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POPULATIONS AT RISK

Housing Instability and Food Insecurity as Barriers to Health Care Among Low-Income Americans

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BACKGROUND: Homelessness and hunger are associated with poor health outcomes. Housing instability and food insecurity describe less severe problems securing housing and food.

OBJECTIVE: To determine the association between housing instability and food insecurity and access to ambulatory health care and rates of acute health care utilization.

DESIGN: Secondary data analysis of the National Survey of American Families.

PARTICIPANTS: 16,651 low-income adults.

MEASUREMENT: Self-reported measures of past-year access: (1) not having a usual source of care, (2) postponing needed medical care, or (3) postponing medication; and past-year utilization: (1) not having an ambulatory care visit, (2) having emergency department (ED) visits, or (3) inpatient hospitalization.

RESULTS: 23.6% of subjects had housing instability and 42.7% had food insecurity. In multivariate logistic regression models, housing instability was independently associated with not having a usual source of care (adjusted odds ratio [AOR] 1.31, 95% confidence interval [CI] 1.08 to 1.59), postponing needed medical care (AOR 1.84, 95% CI 1.46 to 2.31) and postponing medications (AOR 2.16, 95% CI 1.70 to 2.74), increased ED use (AOR: 1.43, 95% CI 1.20 to 1.70), and hospitalizations (AOR 1.30, 95% CI 1.01 to 1.67). Food insecurity was independently associated with postponing needed medical care (AOR 1.74, 95% CI 1.38 to 2.21) and postponing medications (AOR 2.15, 95% CI 1.62 to 2.85), increased ED use (AOR 1.39, 95% CI 1.17 to 1.66), and hospitalizations (AOR 1.42, 95% CI 1.09 to 1.85).

CONCLUSIONS: Housing instability and food insecurity are associated with poor access to ambulatory care and high rates of acute care. These competing life demands may lead to delays in seeking care and predispose to acute care.

KEY WORDS: homelessness; hunger; access to care; disparities.
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In the United States, approximately 3 million people experience an episode of homelessness,[1] and approximately 9 million people experience hunger annually.[2] Homelessness is associated with high rates of morbidity[3–5] and mortality.[6–9] Homeless persons face barriers to receiving health care and have higher rates of emergency department (ED) use,[10] inpatient hospitalization,[11,12] and longer hospital stays[13] than low-income housed persons. They are less likely to use ambulatory care and preventive services.[11,14–16]

Persons experiencing hunger generate more costs per diagnostic-related group.[17] Diabetics with hunger have increased hypoglycemic episodes[18] and increased health care utilization.[19] Individuals at risk for homelessness or hunger may prioritize meeting basic needs over seeking health care.[20]

Housing instability and food insecurity represent the less severe and more widespread forms of homelessness and hunger. Housing instability is variably defined as having difficulty paying rent, spending more than 50% of household income on housing,[21] having frequent moves, living in overcrowded conditions, or doubling up with friends and relatives.[16,22,23] There is no standard definition or validated instrument to assess housing instability; there are limited data on its prevalence. Differing forms of housing instability are potential risk factors for homelessness.[24–29]

Annually, 39 million persons experience food insecurity.[2] Food insecurity is defined as having limited or uncertain availability of nutritionally adequate and safe foods or ability to acquire foods in socially acceptable ways.[30] Food insecurity exists upon a continuum, with food insecure in between food secure and hunger.[31] There is a small literature on food insecurity and health. ED patients who reported prioritizing food over medications reported increased visits[32] and children with food insecurity had higher rates of acute care and worse outcomes than food-secure children.[33]

Whereas homelessness and hunger are known to be associated with poor access to health care,[11,20,32] it is not known whether housing instability and food insecurity are. We hypothesize that competing demands to acquire food and shelter in persons with housing instability and food insecurity are associated with decreased access to ambulatory health care and increased use of acute care. We compared barriers to access and use of health care for a household-based nationally representative sample of low-income adults with and without housing instability and food insecurity.

METHODS

Subjects and Setting

We conducted a secondary data analysis of factors associated with access to health care and utilization of ambulatory, ED,

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and inpatient hospital services among low-income adults who participated in the 1999 National Survey of America's Families (NSAF).[34] NSAF, a household survey conducted by the Urban Institute, was designed to provide a nationally representative sample of the civilian, noninstitutionalized U.S. population under the age of 65 years.[35] Interviews were conducted between February and October 1999. The 1999 public use data files provide data on over 100,000 nonelderly persons from over 42,000 households sampled from 13 states.[36] In order to obtain information on the low-income population, researchers oversampled families with incomes less than 200% of the federal poverty level. There were 2 sampling frames: random digit dialing and area sampling to include households without telephones.[35] The study did not include homeless or institutionalized persons. The overall response rate was approximately 70%.[34] There were no differences in response rates between those above and below 200% poverty level.[37]

The institutional review board at University of California, San Francisco approved the study.

