Getting sick and falling behind: health and the risk of mortgage default and home foreclosure

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ABSTRACT

Background An emerging literature shows that mortgage strain can lead to poor health outcomes, but less work has focused on whether and how health shocks influence mortgage distress. We examine the link between changes in health status and default/foreclosure risk among older middle-aged adults.

Method We used National Longitudinal Study of Youth 1979 data and multivariate logistic regression models to examine the relationship between changes in health limitations and chronic conditions across survey waves and risk of mortgage default and foreclosure.

Results We found that changes in health limitations and chronic conditions increased the risk of default and foreclosure between 2007 and 2010. These associations were partially mediated by changes in family income and loss of health insurance.

Conclusions From a policy perspective, the strong link between the onset of illness and foreclosure suggests a need to re-examine the safety-nets that are available to individuals who become ill or disabled.

INTRODUCTION

The housing market crash of 2007 led to an unprecedented rise in home foreclosures—from around 650 000 in 2007 to a record 2.9 million homes in 2010.[1] In recent years, researchers have recognised this growing fragility of American homeownership as not just an economic matter, but also a critical public health concern, particularly among older and middle-aged adults who experience more health vulnerabilities than their younger counterparts,[2 3] and also have experienced a rapid rise in home foreclosures.[4] Our study builds on this literature by examining the relationship between becoming ill and risk of default and foreclosure using data from a nationally representative longitudinal study of older middle-aged adults.

A growing body of literature has examined the relationship between health and mortgage strain.[5 6] Recent studies suggest that the experience of default and foreclosure[3 7–10] and living in high-foreclosure areas[11–13] can lead to poor health outcomes. However, much less research has considered whether poor health may increase default and foreclosure risk.[6 14 15]

While there is significant literature on the medical causes of debt and financial strain,[16–19] few studies have examined health as a predictor of mortgage strain. A few recent cross-sectional studies find significantly higher rates of physical and mental illness among individuals who are in default or foreclosure, compared to those who are not.[6 20 21] However, these studies' cross-sectional design makes it difficult to disentangle cause and

effect. In one survey of Philadelphia homeowners facing foreclosure, Pollack and Lynch[6] found that only 9% cited illness or medical costs as the primary reason for being behind on mortgage payments. However, they also found that more than a quarter of those facing foreclosure had medical bills in excess of $1000. Another study found that when respondents were asked to list all of the factors that contributed to their foreclosure, nearly half cited a health-related cause. While this is a small study (N=128) with a low response rate (7%) it is suggestive of a potential relationship between poor health and foreclosure. Furthermore, findings from qualitative studies suggest that illness strains fragile household budgets and produces mortgage trouble, particularly when it leads to declines in income.[15 22]

Our study builds on this nascent body of work by using nationally representative longitudinal data from the National Longitudinal Survey of Youth 1979 Cohort (NLSY-79) to examine how changes in health limitations and changes in chronic conditions from age 40 to 50 predict mortgage default and foreclosure among middle-aged adults between 2007 and 2010. We make several contributions. First, we expand on prior work by controlling for previous health status, home debt, home value and a range of sociodemographic confounders to increase confidence in the effect of poor health on default and foreclosure. Second, we expand on existing cross-sectional studies[6 20 21] by using longitudinal data. Third, we expand on local studies[6 14] by using a nationally representative sample. Finally, we test mechanisms that may link poor health to default and foreclosure. We hypothesise that getting sick precipitates a loss of employment, which then leads to a loss of income and a loss of health insurance, which both contribute to the risk of default and foreclosure. As those who become sick struggle to deal with limited income and high medical costs while paying their mortgages, we hypothesise that declines in savings and increases in consumer debt may also mediate this association.

