Homelessness and CKD: A Cohort Study

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Summary

Background and objectives This study examined the associations between homelessness and clinical outcomes of CKD among adults from the urban healthcare safety net.

Design, setting, participants, & measurements This retrospective cohort study examined 15,343 adults with CKD stages 3–5 who received ambulatory care during 1996–2005 from the Community Health Network of San Francisco. Main outcome measures were time to ESRD or death and frequency of emergency department visits and hospitalizations.

Results Overall, 858 persons (6%) with CKD stages 3–5 were homeless. Homeless adults were younger, were disproportionately male and uninsured, and suffered from far higher rates of depression and substance abuse compared with adults with stable housing ($P<0.001$ for all comparisons). Over a median follow-up of 2.8 years (interquartile range=1.4–6.1), homeless adults experienced significantly higher crude risk of ESRD or death (hazard ratio=1.82, 95% confidence interval=1.49–2.22) compared with housed adults. This elevated risk was attenuated but remained significantly higher (adjusted hazard ratio=1.28, 95% confidence interval=1.04–1.58) after controlling for differences in sociodemographics, comorbid conditions, and laboratory variables. Homeless adults were also far more likely to use acute care services (median [interquartile range] number of emergency department visits was 9 [4–20] versus 1 [0–4], $P<0.001$) than housed counterparts.

Conclusions Homeless adults with CKD suffer from increased morbidity and mortality and use costly acute care services far more frequently than peers who are stably housed. These findings warrant additional inquiry into the unmet health needs of the homeless with CKD to provide appropriate and effective care to this disadvantaged group.

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Introduction

In the United States, an estimated 3.5 million people experience homelessness annually (1). Homeless persons are among the most vulnerable groups in society and suffer from high rates of physical illness, mental health disorders, and substance abuse (2,3). Several cohort studies conducted over the past decade indicate that increased morbidity among the homeless predictably leads to worse survival and excess healthcare costs (4,5).

In the United States, homeless adults are overwhelmingly uninsured, and many receive the majority of their medical care through emergency departments, public hospitals, and safety net health clinics (6,7). Like many disadvantaged populations, homeless persons experience multilevel barriers to accessing regular healthcare (8–10). Securing adequate shelter, food, and clothing often competes with regular healthcare and results in more frequent use of acute care services to manage chronic conditions (11,12). Despite the reportedly high prevalence among the homeless of risk factors for CKD such as diabetes mellitus and hypertension (8,13), little is known about the characteristics and adverse outcomes of CKD among this marginalized group.

To describe the characteristics and adverse clinical outcomes of homeless persons with CKD, we examined data from a diverse cohort of adults with impaired kidney function (estimated GFR [eGFR]<60 ml/min per 1.73 m^2) receiving routine clinical care in the Community Health Network, a public healthcare delivery system owned and operated by the City and County of San Francisco. We hypothesized that, in this resource-poor setting, homelessness would be associated with a higher risk of progression to ESRD or death. We also hypothesized that homeless adults with CKD would use healthcare resources less efficiently, which is reflected in more frequent hospitalizations and emergency department visits and fewer nephrology clinic visits than indigent peers with stable housing. We hypothesized that this risk would be, in part, attributable to higher rates of substance use among the homeless.

Materials and Methods

Data Sources

The study is a retrospective cohort study of adults with nondialysis-dependent CKD receiving care within San Francisco Department of Public Health's Community Health Network. The Community Health Network