We selected study subjects from the 1999 NSAF public use data files. We included all adults aged 18 to 64 with total family incomes less than 200% of the federal poverty level.

MEASURES

Primary Independent Variables

Our primary independent variables were housing instability and food insecurity. We defined housing instability as self-reported difficulty in paying rent, mortgage, or utility bills in the past year. Respondents with housing instability were asked whether they had moved in with friends or family because they had no other choice; we considered those who had to be doubled up. For food insecurity, we defined anyone having any positive response to the following 3 questions: in the past year did they, or their family, (1) worry that their food would run out, (2) have the food that they bought not last and not have the money to buy more, and (3) cut the size of meals or skipped meals because there was not enough money for food. Respondents were asked, for the first 2 questions, whether these were often true, sometimes true, or never true, and for the third they were asked the frequency with which they cut meals. These represent 3 questions from the United States Department of Agriculture's 18-item scale to ascertain food insecurity and hunger.[31]

Independent Covariates

Independent covariates were categorized into predisposing, enabling, and need factors after Gelberg and colleagues' behavioral model of health care utilization for vulnerable populations.[38,39] According to the model, predisposing, enabling, and need factors determine patterns of health care utilization. Predisposing variables included housing instability, food insecurity, age, gender, race/ethnicity, marital status, whether or not the subject had children, region of country, immigration status, and education. Enabling factors included income, employment status, receipt of governmental income subsidies, and health insurance. Need factors included current self-reported health status, health status compared with 12 months back, and having a work-limiting health condition. We did not have data on other health indicators or substance use.

We defined race/ethnicity as white non-Latino, black non-Latino, Latino, or other, and marital status as married/partnered or unmarried/unpartnered. We classified respondents as either U.S. or foreign born, and as U.S. citizen or noncitizen. We defined income based on percentage of the federal poverty level for the household: $<50\%$, 50% to $<100\%$, 100% to 150%, or 150% to 200% of federal poverty level. We defined subjects' health insurance status as either full-year private insurance, full-year public insurance, full-year public and private insurance, part-year uninsured, or full-year uninsured.

Dependent Variables

For our dependent variables, we used 3 past-year measures of access to care: (1) not having a usual source of care, (2) postponing needed medical care, and (3) postponing needed medications, and 3 past-year utilization measures: (1) not having ambulatory care use, (2) number of ED visits, and (3) any nonmaternal hospitalizations. We classified respondents as not having a usual source of care if they reported either not having a usual place for health care or that the ED was their usual source of care. We categorized ED use as 0, 1 to 2, or 3 or more ED visits based on the respondent's self-reported number of ED visits for physical health care in the prior year. We dichotomized ambulatory care use (present or absent) based on the respondent's self-reported number of physician or mid-level provider visits for physical health care in the past year, excluding ED or inpatient hospital settings. We dichotomized inpatient hospital use (present or absent) based on the respondent's self-report of any overnight inpatient hospital stay for nonpregnancy-related medical care in the past year.

Statistical Analysis

We excluded respondents with missing data for specific variables from models that relied on those data. In all but the ED model, this resulted from missing data from independent variables and ranged from 0.8% to 1.3% of respondents. For the ED model, 2.7% of respondents were missing data on the outcome; there were a total of 3.3% missing. We used binary logistic regression to test for bivariate associations and to determine adjusted odds ratios (AORs) in multivariate models for all the outcomes except the ED, for which we used ordinal logistic regression. In ordinal logistic regression, each category is compared with the one previous (we compared those with 1 to 2 visits with those with no visits, and those with 3 or more to those with 1 to 2 visits); the AORs hold for each comparison. We constructed stepwise multivariate models. We considered as candidates all variables that were associated with the outcome at $\alpha<0.15$ in the bivariate models. We began constructing each model with housing instability and food insecurity, and then added, singly and in order, the predisposing, enabling, and need factors. We retained the newly added variable if its effect was statistically significant at $\alpha<0.05$. If the new variable rendered statistically insignificant any variable already in the model (except housing instability and food insecurity), we removed the variable rendered insignificant. When no additional candidate variables remained, we retested all variables that were removed in a previous step for addition to the model at $\alpha<0.05$. We reperformed analyses using a 3-level housing variable (stable/unstable/doubled up). We present all candidate variables in Table 1. We present only the AORs for health

