<0.001**
Sex				**0.03**
Male	13,167 (91.8)	5,260 (91.2)	7,907 (92.2)	
Female	1,173 (8.2)	506 (8.8)	667 (7.8)	
Race				**0.01**
White	6,724 (46.9)	2,734 (47.4)	3,990 (46.5)	
African American	6,183 (43.1)	2,507 (43.5)	3,676 (42.9)	
Other	1,433 (10.0)	525 (9.1)	908 (10.6)	
Married	2,097 (14.6)	890 (15.4)	1,207 (14.1)	**0.02**
H-PACT care receipt	9,095 (63.4)	3,394 (58.9)	5,701 (66.5)	**<0.001**
VA region				**<0.001**
South	5,168 (36.0)	2,154 (37.4)	3,014 (35.2)	
Northeast	1,075 (7.5)	443 (7.7)	632 (7.4)	
Midwest	1,433 (10.0)	624 (10.8)	809 (9.4)	
West	6,664 (46.5)	2,545 (44.1)	4,119 (48.0)	
Substance use				
Drug problem[b]	5,496 (38.3)	1,999 (34.7)	3,497 (40.8)	**<0.001**
Alcohol problem[b]	5,848 (40.8)	2,258 (39.2)	3,590 (41.9)	**0.001**
Mental and physical health status				
PTSD	4,167 (29.1)	1,506 (26.1)	2,661 (31.0)	**<0.001**
Psychotic disorder	1,951 (13.6)	625 (10.8)	1,326 (15.5)	**<0.001**
Count of health conditions[c], M (SD)	3.7 (2.4)	3.9 (2.3)	3.6 (2.4)	**<0.001**
Service utilization				
Primary care visits				**<0.001**
2, 3, 4 visits	3,400 (23.7)	1,082 (7.6)	2,318 (27.0)	
5, 6, 7 visits	3,170 (22.1)	1,212 (21.0)	1,958 (22.8)	
8, 9, 10 visits	2,421 (16.9)	1,022 (17.7)	1,399 (16.3)	
>10 visits	5,349 (37.3)	2,450 (42.5)	2,899 (33.8)	
Homeless stop code mentions				**<0.001**
Zero	1,257 (8.8)	586 (10.2)	671 (7.8)	
1	1,669 (11.6)	774 (13.4)	895 (10.4)	
2	867 (6.1)	362 (6.3)	505 (5.9)	
3	10,547 (73.6)	4,044 (70.1)	6,503 (75.9)	

Characteristics	Overall cohort N=14,340	Respondents N=5,766	Non-respondents N=8,574	p-value[a]
	N (%)	N (%)	N (%)	
Emergency department visits (≥4)	3,929 (27.4)	1,443 (25.0)	2,486 (29.0)	**<0.001**
Mental health visits (≥8)	4,039 (29.2)	1,516 (26.3)	2,523 (29.4)	**<0.001**
Any hospitalizations	5,035 (35.1)	1,967 (34.1)	3,068 (35.8)	**0.040**

Notes:

[a]Boldface indicates statistical significance ($p<0.05$).

[b]Alcohol and drug problems are based on relevant ICD-10 codes, in an adaptation of Elixhauser's comorbidities published by Quan et al. Quan H, Sundararajan V, Halfon P, et al. Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. Med Care. 2005;43(11):1130–1139.

[c]Count of health conditions includes all Elixhauser comorbidities, as per Quan et al, and 4 additional condition categories as follows: post-traumatic stress disorder (PTSD), anxiety-related disorders, Traumatic Brain Injury, and environmental/temperature-related injury. The resulting count ranges from 0 to 28.

[d]A homeless "stop code mention" indicates use of a VA homeless-related service.

H-PACT, Homeless Patient Aligned Care Teams.

