



Housing wealth and mortality: A register linkage study of the Finnish population[☆]

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ABSTRACT

In many countries home ownership is the main form of property and covers a major part of people's possessions. Since overall wealth is difficult to measure, many health studies have used home ownership as an indicator of wealth and material resources. However, most studies have measured housing wealth with a simple dichotomous measure of home ownership. We examined the associations between three different measures of housing wealth and overall mortality, separating subsidized renters and private renters, and using floor area and the number of rooms as measures of dwelling size. We further examined whether other socioeconomic factors, level of urbanisation of the region of residence, and household composition account for the found associations. Finns aged 35–79 years at the end of 1999 were followed up until the end of 2004. Data were drawn from various registers combined by Statistics Finland and linked with death records. The age-adjusted hazard ratio for mortality among subsidized renters compared to owner-occupiers was 2.26 in men and 1.87 in women. However, also private renters had clearly higher mortality than owner-occupiers, with the excess mortality of 92% in men and 61% in women. Both measures of home size were also strongly associated with mortality, with the excess risk of 1.7–3.0 in the lowest home size quintile compared to the highest. Adjusting for socioeconomic factors and mutually for all housing wealth measures considerably attenuated the associations. Further adjustment for urbanisation had no effect whereas adjustment for household size, marital status and living arrangements attenuated the associations of the two home size measures and mortality. However, a clear association remained between all housing wealth measures and mortality after all adjustments. Housing wealth summarises one's material circumstances over a prolonged period of time. Measures of housing wealth may therefore provide useful social classifications for studies on poor health and mortality especially in older age groups where most deaths occur.

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Introduction

In many countries home ownership is the main form of property and covers a major part of people's possessions. Housing costs typically account for a large part of the total household expenditure and for most families buying a home is the largest investment in their whole life. Since overall wealth is difficult to measure, many studies have used home ownership as an indicator of wealth and material resources. Those who live in rented housing have been shown to have poorer physical and mental health and increased mortality compared to owner-occupiers (Dalstra, Kunst, &

Mackenbach, 2006; Fox & Goldblatt, 1982; Huisman et al., 2004; Kuh, Hardy, Langenberg, Richards, & Wadsworth, 2002; Laaksonen, Martikainen, Nihtilä, Rahkonen, & Lahelma, 2008; Macintyre, Ellaway, Der, Ford, & Hunt, 1998; Macintyre, Hiscock, Kearns, & Ellaway, 2001; Pollack, von dem Knesebeck, & Siegrist, 2004; Smith & Harding, 1997; Sundquist & Johansson, 1997). The associations found between home ownership and mortality have been of about the same magnitude as those between the conventional socioeconomic indicators like educational level, occupational social class, and income and mortality (Huisman et al., 2004; Kuh et al., 2002; Sundquist & Johansson, 1997).

Most studies have measured housing wealth with a simple dichotomous measure of home ownership. However, renters can be divided into different subgroups. In Finland about one fifth of people live in rented housing, and about half of them are renters from private landlords while the other half live in local government subsidized housing (Statistics Finland, 2003). Local government

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renting has income limits and selection criteria that include reasons like having a notice or decision on eviction, over-crowding, and poor condition of current housing. Local government renters are therefore clearly a socially underprivileged population segment. In contrast, private renters can be relatively well off. Thus, while poor health and high mortality among local government renters would be no surprise the situation among private renters is more unclear. It is possible that the excess mortality among renters is entirely driven by very high mortality among subsidized renters, while the mortality of private renters is at the same level with owner-occupiers. In addition to home ownership, size of the dwelling is shown to be associated with mortality (Fox & Goldblatt, 1982), although the studies using measures of dwelling size are few. Since wealthier people are likely to live in more spacious housing, measures of home size can be used as additional indicators of housing wealth.

It is unclear to what extent the association between home ownership and mortality merely reflects the effects of other socioeconomic factors. Previous studies have shown that adjusting for education, occupational social class and income attenuates the association between home ownership and poor health to a varying degree (Dalstra et al., 2006; Macintyre et al., 2001). A previous study showed that in Finland the risk of death among renters was nearly twofold compared to owner-occupiers (Laaksonen et al., 2008). Less than a third of this excess mortality was explained by other socioeconomic factors, with the largest effect of income among working aged men. Among subsidized renters such an effect might be expected to be stronger than among private renters. Similarly, adjusting for socioeconomic factors could be expected to attenuate the association of housing size and mortality as well.