Table 1. Characteristics of Low-Income (<200% Poverty Level) Respondents to the National Survey of Families

	Total 16,651 (%)‡	Housing Instability* 4,293 (23.6%‡) (%)†	Food Insecurity† 7,659 (42.7%‡) (%)†
Predisposing factors			
Age			
<25	21.9	17.8	20.5
25 to 44	49.8	57.8	54.4
45 to 65	28.3	24.4	25.1
Women	56.7	60.9	59.2
Race/ethnicity			
White non-Latino	57.1	51.0	48.6
Black non-Latino	18.7	25.3	23.9
Latino	19.9	20.4	23.9
Other	4.3	3.3	3.6
Region			
Northeast	16.4	15.7	14.8
Midwest	20.6	19.9	17.1
South	39.5	39.4	42.9
West	23.4	25.0	25.3
Birthplace			
U.S. born	82.0	82.7	80.7
Education			
No HS diploma/GED	28.2	33.2	35.9
HS diploma/GED	40.7	40.7	39.8
Any college	31.1	26.1	24.3
Married (or partnered)	54.8	53.6	50.3
Have children	55.2	62.8	59.6
Housing instability	23.6	100.0	42.4
Food insecurity*	42.7	76.7	100.0
Worried whether food would run out			
Often true	11.5	26.6	27.0
Sometimes true	26.5	44.5	62.1
Never true	62.0	28.9	10.9
Food bought did not last			
Often true	8.2	20.0	19.3
Sometimes true	24.3	43.9	56.9
Never true	67.5	36.1	23.4
Cut or skipped meals for lack of money			
Never	78.6	55.6	49.6
Almost every month	6.7	16.1	15.6
Some but not every month	8.4	17.7	19.9
Only 1 or 2 mo	6.3	10.6	14.9
Enabling factors			
Family income (% of poverty line)			
<50% of poverty line	17.6	21.4	21.7
50% to 100% of poverty line	23.2	27.1	26.2
100% to 150% of poverty line	29.6	28.1	28.5
150% to 200% of poverty line	29.7	23.4	23.6
Employment status			
Not in labor force	33.4	30.1	34.4
Looking for work	8.6	10.0	10.5
Working	58.0	59.9	55.1
Public assistance			
No subsidies	70.5	59.8	60.5
Social security income/ SSDI	11.4	11.4	14.0
Other public assistance§	18.1	28.8	25.5
Insurance status			
Full year private	40.3	24.5	25.6
Full year public	13.2	19.0	20.5
Insurance all year public/ private	3.4	4.3	4.4
Uninsured, part year	14.8	20.8	18.0
Uninsured all year	27.3	31.4	31.5
Need factors			
Current health status			
Fair or poor	23.2	32.0	31.8
Health worse than prior year	10.2	16.7	13.9
Health condition that limits work	22.1	29.6	28.4
Outcomes			
Access measures			
No usual source of care‖	23.9	29.2	27.8
Postponed needed medical care (past year)	10.0	18.4	14.9
Postponed medication (past year)	9.1	18.8	14.9
Utilization measures			
No ambulatory care visits (past year)	31.3	30.4	32.6
Number of emergency department visits (past year)			
0	73.0	62.7	65.8
1 to 2	22.9	29.4	27.9
≥3	4.1	7.9	6.3
Hospitalizations (past year)§	9.8	13.8	13.0

Housing instability defined as difficulty in paying rent, mortgage, or utilities in the prior year.

†*Food insecurity defined as having any 1 of 3 indicators of food insecurity: (1) worrying that their food would run out, (2) having the food that they bought not last and not having the money to buy more, or (3) having cut the size of meals or skipped meals in the past year because there was not enough money for food.*

‡*Rates weighted to reflect U.S. low-income population.*

§*Temporary assistance to needy families, general assistance.*

‖*Emergency department not considered usual source of care.*

HS, high school; GED, general educational development high school equivalency exam.

insurance and the primary independent variables in Tables 2 and 3.

We used the random adult weights provided by NSAF to derive nationally representative proportions (for the <200% poverty-level population) and regression analyses estimates. The weights account for the unequal probability of sampling (at both the household and person levels) and include adjustments for nonresponse and undercoverage.[40] We adjusted for clustering of individuals within households. All analyses used the survey data modules of Intercooled STATA 8.0 for Windows software (Stata Corporation, College Station, TX).