DATA AND METHODS

Data are drawn from the NLSY-79. The NLSY-79 is a nationally representative sample of 12 686 young men and women who were between the ages of 14 and 22 in 1979. The response rate across survey years is well over 90% in most years, and over three quarters of initial respondents have been retained.[23]

NLSY-79 respondents were interviewed annually until 1994, and have been interviewed biannually ever since. Our analysis is limited to respondents who owned a home between 2007 and 2010

(N=4971). An additional 664 respondents were removed due to missing data reducing the sample to N=4307. For analyses of chronic conditions and default/foreclosure, we further limited our sample to respondents who have completed the 50+ health survey, as not all respondents have reached 50 years of age (N=2387, N=2044 after listwise deletion). All analyses are adjusted for survey design effects using an NLSY-created sample weight. Weighting helps to account for the complex sampling design of the NLSY survey and to ensure that our sample is nationally representative. However, unweighted results are identical to the results presented here.

Health conditions
Health limitations
Participants were surveyed in 2006 and then again in 2008 about health limitations. At each survey wave, respondents were asked whether or not they had a health limitation that could prevent the amount or the type of work they can do (1=yes). We measure baseline (time 1) health limitations with a dichotomous measure in 2006 (1=health limitation; 0=no health limitation). Change in health between survey waves is measured with a dichotomous variable that indicates whether or not respondents who had no health limitations at baseline reported a health limitation in 2008 (1=yes).

Chronic conditions
Respondents were asked about life-threatening and disabling chronic conditions in the 40+ (time 1) and 50+ (time 2) health modules. Respondents completed the 40+ health module once in the survey year closest to their 40th birthday, in either 1998, 2000, 2002, 2004 or 2006. Similarly, respondents completed the 50+ health module once in the survey year closest to their 50th birthday, in either 2008 or 2010. Our primary analyses include a baseline count of the number of chronic conditions reported by respondents in the 40+ survey, and a dichotomous indicator of whether respondents' reported more chronic conditions in the 50+ survey than in the 40+ survey (1=yes). Chronic conditions include: cardiovascular disease and heart failure, lung disease, stroke, cancer, diabetes, hypertension, arthritis, asthma, joint pain and osteoporosis.

Mortgage default and foreclosure
In 2010, respondents who owned a home in the past 3 years were asked whether they experienced default, were at risk of defaulting in the next 6 months, or had their home foreclosed on in the past 3 years. We created two dichotomous measures of default and foreclosure. Mortgage default is a dichotomous indicator of whether respondents experienced a mortgage default or reported that it was 'very likely' that they would default in the next 6 months (1=yes). We include those who anticipate future default in order to capture those who are currently struggling to make mortgage payments. Foreclosure is a dichotomous indicator of whether respondents went through a home foreclosure in the past 3 years (1=yes).

Sociodemographic confounders and mediators
We control for a range of variables that are correlated with health and default/foreclosure. We control for the following sociodemographic confounders measured at or prior to the survey year when baseline health is measured: race (Caucasian (referent), African–American, other), marital status (married (referent), never married, divorced/separated), educational attainment (less than or equal to high school degree (referent), some college, 4-year college degree or more), family size, sex (male=1) and age

(in years). We also account for financial characteristics at baseline, including the amount of respondents' lagged home mortgage debt, lagged home value, consumer debt (eg, credit card and medical debt), savings and family income, coded in constant 2010 thousands of dollars. We also control for the number of months unemployed in baseline survey year and health insurance status (1=has health insurance; 0=no health insurance). Finally, given that living in high-foreclosure areas is associated with poor health[11 24] and may confound our association of interest, we control for a dichotomous variable indicating whether or not the respondent lived in a high-foreclosure state (Nevada, Florida, Arizona, California, Colorado, Michigan, Ohio, Georgia, Illinois, New Jersey) at baseline (1=yes).

Mediators of the association between becoming ill and default/foreclosure are measured to reflect changes in circumstances between when time 1 health is measured and time 2 health is measured (eg, time 2 status—time 1 status). These include: changes in family income, savings and consumer debt (all measured in constant 2010 thousands of dollars), loss of health insurance (1=yes), and the number of months unemployed between survey waves.

Study design and analytic strategy
We estimate logistic regression models to examine the association between changes in health conditions and default/foreclosure. For each outcome, we estimate a series of three models. Model 1 shows the association between health change between time 1 and time 2 and default or foreclosure, net of baseline health conditions and sociodemographic confounders. Model 2 adds baseline health insurance status, family income, savings, consumer debt and the number of months unemployed. Model 3 adds potential mediators, which include changes in health insurance status, family income, savings, consumer debt and employment. We use a Sobel Mediation test to determine the strongest mediators of the association between health and default/foreclosure.