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is the healthcare delivery system of the Department of Public Health of the City and County of San Francisco. It, along with a consortium of not for profit primary care clinics (Consortium), forms the backbone of San Francisco's healthcare safety net system and offers an array of healthcare services, including primary care, specialty care, and acute care. The Community Health Network (CHN) includes an acute care hospital (San Francisco General Hospital) with on-site primary and specialty care clinics as well as 11 community-based primary care clinics. Providers in these clinics, as well as the providers practicing in the Consortium clinics rely on San Francisco General Hospital for a significant portion of their laboratory testing, specialty referrals, and inpatient care. All of the CHN and Consortium clinics have access to the San Francisco Department of Public Health's electronic health information system to assist in shared patient care. The CHN also provides a wide range of interpreter services, which reduce linguistic barriers to care for San Francisco's diverse patient population. The CHN provides ambulatory and acute care to the majority of the estimated 130,000 uninsured residents of San Francisco. Services are available for free or on a sliding scale based on income (14). The CHN has a limited outpatient pharmacy, and the majority of its patients are directed to receive their medications at outside pharmacies. The pharmacy at the San Francisco General Hospital provides a maximum of 7 days of medications to eligible patients at discharge from the emergency department or an acute hospitalization. Demographic information, health care use, diagnostic and procedural codes, and laboratory data are obtained during the course of routine clinical care at various CHN sites and stored in a clinical data repository known as the Lifetime Clinical Record. Patient-level data were extracted from the Lifetime Clinical Record and linked to (*1*) the US Renal Data System (15) to exclude persons who were already receiving renal replacement therapy and identify new cases of treated ESRD that occurred during follow-up and (*2*) the California Department of Health Services Death Registry to ascertain vital status.

Study Sample

We included all adults with nondialysis-dependent CKD stages 3–5 receiving regular ambulatory care in the Community Health Network from January 1, 1996 to December 31, 2005. All participants were (*1*) aged ≥20 years, (*2*) diagnosed with CKD, which was defined by at least two outpatient eGFR measurements<60 ml/min per 1.73 m^2 separated by at least 1 year (16), and (*3*) had at least one CHN outpatient encounter subsequent to the initial eGFR date. We imposed these restrictions to ensure that the study cohort comprised persons who met the National Kidney Foundation definition for CKD (17) stages 3–5 and had access to outpatient care rather than individuals with misclassified AKI or who transiently visited the CHN (Supplemental Appendix A).

Outcome Measures

The primary outcome was time to ESRD, which was defined as having a first service date for maintenance dialysis or kidney transplantation or all-cause death (combined endpoint). Secondary outcomes included use of acute care services, defined as frequency of emergency department visits or acute hospitalizations, and access to nephrology care. To ascertain death, we matched subjects based on last name, first name, date of birth, and sex. To ascertain ESRD, we matched subjects using similar identifiers, except that we used Social Security number in place of sex per United States Renal Data System convention. We calculated survival time from the second qualifying outpatient eGFR<60 ml/min per 1.73 m^2 to ESRD, death, or end of follow-up through December 31, 2005.

Primary Explanatory Variable

The primary explanatory variable was the presence or absence of stable housing (homeless status) defined as housing for which a person had adequate resources and there were no time limits (18). When presenting for medical care, CHN eligibility workers ask patients for their address and assign the zip code 99997 to any patient who identifies him- or herself as homeless or without a stable address (19). Homelessness exposure was assessed within the 2-year period preceding and closest to the index-qualifying eGFR. We also compared assessments of homeless status between administrative codes and data extracted during chart review of medical records from a computer-generated, random sample of 50 patients. We qualified homelessness as living in a shelter, hostel, transitional housing, public place (*e.g.*, street or makeshift area), vehicle, or someone else's home and not having a place of one's own (18). The percent agreement for homeless status between administrative codes and chart review was 92% (κ=0.56, 95% confidence interval=0.29–0.83).