RESULTS

Predisposing Factors

There were 16,651 subjects. The median age was 37. The majority of respondents were women (56.7%—Table 1). The majority of respondents were white. Approximately two thirds had at least a high school diploma. Slightly more than half were married or partnered, and more than half had children.

Housing Instability and Food Insecurity

One quarter (23.6%) of the respondents noted having had difficulties paying their rent, mortgage, or utilities in the past year, thus meeting our definition for housing instability. Among the subset of respondents who reported housing instability, 11.0% were doubled up.

Table 2. Factors Associated with Health Care Access Among Low-Income Respondents to the NSAF

	No Usual Source of Care*			Postponed Needed Medical Care (Past Year)			Postponed Medications (Past Year)		
	n=3,456 (23.9%†)			*n*=1,830 (10.0%†)			*n*=1,662 (9.1%†)		
	Bivariate Rate (%)†	Multivariate‡		Bivariate Rate (%)†	Multivariate§		Bivariate Rate (%)†	Multivariate‖	
		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI
Housing instability¶									
No	22.3	1.00		7.4	1.00		6.1	1.00	
Yes	29.3	1.31	1.08 to 1.59	18.4	1.84	1.46 to 2.31	18.8	2.16	1.70 to 2.74
Food insecurity#									
No	21.1	– 1.00		6.4	1.00		4.8	1.00	
Yes	27.8	1.09	0.92 to 1.29	14.9	1.74	1.38 to 2.21	14.9	2.15	1.62 to 2.85
Insurance status									
Full year private	13.2	1.00		5.7	1.00		5.4	1.00	
Full year public	15.0	1.24	0.91 to 1.71	11.0	0.86	0.61 to 1.22	13.0	0.97	0.69 to 1.36
Full year public/private	21.6	1.75	1.08 to 2.83	7.8	0.83	0.42 to 1.62	11.1	1.16	0.60 to 2.25
Uninsured, part year	28.1	2.23	1.77 to 2.80	14.6	2.28	1.68 to 3.09	13.7	2.01	1.45 to 2.79
Uninsured all year	42.3	3.86	3.13 to 4.76	13.6	2.57	1.93 to 3.42	9.8	1.62	1.17 to 2.24

*Includes subjects who reported no usual source of care and subjects who reported regular source of care was the ED.
†Rates weighted to reflect U.S. low-income population.
‡Model also adjusted for age, gender, race/ethnicity, immigration status, education, marital status, children, and family income.
§Model also adjusted for: gender, race/ethnicity, marital status, health status, change in health status from prior year, and presence of work-limiting condition.
‖Model also adjusted for: gender, race/ethnicity, marital status, children, health status, change in health status, and work-limiting condition.
¶Housing instability defined as difficulty in paying rent, mortgage, or utilities in the prior year.
#Food insecurity defined as having any one of 3 indicators of food insecurity: (1) worrying that their food would run out, (2) having the food that they bought not last and not having the money to buy more, or (3) having cut the size of meals or skipped meals in the past year because there was not enough money for food.
NSAF, National Survey of America's Families; CI, confidence interval; ED, emergency department.

Almost one half (42.7%) of the respondents fulfilled our criteria for having food insecurity. Over a third (38.0%) noted worrying about whether their food would run out. A third (32.5%) noted that the food that they had had not lasted. A quarter (21.4%) noted skipping meals for lack of money. Among those with housing instability, 76.7% reported food insecurity. Among those with food insecurity, 42.4% reported housing instability (Table 1).

Enabling Factors

Less than one fifth of the respondents reported their household income to be less than 50% of the poverty line; the remainder was evenly divided between 50% to 100%, 100% to 150%, and 150% to 200% of the poverty line. Over half of the respondents reported working for income. Approximately one third of the respondents reported receiving income support.

Over half of the respondents reported being covered by insurance for the full year prior to the survey. Over a quarter reported being uninsured for the full year, and almost 15% reported being uninsured for part of the year (Table 1).

Need Factors

One quarter of the respondents reported fair or poor health, and approximately 10% noted that their health had declined in the prior year. Almost a quarter had a work-limiting health condition (Table 1).