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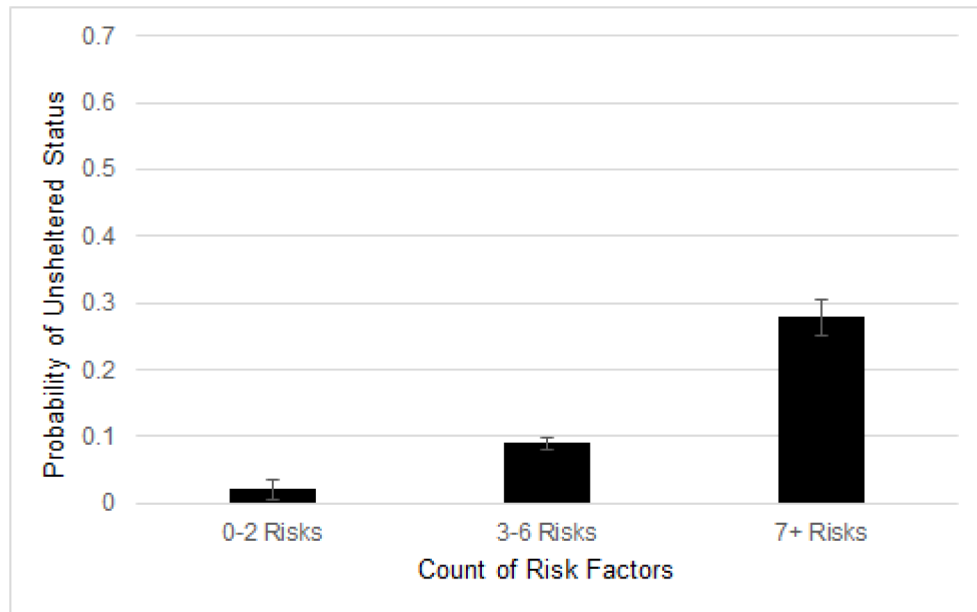
Figure 1.
Predicted probability of unsheltered status based on risk factor count, all respondents.
Notes: Figure shows the predicted probability of being unsheltered for all respondents varying in their number of risk factors, categorized as 0–2, 3–6, or 7–11. Risk factors associated with unsheltered status at p<0.05 in bivariate analyses included 9 self-reported variables from the survey. These were: never having been married, monthly income <$1,000, difficulty paying for basic necessities, a criminal record that impeded housing or employment (from the perspective of the respondent), time in jail/prison in the prior year, low social support, 2 medical diagnoses, high psychological distress, self-report of a drug problem) and 2 community-level variables (ratio of shelter beds to homeless population based on the 2018 Point-in-Time count for their community, and cold weather, defined as having average January nighttime temperatures below 30 degrees Fahrenheit). Estimates were obtained from a mixed effect logistic regression of unsheltered status that included site as a random effect (Table 3).

Table 1.

Comparison of Homeless-Experienced Veterans With Recent Unsheltered Experience of 7 Nights Versus Completely Sheltered

Characteristics[a,b]	Overall N=5,406 N (%)	Unsheltered N=481 N (%)	Sheltered N=4,925 N (%)	p-value[c]
Demographics				
Age,[d] years				**0.002**
18–50	987 (18.3)	93 (19.3)	894 (18.2)	
51–64	3,054 (56.5)	298 (62.0)	2,756 (56.0)	
65	1,365 (25.2)	90 (18.7)	1,275 (25.9)	
Sex				**0.03**
Female	485 (9.1)	29 (6.2)	456 (9.4)	
Male	4,825 (90.9)	440 (93.8)	4,385 (90.6)	
Marital status[e]				0.08
Married/Marriage-like[f]	1,005 (18.9)	72 (15.3)	933 (19.3)	
Never married	1,435 (27.0)	139 (29.6)	1,296 (26.8)	
Divorced/Separated	2,501 (47.1)	233 (49.6)	2,268 (46.9)	
Widowed	366 (6.9)	26 (5.5)	340 (7.0)	
Race/Ethnicity[g]				0.22
Black, non-Hispanic	2,187 (40.6)	198 (41.4)	1,989 (40.5)	
White, non-Hispanic	2,124 (39.4)	171 (35.8)	1,953 (39.8)	
Hispanic	561 (10.4)	60 (12.6)	501 (10.2)	
Other	516 (9.6)	49 (10.3)	467 (9.5)	
Education				0.24
High school or equivalent degree	2,072 (39.8)	195 (42.5)	1,877 (39.5)	
Beyond high school	3,135 (60.2)	264 (57.5)	2,871 (60.5)	
Employment status[h]				**<0.001**
Employed[i]	1,103 (21.0)	74 (16.0)	1,029 (21.5)	