Independent Variables

We extracted data for key sociodemographic and clinical factors that might influence progression to ESRD and/or death based on prior studies and our experience in treating patients within CHN (2–7,13,17). Covariates were defined within the 2-year period preceding and closest to the index-qualifying eGFR. Sociodemographic covariates included patient age, sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, Asian/Pacific Islander, or other), health insurance coverage (uninsured, Medicaid, Medicare, or commercial/other), occupational status (employed, unemployed, disabled, or retired), and annual income based on administrative data. We ascertained comorbid conditions based on established algorithms using discharge diagnostic codes, ambulatory diagnostic codes, and procedural codes for diabetes, hypertension, congestive heart failure, cardiovascular disease, chronic obstructive lung disease, hepatitis C virus, HIV or AIDS, depression, tobacco smoking, alcoholism, and drug abuse. We defined substance abuse as having a primary hospital discharge diagnosis or physician-assigned, ambulatory-based diagnosis of alcoholism or drug abuse (Supplemental Appendix B). Serum creatinine was measured using the Jaffe assay and recalibrated to reflect the isotope dilution–mass spectrometry standard of the Cleveland Clinic laboratory (20). We used the re-expressed Modification of Diet in Renal Disease study equation to estimate GFR based on calibrated serum creatinine, age, race, and sex (20). Additional laboratory data included presence and severity of proteinuria, hemoglobin, and serum albumin concentrations (21). We classified proteinuria as normal (urinary albumin-to-creatinine ratio [ACR]<30 mg/g or urine dipstick negative), mild (ACR≥30 and <300 mg/g or urine dipstick trace or 1+), or heavy (ACR>300 mg/g or urine dipstick≥2+) (22,23).

Statistical Analyses

We described baseline characteristics of adults with and without stable housing using means (±SD), medians (interquartile range [IQR]), and proportions. In bivariate analyses, we examined the association of homeless status and measures of interest using the chi-squared test for categorical variables and the *t* test or Wilcoxon rank sum test for continuous variables.

We calculated crude incidence rates of ESRD or death per 1000 person-years stratified by homeless status. To examine the multivariable association of homeless status and the risk of ESRD or death, we used proportional hazards (Cox) regression controlling for potential confounders of the association of homeless status and outcomes of interest. The final models included age, sex, race/ethnicity, income, health insurance, comorbid conditions, substance abuse, index eGFR, proteinuria, hemoglobin, and serum albumin concentrations. To determine whether the relations of homelessness and the risk of ESRD or death might differ because of sex, race/ethnicity, diabetes, substance abuse, or eGFR category (8), we examined two-way interactions using the Wald test. We tested for and found no violations of the proportionality assumption using scaled Schoenfeld residuals and examining plots of −log(−log [survival rate]) against log (survival time). We also examined the association of homelessness and access to nephrology care using multivariable logistic regression adjusting for the variables described above. To avoid bias caused by excluding patients with missing data, we performed multiple imputation using the Markov chain Monte Carlo method, with 100 imputations for these variables (3% of the cohort were missing data for race/ethnicity, 17% were missing data for health insurance coverage, 16% were missing data for income, 27% were missing data for income source, 27% were missing data for proteinuria, and <1% were missing data for other variables, including hemoglobin and serum albumin) (24). For all analyses, we considered a two-tailed *P* value<0.05 as statistically significant without adjustment for multiple comparisons. We used Stata statistical software for all analyses (Stata MP version 11.0; Stata Corp, College Station, TX). The Committees on Human Research at the University of California San Francisco and University of Washington approved the study protocol.

Results

Patient Characteristics

Overall, 858 (6%) of 15,353 adults with impaired kidney function receiving routine care in the CHN were homeless. Table 1 shows the baseline characteristics of study participants according to homeless status. Homeless adults with CKD were younger, disproportionately male, and uninsured or enrolled in Medicaid, and they suffered from higher rates of depression, alcoholism, and drug use compared with housed counterparts. The large majority of the homeless were destitute, reporting an annual income of less than \$5,000 USD, and most were unemployed, disabled, and/or receiving public assistance. Compared with indigent adults with stable housing, those adults who were homeless had a higher prevalence of mild or heavy proteinuria and more advanced CKD (eGFR<45 ml/min per 1.73 m^2), but they had a lower prevalence of diabetes and hypertension at the time of cohort entry (*P*<0.001, respectively) (Table 1).