One limitation of this study is that changes in health may have occurred after default or foreclosure. For example, we measure changes in health limitations from 2006 to 2008, but foreclosure or default could have occurred anytime between 2007 and 2010. However, despite this limitation, we contend that foreclosure is unlikely to be causing the types of disabling and chronic health conditions that we examine within such a short time frame. Additionally, our ability to look at events that precede foreclosure, such as mortgage default, helps to alleviate this concern. Furthermore, to address this limitation, we conduct several additional analyses. First, we limit our analyses of chronic conditions to conditions that are unlikely to be triggered by short-term stress associated with foreclosure, such as lung disease and cancer, while omitting conditions such as hypertension. Second, to further account for reverse causality, we control for mental health at time 1 and time 2 (as measured by the Center for Epidemiologic Studies Depression Scale), as depression is an immediate consequence of default and foreclosure.[3] Third, for the health limitations analyses, we examine limitations that occurred between 2006 and 2007. While this model better addresses time ordering issues, it does not allow us to examine mediators that were only measured in 2008. For all of these supplemental analyses, results were statistically and substantively similar to the results presented here and available on request.

RESULTS
Descriptive statistics and bivariate analyses
Table 1 shows weighted descriptive statistics for all study variables. As shown in table 1, 11% of respondents report that they

Table 1 Descriptive statistics

	Mean or proportion	Range
Mortgage default or at high risk of default	0.11	0–1
Home foreclosure	0.03	0–1
Health conditions at baseline (T1)		
Health is limited	0.11	0–1
Number of chronic conditions	0.40	0–6
Changes in health over time (T1–T2)		
Health limitations worsened over time	0.04	0–1
Chronic conditions worsened over time	0.58	0–1
Change in social status over time (T1–T2)		
Lost health insurance between survey waves	0.03	0–1
# Months unemployed between survey waves	0.41	0–24
Δ Family income (thousands of dollars)	−0.71	−519–460
Δ Savings (thousands of dollars)	10.30	−356–589
Baseline sociodemographics and confounders (T1)		
Has health insurance	0.91	0–1
# Months unemployed at baseline survey year	1.06	0–12
Family income at baseline (thousands of dollars)	102.98	0–519
Savings at baseline (thousands of dollars)	26.07	0–356
Lagged home value (thousands of dollars)	175.47	0–1057
Lagged home debt (thousands of dollars)	88.66	0–492
Race		
Caucasian (reference)		
African–American	0.09	0–1
Other race	0.02	0–1
Marital status		
Married (reference)		
Never married	0.08	0–1
Divorced/separated	0.15	0–1
Widowed	0.01	0–1
Educational attainment		
≤High school degree (ref)		
College degree or more	0.33	0–1
Some college	0.24	0–1
Sex (male=1)	0.50	0–1
Age	44.90	41–50
Family size	3.18	1–13
Respondent lives in high foreclosure state	0.37	0–1

Source: National Longitudinal Survey of Youth 1979 Cohort (NLSY-79); N=4307 (N=2044 when using 40+ and 50+ health module).

Table 2 Bivariate association between health status and default/foreclosure

	% in default or foreclosure	
	Mortgage default	Foreclosure
Health limitations (2006–2008; N=4307)		
No health limitations at either wave	9.9	2.7
Health diminished over time	19.6	7.6
Poor health at both waves	16.9	5.3
	χ^2=14.5, p<0.01	χ^2=11.6, p<0.01
	γ=0.18	γ=0.23
Chronic conditions (40+ −50+ survey; N=2044)		
N chronic conditions, 40+ survey		
No chronic conditions	9.8	2.4
1–2 conditions	13.8	5.0
3 plus conditions	13.8	7.8
	χ^2=5.7, p<0.10	χ^2=9.6, p<0.01
	γ=0.10	γ=0.22
N chronic conditions, 50+ survey		
No chronic conditions	6.1	1.3
1–2 conditions	13.3	4.1
3 plus conditions	14.6	5.1
	χ^2=15.1, p<0.001	χ^2=8.5, p<0.05
	γ=0.16	γ=0.20
Change in chronic conditions		
N chronic conditions do not increase over time	7.2	1.9
N chronic conditions increase over time	13.7	4.1
	χ^2=24.9, p<0.001	χ^2=9.6, p<0.01
	γ=0.33	γ=0.36