Characteristics[ab]	Overall N=5,406	Unsheltered N=481	Sheltered N=4,925	p-value[c]
	N (%)	N (%)	N (%)	
Unemployed	2,826 (53.8)	301 (65.2)	2,525 (52.7)	
Retired	1,326 (25.2)	87 (18.8)	1,239 (25.9)	
Monthly income <$1,000	2,075 (39.6)	249 (54.0)	1,826 (38.3)	<0.001
Difficulty paying for basics[j]	1,266 (24.0)	213 (46.1)	1,053 (21.8)	<0.001
Social, medical, and behavioral characteristics				
Criminal record that impeded housing or employment[k]	1,138 (21.4)	174 (37.0)	964 (19.9)	<0.001
Jail/Prison in last year	310 (5.8)	72 (15.2)	238 (4.9)	<0.001
Social support[l]				<0.001
Low (<4 of 6)	1,943 (36.5)	256 (54.5)	1,687 (34.8)	
High (4 of 6)	3,375 (63.5)	214 (45.5)	3,161 (65.2)	
Medical condition count[m]				0.22
<2 comorbidities	2,389 (44.8)	199 (42.0)	2,190 (45.1)	
2 comorbidities	2,946 (55.2)	275 (58.0)	2,671 (54.9)	
Chronic pain[n]	2,033 (37.6)	239 (49.7)	1,794 (36.4)	<0.001
Psychological distress[o]	1,724 (32.4)	250 (53.1)	1,474 (30.4)	<0.001
General health				0.002
Excellent/Very good/Good	2,721 (52.4)	211 (45.5)	2,510 (53.1)	
Fair/Poor	2,468 (47.6)	253 (54.5)	2,215 (46.9)	
Alcohol problem[p]	1,481 (27.9)	183 (38.9)	1,298 (26.8)	<0.001
Drug problem[p]	694 (13.1)	126 (26.8)	568 (11.7)	<0.001
Primary care type				<0.001
H-PACT patient[q]	3,162 (58.5)	321 (66.7)	2,841 (57.7)	
Mainstream patient	2,244 (41.5)	160 (33.3)	2,084 (42.3)	
Community characteristics				
Shelter beds ratio to homeless population[r]				<0.001

Characteristics [a,b]	Overall N=5,406	Unsheltered N=481	Sheltered N=4,925	p-value [c]
	N (%)	N (%)	N (%)	
	3,102 (57.4)	325 (67.6)	2,777 (56.4)	
	2,304 (42.6)	156 (32.4)	2,148 (43.6)	
Housing wage [s]				0.10
Lower (<$22.00)	3,835 (70.9)	325 (67.6)	3,510 (71.3)	
Higher ($22.00)	1,571 (29.1)	156 (32.4)	1,415 (28.7)	
January nightime temperature [t]				**<0.001**
Colder (<30° F)	1,225 (22.7)	65 (13.5)	1,160 (23.6)	
Warmer (30° F)	4,181 (77.3)	416 (86.5)	3,765 (76.4)	

Notes: Boldface indicates statistical significance (*p*<0.05).

[a] Missing information from survey response: sex 96, marital status 99, race/ethnicity 18, education 199, employment 151, monthly income <$1,000 172, difficulty paying for basics 123, criminal record that impeded housing or employment 86, jail/prison in last year 56, social support 88, medical condition count 71, psychological distress 83, general health 217, alcohol or drug use disorder 100.

[b] Degrees of freedom: All chi-square tests are df=1 except where otherwise indicated.

[c] Comparisons carried out with t-tests or chi-squared tests, as appropriate.

[d] Age: df=2.

[e] Marital status: df=3.

[f] Married/Marriage-like: Respondent checked *married or in a marriage-like relationship* among a response set also permitting *single, never married, widowed, divorced, separated, and other*.

[g] Race/Ethnicity: df=3.

[h] Employment status: df=2.