Dependent Variables

A quarter of the respondents (23.9%) fulfilled our criteria for not having a usual source of health care, either by stating that they did not have a usual source of care or that an ED was their usual source; 10.0% of respondents reporting having postponed needed medical care and 9.1% reported having postponed needed medications. Almost a third (31.3%) noted not having had an ambulatory care visit. Over a quarter (27.0%) of respondents had at least 1 ED visit, 22.9% had 1 or 2 visits, and 4.1% had 3 or more visits. 9.8% had a nonpregnancy-related hospitalization (Table 1).

Factors Associated with Access to Care

Housing instability and food insecurity were both associated with our predetermined measures of poor access to health care (Table 2). In multivariate models, housing instability was associated with all 3 measures: not having a usual source of care (AOR 1.31, 95% CI 1.08 to 1.59), postponing needed health care (AOR 1.84, 95% CI 1.46 to 2.31), and postponing needed medications (AOR 2.16, 95% CI 1.70 to 2.74). Food insecurity was associated with both postponing needed health care (AOR 1.74, 95% CI 1.38 to 2.21) and medications (AOR 2.15, 95% CI 1.62 to 2.85) but not with having no usual source of care.

Health Care Utilization

While neither housing instability nor food insecurity were associated with not having had ambulatory care visits in the prior year, both were associated with increasing numbers of ED visits and having had a nonpregnancy-related hospitalization in the prior year (Table 3). In the ED model, using an ordinal logistic model, comparing those with no ED visits to those with 1 to 2 and those with 3 or more ED visits, we found that housing instability (AOR: 1.43, 95% CI 1.20 to 1.70) and food insecurity (AOR 1.40,

Table 3. Factors Associated with Health Care Utilization Among Low-Income Respondents to the NSAF Continued

	No Ambulatory Care Visits (Past Year)			ED Visits (Past Year)				Hospitalizations* (Past Year)		
	n=4,730 (31.3%†)			1 to 2 ED Visits, *n*=3,841 (22.9%†) 3 ED Visits, *n*=1,224 (4.1%†)				*n*=1,663 (9.8%†)		
	Bivariate Rate (%)†	Multivariate‡		Bivariate Rate†		Multivariate§‖		Bivariate Rate (%)†	Multivariate¶	
		Odds Ratio	95% CI	1 to 2 ED Visits (%)	≥3 ED Visits (%)	Odds Ratio	95% CI		Odds Ratio	95% CI
Housing instability#										
No	31.5	1.00		21.0	2.9	1.00		8.6	1.00	
Yes	30.5	0.92	0.77 to 1.12	29.4	7.9	1.43	1.20 to 1.70	13.8	1.30	1.01 to 1.67
Food insecurity**										
No	30.0	1.00		19.4	2.4	1.00	1.17 to 1.66	7.5	1.00	
Yes	32.6	1.05	0.90 to 1.23	27.9	6.4	1.39		13.0	1.42	1.09 to 1.85
Insurance status										
Full year private	21.3	1.00		21.2	2.3	1.00		9.5	1.00	
Full year public	18.1	1.13	0.85 to 1.51	31.0	11.8	1.35	1.04 to 1.74	21.8	0.91	0.64 to 1.31
Full year public/private	21.4	1.09	0.69 to 1.74	33.6	7.2	1.30	0.89 to 1.88	13.8	0.84	0.50 to 1.42
Uninsured, part year	31.8	1.63	1.33 to 2.00	24.4	4.8	1.01	0.83 to 1.24	7.2	0.63	0.45 to 0.88
Uninsured all year	53.8	3.59	3.01 to 4.27	19.5	2.0	0.76	0.62 to 0.92	5.0	0.44	0.32 to 0.62

*Excludes pregnancy-related hospitalizations.
†Rates weighted to reflect U.S. low-income population.
‡Model also adjusted for: age, race/ethnicity, region of country, immigration status, receipt of public assistance, health status, change in health status from prior year, presence of work-limiting condition.
§Model also adjusted for: gender, race/ethnicity, education, employment status, health status, change in health status from prior year, presence of work-limiting condition.
‖Adjusted OR refer to single category increase (1 to 2 vs 0 and 3 or more vs 1 to 2).
¶Model also adjusted for: age, immigration status, receipt of public assistance, health status, change in health compared to prior year, presence of work-limiting condition.
#Housing instability defined as difficulty in paying rent, mortgage, or utilities in the prior year.
**Food insecurity defined as having any 1 of 3 indicators of food insecurity: (1) worrying that their food would run out, (2) having the food that they bought not last and not having the money to buy more, or (3) having cut the size of meals or skipped meals in the past year because there was not enough money for food.
NSAF, National Survey of America's Families; CI, confidence interval; ED, emergency department.

