



The impact of persistent poor housing conditions on mental health: A longitudinal population-based study



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ABSTRACT

Living with housing problems increases the risk of mental ill health. Housing problems tend to persist over time but little is known about the mental health consequences of living with persistent housing problems. We investigated if persistence of poor housing affects mental health over and above the effect of current housing conditions. We used data from 13 annual waves of the British Household Panel Survey (1996 to 2008) (81,745 person/year observations from 16,234 individuals) and measured the persistence of housing problems by the number of years in the previous four that a household experienced housing problems. OLS regression models and lagged-change regression models were used to estimate the effects of past and current housing conditions on mental health, as measured by the General Health Questionnaire. Interaction terms tested if tenure type modified the impact of persistent poor housing on mental health. In fully adjusted models, mental health worsened as the persistence of housing problems increased. Adjustment for current housing conditions attenuated, but did not explain, the findings. Tenure type moderated the effects of persistent poor housing on mental health, suggesting that those who own their homes outright and those who live in social housing are most negatively affected. Persistence of poor housing was predictive of worse mental health, irrespective of current housing conditions, which added to the weight of evidence that demonstrates that living in poor quality housing for extended periods of time has negative consequences for mental health.

1. Introduction

It is generally accepted that good housing protects health (Shaw, 2004; Thomson and Thomas, 2015). Exposure to poor housing conditions, such as damp, leaks, and inadequate heating, has been shown to increase the risk of developing respiratory infections and asthma, but also more serious conditions such as tuberculosis (Bonney et al., 2003; Shaw, 2004; Walker et al., 2006; Bonney, 2007; Webb et al., 2013). Poor housing conditions also affect mental health. People living in housing with more problems have a greater likelihood of experiencing mental ill health (Pevalin et al., 2008) while physical improvements to housing improves mental health (Curl et al., 2015; Willand et al., 2015). However, the influence of longer-term exposure (persistence) to poor housing on mental health specifically remains unclear (Marsh et al., 2000). This paper aims to address two questions: first, does the persistence of poor housing conditions over the previous four years affect mental health in the present and, second, does a person's

experience of poor housing conditions in the past continue to affect their mental health in the present irrespective of whether they are currently experiencing poor housing conditions?

People who are living in poor housing conditions today are far more likely to experience poor housing conditions in the future. Data from the UK shows that among people living with (one or more) housing problems in 2001, 57% had housing problems in 2002 and 56% had housing problems in 2003. Some housing problems may change year to year but others, such as damp, may be especially difficult to rectify. Persistent housing problems affect a relatively small proportion of households, for example, just under 10% of households with housing problems in 2000 reported housing problems each year until 2003.

Persistence of poor housing may, in part, be due to a lack of autonomy or inadequate financial resources (Kemp, 2011; Desmond, 2016). Renters are reliant on their landlords to fix housing problems. In the low-cost end of the housing market landlords have few incentives to

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make costly repairs and so renters may be forced to choose between poor quality housing and trying to find better quality housing, which may require moving and be less affordable (Kemp, 2011). Similarly, and especially among lower-income homeowners, housing problems may persist because households lack the financial resources to engage tradespeople (Bogdon, 1996).

We argue that, similar to unemployment, the health consequences of housing problems at a particular point-in-time may be quite different from the health effects of housing problems that persist over time (Paul and Moser, 2009). The association between current housing problems and current mental health may overlook the persistence of housing problems and the toll they take on mental health. Further complicating the interpretation of any association between housing problems and health are potential effect lags. Mental health problems may be ‘sticky’; persisting even after the initial trigger has been removed (Clark et al., 2001; Lucas et al., 2004; Davydov et al., 2010; Huijts et al., 2015). Previous housing problems may initiate stress and anxiety that is not immediately alleviated when the problem is fixed (Curl et al., 2015).

Building on the previous literature, we hypothesize that housing problems in the past will affect health in the present and that this relationship will be observable even after accounting for current housing problems. To explore this hypothesis, we develop a new measure of housing problems over time using a longitudinal data set that is better able to disentangle the health effects of current and past housing problems. To our knowledge, few studies have attempted to disentangle the health consequences of current and previous housing conditions. Our study, therefore, provides one of the first examinations of the cumulative impact of housing problems on mental health.

