

Housing and Food Insecurity, Care Access, and Health Status Among the Chronically Ill: An Analysis of the Behavioral Risk Factor Surveillance System

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BACKGROUND: The proportion of the United States population with chronic illness continues to rise. Understanding the determinants of quality of care—particularly social determinants—is critical to the provision of care in this population.

OBJECTIVE: To estimate the prevalence of housing and food insecurity among persons with common chronic conditions and to assess the independent effects of chronic illness and sociodemographic characteristics on (1) housing and food insecurity, and (2) health care access hardship and health status.

DESIGN: Cross-sectional study.

PARTICIPANTS: We used data from the 11 states and one territory that completed the social context module of the 2015 Behavioral Risk Factor Surveillance System (BRFSS).

MAIN MEASURES: We estimated the prevalence of housing and food insecurity among patients with cancer, stroke, cardiovascular disease, and chronic lung disease. Logistic regression models were used to assess the independent effects of housing and food insecurity, chronic conditions, and demographics on health care access and health status.

KEY RESULTS: Among the chronically ill, 36.71% (95% CI: 35.54–37.88) experienced housing insecurity and 30.60% (95% CI: 29.49–31.71) experienced food insecurity. Cardiovascular and lung disease increased the likelihood of housing (OR 1.69, 95% CI: 1.07–2.66 and OR 1.71, 95% CI: 1.12–2.60, respectively) and food insecurity (OR 1.75, 95% CI: 1.12–2.73 and OR 1.78, 95% CI: 1.20–2.63, respectively). Housing and food insecurity significantly increased the risk of health care access hardship. Being insured or having an income level above 200% of the federal poverty level significantly reduced the likelihood of access hardship, while female gender significantly increased the likelihood.

CONCLUSIONS: Chronic illness independently affects housing and food insecurity. In turn, food and housing anxiety leads to reduced access to care, likely due to cost concerns, and correlates with poorer health. A more complete understanding of the pathways by which chronic illness influences social determinants and clinical outcomes is needed.

KEY WORDS: health care cost; health care access; health status; homelessness; chronic disease; social determinants of health; stroke; cardiovascular disease; COPD.

J Gen Intern Med 33(5):644–50

DOI: 10.1007/s11606-017-4255-z

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INTRODUCTION

Nearly half of all adults in the United States—117 million individuals—had at least one chronic condition in 2012.¹ Despite significant health care utilization among chronic disease patients, low-quality care remains common in this vulnerable group.² Increased cost of care and reduced affordability have been reported as the leading cause of medication nonadherence³ in this group. The financial burden of medical care as a cause of poorer health outcome is exacerbated in those who face other hardships, including the ability to afford housing and proper nutrition.

Housing and food insecurity are emerging critical social determinants of health. With regard to the epidemiology of these determinants, there is higher prevalence of both among women, younger adults, and those with a lower level of education.⁴ Food insecurity correlates with mental stress,⁴ obesity,⁵ peripheral arterial disease,⁶ hypertension, and diabetes.⁷ Both food and housing insecurity increase the likelihood of poorer health⁸ and less access to health care.⁹ Various studies have addressed the vital roles of social determinants of health and the influence of housing and food insecurity on sociodemographic features such as ethnicity and preventable conditions including obesity and psychological distress using the Behavioral Risk Factor Surveillance System (BRFSS) data^{4,5,10}; however, the relationship between housing and food insecurity, and treatable but generally irreversible chronic illness and health outcomes is less well known. We aim to assess the prevalence of housing and food insecurity among the chronically ill. We further characterize the independent effects of chronic illness and sociodemographic characteristics on (1) housing and food insecurity, and (2) health care access hardship and health status. We focus our analyses on four chronic illnesses—cancer, stroke, cardiovascular disease, and

Received July 28, 2017

Revised October 27, 2017

Accepted November 16, 2017

Published online January 3, 2018

chronic lung disease—as these represent four of the five most common causes of death in US adults.¹¹

METHODS

Data Source

We used data from the 2015 Behavioral Risk Factor Surveillance System (BRFSS). BRFSS is a nationwide telephone-based survey of US residents 18 years of age and older which collects information regarding health-related risk behaviors, chronic health conditions, and use of preventive services.¹² Alabama, Arkansas, Delaware, Georgia, Louisiana, Minnesota, Mississippi, Missouri, Rhode Island, Tennessee, Utah, and the District of Columbia (DC) used the optional social context module in the 2015 BRFSS, covering about 15% of the population.