Source: National Longitudinal Survey of Youth 1979 Cohort (NLSY-79); N=4307 (N=2044 when using 40+ and 50+ health module).

defaulted on their mortgage or were at risk of default and 3% of respondents experienced a home foreclosure in the preceding 3 years. This is similar to national estimates of default and foreclosure during this period.[1] Only 11% of respondents report a health limitation at baseline, while 4% did not report a health limitation at baseline but did report a health limitation at follow-up. In addition, the average number of chronic conditions reported at age 40 was 0.4, and 58% of the sample reported more chronic conditions at age 50 than they did at age 40.

Table 2 shows the bivariate association between health and mortgage default/foreclosure. Panel A shows the percentage of respondents who report a default or foreclosure by health limitations, while panel B shows the percentage of respondents reporting a default or foreclosure by the number of chronic conditions. As shown in panel A, respondents whose health declined over time, or reported poor health at both waves, were significantly more likely to default on their mortgage than those who reported no health limitations at either wave (χ^2=14.5, p<0.01; γ=0.18). Approximately 10% of respondents who had no health limitations defaulted on their mortgage compared to nearly 20% of those whose health diminished over time, and 17% of those who reported poor health at both waves defaulted on their mortgage. There is a slightly stronger association between health limitations and home foreclosure (γ=0.23).

Panel B shows a similar pattern of findings for chronic conditions. Number of chronic conditions reported at age 40 (time 1) are positively associated with the risk of default (χ^2=5.7, p<0.10; γ=0.18) and foreclosure (χ^2=9.6, p<0.01; γ=0.22). There is a similar pattern between chronic conditions reported at age 50 (time 2) and risk of default and foreclosure. Changes in chronic conditions over time are also linked to default and foreclosure risk. 13.7% of respondents whose chronic conditions increased over time defaulted on their mortgage, while only 7% of respondents whose chronic conditions did not increase over time defaulted on their mortgage (χ^2=24.9, p<0.001; γ=0.33). There is a similar pattern for home foreclosure.

Multivariate analysis

Table 3 shows results from multivariate logistic regression models estimating the association between changes in health limitations and home mortgage default (panel A) and foreclosure (panel B). In model 1a, respondents whose health worsens over time have approximately 1.7 times the risk of default than those whose health did not worsen over time (OR: 1.65, p<0.05), net of baseline health and a range of confounders.

Table 3 ORs from models predicting the association between health limitations and mortgage default and home foreclosure