In rural areas living in owner-occupied housing is more common than in urban areas. Since prices in less urbanised areas are lower people can also afford larger housing. Therefore, the level of urbanisation of the region of residence can confound the associations of home ownership and dwelling size with mortality. In addition, larger families need larger housing than smaller families. Marital status and living arrangement are thus necessarily tied with household size, but may also reflect different mechanisms to mortality. Overall, urbanisation of the region of residence and household composition can thus be important confounding factors that need to be taken into account when considering the effects of home ownership and home size on mortality.

This study examines the associations of three different measures of housing wealth and overall mortality among 35–79 year old Finns living in private households using national register based data. We separate subsidized renters and private renters, and use floor area and the number of rooms as measures of dwelling size. We further examine whether socioeconomic factors, level of urbanisation of the region of residence, and household composition account for the associations of these measures and mortality.

Material and methods

The study sample consists of 35 to 79 year old Finns at the end of 1999 living in private households. A random sample of 11 percent was derived from the population register of Finland. Data from various registers were combined by Statistics Finland and linked with death records from the beginning of 2000 until the end of 2004 using personal identification codes (permission TK-53-1783-96). In order to increase power in the analyses, an over-sample of deaths was taken, covering 80% of all deaths during the follow-up period. Characteristics of the study population are presented in Table 1.

Table 1

Distribution of person years, deaths and age adjusted mortality rates across the categories of housing wealth variables.

	Person years	Percent	Deaths ^a	Age adjusted mortality ^b
Home ownership				
Owner-occupiers	2,035,962	81	75,638	9.1
Private renters	266,310	11	16,407	18.0
Subsidized renters	228,403	9	11,223	15.5
Floor area (m ²)				
> 120	482,851	19	11,972	8.2
97–119	521,103	21	13,590	8.4
77–96	497,423	20	17,258	9.1
59–76	502,769	20	23,544	10.7
< 58	526,528	21	36,904	15.1
Number of rooms				
5+	489,190	19	10,900	8.1
4	660,437	26	18,178	8.4
3	641,984	25	24,665	9.4
2	555,817	22	33,326	12.6
1	183,246	7	16,199	19.4
Total	2,530,674		103,268	

^a Numbers of deaths are those observed in the original sample, while other columns are based on analyses that use weights to account for the different sampling probabilities.

^b Per 100,000 person years.

Measures of housing wealth

We use the concept “housing wealth” to refer to the three main independent variables of the study: home ownership, floor area of the dwelling, and number of rooms of the dwelling. Home ownership was divided into owner-occupiers (including those having mortgages), private renters, and subsidized renters. Altogether 20% of people lived in rented housing, and half of them were private renters and other half subsidized renters (Table 1). People who could not be classified in these housing types (2.1%) were excluded.

Home size was measured by the floor area of the dwelling and the number of rooms. Floor area was divided in quintiles. A room was defined as a space with a window of at least 7 m² and medium height of at least 2 m. The number of rooms, excluding kitchen, was truncated at five.

Other variables

Distributions of other variables used in the analyses are shown in Table 2. Age was classified in five-year age groups. Educational level was based on the highest completed educational degree or certificate. We separated five categories ranging from primary school to university degree. Occupational social class was classified into seven categories: upper non-manual employees, lower non-manual employees, skilled manual workers, unskilled manual workers, farmers, other self-employed workers, and others (Central Statistical Office of Finland, 1989). The unemployed and the retired were classified according to their previous occupation, and persons carrying out housework were categorized according to the occupation of the head of the household. Occupational social class was unknown for 0.2% of the respondents and they were excluded from the analyses. Household disposable income included all taxable income received by the household members, such as wages and salaries, capital income and taxable income transfers, and subtracted paid taxes and social security payments. The information on the sources of income came from the registers of the Finnish Tax Administration and the Social Insurance Institution.

Urbanisation of the region of residence was measured at the level of the municipality. The Capital region of Helsinki was

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