HOUSING

Differences in the effect of homeownership on health status across health regions in Alberta, 2011-2012

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ABSTRACT

The housing we live in - from the type and the location to our homeownership status - impacts our health status. Housing is one of the most central environments individuals live in, and as a socio-economic determinant of health, has disproportionate impact on certain groups. Previous research indicates that homeowners tend to have better health than renters. However, this relationship changes when living in unaffordable housing. Organizations have issued numerous warnings about rising unaffordability, debt, and home prices in Canada. In this paper, I focus on the effects of homeownership status in the five different health regions in Alberta, stratified by housing affordability. Using Statistics Canada's Canadian Community Health Survey from 2011-2012 in a logistic multivariate regression, I find that homeownership is positively associated with self-reported good or better health status, but that the association was smaller in less affordable regions. This suggests living in regions that are less affordable dampens the health benefits of homeownership. These findings also support the the idea that homeownership is more than a proxy for socioeconomic status and has its own effects on health.

INTRODUCTION

In the last twenty years, there has been a shift towards more inclusive models of health. The population health framework suggested by Evans and Stoddart (1990) and expanded on by Dunn and Hayes (1999) focuses on the social environment and explicitly includes the socio-economic determinants of health. Determinants include: workplace, occupation, income, education, gender, and housing. Housing is a central part of individuals' environment (Dunn, 2000; Dunn & Hayes, 2000; Moloughney, 2004) and occupies a unique space where it represents both social and economic environments, but also has a significant influence on health through its physical environment. Many of these physical effects of housing on health have been well-studied (example, Rauh, Landrigan & Claudio, 2008). Housing can be considered:

> "a nexus for the operation of unequal social relations and a medium through which socio-economic status is expressed and through which a wide range of known health determinants operate (Dunn, Hayes, Hulchanski, Hwang & Potvin, 2003, p.3)."

Housing factors, including size, quality, and location, are mediated through an individual's socio-economic status, which all impact health outcomes. Further, housing is often a significant portion of a household's wealth. In high income countries, health and wealth are positively correlated (Dunn, 2000; Moloughney, 2004). Research has also illustrated the benefits of homeownership, independent from socioeconomic status (Macintyre, Ellaway, Hiscock, Kearns, Der & McKay, 2003; Dunn & Hayes, 2000, Dunn et al., 2003). Therefore, it is reasonable to believe that housing would have an impact on health outcomes through its place as a socio-economic determinant of health, and as a mediator of both the social environment and the physical environment.

Access to affordable and adequate housing has been raised as growing issue in Canada (United Nations Human Rights Council, 2009; Cheung, 2014). In the 1990s, the federal government made significant cuts to social and affordable housing, downloading those

responsibilities to provincial and municipal governments (United Nations Human Rights Council, 2009). Similarly, market prices for housing has increased significantly throughout Canada over the past twenty years. In cities such as Toronto and Vancouver, housing can cost as much as 80% of median income (RBC Economics/Research, August 2015); unaffordable housing is considered shelter costs greater than 30% of pre-tax household income (Statistics Canada, 2013a). Access to affordable and adequate housing could potentially become a larger issue for a greater amount of the population as social housing agreements expire in the coming years and housing affordability continues to erode (United Nations Human Rights Council, 2009).

The purpose of this paper is to explore how the effects of homeownership on health vary with place of residence. How do these effects connect to housing affordability? To explore these questions, I use data from Statistics Canada's Canadian Community Health Survey, 2011-2012 to compare the effect of homeownership on health status across the five health regions in Alberta. These five health regions are categorized from least affordable to most affordable based on housing data from Statistics Canada's National Household Survey from 2011. This paper is divided into four sections: previous research, methods and data, results and discussion, and lastly, conclusion.

PREVIOUS RESEARCH ON HOUSING AND HEALTH

Housing occupies a unique space, mediating individual experience of both the physical environment and social environment – research tends to focus on one of these environments. The physical environment of housing and its impacts on health outcomes has been well researched, including both housing conditions and neighbourhood conditions. For example, housing materials can expose residents to a variety of known toxic materials. In a review of housing research by Moloughney, (2004) he notes that some of the strongest evidence for the relationship between housing and health comes from exposure to toxins. These include lead from lead paint, asbestos, and radon, which are known carcinogens. Environmental exposures such as indoor tobacco smoke and cold and/or damp housing have been linked to health effects like asthma and other respiratory problems (Moloughney, 2004; Dunn, 2000). For those living on the streets or in homeless shelters, health outcomes are even worse, with higher rates of mortality, infectious diseases, and stress (Gaetz, 2015). Housing, therefore, has an effect on health through mediating exposure to physical health determinants.