	Mortgage default			Home foreclosure		
	Model 1a	Model 2a	Model 3a	Model 1b	Model 2b	Model 3b
Baseline health limitations	1.49 (0.25)*	1.48 (0.27)*	1.42 (0.26)†	1.49 (0.41)	1.36 (0.43)	1.25 (0.39)
Health worsened (2006–2008)	1.65 (0.40)*	1.63 (0.40)*	1.45 (0.35)	2.69 (0.95)**	2.65 (0.93)**	2.32 (0.84)*
Mediators (change between T1 and T2)						
Lost health insurance			2.51 (0.61)***			1.65 (0.69)
Number of months unemployed			1.02 (0.03)			1.04 (0.02)†
Δ Family income (thousands of dollars)			1.00 (0.00)**			0.99 (0.00)*
Δ Savings (thousands of dollars)			0.99 (0.01)			0.96 (0.02)*
Δ Consumer debt (thousands of dollars)			1.00 (0.00)*			1.00 (0.00)
Baseline (T1) sociodemographics and confounders						
Has health insurance		0.61 (0.10)**	0.62 (0.11)**		0.56 (0.15)*	0.64 (0.18)
Number of months unemployed		0.98 (0.02)	0.97 (0.02)		1.00 (0.03)	0.98 (0.03)
Family income (thousands of dollars)		1.00 (0.00)**	1.00 (0.00)***		1.00 (0.00)	1.00 (0.00)†
Savings (thousands of dollars)		1.00 (0.00)	0.99 (0.01)†		0.99 (0.01)	0.96 (0.02)*
Consumer debt (thousands of dollars)		1.00 (0.00)†	1.01 (0.00)*		1.00 (0.00)	1.00 (0.00)
Home debt (thousands of dollars)	1.01 (0.00)***	1.01 (0.00)***	1.01 (0.00)***	1.01 (0.00)***	1.01 (0.00)***	1.01 (0.00)***
Home value (thousands of dollars)	1.00 (0.00)***	1.00 (0.00)**	1.00 (0.00)*	0.99 (0.00)***	0.99 (0.00)**	1.00 (0.00)*
Respondent lives in high foreclosure state	1.44 (0.16)**	1.45 (0.16)**	1.46 (0.17)***	2.18 (0.44)***	2.20 (0.45)***	2.23 (0.45)***
Race/ethnicity (ref=NH Caucasian)						
African–American	2.38 (0.29)***	2.37 (0.29)***	2.34 (0.28)***	2.17 (0.44)***	2.13 (0.45)***	2.06 (0.43)***
Other race	1.38 (0.35)	1.38 (0.35)	1.35 (0.35)	1.67 (0.76)	1.71 (0.78)	1.63 (0.74)
Educational attainment (ref=≤high school degree)						
Some college	1.01 (0.13)	1.08 (0.14)	1.13 (0.15)	1.20 (0.26)	1.31 (0.28)	1.39 (0.30)
College degree or more	0.46 (0.07)***	0.55 (0.09)***	0.63 (0.11)**	0.61 (0.18)†	0.76 (0.23)	0.96 (0.30)
Marital status (ref=married)						
Never married	1.11 (0.24)	0.95 (0.21)	0.87 (0.20)	0.26 (0.11)**	0.23 (0.10)***	0.20 (0.09)***
Divorced/separated	1.73 (.27)***	1.45 (0.24)*	1.32 (0.22)†	2.57 (0.63)***	2.18 (0.57)**	1.89 (0.48)*
Age	1.00 (0.02)	1.00 (0.02)	1.00 (0.03)	1.00 (0.04)	1.01 (0.04)	1.01 (0.04)
Male	0.88 (0.09)	0.88 (0.10)	0.89 (0.10)	1.23 (0.23)	1.25 (0.24)	1.31 (0.25)
Family size	1.11 (0.05)*	1.11 (0.05)*	1.11 (0.05)*	1.11 (0.08)	1.10 (0.07)	1.10 (0.08)
Constant	0.11 (0.12)*	0.17 (0.19)	0.19 (0.22)	0.01 (0.02)*	0.02 (0.03)*	0.02 (0.04)†
Pseudo R^2	0.07	0.08	0.10	0.10	0.11	0.15

N=4307; ***$p \le 0.001$; **$p \le 0.01$; *$p \le 0.05$; †$p \le 0.10$.

The association persists though it is attenuated slightly after accounting for employment, health insurance status, savings, family income and consumer debt at baseline (time 1). In model 3, the association is reduced to non-significance, though it remains positive, after accounting for potential mediators of the association. A Sobel-Goodman mediation test reveals that changes in family income and loss of health insurance are the strongest mediating factors.

Panel B of table 3 shows a similar pattern of findings. Net of baseline sociodemographic confounders and health status, respondents whose health worsens over time have over 2.5 times the risk of foreclosure than those whose health does not worsen (model 1b OR: 2.69; p<0.01; model 2b OR: 2.65; p<0.01). In model 3b, the mediating variables partially explain the association between worsening health and foreclosure, though the association remains statistically significant (OR: 2.32; p<0.05). A mediation test reveals that changes in family income and loss of health insurance are the strongest mediating factors of the association.