Our primary independent variables were housing insecurity and food insecurity. We defined housing insecurity as a response of “always,” “usually,” or “sometimes” to the question: “How often in the past 12 months would you say you were worried about having enough money to pay your rent/mortgage?” Food insecurity was similarly defined in response to the question: “How often in the past 12 months would you say you were worried about having enough money to buy nutritious meals?” We estimated the prevalence of housing and food insecurity among patients with the following four chronic conditions: (1) cancer excluding skin cancer, (2) stroke, (3) cardiovascular disease including myocardial infarction, angina, or coronary heart disease, and (4) chronic lung disease including chronic obstructive pulmonary disease and emphysema. The Centers for Disease Control and Prevention (CDC) has identified these conditions as four of the top five causes of death in the United States.¹¹

Our primary outcomes were health care access hardship and health status. We defined health care access hardship as needing to see a doctor in the past 12 months but unable to due to cost. Good health status was defined as having excellent, good, or fair health.

We also examined the following sociodemographic factors as covariates: age, race/ethnicity, sex, educational attainment, marital status, employment and insurance status, and household percentage of the poverty line. Education was dichotomized to those who attended at least some college and those who did not.

Statistical Analysis

All analyses were conducted with STATA 11.0 software (StataCorp LP, College Station, TX), and used BRFSS sampling weights and stratum indicators to adjust for the complex sampling design.

We first used descriptive statistics for sociodemographic characteristics. Continuous data were summarized using

weighted means and standard deviations; binary and categorical data were summarized using weighted percentages (\pm 95% confidence intervals [CI]). Demographic characteristics of those with and without chronic illness were compared using chi-square tests.

We then performed a series of design-based multivariate logistic regressions, fully accounting for the BRFSS sampling weights and the other sample design features (e.g., stratification).

Housing and food insecurity: We evaluated the independent effects of chronic illness on housing and food insecurity using separate regression models. In both models, we adjusted for sociodemographic characteristics.

Health care access hardship: We assessed the independent effects of housing and food insecurity and chronic illness, adjusting for sociodemographic characteristics. Acknowledging that housing and food insecurity may be correlated, we included an interaction term between these two as a predictor of health care access hardship.

Health status: We estimated the effects of housing and food insecurity and chronic illness, adjusting for sociodemographic characteristics and health care access hardship. As in the model above, we included an interaction term between these two as a predictor of health care access hardship in both models.

RESULTS

Sample characteristics and key study variables are summarized in Table 1. Of the chronically ill, 36.71% (95% CI: 35.54–37.88) and 30.60% (95% CI: 29.49–31.71) experienced housing and food insecurity, compared to 32.80% (95% CI: 31.99–33.62) and 23.80% (95% CI: 23.09–24.51), respectively, among those without chronic illness. The prevalence of reported housing and food insecurity varied by condition, with chronic lung disease patients having the highest prevalence (51.16%, 95% CI: 48.97–53.35 and 44.71%, 95% CI: 42.61–46.82, respectively) and cancer patients the lowest (28.23%, 95% CI: 26.79–29.66 and 22.66%, 95% CI: 21.31–24.01, respectively).

With regard to social determinants of health, having any chronic condition increased the likelihood of housing (adjusted odds ratio [AOR] 1.42, 95% CI: 1.13–1.80) and food (AOR 1.62, 95% CI: 1.27–2.06) insecurity (Table 2). Cardiovascular disease and chronic lung disease significantly increased the likelihood of housing insecurity (AOR 1.69, 95% CI: 1.07–2.66 and AOR 1.71, 95% CI: 1.12–2.60, respectively). Cancer, cardiovascular disease, and chronic lung disease all increased the likelihood of food insecurity (AOR 1.39, 95% CI: 1.02–1.91, AOR 1.75, 95% CI: 1.12–2.73, and AOR 1.78, 95% CI: 1.20–2.63, respectively). Stroke was associated with neither housing nor food insecurity. Accounting for chronic illness, women and the unemployed were more likely to report housing and food insecurity, while those with income \geq 100% of the 2015 federal poverty level and those with a partner were less likely to experience housing or