Further, housing also impacts health by mediating exposure to different social environments. Housing plays an important role in health outcomes, particularly as it is highly connected to a variety of known determinants of health (Dunn et al., 2003; Moloughney, 2004). Dunn and Hayes (2000) studied the relationship between housing and health in two neighbourhoods in Vancouver. They explored how the material and social dimensions of housing impact social inequality. They found a clear gradient between housing tenure and health, where homeowners in Mount Pleasant had a higher likelihood of reporting better health status, better mental health status and greater satisfaction with their health than renters in the same neighbourhood (Dunn & Hayes, 2000).

Housing is a particularly important aspect of the social environment due to the connection between homeownership and wealth. Wealth, like income, is positively correlated with health outcomes (Dunn, 2000; Dunn et al., 2003; Moloughney, 2004; Macintyre et al., 2003). For most individuals, homeownership represents their largest wealth asset (Dunn et al., 2003). According the Survey of Financial Security in 2012, conducted by Statistics Canada, the financial value of

the principal residence constitutes 34.6% of total assets (Statistics Canada, 2015a). Housing can act as a double determinant then, as a proxy for wealth and social status as well as through its own specific benefits.

Additional studies have focused on the relationship between housing tenure specifically and health outcomes, illustrating that homeowners typically have better health outcomes than renters. (Moloughney, 2004; Dunn et al., 2003; Dunn, 2000). In a study on housing tenure and health in Scotland by Macintyre et al., (2003), the researchers found that the positive health effects of homeownership remained even after controlling for age, sex, marital status and income/social class. Individuals living in owner-occupied housing had better access to amenities, such as gardens, and had fewer housing and neighbourhood problems such as crime, vandalism, and damp and cold housing. The researchers hypothesize that the relationship between housing and health is connected through these environmental variables that differ with housing tenure, but they also recognize that the social significance of housing differs with context and can have an effect on health as well (Macintyre et al., 2003).

Interestingly, some research has indicated that the relationship between housing tenure and health status may go the opposite direction, that the housing market for homeownership excludes individuals with health problems (Easterlow, Smith & Mallinson, 2000). Easterlow et al. (2000) conducted interviews with individuals with health problems or disabilities to examine how health status might affect housing status. They note that living with ill health or disability can make access to quality, affordable, and suitable private homeownership more difficult for this group, which could compound the health disparities between tenants and homeowners shown in the literature (Easterlow et al., 2000).

However, homeownership, particularly the stress of affordability, can have negative health effects. Issues with housing affordability can potentially reallocate funds away from other health related factors, such as nutrition and medicine, to cover shelter costs such as rent and mortgage payments (Moloughney, 2004). In a study on food adequacy and shelter costs in Canada by Kirkpatrick and Tarasuk (2007), the researchers found that for households on the lower end of the income distribution, there was a negative relationship between housing costs and adequacy of food spending. Particularly notable, even when housing costs were 30% or less of household income (considered to be affordable), households in the lowest income quintile did not spend enough to reach the estimated value of a basic nutritious diet. As diet is a major health determinant, housing affordability could have a double impact on these households (Kirkpatrick & Tarasuk, 2007).

Moreover, returning to Statistics Canada (2015a) data on assets and debts, principal residences are a larger percent of debt than of wealth, at 61.4% of total debt (Statistics Canada, 2015a). Mortgage debt from all real estate constitutes a significant proportion of debt, at 77.0% (Statistics Canada, 2015a). Mortgage debt can have health consequences: a study by Cairney and Boyle (2003) illustrated that there is a social gradient of health within housing tenure status. Tenants experience the most distress, followed by homeowners with a mortgage. Homeowners without a mortgage experienced the lowest levels of distress, as they were best situated to experience the health benefits of homeownership.

The relationship between housing tenure and health status is conceptualized through the social significance imbued in housing and homeownership. Housing is a major expression of identity and social status, and as such, individuals attach meaning to the space. In that same study of two Vancouver neighbourhoods, Dunn and Hayes (2000) illustrated that the symbolic meaning of housing played an important role in predicting health outcomes. For example, pride in dwelling was positively correlated with health status (Dunn & Hayes, 2000). Second, housing is one of the few, if the only, areas where individuals can exercise control (Dunn et al., 2003). Control has previously been shown as an important determinant of health in the workplace through the Whitehall studies (Marmot, 2007). A third important factor of housing is the creation of social support and networks based around housing. Inviting other people into individual, personal space such as the home is an important marker in social support networks, and is made easier by having access to quality housing (Dunn et al., 2003).