[i] Employed: Participants in this group indicated being employed either full or part time.

[j] Difficulty paying for basics: This was based on answering *Very Hard or Extremely Hard* to the following question: *How hard is it for you to pay for the very basics like food and heating?*

[k] Criminal record that impeded housing or employment: This was based on answering *Yes* to the following question: *Have you ever had trouble getting a job or housing because of a criminal record?*

[l] Social support: This was based on 6 yes/no items, with 4 from "Emotional Support" in the NIH Patient-Reported Outcomes Measurement Information System, 1 from its Social Isolation scale, and 1 referencing capacity to borrow $20. Six forms of social support were queried, and respondents had to endorse 4 to qualify as *high*.

[m] Medical condition count: Count of 8 self-reported medical conditions used in patient satisfaction studies from the Medical Expenditure Panel Survey.

[n]Chronic pain: Participants who reported having bodily pain that of more than 3 months' duration, coupled with current pain ≥ 7 on a 0–10 scale.

[o]Psychological distress: This was based on 6 Likert-type items, 4 from the validated Patient Health Questionnaire-4 scale for anxiety and depression, and 2 from the modified Colorado Symptom Index. Possible scores ranged from 0–24. Psychological distress was dichotomized at ≥ 10 to indicate *severe*, based on face validity.

[p]Alcohol or Drug problem: Based on the Two-Item Conjoint Screening test, pertaining to the last 12 months.

[q]H-PACT: Homeless Patient Aligned Care Teams (H-PACTs) are VA's homeless-tailored primary care clinics.

[r]Shelter beds ratio to homeless population: The ratio between the number of shelter beds for single adults and the Point-in-Time count of single homeless adults in 2018's Annual Homelessness Assessment Report.

[s]Housing wage: Estimated hourly minimum wage a person, working full-time, would need to earn in order to afford a 1-bedroom apartment at federally designated Fair Market Rent, spending no more than 30% of their income on housing. Sourced from the National Low Income Housing Coalition.

[t]January nighttime temperature: Average nighttime low temperature in January as reported by the National Centers for Environmental Information.

Table 2.

Comparison of Currently Homeless Veterans With Recent Unsheltered Experience of ≥ 7 Nights Versus Completely Sheltered

Characteristics [a,b]	Overall N=620 N (%)	Unsheltered N=288 N (%)	Sheltered N=332 N (%)	p-value [c]
Demographics				
Age,[d] years				0.27
18–50	125 (20.2)	60 (20.8)	65 (19.6)	
51–64	370 (59.7)	178 (61.8)	192 (57.8)	
65	125 (20.2)	50 (17.4)	75 (22.6)	
Sex				0.30
Female	38 (6.3)	14 (5.0)	24 (7.4)	
Male	568 (93.7)	266 (95.0)	302 (92.6)	
Marital status [e]				0.23
Married/Marriage-like [f]	78 (12.9)	42 (14.9)	36 (11.1)	
Never married	172 (28.4)	86 (30.6)	86 (26.5)	
Divorced/Separated	313 (51.7)	136 (48.4)	177 (54.6)	
Widowed	42 (6.9)	17 (6.0)	25 (7.7)	
Race/Ethnicity [g]				0.34
Black, non-Hispanic	248 (40.2)	118 (41.1)	130 (39.4)	
White, non-Hispanic	240 (38.9)	102 (35.5)	138 (41.8)	
Hispanic	64 (10.4)	32 (11.1)	32 (9.7)	
Other	65 (10.5)	35 (12.2)	30 (9.1)	
Education				0.24
High school or equivalent degree	343 (58.4)	167 (61.2)	176 (56.1)	
Beyond high school	244 (41.6)	106 (38.8)	138 (43.9)	
Employment status [h]				0.09
Employed [i]	108 (18.1)	44 (15.9)	64 (20.0)	