Progression to ESRD or Death

Median follow-up was 2.6 (IQR=1.3–5.1) years among homeless and 2.9 (IQR=1.4–6.2) years among housed participants. Over 57,698 person-years, 83 (10%) homeless adults died, and 31 (4%) homeless adults progressed to ESRD compared with 901 (6%) and 528 (4%) housed counterparts, respectively. Crude rates of ESRD or death were 1.8-fold (95% confidence interval [CI]=1.49–2.22) higher among homeless than housed adults (Figure 1). The risk of ESRD or death was attenuated but remained significantly higher among homeless compared with housed adults (adjusted hazard ratio [HR; 95% CI]=1.28 [1.04–1.58]) after controlling for differences in age, sex, race/ethnicity, comorbid conditions, substance abuse, index kidney function, proteinuria, hemoglobin, and serum albumin concentrations. Moreover, the association of homeless status and the risk of ESRD or death seemed to differ according to substance abuse (interaction *P*=0.055). Among adults without a history of substance abuse, the risk of ESRD or death was higher among homeless compared with housed adults (adjusted HR [95% CI]=1.54 [1.18–2.03]). Among adults with a history of substance abuse, there was no strong evidence that the adjusted risk of ESRD or death differed between homeless compared with housed adults (adjusted HR [95% CI]=0.99 [0.72–1.36]). The relations of homeless status and the risk of ESRD or death did not significantly differ by sex (Wald test statistic *P*=0.41), race/ethnicity (*P*=0.53), the presence or absence of diabetes (*P*=0.42), or initial eGFR category (*P*=0.13).

Acute and Chronic Care Use

Homeless adults with CKD were far more likely to use acute care services than housed counterparts. The majority of poor but stably housed adults made two or fewer visits to the emergency department, and approximately 35% made no visits. In contrast, most homeless adults with CKD recorded at least 9 emergency department visits, and 25% made more than 20 visits. Similar trends were observed for acute hospitalizations (Table 2). Among homeless adults with CKD, acute care use was significantly higher among individuals with compared with individuals without a history of substance abuse (Table 3). However, even among adults with a history of substance abuse, emergency department visits and hospitalizations were significantly higher among the homeless compared with housed peers (Figure 2).

Overall, 1721 (11%) of the cohort accessed nephrology care at least one time. Compared with housed individuals, homeless adults were significantly less likely to have received any nephrology care (unadjusted odds ratio [95% CI]=0.56 [0.43–0.73]). The likelihood of accessing nephrology care remained significantly and substantially lower

Table 1. Characteristics of 15,353 adults with CKD stages 3–5 by homeless status

Characteristic	Homeless Status		
	Housed (n=14,495)	Homeless (n=858)	P for Between-Group Differences
Mean age (SD) in years	60 (14)	50 (11)	<0.001
Age category in years (%)			<0.001
<40	8	18	
40–49	16	36	
50–59	23	30	
60–69	30	12	
≥70	22	5	
Female (%)	54	32	<0.001
Race/ethnicity (%)			<0.001
non-Hispanic white	27	48	
non-Hispanic black	20	36	
Hispanic	19	9	
Asian/Pacific Islander	31	5	
other race/ethnicity	3	3	
Income ≤$15,000 USD (%)	71	95	<0.001
Income source (%)			<0.001
unemployed/none	45	58	
Uninsured (%)	17	30	<0.001
Medicaid (%)	22	42	<0.001
Comorbid conditions (%)			
diabetes	22	16	<0.001
hypertension	47	29	<0.001
cardiovascular disease	18	13	<0.001
congestive heart failure	6	8	0.08
chronic obstructive lung disease	15	22	<0.001
AIDS/HIV	4	9	<0.001
hepatitis C virus infection	4	14	<0.001
alcoholism	6	27	<0.001
depression	15	27	<0.001
history of drug use	14	52	<0.001
tobacco smoking	4	8	<0.001
Laboratory measures (%)			
estimated GFR category (ml/min per 1.73 m^2)			<0.001
45–59	80	71	
30–44	13	17	
15–29	5	9	
<15	2	3	
proteinuria category			0.001
none	59	52	
mild	22	24	
heavy	19	23	
hemoglobin mean (SD; g/dl)	12.9 (2.0)	12.4 (2.4)	<0.001
serum albumin mean (SD; g/dl)	3.9 (0.7)	3.6 (0.8)	<0.001