The connections between housing and health are important in light of degrading housing affordability in Canada (RBC Economics/Research, 2015; UN Human Rights Council, 2009). As house prices have increased dramatically, Canadians have had to take on more debt to be able to afford homeownership - the median value of mortgages on principal residences have increased from $87,100 in 1999 to $145,000 in 2012 (Statistics Canada, 2015). This study then seeks to expand on the relationship between homeownership, housing affordability and health inequalities. Just as housing mediates individual experience of the social and physical environment, housing affordability mediates access to homeownership and the associated benefits. This idea is explored by examining how living in an area with poorer housing affordability might impact the role of homeownership on health outcomes compared to living in an area with better housing affordability.

DATA AND METHODS

Data

To explore the effects of housing affordability, I used data from two Statistics Canada surveys. I combined health data from the Canadian Community Health Survey 2011-2012 with housing data from the National Household Survey 2011. The Canadian Community Health Survey (CCHS) is an annual, national, cross-sectional survey of health in Canada conducted by Statistics Canada. The survey coverage is persons 12 years and older living in all Canadian provinces and territories. Excluded from the sampling frame are individuals living on reserves, in institutions, and some remote areas (Statistics Canada, 2013c). Data was released as a pooled dataset for both years 2011 and 2012, allowing for a larger sample size of 124,929 cases.

The second data source is the National Household Survey (NHS), which replaced Canada's long form census in 2011. Like the CCHS, the NHS is a national, cross sectional survey, sampling over 3 million households living in the provinces and territories. This includes households living on reserves, as well as individuals living in Canada on work or study permits (Statistics Canada, 2015b). Like the CCHS, the NHS excludes those living in institutions such as hospitals, the Armed Forces and prisons. The overall response rate to the NHS 2011 was 68.6%. The NHS 2011 is the source of housing data for Statistics Canada, particularly the measure of housing affordability used by Statistics Canada.

Methods

I used these two datasets in a logistic regression, based on a simplification of the methods of Dunn and Hayes (2000), to explore the association between homeownership and health status. The dependent variable is perceived health status, which was recoded into two categories: excellent/very good/good and fair/poor. The explanatory variable is tenure status (homeowner or tenant), categorized by health region of residence. There are five health regions in Alberta: North Zone, Edmonton Zone, Central Zone, Calgary Zone and Southern Zone. I ran one regression per region to compare the effects of homeownership on health and to explore the connections with housing affordability.

These regions are stratified by housing affordability, which was measured as the percent of households spending more than 30% of income on shelter costs and is consistent with data from Statistics Canada (Statistics Canada, 2013a). I complement this measure with the ratio between median dwelling value and median household income based the more complex ratios used by the OECD (Cheung, 2014) and by RBC Economics/Research (2015). Further, I controlled for age, as the likelihood of being in worse health increases with age, as well as two major socioeconomic determinants of health, household income and education level. These variables are included based off the framework used by Dunn and Hayes (2000), which focused on the socioeconomic determinants of health, and by the review on housing and health by Moloughney (2004). Descriptive statistics for the explanatory variables by health region are illustrated below in Table 1, and the results from the logistic regression presented in Table 2.

RESULTS AND DISCUSSION

Starting first with the data on housing affordability, Calgary Zone was the most unaffordable, with 24.93% of households living in unaffordable housing and a price to income ratio of 4.78. This was followed by the Edmonton Zone with 24.61% of households in unaffordable housing and a ratio of 4.28 (Table 1). The other three health regions listed in order of least to most affordable are Central Zone (22.31%), South Zone (21.91%) and North Zone (19.38%). The two least affordable zones are primarily urban, whereas the other three zones are primarily rural. It is important to recognize that more tenants than homeowners face housing affordability issues. In Calgary, 38.50% of tenant households were spending 30% or more of their income on shelter costs, compared to 20.30% of owner households. Edmonton has the highest percentage of tenant households in unaffordable housing, at 41.00% of tenants compared to 17.80% of owner households.

Examining next the summary descriptive statistics for each health region (Table 1), a similar urban/rural divide appears. Calgary and Edmonton have many similar statistics, while the three more rural regions of South, Central and North have many variables in common. Calgary and Edmonton have the highest proportions of individuals in good, very good or excellent health, with 89.92% in Calgary and 87.02% in Edmonton. Calgary and Edmonton also have the lowest proportions of homeowners, with 78.87% and 73.87% respectively, compared to more than 80.00% in other other three regions. The North Zone has the highest proportion of households with an income of $80,000 or more, with 54.42%. The lowest proportion of high income households is in the South Zone where 32.58% of households have a yearly income of $80,000 or more. The majority of respondents in Calgary and Edmonton hold a post-secondary degree or certificate, while just under 50% have post-secondary education in the South, Central and North regions.

