Mortgage Delinquency, Health Status, and Unmet Needs: Evidence from the Health and Retirement Study

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Following a dramatic increase in subprime lending beginning in 2003, foreclosure rates increased rapidly through 2009, with 2.21% of all U.S. homes—a total of more than 2.8 million properties—in some stage of foreclosure during that year.[1] Home ownership has been associated with greater life satisfaction, better psychological health, higher self-esteem and perceived control, and better self-rated health.[2] Financial strain, as measured by debt-to-income ratio or inability to meet one's material resource needs, is associated with worse health.[3-5] Thus, the recent increase in mortgage delinquency and home foreclosures may have population health ramifications due to the widespread loss of wealth, exposure to financial strain, and disruption in access to necessary material resources.[6]

Like other sources of financial strain, mortgage delinquency is likely to affect health through multiple mechanisms, including psychological stress and disrupted access to essential material goods (like food) and services (like health care). As housing strain increases, borrowers may increasingly be forced to balance tradeoffs in order to meet mortgage obligations, such as forgoing health-relevant goods. Previous research has shown that persons in mortgage default are more likely to experience food insecurity and cost-related prescription nonadherence.[7] These material disadvantages are associated with declines in self-rated health and increased risk of disability in older persons.[8]

A recent cross-sectional study found that clients of a mortgage counseling agency in Philadelphia undergoing mortgage foreclosure had higher rates of depression, hypertension, and heart disease, as well as a higher prevalence of cost-related health care and prescription non-adherence relative to the general population.[7] Poor health and health-related debt were also noted as antecedents of foreclosure risk. Longitudinal research is necessary to determine whether housing foreclosure predicts health declines, net of pre-foreclosure health status. The purpose of this paper is to examine whether mortgage delinquency is associated with decrements in health

and health-relevant resources over a two-year period in a nationally representative cohort of Americans over 50 years of age.

Methods: We examined data from the 2006 and 2008 Health and Retirement Study (HRS), a nationally representative panel study of Americans aged over 50 years old at baseline in 2004. Participants were interviewed about mortgage delinquency if they either: 1) had a current mortgage in 2008; or 2) no longer owned a home that was owned in 2006. These participants were asked "Have you fallen more than two months behind on mortgage payments in the past two years?" Participants who answered yes were considered to be mortgage delinquent. Participants who had an active mortgage and had not fallen behind on mortgage payments in the past two years were considered "housing secure."

Health measures captured indicators of general health status, psychological well-being, and unmet health-related needs. Major decline in self-rated health was defined as either a decline from excellent, very good, or good health in 2006 to fair or poor health in 2008 or from fair in 2006 to poor in 2008. A revised version of the Center for Epidemiological Studies-Depression (CES-D) scale was used to measure depressive symptoms. For each of 8 items, participants reported whether or not they had experienced the symptom "much of the time during the past week." A summary score was created indicating the total number of symptoms endorsed (0-8), and a score of six or greater was considered indicative of high depressive symptoms.

Participants were considered to have foregone medications if they reported taking less medication than was prescribed because of cost any time in the last two years. Participants were considered to have food insecurity if they answered no to the question, "In the last two years, have you always had enough money to buy the food you need?" or if anyone in the household received government food stamps at any time in the last two years.

Participants self-reported their age, sex, race/ethnicity (Hispanic, Black, White, or other), marital status, smoking status and annual income. Annual income was log-transformed in regression analysis. Participants self-reported history of diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis, and a summary score was created to indicate the number of chronic conditions (0-7). Physical activity was coded in three categories based on self report: 1) vigorous activity at least once per week; 2) light or moderate activity at least once per week; and 3) sedentary. Additional analysis controlled for household changes in employment status between 2006 and 2008.

Chi-square tests were used to test differences in categorical variables across housing groups, and comparisons of continuous variables were performed using t-tests or Wilcoxon's rank-sum tests. Logistic regression was used to predict the odds of incident depression, decline in self-rated health, and new onset of unmet material resource needs (food insecurity and cost-related prescription non-adherence), adjusted for covariates. Participants who already had health problems or unmet needs in 2006 were excluded in order to examine risk of onset between 2006 and 2008. All analyses utilized sampling weights designed to account for sample design and non-response.

Results: Among 2260 eligible respondents, 69 had fallen behind on their mortgage in the last two years. The relatively low rate of mortgage default is consistent with the time period and the age group of the sample. Mortgage default at the beginning of the housing crisis was closely related to trends in the mortgage market, including subprime lending and adjustable rate mortgages, which affected younger borrowers more heavily.

Table 1 provides participant characteristics by mortgage status. Participants in the mortgage delinquent group in 2008 were more likely to be female, more likely to be non-White, and less likely to be married relative to secure homeowners. Participants who were mortgage delinquent also had lower incomes in both 2006 and 2008 relative to secure homeowners.

Table 2 provides the prevalence of health problems and unmet need at baseline (2006) and the incidence of new onset health problems and unmet need between 2006 and 2008 by mortgage status. Participants in the mortgage delinquent group had worse health status and higher levels of unmet need even before they fell behind on mortgage payments. For example, 15% of participants who became mortgage delinquent had elevated depressive symptoms in 2006, compared to only 5% of participants who were housing secure. Nearly one third of participants who became mortgage delinquent had fair or poor self-rated health at baseline, compared to 19% in the housing secure group. Participants who became mortgage delinquent were also much more likely to be food insecure (23% v. 6%) and to have unmet prescription needs (28% v. 9%) relative to participants who were housing secure.

In addition to differences in baseline health status, there were large and significant differences in change in health and unmet needs over time for all outcomes except self-rated health. Among participants who were mortgage delinquent, 19% developed elevated depressive symptoms over the 2 year period, compared to only 3% of housing secure individuals. Nearly 29% of mortgage delinquent participants developed food insecurity, and 32% developed unmet prescription needs. Mortgage status remained associated with these outcomes after controlling for demographic variables, health behaviors, and changes in income and employment.

Table 1. Participant characteristics by mortgage status

	Housing secure	Mortgage delinquent	p=
N	2,191	69	
Baseline characteristics (2006)			
Age (mean, SD)	62.5 (8.4)	61.6 (9.7)	0.500
Female (%)	46.3	62.9	0.022
Race/ethnicity (%)			<0.001
White	83.9	55.9	
Black	7.7	25.6	
Hispanic	5.7	13.8	
Other	2.7	4.6	
Married (%)	64.5	49.1	0.030
Income ($, Median)	60,725	42,800	<0.001
Number of chronic conditions (0-7, mean, SD)	0.19 (0.5)	0.20 (0.5)	0.883
Current smoker (%)	13.7	18.8	0.301
Weekly physical activity level (%)			0.478
None	6.7	10.4	
Light	54.9	58.1	
Vigorous	37.7	30.4	
Follow-up characteristics (2008)			
Income ($, Median)	63,872	43,000	<0.001
Decline in household employment (%)	17.5	21.5	0.479

Table 2. Health status in 2006 and change in health status between 2006 and 2008 by mortgage status			
	Housing secure	Mortgage delinquent	p=
Depressive symptoms (%)			
High baseline	5.19	15.45	0.004
New onset	2.95	19.02	<0.001
Self-rated health (%)			
Fair/poor baseline	18.84	32.86	0.011
Major decline	10.89	21.14	0.093
Food insecurity (%)			
Baseline	6.4	22.79	<0.001
New onset	3.62	28.80	<0.001
Unmet prescription needs (%)			
Baseline	9.22	28.35	<0.001
New onset	4.86	32.11	<0.001

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