Table values are nonimputed. Overall, 3% of the cohort were missing data for race/ethnicity, 17% were missing data for health insurance coverage, 16% were missing data for income, 27% were missing data for income source, and 27% were missing data for proteinuria. Less than 1% was missing data for other variables, including hemoglobin and serum albumin.

among the homeless, even after controlling for differences in sociodemographic factors, comorbid conditions, substance abuse, eGFR, proteinuria, hemoglobin, and serum albumin concentrations (adjusted odds ratio [95% CI]=0.49 [0.37–0.66]).

Discussion

For homeless persons, securing food and shelter represent tiresome, daily tasks that are rendered immeasurably more difficult when combined with acute illness or complex comorbidities (25). In this urban public healthcare setting, we found that homeless adults with impaired kidney function were disproportionately younger men, and a substantial fraction of them suffered from depression and substance abuse. Homeless adults with CKD had a higher prevalence of proteinuria and advanced CKD, and they experienced higher rates of death or progression to ESRD compared with their domiciled counterparts. In addition, homeless adults with CKD, particularly those individuals

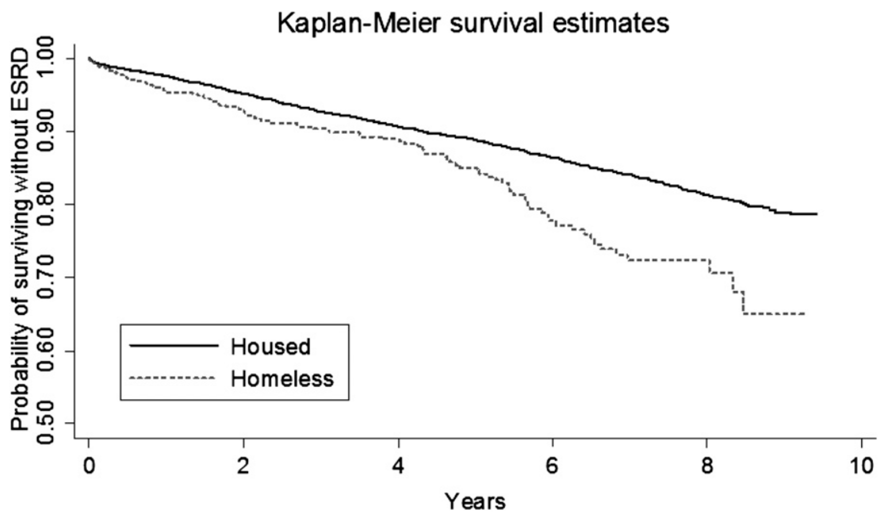

Figure 1. | **Kaplan–Meier survival curves comparing time to ESRD or death by homeless status.**

Table 2. Emergency department visits and hospitalizations among 15,353 adults with CKD by homeless status

Outcome	Housed	Homeless	*P* Value
Number of subjects	14,495	858	
Emergency department visits			
median (IQR)	1 (0–4)	9 (4–20)	<0.001
number of visits			
0	4645 (32%)	57 (7%)	<0.001
1	2778 (19%)	37 (4%)	
2	1689 (12%)	54 (6%)	
3–9	3933 (27%)	292 (34%)	
≥10	1450 (10%)	418 (49%)	
Hospitalizations			
median (IQR)	1 (0–4)	5 (2–10)	<0.001
number of hospitalizations			
0	4984 (34%)	131 (15%)	<0.001
1	2715 (19%)	70 (8%)	
2	1723 (12%)	80 (9%)	
3–9	3915 (27%)	339 (40%)	
≥10	1158 (8%)	238 (28%)	

IQR, interquartile range (the difference between the 75th and 25th percentiles).

with a history of substance abuse, were far more likely to use acute care services and substantially less likely to access nephrology care than indigent peers who were stably housed. Few prior studies have examined correlates and consequences of CKD among the homeless, one of society's most marginalized and vulnerable groups.