Table 1: Summary Statistics, Housing Affordability by Health Region, Alberta, 2011

	Calgary Zone	Edmonton Zone	Central Zone	South Zone	North Zone
Regional Variables					
Median dwelling value ($)	400,649	350,126	284,854	255,985	299,513
Median after-tax household income ($)	83,828	81,842	72,660	67,554	82,785
Unaffordable housing (%)	24.93	24.61	22.31	21.91	19.38
Owner Households	20.30	17.80	17.20	17.40	15.30
Tenant Households	38.50	41.00	38.60	36.60	31.40
Price to Income Ratio	4.78	4.28	3.92	3.79	3.62
Individual Variables					
Self Reported Health Status (%)					
Excellent, Very Good, Good	89.92	87.02	85.71	86.14	85.70
Fair or Poor	10.08	12.98	14.29	13.86	14.30
Tenure (%)					
Homeowner	78.87	73.87	82.05	81.03	80.65
Tenant	21.13	26.13	17.95	18.97	19.35
Median Age Group (years)	40-44	45-49	50-54	50-54	40-44
Gender (%)					
Female	54.00	55.20	54.50	55.27	52.42
Male	46.00	44.80	45.50	44.73	47.58
Household Income Group ($)					
<20,000	5.34	7.39	8.58	9.95	5.93
20,000 - 39,999	16.35	17.34	17.54	22.39	14.09
40,000 - 59,999	16.69	16.67	17.01	20.31	11.78
60,000 - 79,999	14.37	13.83	14.79	14.77	13.67
≥80,000	47.26	44.76	42.09	32.58	54.52
Education Level (%)					
Less than high school	17.63	19.19	26.88	25.41	26.63
High School	17.86	18.78	21.25	20.40	19.19
Some Post Secondary	3.39	4.06	3.54	4.46	4.29
Post Secondary Certificate/Degree	61.12	57.97	48.33	49.73	49.89
n	2624	2531	2110	1679	2377

Source: Regional data from Statistics Canada NHS 2011, individual level data from Statistics Canada CCHS 2011-2012.
Notes: Unaffordable housing is where the household is spending more than 30% of household income on shelter costs. Regional affordability is measured as the percentage of households in unaffordable housing.

The third table indicates the results from the logistic regression (Table 2). Gender was not significant in any health region. Age was associated with a decrease in the likelihood of being in good or better health. Income follows a perfect gradient in each region, where each successive step up the income ladder is associated with an increase in the likelihood of being in good or better health, compared to the lowest income group, net of the effects of age, gender, homeownership and education level. These findings are consistent with previous research that found that income was positively associated with health status (Moloughney, 2004; Dunn & Hayes, 2000). Further, the effects of income largely follow the stratification of regions by housing affordability. Income has the largest effect on health status at all levels in Calgary, which is the least affordable region. Edmonton has the second largest effects from income on health status, but only at the top two levels. The North Zone, which is the most affordable, has the lowest effects from income, but again, only at the top two levels. This suggests that income has a larger impact on the likelihood of being in good or better health in areas that have less affordable housing.

However, the effects of education on health status are less clear from this survey. Post-secondary education is associated with a positive increase in the likelihood of being in good or better health compared to the referent group of less than high school, controlling for age, gender, income and homeownership. However, high school only appears to have the largest percent increase in the likelihood of being in good or better health status, particularly in Calgary and North Zone. In Calgary, post-secondary is associated with an 79.71% increase in the likelihood of being in good or better health compared to an individual with less than high school education. High school only is associated with a 94.35% increase. This difference is greater in the North Zone, where high school education is associated with a 121.62% increase in the likelihood of being in good or better health, whereas post-secondary is associated with a 77.70% increase in the odds. Without further investigation, it is difficult to speculate the cause of these results. Despite these differences in the effects of education on health status, higher education is associated with an increase in the likelihood of being in good or better health, compared to having less than a high school diploma.