Characteristics[a,b]	Overall N=620	Unsheltered N=288	Sheltered N=332	p-value[c]
	N (%)	N (%)	N (%)	
Unemployed	384 (64.3)	191 (69.0)	193 (60.3)	
Retired	105 (17.6)	42 (15.2)	63 (19.7)	0.19
Monthly income <$1,000	315 (52.9)	154 (56.0)	161 (50.3)	<0.001
Difficulty paying for basics[j]	265 (44.0)	146 (52.3)	119 (36.8)	
Social, medical, and behavioral characteristics				
Criminal record that impeded housing or employment[k]	220 (36.4)	123 (43.5)	97 (30.1)	<0.001
Jail/Prison in last year	93 (15.2)	52 (18.2)	41 (12.6)	0.07
Social support[l]				<0.001
Low (<4 of 6)	320 (53.2)	168 (59.6)	152 (47.5)	
High (4 of 6)	282 (46.8)	114 (40.4)	168 (52.5)	
Medical condition count[m]				0.33
<2 comorbidities	268 (44.2)	119 (41.9)	149 (46.1)	
2 comorbidities	339 (55.8)	165 (58.1)	174 (53.9)	
Chronic pain[n]	288 (46.5)	151 (52.4)	137 (41.3)	0.01
Psychological distress[o]	304 (49.8)	165 (57.9)	139 (42.8)	<0.001
General health				0.02
Excellent/Very good/Good	280 (47.1)	117 (41.9)	163 (51.7)	
Fair/Poor	314 (52.9)	162 (58.1)	152 (48.3)	
Alcohol problem[p]	220 (36.4)	122 (43.3)	98 (30.4)	0.002
Drug problem[p]	143 (23.7)	86 (30.5)	57 (17.7)	<0.001
Primary care type				0.95
H-PACT patient[q]	426 (68.7)	197 (68.4)	229 (69.0)	
Mainstream patient	194 (31.3)	91 (31.6)	103 (31.0)	
Community characteristics				
Shelter beds ratio to homeless population[r]				0.002

Characteristics[a,b]	Overall N=620	Unsheltered N=288	Sheltered N=332	p-value[c]
	N (%)	N (%)	N (%)	
<0.65	408 (65.8)	208 (72.2)	200 (60.2)	
0.65	212 (34.2)	80 (27.8)	132 (39.8)	
Housing wage[s]				0.01
Lower (<$22.00)	434 (70.0)	187 (64.9)	247 (74.4)	
Higher ($22.00)	186 (30.0)	101 (35.1)	85 (25.6)	
January nighttime temperature[t]				0.003
Colder (<30°F)	82 (13.2)	25 (8.7)	57 (17.2)	
Warmer (30°F)	538 (86.8)	263 (91.3)	275 (82.8)	

Notes. Boldface indicates statistical significance (*p*<0.05).

[a]Missing information from survey response: sex 14, marital status 15, race/ethnicity 3, education 33, employment 23, monthly income <$1,000 25, difficulty paying for basics 18, criminal record that impeded housing or employment 15, jail/prison in last year 9, social support 18, medical condition count 13, psychological distress 10, general health 26, alcohol or drug use disorder 16.

[b]Degrees of freedom: All chi-square tests are df=1 except where otherwise indicated.

[c]Comparisons are from t-tests or chi-squared tests, as appropriate.

[d]Age: df=2.

[e]Marital status: df=3.

[f]Married/Marriage-like: Respondent checked *married or in a marriage-like relationship* among a response set also permitting *single, never married, widowed, divorced, separated, and other*.

[g]Race/Ethnicity: df=3.

[h]Employment status: df=2.

[i]Employed: Participants in this group indicated being employed either full or part time.

[j]Difficulty paying for basics: This was based on answering *Very Hard or Extremely Hard* to the following question: *How hard is it for you to pay for the very basics like food and heating?*

[k]Criminal record that impeded housing or employment: This was based on answering *Yes* to the following question: *Have you ever had trouble getting a job or housing because of a criminal record?*

[l]Social support: This was based on 6 yes/no items, with 4 from "Emotional Support" in the NIH Patient-Reported Outcomes Measurement Information System, one from its Social Isolation scale, and 1 referencing capacity to borrow $20. Six forms of social support were queried, and respondents had to endorse 4 to qualify as *high.*

[m]Medical condition count: Count of 8 self-reported medical conditions used in patient satisfaction studies from the Medical Expenditure Panel Survey.