2. Methods

2.1. Study sample

The data came from the 13 annual waves (1996 to 2008) of the British Household Panel Survey (BHPS) that included questions about housing conditions. The BHPS is a well-established survey and is extensively documented (Taylor et al., 2010; University of Essex. Institute for Social and Economic Research, 2010). Panel data for analysis was unbalanced as individuals move in and out of the survey according to a set of following rules (Taylor et al., 2010). To be included in the sample for this analysis an individual had to not have any missing values on all of the six measures of housing quality, described below (excluding 269 respondents; 2347 person/years). The main analytical sample contained 81,745 person/year observations from 16,234 individuals. In the longitudinal analysis, respondents were required to have complete data for the current year and three years prior (excluding 7869 respondents; 46,660 person/years). Descriptive statistics for the main analytical sample are provided in Table 1.

2.2. Measures

Households were asked, “Does your accommodation have any of the following problems?” and then shown a list including the six items directly related to poor housing conditions: not enough light; lack of adequate heating; condensation; leaky roof; damp walls or roof etc.; and rot in the walls or floor etc. If a respondent answered ‘yes’ to any of these six indicators they were considered to be living with a housing problem in that year, which is consistent with other studies in the field (Webb et al., 2013). We measured the density of housing problems as the proportion of years over the last four years that people have been living with housing problems. For example, in 2000:

Table 1
Descriptive statistics for pooled main analytic sample.

Variable	N	Mean (%)	SD	Min	Max
GHQ	81,741	11.36	5.45	1	36
Presence of housing problems	81,741	20.04%	–	0	1
Density of housing problems	81,741	0.22	0.31	0	1
Specific housing problems					
Not enough light	81,736	4.93%	–	0	1
Lack of adequate heating	81,731	3.13%	–	0	1
Condensation	81,720	9.09%	–	0	1
Leaky roof	81,670	3.37%	–	0	1
Damp walls, floors, etc.	81,722	6.46%	–	0	1
Rot in windows, floors	81,730	4.99%	–	0	1
Age	81,741	49.57	17.18	19	100
Sex (1 = female)	81,741	0.55	0.50	0	1
Equalized household income	81,741	2372.42	1670.83	0	66,216.98
Social renters	81,741	6.71%	–	0	1
Private renters	81,741	14.93%	–	0	1
Own outright	81,741	32.43%	–	0	1
Financial strain	81,741	2.04	0.93	1	5
Moved house in last 12 months	81,741	0.08	0.26	0	1
Divorced, widowed, or separated	81,741	15.75%	–	0	1
Never married	81,741	14.22%	–	0	1

$$\text{Housing problem density}_{2000} = (\text{Housing problem}_{2000} + \text{Housing problem}_{1999} + \text{Housing problem}_{1998} + \text{Housing problem}_{1997})/4$$

One possible problem with this measure is that it assumes that the mental health effects of housing problems in the distant past are the same as the mental health effects in the recent past. We cannot differentiate if the past matters more than the present, or if the present matters more than the past. We explored how these possibilities may affect our results using a simulation that used weights to stress the importance of the past or the present, creating 1000 different versions of this measure of the density of housing problems. Each one was then used in a different regression model to see how much the association between persistent poor housing and mental health varied depending on the assumptions made regarding how the past affects the future (Full details of procedure in Table S1).

Our analyses also controlled for: age (in years); sex (0 = male, 1 = female); a self-reported measure of current financial strain (1 = ‘living comfortably’ to 5 = ‘finding it very difficult’); moved in the last 12 months; equalized monthly income before housing costs using the McClements Equivalence Scales (McClements, 1977; Taylor et al., 2010); marital status (0 = married or cohabiting, 1 = divorced, separated, widowed, 2 = never married); and tenure type (0 = mortgage, 1 = rent in private sector, 2 = rent social housing, 3 = own outright). The prevalence of housing problems and mental ill health vary by geography, we therefore included a series of regional indicators for each UK government office region. As a final set of controls we included time dummies to adjust for spatial correlation over time.

Mental health was measured by the 12-item General Health Questionnaire (GHQ). The GHQ is a widely used measure of mental health. Usually self-administered, it is based on the respondent’s assessment of their present state relative to their usual or normal state. It is used here as an indicator of minor psychiatric morbidity and has been assessed to be a useful longitudinal indicator of mental health (Goldberg and Williams, 1988; Pevalin, 2000). The GHQ items were scored 0–3 resulting (after some items being reversed coded) in an overall score of 0–36 with a higher score indicating poorer mental health. Internal consistency of the GHQ in the waves of data included in this study were alpha = 0.89 to 0.91. We excluded individuals who have missing data on any of these items (41 respondents).

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