Table 1 Population Characteristics

Sociodemographic characteristics	With chronic conditions %, (95% CI) (n = 24,480)	Without chronic conditions %, (95% CI) (n = 59,873)
Age (years)*		
18–29	4.63 (3.93–5.33)	26.39 (25.64–27.14)
30–49	17.16 (16.18–18.12)	38.28 (37.53–39.01)
≥ 50	78.21 (77.11–79.30)	35.33 (34.70–35.95)
Female*	53.69 (52.61–54.76)	51.00 (50.25–51.74)
Race*		
White	81.37 (80.41–82.32)	71.41 (70.67–72.15)
Black	15.33 (14.43–16.21)	22.00 (21.31–22.69)
Native American	1.69 (1.37–2.01)	1.32 (1.13–1.50)
Asian	0.40 (0.26–0.53)	2.46 (2.18–2.72)
Other race†	1.21 (0.92–0.14)	2.81 (2.49–3.11)
Ethnicity*		
Latino	1.90 (1.51–2.27)	6.28 (5.80–6.75)
Non-Latino	98.10 (97.72–98.48)	93.72 (93.24–94.19)
Education*		
No college	52.23 (51.17–53.29)	42.85 (42.09–43.60)
At least some college	47.77 (46.70–48.82)	57.15 (56.39–57.90)
Have partner	55.55 (54.48–56.61)	54.32 (53.56–55.06)
Insured*	91.60 (90.86–92.34)	84.66 (84.01–85.30)
Employment status*		
Employed	30.34 (29.30–31.37)	62.56 (61.83–63.27)
Unemployed‡	25.50 (24.49–26.50)	11.54 (11.03–12.04)
Retired	37.74 (36.77–38.70)	11.63 (11.29–11.95)
Other§	6.42 (5.87–6.95)	14.27 (13.68–14.85)
Income as percentage of 2015 federal poverty level*		
< 100	39.48 (35.49–43.48)	23.75 (22.19–25.29)
100–200	23.43 (19.85–26.99)	24.48 (23.04–25.92)
≥ 200	37.09 (33.16–41.01)	51.77 (50.11–53.42)

*Statistically significant difference between those with and without chronic conditions

†Other race includes Native Hawaiian/other Pacific Islander or multiracial but preferred race not answered

‡Unemployed defined as out of work for 1 year or more/out of work for less than 1 year; or unable to work

§Homemaker, student, or refused to answer

food insecurity. Also, those who had completed at least some college were less likely to report housing insecurity. Adjusting for the independent effects of chronic illness and other sociodemographic variables, Latinos were not at increased risk of housing or food insecurity compared to non-Latinos. Blacks were less likely than whites to report food insecurity (which is in line with a previous study on food insecurity using the BRFSS¹⁰).

Table 2 Modeling the Independent Effects of Chronic Conditions and Other Correlates on Housing and Food Insecurity

	Housing insecurity OR (95% CI)	Food insecurity OR (95% CI)
Key variables		
Chronic condition		
Cancer (n = 10,232)	1.11 (0.81–2.36)	1.39 (1.02–1.91)*
Cardiovascular disease (n = 6005)	1.69 (1.07–2.66)*	1.75 (1.12–2.73)*
Stroke (n = 3205)	1.31 (0.77–2.21)	1.25 (0.75–2.09)
Chronic lung disease (n = 6394)	1.71 (1.12–2.60)*	1.78 (1.20–2.63)*
Sociodemographic characteristics		
Age (years)		
18–29	Ref	Ref
30–49	0.99 (0.79–1.23)	1.29 (1.04–1.60)*
≥ 50	0.79 (0.60–1.06)	0.88 (0.64–1.19)
Insured	0.85 (0.65–1.11)	0.84 (0.66–1.05)
Female	1.34 (1.14–1.59)*	1.35 (1.13–1.61)*
Income as percentage of 2015 federal poverty level		
< 100	Ref	Ref
100–200	0.55 (0.43–0.70)*	0.76 (0.61–0.96)*
≥ 200	0.20 (0.15–0.25)*	0.23 (0.17–0.30)*
Education		
No college	Ref	Ref
At least some college	0.78 (0.65–0.93)*	0.95 (0.72–1.14)
Ethnicity		
Latino	1.02 (0.69–1.49)	1.01 (0.67–1.53)
Non-Latino	Ref	Ref
Race		
White	Ref	Ref
Black	0.80 (0.63–1.02)	0.65 (0.51–0.82)*
Native American	1.08 (0.49–2.36)	1.20 (0.58–2.47)
Asian	0.61 (0.30–1.23)	0.89 (0.44–1.82)
Other race†	0.97 (0.54–1.75)	1.16 (0.67–2.02)
Have partner	0.80 (0.66–0.97)*	0.66 (0.54–0.80)*
Employment status		
Employed	Ref	Ref
Unemployed‡	1.64 (1.22–2.21)*	2.01 (1.51–2.68)*
Retired	0.57 (0.32–1.02)	0.68 (0.35–1.31)
Other§	0.69 (0.54–0.89)*	1.14 (0.89–1.46)