[n]Chronic pain: Participants who reported having bodily pain that of more than 3 months' duration, coupled with current pain ≥ 7 on a 0–10 scale.

[o]Psychological distress: This was based on 6 Likert-type items, 4 from the validated Patient Health Questionnaire-4 scale for anxiety and depression, and 2 from the modified Colorado Symptom Index. Possible scores ranged from 0–24. Psychological distress was dichotomized at ≥ 10 to indicate *severe*, based on face validity.

[p]Alcohol or Drug problem: Based on the Two-Item Conjoint Screening test, pertaining to the last 12 months.

[q]H-PACT: Homeless Patient Aligned Care Teams (H-PACTs) are VA's homeless-tailored primary care clinics.

[r]Shelter beds ratio to homeless population: The ratio between the number of shelter beds for single adults and the Point-in-Time count of single homeless adults in 2018's Annual Homelessness Assessment Report.

[s]Housing wage: Estimated hourly minimum wage a person, working full-time, would need to earn in order to afford a 1-bedroom apartment at federally designated Fair Market Rent, spending no more than 30% of their income on housing. Sourced from the National Low Income Housing Coalition.

[t]January nighttime temperature: Average nighttime low temperature in January as reported by the National Centers for Environmental Information.

Table 3.

Predictors of Unsheltered Experience Among Veterans With Homeless Experiences[a]

Characteristics	Entire cohort[a] N=4,568		Currently homeless[a] N=497	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Age, years (ref=18–50)[b]		0.83		0.04 *
51–64	1 (0.84, 1.19)		1.46 (1.09, 1.96)	
65	0.93 (0.72, 1.22)		1.04 (0.66, 1.63)	
Sex (ref=female)		0.21		0.55
Male	0.84 (0.64, 1.10)		0.86 (0.52, 1.42)	
Marital status (ref=married/marriage-like)[c]		0.02 **		0.20
Never married	1.24 (1.00, 1.54)		1.19 (0.79, 1.79)	
Divorced/Separated	1.2 (0.98, 1.46)		0.96 (0.66, 1.40)	
Widowed	0.77 (0.53, 1.13)		0.75 (0.39, 1.43)	
Race/Ethnicity (ref=Black, non-Hispanic)[d]		0.79		0.11
White, non-Hispanic	0.94 (0.79, 1.11)		0.90 (0.66, 1.21)	
Hispanic	0.93 (0.73, 1.18)		0.91 (0.59, 1.40)	
Other[e]	1.02 (0.81, 1.29)		1.49 (0.96, 2.29)	
Education (ref=beyond high school)[f]		0.09		–
High school/Graduate equivalent degree or less	1.13 (0.98, 1.30)		–	
Employment status (ref=employed)[f]		0.28		0.60
Unemployed	1.16 (0.96, 1.41)		1.13 (0.82, 1.56)	
Retired	1.17 (0.90, 1.51)		0.94 (0.59, 1.51)	
Monthly income <$1,000[f]	1.34 (1.16, 1.55)	<0.001 **	–	–
Difficulty paying for basics[g]	2.01 (1.73, 2.34)	<0.001 **	1.27 (0.98, 1.64)	0.07 *
Criminal record that impeded housing or employment[h]	1.47 (1.27, 1.72)	<0.001 **	1.65 (1.27, 2.16)	<0.001 *
Jail/Prison in last year	1.74 (1.41, 2.16)	<0.001 **	0.80 (0.57, 1.14)	0.22