Table 4 shows results from multivariate logistic regression models estimating the association between changes in the number of chronic conditions reported over time and home mortgage default (panel A) and foreclosure (panel B). Net of confounders, respondents who reported more chronic conditions at age 50 than age 40 have nearly twice the odds of

default than those who do not report increased chronic conditions (model 2a OR: 1.99, p<0.001). We find that the hypothesised mediators explain only a relatively small proportion of the association, though a Sobel-Goodman mediation test reveals that loss of health insurance and declines in family income mediate the largest percentage of the association. A similar pattern of findings is shown in panel B for home foreclosure. Net of sociodemographic characteristics, respondents' whose chronic conditions increase over time have nearly triple the odds of experiencing a home foreclosure than their healthier counterparts (model 2b OR: 2.67, p<0.01). This effect is partially mediated by the hypothesised changes in family income.

DISCUSSION

In the wake of the recession, scholars have examined how rising foreclosures impact population health. However, little work has examined whether poor health increases the risk of default and foreclosure.[6] [14] In this study, we find that worsening health increases the risk of default and home foreclosure. The association is partially mediated by changes in family income, savings, health insurance status and employment status. Although changes in family income and health insurance are the strongest mediators, changes in income and health insurance likely stem from job loss. This suggests that those who get sick have a higher risk of foreclosure and default, in part because

Table 4 ORs from Models predicting the association between chronic conditions, mortgage default and home foreclosure

	Mortgage default			Home foreclosure		
	Model 1a	Model 2a	Model 3a	Model 1b	Model 2b	Model 3b
Baseline number of chronic conditions	1.08 (0.10)	1.06 (0.10)	1.05 (0.10)	1.35 (0.17)*	1.34 (0.19)*	1.24 (0.19)
Chronic conditions worsened over time	1.99 (0.36)***	1.95 (0.36)***	1.90 (0.35)***	2.56 (0.90)**	2.62 (0.89)**	2.51 (0.87)**
Mediators (change between T1 and T2)						
Lost health insurance			2.08 (0.71)*			0.58 (0.37)
Number of months unemployed			1.00 (0.00)			1.00 (0.01)
Δ Family income (thousands of dollars)			0.99 (0.00)*			0.99 (0.00)***
Δ Savings (thousands of dollars)			1.00 (0.01)			0.98 (0.02)
Δ Consumer debt (thousands of dollars)			1.00 (0.00)			1.00 (0.00)
Baseline (T1) sociodemographics and confounders						
Has health insurance		0.62 (0.15)†	0.64 (0.16)†		0.98 (0.43)	1.37 (0.62)
Number of months unemployed		1.00 (0.02)	1.02 (0.03)		1.02 (0.04)	1.00 (0.04)
Family income (thousands of dollars)		1.00 (0.00)†	0.99 (0.00)†		1.00 (0.00)	0.99 (0.00)†
Savings (thousands of dollars)		0.99 (0.00)	0.99 (0.01)		1.00 (0.00)	0.98 (0.02)
Consumer debt (thousands of dollars)		1.01 (0.00)	1.01 (0.00)		1.00 (0.01)	1.00 (0.01)
Home debt (thousands of dollars)	1.00 (0.00)*	1.00 (0.00)*	1.01 (0.00)*	1.01 (0.00)**	1.01 (0.00)**	1.01 (0.00)**
Home value (thousands of dollars)	1.00 (0.00)***	1.00 (0.00)**	1.00 (0.00)**	0.99 (0.00)***	0.99 (0.00)***	0.99 (0.00)**
Respondent lives in high-foreclosure state	1.46 (0.24)*	1.46 (0.25)*	1.46 (0.25)*	1.98 (0.58)*	1.94 (0.58)*	1.99 (0.61)
Race/ethnicity (ref=NH Caucasian)						
African–American	2.25 (0.38)***	2.23 (0.38)***	2.20 (0.38)***	2.22 (0.67)**	2.22 (0.67)**	2.13 (0.66)
Other race	1.70 (0.66)	1.64 (0.65)	1.64 (0.66)	2.99 (1.93)†	3.10 (2.02)†	2.94 (2.12)
Educational attainment (ref=≤high school degree)						
Some college	0.97 (0.18)	1.03 (0.19)	1.09 (0.20)	1.86 (0.58)*	1.86 (0.57)*	2.12 (0.67)
College degree or more	0.47 (0.11)**	0.54 (0.13)*	0.64 (0.17)†	0.83 (0.39)	0.81 (0.38)	1.24 (0.59)
Marital status (ref=married)						
Never married	0.99 (0.33)	0.91 (0.31)	0.80 (0.28)	0.40 (0.25)	0.41 (0.26)	0.30 (0.19)
Divorced/separated	1.83 (0.40)**	1.83 (0.40)**	1.44 (0.33)	3.33 (1.08)***	3.42 (1.11)***	2.14 (0.69)
Age	1.05 (0.08)	1.05 (0.08)	1.02 (0.08)	0.97 (0.12)	0.96 (0.12)	0.96 (0.12)
Male	0.86 (0.14)	0.87 (0.15)	0.87 (0.15)	1.12 (0.32)	1.13 (0.32)	1.22 (0.35)
Family size	1.11 (0.07)	1.12 (0.07)†	1.14 (0.07)*	1.17 (0.11)†	1.17 (0.11)	1.15 (0.11)
Constant	0.01 (0.03)	0.01 (0.04)	0.05 (0.17)	0.02 (0.10)	0.02 (0.11)	0.06 (0.30)
Pseudo R²	0.08	0.09	0.12	0.13	0.14	0.19