Prior studies of homeless persons report numerous system-level barriers to accessing healthcare, such as lack of health insurance, limited medication coverage, and frequent communication breakdown between the patient and healthcare system (25,26). Lack of transportation, prolonged waiting times, and feelings of being stigmatized by other patients and health professionals only add to delays in seeking regular care to manage chronic conditions (8,9,27,28). The higher prevalence of proteinuria and more advanced CKD among homeless adults in our study are consistent with these reports and collectively suggest delayed care-seeking and/or poorer control of chronic conditions associated with progressive CKD. Notably, we observed similar crude rates of treated ESRD among homeless and housed adults. Although there are no official records of how many homeless individuals eventually progress to and receive treatment for ESRD in the United States (15), our data suggest that this number may be substantial. Providing ongoing ambulatory care to homeless persons with impaired kidney function is challenging; however, these concerns, at first glance, seem minor relative to the complexities of delivering care to persons with ESRD whether on dialysis (the vast majority) or after kidney transplantation. However, homeless persons seem willing to pursue healthcare for chronic conditions provided that they have access and believe that such care is important (25). Anecdotal evidence suggests that use of acute care services might actually decline among the

Table 3. Emergency department visits and hospitalizations among homeless adults by history of substance abuse

Outcome	No History of Substance Abuse	History of Substance Abuse	*P* Value
Number of subjects	387	471	
Emergency department visits			
median (IQR)	5 (2–12)	13 (6–28)	<0.001
number of visits			
0	48 (12%)	9 (2%)	<0.001
1	29 (8%)	8 (2%)	
2	39 (10%)	15 (3%)	
3–9	150 (39%)	142 (30%)	
≥10	121 (31%)	297 (63%)	
Hospitalizations			
median (IQR)	3 (0–6)	7 (3–13)	<0.001
number of hospitalizations			
0	106 (27%)	25 (5%)	<0.001
1	40 (10%)	30 (6%)	
2	41 (11%)	39 (8%)	
3–9	137 (35%)	202 (43%)	
≥10	63 (16%)	175 (37%)	

IQR, interquartile range (the difference between the 75th and 25th percentiles).

homeless when wraparound services such as transportation, social work, nutrition, and healthcare provider access become available (29).

Perhaps unsurprisingly, homeless adults with CKD were far more likely to use acute care services than housed counterparts: nearly one-half of homeless adults visited the emergency department at least 10 times, and over one-quarter experienced 10 or more hospitalizations. Consistent with reports from non-CKD cohorts, these trends were even more pronounced among homeless individuals with a history of substance abuse (30,31). In addition, after accounting for the severity of CKD and other clinical factors, homeless adults were over 50% less likely to access nephrology care than poor counterparts who were stably housed. It is possible that the lower ascertained prevalence of hypertension and diabetes among homeless adults in our study reflects this disproportionate reliance on acute care services for management of acute (rather than chronic) diseases and assistance with social issues (8,9,27,28). Although some excess use of services by homeless adults might be expected because of social reasons, the striking difference in care use for the homeless compared with indigent, stably housed peers in our study is noteworthy, because prior (non-CKD) cohort studies have overwhelmingly examined outcomes relative to controls from the general population (4,5).