Characteristics	Entire cohort[a] N=4,568		Currently homeless[a] N=497	
	OR (95% CI)	**p-value**	**OR (95% CI)**	**p-value**
Social support (ref=high (≥4 of 6))[j]		**<0.001****		0.22
Low (<4 of 6)	1.37 (1.18, 1.58)		1.18 (0.91, 1.52)	
Medical condition count (0–8)[j,r]	1.09 (1.04, 1.15)	**<0.001****	—	—
Chronic pain[k]	1.15 (0.99, 1.34)	0.07	1.27 (0.96, 1.67)	**0.09** *
Psychological distress (ref=low)[l]		**<0.001****		**0.07** *
High	1.50 (1.28, 1.75)		1.30 (0.98, 1.73)	
General health (ref=excellent/very good/good)		0.24		0.21
Fair/Poor	0.91 (0.79, 1.06)		1.20 (0.91, 1.56)	
Alcohol problem[m]	1.00 (0.86, 1.17)	1.00	1.20 (0.92, 1.57)	0.17
Drug problem[m]	2.08 (1.75, 2.47)	**<0.001****	1.74 (1.28, 2.36)	**<0.001** *
H-PACT patient[n]	1.29 (1.11, 1.50)	**<0.001****	0.93 (0.70, 1.23)	0.62
Shelter beds ratio to homeless population (ref= ≥0.65)[o]		**<0.001****		0.34
<0.65	1.66 (1.17, 2.35)		1.56 (0.63, 3.85)	
Housing wage (ref=lower (<$22.00))[p]		0.65		0.53
Higher (≥$22.00)	1.08 (0.77, 1.53)		1.34 (0.54, 3.36)	
January nighttime temperature (ref=colder (<30°))[q]		**0.04****		0.14
Warmer (≥30°F)	1.50 (1.03, 2.21)		2.12 (0.79, 5.70)	

Notes: Boldface indicates statistical significance

**
  p<0.05.

*
  p<0.10.

[a] Multivariable models control for clinic type (H-PACT vs mainstream) and a random effect for site. Two models are shown, one based on the entire analysis cohort, and one restricted to persons affirming current homelessness on the day they were surveyed.

[b] Age: df=2.

[c] Marital status: df=3; Married/Marriage-like: Respondent checked *married or in a marriage-like relationship* among a response set also permitting *single, never married, widowed, divorced, separated,* and *other.*

[d] Race/Ethnicity: df=3.

[e] Other race in the currently homeless model has a *p*=0.07.

[f] Employment status: df=2; Employed: Participants in this group indicated being employed either full or part time.

[g] Difficulty paying for basics: This was based on answering *Very Hard or Extremely Hard* to the following question: *How hard is it for you to pay for the very basics like food and heating?*

[h] Criminal record that impeded housing or employment: This was based on answering *Yes* to the following question: *Have you ever had trouble getting a job or housing because of a criminal record?*

[i] Social support: This was based on 6 yes/no items, with 4 from "Emotional Support" in the NIH Patient-Reported Outcomes Measurement Information System, 1 from its Social Isolation scale, and 1 referencing capacity to borrow $20. Six forms of social support were queried, and respondents had to endorse 4 to qualify as *high*.

[j] Medical condition count: Count of 8 self-reported medical conditions used in satisfaction studies from the Medical Expenditure Panel Survey.

[k] Chronic pain: Participants who reported having bodily pain that of more than 3 months duration coupled with current pain ≥7 on a 0–10 scale.

[l] Psychological distress: This was based on 6 items derived the validated Patient Health Questionnaire–4 scale for anxiety and depression and the modified Colorado Symptom Index. Possible score ranged from 0–24. Psychological distress was dichotomized at ≥10 to indicate *severe*, based on face validity.

[m] Alcohol or Drug problem: Based on the Two-Item Conjoint Screening test, pertaining to the last 12 months.

[n] H-PACT: Homeless Patient Aligned Care Teams (H-PACTs) are VA's homeless-tailored primary care clinics.

[o] Shelter beds ratio to homeless population: The ratio between the number of shelter beds for single adults and the Point in Time count of single homeless adults in 2018's Annual Homelessness Assessment Report.

[p] Housing wage: Estimated hourly minimum wage a person, working full-time, would need to earn in order to afford a 1-bedroom apartment at federally designated Fair Market Rent, spending no more than 30% of their income on housing. Sourced from the National Low Income Housing Coalition.

[q] January nighttime temperature: Average nighttime low temperature in January as obtained by the National Centers for Environmental Information.

[r] Variables not included in the multivariable model, based on not attaining significance in the bivariate comparison, set at *p*<0.05 for the overall cohort (Table 1), and *p*<0.10 for the currently homeless comparison (Table 2).