CI = confidence interval; OR = odds ratio; Ref = reference

*Statistically significant difference

†Other race includes Native Hawaiian/other Pacific Islander or multiracial but preferred race not answered

‡Unemployed defined as out of work for ≥ 1 year/out of work for < 1 year; or unable to work

§Homemaker, student, or refused to answer

In logistic regression models predicting health care access hardship (Table 3), housing and food insecurity significantly increased the likelihood of health care access hardship (AOR 2.49, 95% CI: 1.78–3.49 and AOR 2.48, 95% CI: 1.65–3.73, respectively); however, we detected no interaction between

Table 3 Modeling the Independent Effects of Housing and Food Insecurity and Other Correlates on Health Care Access Hardship and Health Status

	Health care access hardship OR (95% CI)	Health status OR (95% CI)
Key Variables		
Housing insecurity	2.49 (1.78–3.49)*	0.57 (0.46–0.72)*
Food insecurity	2.48 (1.65–3.73)*	0.79 (0.56–1.12)
Interaction between housing and food insecurity	0.75 (0.45–1.24)	1.11 (0.72–1.69)
Chronic condition		
Cancer (<i>n</i> = 10,232)	1.67 (1.13–2.48)*	0.60 (0.44–0.82)*
Cardiovascular disease (<i>n</i> = 6005)	1.77 (1.02–3.06)*	0.14 (0.07–0.28)*
Stroke (<i>n</i> = 3205)	1.10 (0.58–2.09)	0.48 (0.25–0.92)*
Chronic lung disease (<i>n</i> = 6394)	2.05 (1.36–3.07)*	0.47 (0.29–0.74)*
Health care access hardship	–	0.54 (0.42–0.69)*
Sociodemographic		
Age (years)		
18–29	Ref	Ref
30–49	1.11 (0.85–1.46)	0.76 (0.61–0.94)*
≥ 50	1.11 (0.77–1.59)	0.59 (0.45–0.78)*
Insured	0.17 (0.13–0.23)*	0.92 (0.71–1.19)
Female	1.68 (1.32–2.14)*	1.09 (0.92–1.29)
Income as percentage of 2015 federal poverty level		
< 100	Ref	Ref
100–200	0.95 (0.72–1.27)	1.22 (0.94–1.57)
≥ 200	0.47 (0.33–0.65)*	1.75 (1.34–2.27)*
Education		
No college	Ref	Ref
At least some college	0.97 (0.77–1.21)	1.58 (1.33–1.87)*
Ethnicity		
Latino	0.88 (0.54–1.43)	0.82 (0.58–1.17)
Non-Latino	Ref	Ref
Race		
White	Ref	Ref
Black	0.86 (0.63–1.16)	0.97 (0.71–1.13)
Native American	0.81 (0.40–1.66)	0.70 (0.36–1.35)
Asian	0.61 (0.21–1.76)	1.11 (0.55–2.26)
Other race [†]	0.46 (0.17–1.20)	1.12 (0.62–2.03)
Have partner	1.04 (0.81–1.35)	1.05 (0.86–1.29)
Employment status		
Employed	Ref	Ref
Unemployed	0.84 (0.59–1.19)	0.57 (0.42–0.77)*
Retired	0.55 (0.26–1.15)	0.47 (0.29–0.73)*
Other [‡]	0.64 (0.46–0.88)*	1.12 (0.87–1.45)

CI = confidence interval; OR = odds ratio; Ref = reference

*Statistically significant difference

[†]Other race includes Native Hawaiian/other Pacific Islander or multiracial but preferred race not answered

[‡]Unemployed defined as out of work for ≥ 1 year/out of work for < 1 year or unable to work

[§]Homemaker, student, or refused to answer

these independent variables. All chronic conditions with the exception of stroke significantly increased the risk of access hardship. Adjusting for chronic illness, being insured or having an income level ≥ 200% of the federal poverty level significantly decreased the likelihood of access hardship, while female gender was associated with a significant increase. No independent effect of race or ethnicity on health status or health care access was detected.