Nationwide concerns about high public costs incurred by homeless people have provoked various housing interventions to eliminate chronic homelessness (27,32,33). One such approach, Housing First, offers permanent housing to homeless people (targeting those individuals with mental illness and substance abuse) with few requirements for participation or success in rehabilitative activities (34). In a population of chronically homeless individuals in Seattle, Washington, a Housing First program was associated with a 52% decrease in total costs related to incarcerations, shelter use, detoxification, and emergency medical and hospital services at 6 months (27). Before the intervention, homeless individuals in the study incurred median monthly costs of approximately $4066 USD (27). Similarly, Sadowski *et al.* (32) found that hospitalized homeless adults who were randomized to receive housing and case management had far less use of acute care services over the following year compared with controls who received standard discharge planning. In the study by Sadowski *et al.* (32), the investigators projected that, for every 100 homeless adults offered the intervention, the expected benefits over the subsequent year would be 116 fewer emergency department visits, 49 fewer hospitalizations, and 270 fewer hospital days (32). Although likely underestimating use of acute care services, our study findings suggest that homeless adults with CKD, particularly those individuals with a history of substance abuse and/or other risk factors for CKD progression, should also be considered for such interventions when policymakers and researchers debate where and to whom these efforts should be applied (35).

Our study provides a rare glimpse into the characteristics and adverse outcomes of CKD among homeless adults with nondialysis-dependent CKD from the urban healthcare safety net. In addition to providing very well-detailed demographic and clinical data, we were able to link the population to statewide and national registries to obtain complete (or nearly so) captures of ESRD and vital status. Our study also had several limitations. First, our study cohort comprised patients receiving ambulatory care in the CHN and thus, may exclude some of the truly itinerant homeless. Second, we were also unable to quantify duration of homelessness in our study. We would expect transient periods of homelessness to have less profound effects on health behaviors and outcomes than more permanent homelessness, the latter being more frequently complicated by substance abuse, abject poverty, and mental illness (3). Third, our use of diagnostic codes to ascertain comorbid conditions likely underestimates the true prevalence and severity of comorbidities, such as cardiovascular disease,