95% CI 1.17 to 1.66) were associated with a single category increase in ED use. In a multivariate model, housing instability (AOR 1.30, 95% CI 1.01 to 1.67) and food insecurity (AOR 1.42, 95% CI 1.09 to 1.85) were both associated with hospitalizations.

Use of 3-Level Housing Measure

When we redid the analyses with a 3-level housing variable, our results did not change significantly. Housing instability/not doubled up remained significantly associated in all models where it previously had been, with similar AOR. Housing instability/doubled up was independently associated with all things that housing instability had, with slightly elevated AOR.

DISCUSSION

In this nationally representative sample of low-income adults, we found a high prevalence of housing instability and food insecurity: 23.6% reported housing instability and 42.7% reported food insecurity. Among persons with housing instability and food insecurity, we found high rates of poor access to care and high rates of acute health care use. These rates were intermediate between those of homeless persons and of the poverty population found in nationally representative surveys. For instance, nationally representative studies that examined postponing needed medical care found rates of 8% to 12% in the overall population, 11% to 12% in the low-income population, and 25% in the homeless population, compared with 19% in the unstable housing group in our study.[10,11,41–44]

Both housing instability and food insecurity were independently associated with having barriers to health care and increased use of acute-care services. While being doubled up was independently associated with the same outcomes that housing instability had, housing instability/not doubled up remained significant, suggesting that the problems with housing instability are not driven by the doubled up. Housing instability and food insecurity were not associated with having no ambulatory care visits, and food insecurity was not associated with having no usual source of care. This suggests that the barriers placed by housing instability and food insecurity are not absolute: affected persons had basic access to care, but were still more likely to delay care when needed and more likely to be seen in the ED or be hospitalized.

Malnutrition has been documented to have adverse affects on health: our results demonstrate that food insecurity is associated with difficulties receiving health care. This extends prior findings of food insecurity being associated with increased hypoglycemia among adult diabetics,[18] rates of obesity in adults,[45] ED visits in adults,[32] and ED use and hospitalizations in infants and toddlers.[33] Homelessness has been shown to be associated with poor health outcomes,[6–9] decreased access to care,[11] and increased use of acute-care services[10,12,13,46]; our findings extend these findings to the unstably housed population. We posit that these negative effects may be understood through the concept of competing

priorities. This prioritization may act through decisions about time and money: people may choose to place limited financial resources or time in food or housing before they do so in health care. Difficulty in obtaining basic necessities, such as food and shelter, has been shown to impair access to health care in homeless populations and among persons with HIV infection.[20,47] As housing instability and food insecurity are more common than homelessness and hunger, these effects may be more widespread than recognized previously.

Our study has several important limitations. The cross-sectional study design limits our ability to draw causal conclusions. There is no standard definition of housing instability and we used a narrow measure. While a validated tool for measuring food insecurity exists, the full scale was not available in NSAF, although the questions in NSAF were derived from those scales. We chose to use any positive response to the questions as indicative of food insecurity. We hypothesize that this would be less sensitive and specific than the validated tool and may have biased our results toward the null. We could not exclude the possibility that some respondents experienced an episode of literal homelessness in the past year; nor could we ascertain whether some had moderate or severe hunger. All responses were self-reported, including health care utilization measures. We did not have information on several potentially important covariates, such as health-related behaviors, substance abuse, and mental illness. We did not know whether ED use or hospitalizations were potentially preventable. We do not know whether pregnancy-related ambulatory care visits accounted for a portion of the visits, and whether these visits were different between those with and without food insecurity and housing instability. Finally, we do not know what came first: poor access to care or housing instability and food insecurity. A subject's poor access to care and increased use of acute care could have negatively impacted his or her ability to secure housing and obtain adequate food.[48,49]

In this nationally representative study of low-income adults, we found that both housing instability and food insecurity were common, and both were independently associated with barriers to health care and high use of acute care. Persons confronted with competing demands on their limited resources may preference obtaining food and housing rather than attending to health care needs. Housing instability and food insecurity should be thought of as risk factors for poor access to care and high use of acute-care services. Policies that improve housing stability (such as rent support programs, housing vouchers, and expansion of low-income housing availability) and food security (such as through the expansion of the food stamp program) may improve access to health care and health care outcomes. Further research needs to be carried out to clarify whether this association is confounded by unmeasured factors, to clarify the direction of the effect, and to determine whether interventions that improve housing stability and food security improve access to care and health care outcomes.

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