Housing insecurity (AOR 0.57, 95% CI: 0.46–0.72), but not food insecurity, significantly decreased the likelihood of better health status, adjusting for other variables (Table 3). No interaction between housing and food insecurity was detected with regard to effect on health status. All evaluated chronic conditions correlated variably with poorer health status. Cardiovascular disease decreased the likelihood of good health almost sevenfold (AOR 0.14, 95% CI: 0.07–0.28), the highest among all chronic illnesses, while cancer had the most modest effect on health status (AOR 0.60, 95% CI: 0.44–0.82). As

predicted, care access hardship independently reduced reported health status (AOR 0.54, 95% CI: 0.42–0.69). Those who were older, unemployed, or retired were less likely to report good health, while those with income ≥ 200% of the federal poverty level and some college education were more likely.

DISCUSSION

In this study, we assessed the prevalence of housing and food insecurity in adults with common chronic diseases. In states that administered the optional social context module of the BRFSS in 2015, we found a high prevalence of housing and food insecurity among individuals with common chronic conditions. Cardiovascular disease and chronic lung disease significantly increased the risk of housing and food insecurity, after controlling for relevant confounders such as socioeconomic and health insurance status, with cancer increasing risk

of food insecurity alone. In turn, we showed that housing and food insecurity independently increased the likelihood of health care access hardship and poorer health status, although we did not detect an interaction between the two independent variables. All chronic illnesses except stroke increased the risk of health care access hardship. All chronic illnesses without exception increased the risk of poorer health.

Our results are in line with previous studies showing that housing and food insecurity can worsen health status and reduce access to health care.⁹ Pobutsky et al., correlating data from the 2012 BRFSS with the Hawaii Health Survey, demonstrated increased mental stress with perceived food and housing insecurity among Hawaiians.⁴ Using the 2009 BRFSS, Pan et al. described obesity in the food-insecure, and revealed that one in three food-insecure adults suffered from obesity.⁵ Among Washington state residents, the housing-insecure were twice as likely to report poorer health and delayed doctor visits.⁸ Others have demonstrated that disabled adults are more likely to report housing and food insecurity, regardless of employment status.¹³

The mechanisms by which different chronic illnesses influence housing and food insecurity were varied. Notably, stroke correlated with neither housing nor food insecurity. Stroke is the leading cause of long-term disability in the United States.¹⁴ Studies have found that about 65% of patients cannot use the affected hand for their usual activities 6 months after stroke,¹⁵ and only 25% of patients were found to return to the level of everyday physical functioning in matched controls who had not had a stroke.¹⁶ Stroke survivors are more likely to move in with family (or into nursing facilities), which we hypothesize explains, at least in part, the lack of housing and food insecurity compared to other chronic illnesses. Choi and colleagues found that among cardiovascular events (stroke, myocardial infarction, and chronic heart failure), stroke was the most significant predictor of disability and of family moving geographically closer.¹⁷ Individuals experiencing a first stroke were almost twice as likely either to move in with or move closer to their children,¹⁷ increasing the availability of support systems and potentially alleviating housing and food anxiety. We posit that the same family circumstances also mitigate the development of care access hardship. However, as with other chronic illnesses, the disease condition itself significantly affects health status.

Cardiovascular and chronic lung disease significantly increased the likelihood of housing and food insecurity. The total annual cost of cardiovascular disease in the United States in 2012–2013 averaged \$316.1 billion,¹⁸ surpassing the costs of other chronic conditions. Pharmaceutical costs contribute to the expense of chronic heart and lung disease treatment. Medicare Part B generally does not cover most prescription drugs used at home,¹⁹ creating a financial burden for patients with these chronic conditions. Researchers found that patients with chronic ischemic heart disease were reimbursed for approximately 64% of the total medication expense; average out-of-pocket costs approached \$80 per month.²⁰ Inhaled

medications are critical for relief of symptoms in patients with chronic obstructive pulmonary disease (COPD). However, up to 31% of Medicare beneficiaries using COPD inhalers have reported nonadherence due to cost.²¹ Tseng and colleagues demonstrated projected annual out-of-pocket costs of at least \$900 under a standard 2015 Medicare Part D plan for patients using a single inhaler each month, even without other medications.²² A study including 60 patients with COPD showed that about 60% of patients experienced two or three exacerbations per year, which resulted in almost a doubling of treatment costs.²³ Unlike those with stroke, patients with chronic heart and lung disease are less likely to relocate closer to their children,¹⁷ reducing the probability of additional family support that could alleviate housing and food insecurity.