N=2044; ***p≤0.001; **p≤0.01; *p≤0.05; †p≤0.10.

they are at risk of losing their jobs and, as a result, experiencing declines in family income and loss of health insurance. Though we cannot measure in this study, the high cost of medical care is also likely to play an important role in this association.

There are some limitations to consider. First, though we are able to adjust for a range of potential confounders, we cannot speak to causal relationships. Second, there are some issues with potential time ordering the health changes and mortgage troubles that we observe in our data. However, our ability to look at events that precede foreclosure—such as mortgage default—and our ability to control for a range of baseline sociodemographic characteristics and health, prior to default and foreclosure, help alleviate this concern. Finally, we cannot speak to health limitations among other family members, and therefore may underestimate the role of illness and disability in default and foreclosure.

Following West,[25] we consider the health selection that we observe to be a profoundly social process that has important policy implications. The social consequences of becoming ill are dependent on social and political context. In particular, understanding the extent to which illness may act as a devastating financial shock has important implications for considering the adequacy of our existing social safety nets. Future research that examines the association between health and mortgage strain

from a cross-national perspective, and across different types of social welfare systems, may help to illuminate the contingent nature of this association.

From a policy perspective, the link between poor health and foreclosure suggests a need to re-examine the safety nets that are available to individuals who become ill or disabled. The huge financial burden associated with illness and adverse medical events also points to the need to re-examine our current system of healthcare financing, which leaves many Americans, even those who are insured, to bear large healthcare costs.[26] The implementation of the Affordable Care Act may be an important step to alleviating the financial burden associated with illness. However, as we show, health insurance mediates only a small portion of this relationship. Broadening the social safety net may be important in protecting individuals and families that become ill from financial devastation. For example, an expansion of disability benefits may help protect households from the loss of income that leads to mortgage strain in the event of illness. An expansion of existing mortgage forbearance and insurance programmes may also be useful. For example, Mortgage Critical Illness insurance, which is available in Canada, pays the mortgage balance in the event that the borrower becomes ill or disabled. More work is needed to understand the benefits of these policy approaches.

What is already known on this subject

Recent literature has examined the link between health and default/foreclosure. Most of this literature conceptualises default and foreclosure as a stressful life event that increases the risk of health problems. However, little research has examined how changes in health conditions—particularly among vulnerable middle-aged populations—may influence the risk of mortgage default and foreclosure. Such an analysis is necessary to fully understand how the foreclosure crisis that characterised the Great Recession is linked to population health.

What this study adds

Our study provides a new insight on how changes in health conditions influence mortgage default risk and foreclosure. In particular, we show that health shocks influence default and foreclosure risk partially through job loss and loss of family income. From a policy perspective, the strong link between the onset of illness and foreclosure suggests a need to re-examine the safety-nets that are available to individuals who become ill or disabled.

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