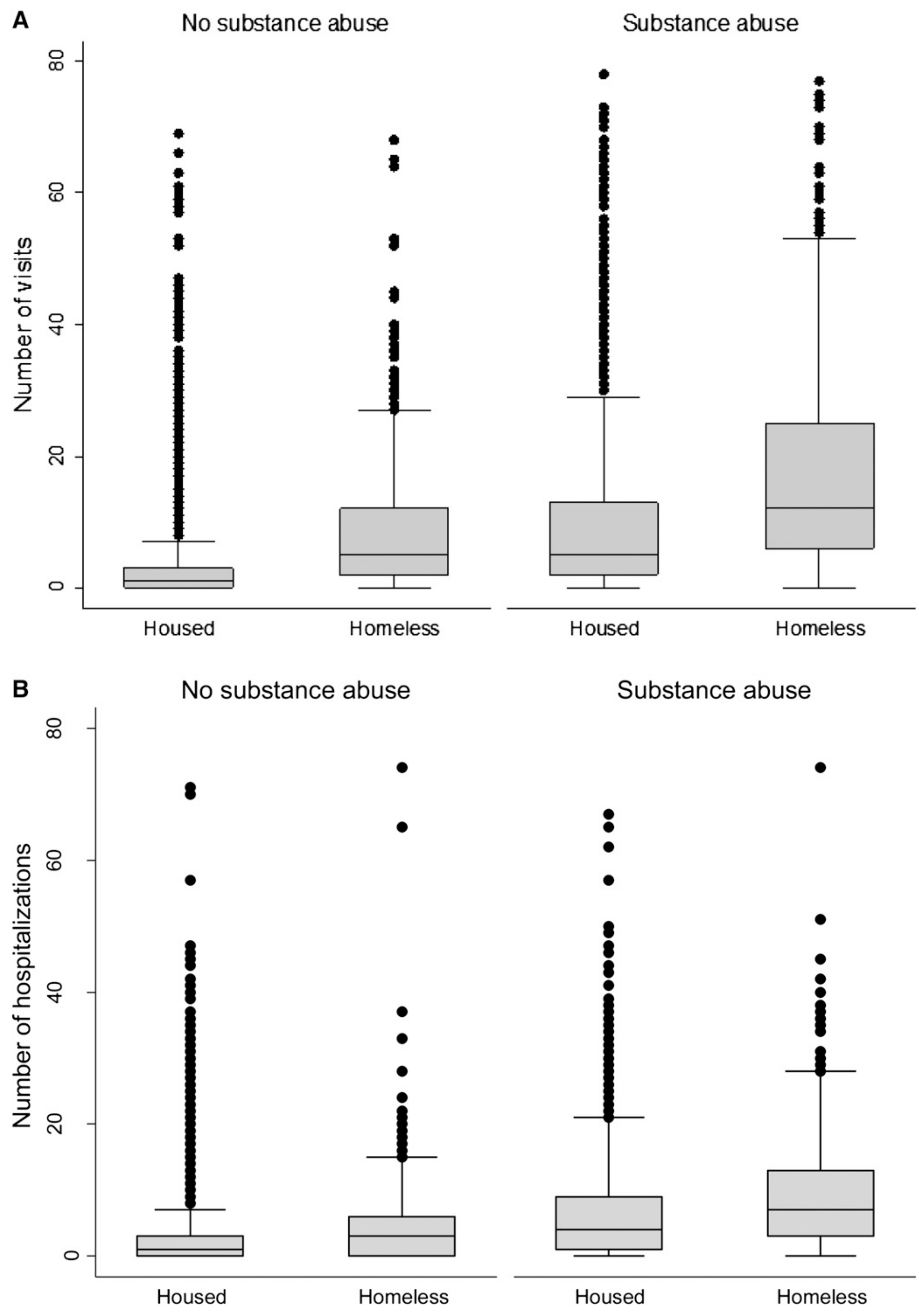

Figure 2. | Distribution of acute care utilization by homeless status and history of substance abuse among 15,353 subjects with CKD. (A) Side-by-side box plots showing the distribution of emergency department visits by homeless status and history of substance abuse. The bottom and top of the box represent the 25th and 75th percentiles (interquartile range [IQR]), respectively, and the band near the middle of the box is the median. The whiskers include values within 1.5 IQR of the lower and upper quartiles, respectively. Outliers are denoted with small circles. (B) Side-by-side box plots showing the distribution of hospitalizations by homeless status and history of substance abuse.

diabetes, and hypertension in this population (36). Fourth, although we undertook efforts to restrict the cohort with true CKD by requiring multiple outpatient eGFR determinations and evidence of ambulatory care within the CHN, it is possible that we have misclassified some persons with AKI or near normal kidney function as having CKD. Fifth, we cannot eliminate the possibility of differential receipt of dialysis or use of acute care services outside CHN according to housing status. To the extent that this occurred, we suspect that housed subjects might be more likely to receive dialysis and seek care outside of CHN than homeless subjects. We, therefore, suspect that, if there is a bias, it would operate conservatively, and we would have potentially underestimated the true difference in ESRD and acute care use between homeless and housed subjects in our study. Lastly, although the distribution of sex, race/ethnicity, health insurance, income, and substance abuse mirrors the distribution of homeless persons surveyed in a nationwide study (8), our cohort may not be fully representative of the homeless from other locales or health systems in the United States (37). Sadly, San Francisco's homeless population has remained remarkably stable over time (38). Accurately classifying the homeless and capturing associated outcomes are extremely challenging tasks; homelessness is a dynamic process in which fleeting contact with medical resources represents the norm (19).

Homeless adults with nondialysis-dependent CKD experience increased morbidity and mortality and use costly acute care services far more frequently than impoverished peers who are stably housed. Whether and to what extent interventions aimed at providing permanent, affordable housing and other supportive services can attenuate these health inequalities warrant additional investigation. Our findings reinforce rising concerns as to how our states and nation can best tackle the unmet needs of the most frequent and vulnerable users of public services.

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Disclosures

None.

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