Cancer increased the likelihood of food but not housing insecurity. The expense and out-of-pocket costs for cancer treatment depend on a variety of factors, including cancer type and stage, insurance status and type, service location, and treatment.²⁴ The stage of the disease impacts the quality of life for cancer patients, as many with stage I or II cancers can work and live independently, minimizing the effect on their pre- versus post-diagnosis income.²⁵ Further, the effect of treatment costs on housing and food security status may be blunted by insurance coverage of outpatient chemotherapy and radiotherapy. Insurance may also cover prescription drugs such as oral medication and anti-nausea medication, thereby reducing the burden of treatment cost to cancer patients¹⁹ compared to those with cardiovascular or chronic lung disease, lowering the risk of housing insecurity. We cannot deny that the cost of cancer care induces distress,²⁶ but the extent, and impact on housing and food security, depends on a variety of clinical factors, analyses of which are beyond the scope of our review.

Comparing across chronic illnesses, we speculate that as costs of care increase, there is a corresponding development of food and then housing insecurity, until individuals are sufficiently disabled as to require family support and non-independent housing, thereby reducing food and housing anxiety. As expected, however, all chronic illnesses reduced health status independent of housing and food insecurity, due to decrements in physical and mental health. Insurance status and gender independently influenced health care access after controlling for chronic illness. However, the effects of these sociodemographic variables on health status dissipated after adjusting for health care access hardship, which we hypothesized would mediate the effect of insurance status and gender. Similarly, the effects of education and employment on health care access hardship were likely mediated by insurance status; however, persistent independent effects—particularly of employment—on health status may be due to psychological effects such as social connection and meaningful activity,²⁷ self-identity,²⁸ or mental health,²⁹ the measurement of which was beyond the scope of our study. These effects may be accentuated if individuals lose employment due to chronic illness before they are prepared to leave work formally.

Previous studies have focused on adult general populations.⁹ Our study highlights the association of housing and food insecurity with health status and care access among the chronically ill adult population. As chronic illness may affect half of the US population by 2025,³⁰ factors associated with managing chronic conditions require special attention, particularly as housing and food insecurity can result from chronic illness and, in turn, can exacerbate it.³¹

Social factors can have a significant impact on health outcomes. A meta-analysis of 47 studies found that lower level of education, racial discrimination, lack of social support, and poverty were factors in over one third of all deaths in the United States in 2000.³² Food insecurity increases the likelihood of cost-related medication underuse,³³ which can lead to poorer health status. Poverty can also negatively impact patient health care utilization, as those who struggle financially may prioritize meeting their basic needs over seeking health care. In 2015, 12.7% of American households were affected by food insecurity, meaning they did not have access to adequate food for an active, healthy life for all household members.³⁴ Estimates show that about 6.4 million low-income renters and 11 million homeowners will be spending more than 30% of their income on housing by 2035.³⁵ With the cost of care rising, patients with chronic illness are at particular risk of financial hardship, including housing and food insecurity. Those who cannot afford basic necessities such as housing and food tend to perceive appropriate health care as a lower priority.³⁶

Several limitations in this study are worth noting. First, BRFSS relies on self-reported information, which may under/overestimate the frequency of our main variables. In addition, the study's cross-sectional design limits our ability to provide information on causal effects of housing and food insecurity with regard to health care access and health status. Finally, as information on housing and food insecurity is available only for 12 states and jurisdictions, the findings may not be generalizable to all US adults.

CONCLUSION

Chronic illness independently affects housing and food insecurity; however, individual chronic conditions differ in their effects on these important social determinants of health. In turn, food and housing anxiety reduces access to care due to cost concerns, and housing anxiety correlates with poorer health. A more complete understanding of the pathways by which chronic illness influences social determinants and clinical outcomes is needed in order to develop appropriately targeted interventions in this vulnerable population.

Acknowledgments: RCC is supported in part by NIH 5UG1CA189828. SFD is supported by NIH T32 EB005970-09. PC was responsible for the data analysis and interpretation, manuscript preparation and revision. SFD participated in data analysis and interpretation and revision of the manuscript. RCC designed the study and the analytic plan and participated in data analysis and

interpretation and manuscript preparation and revision. All authors read and approved the final manuscript. The contents of this article have not been previously presented elsewhere. No financial disclosures were reported by the authors of this paper.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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