Focusing on the effects of homeownership, homeownership has a positive association with health status in all five health regions controlling for age, gender, income and education. This association with health status, net of the two major components of socioeconomic status, is smaller than the association between health status and income or education. While smaller, the separate effects of homeownership on the likelihood of being in good or better health support the idea that housing is more than a proxy for socioeconomic status. However, this effect is reduced in Calgary and Edmonton. The lowest percent increase on the likelihood of being in self-reported good or better health as a homeowner is in Calgary, at 52.60%, which is also the least affordable region, followed by Edmonton at 53.18%, the second least affordable. The other two zones which were significant, Central and North, both have percent increases above 60% (69.40% and 62.47%, respectively).

Table 2: Percent change in odds of being in good health or better, Alberta Health Regions, 2011-2012

	Calgary Zone	Edmonton Zone	Central Zone	South Zone	North Zone
Homeownership (tenants = ref)					
Homeowners	52.60	53.18	69.40	16.23*	62.47
Median age	-82.38	-83.26	-80.52	-82.11	-80.72
Sex (female = ref)					
Male	-21.19*	-15.54*	-8.37*	-24.02*	-18.77*
Household Income Group ($) (<20,000 = ref)					
20,000 - 39,999	70.36	50.00*	34.47*	25.31*	70.07
40,000 - 59,999	194.51	141.00	97.06	101.05	152.79
60,000 - 79,999	238.94	198.34	166.90	217.91	113.61
≥80,000	377.13	305.02	278.10	298.90	177.83
Education Level (less than high school = ref)					
High school only	94.35	20.44*	113.01*	77.08	121.62
Some post secondary	30.81*	71.57*	82.57*	29.95*	25.04*
Post secondary certificate or degree	79.71	83.61	70.87	80.53	77.70
n	2624	2531	2110	1679	2377

Notes: Based on logistic regression using data from Statistics Canada Canadian Community Health Survey, 2011-2012.

(*) indicates not significant at the 95% level.

Thus, living in regions that are less affordable appears to dampen the health benefits of homeownership. This is consistent with other studies that indicate housing affordability has a negative association with health status (Moloughney, 2004; Easterlow et al., 2000; Cairney & Boyle, 2003; Kirkpatrick and Tarasuk, 2007). In addition, homeownership was positively associated with health in all five regions, four of which were significant, net of the effects of income and education. These results support the idea that housing is more than a proxy for socioeconomic status and has its own effects on health (Dunn & Hayes, 2000; Dunn et al, 2003; Macintyre et al., 2003). However, housing is intimately connected to socioeconomic status and could contribute doubly to health status. Homeownership is major component of wealth, and both homeownership and wealth are positively associated with health. Not only wealth then, but health status as well can contribute to inequality between tenants and homeowners.

It is important to recognize that these results are not causal and do not indicate the direction of the relationship. As Easterlow et al. (2000) demonstrated in their qualitative study, health status can affect housing status. The health differences between tenants and homeowners can make it increasingly difficult for tenants to move to owner-occupied housing. Thus, these findings of positive relationship between homeownership and health status might reflect the increased likelihood for those who are healthier to move into owner-occupied housing compared to those

who are in poorer health. Further, these results do not indicate the experience of any one individual. Rather, these results are at the population level. Further study is need to expand on these findings and explore the causality of homeownership and health, but regardless, these results illustrate an increased likelihood for homeowners to report good or better health.

A significant limitation of these results is the use of health region of residence as a proxy for housing affordability. Other studies on housing and health used specific surveys or interviews, allowing for more flexibility and specificity in the data. While the Canadian Community Health Survey 2011-2012 includes a variety of questions on health and demographics, it does not include questions about housing affordability or shelter costs. Therefore, I used health region as a proxy and used aggregate data to include housing affordability in the analysis. Without household affordability measures, the results are confined to differences between the effects of homeownership at the aggregate level. Particularly, as housing is a central environment for individuals with its own health effects and mediating the health effects of other determinants, more data on housing should be included on surveys such as the Canadian Community Health Survey. Moreover, health data should be included on surveys such as the National Household Survey due to the richness of its demographic and socioeconomic data.

CONCLUSION

This paper explored how the effect of homeownership on health varied with health region of residence in Alberta, based on data from 2011-2012. Homeownership was positively associated with health status in all five health regions, where being a homeowner was associated with an increased likelihood of being in good or better self-reported health. Importantly, there were regional differences in this relationship. Homeownership had smaller effects on health in urban, less affordable health regions of Calgary and Edmonton compared to the more rural and affordable regions of Central and North. Noticeably, these effects were separate from those effects of two major socioeconomic determinants of health that are income and education. These findings support previous studies that have found a positive association between homeownership and health (Dunn & Hayes, 2000; Dunn, 2000; Dunn et al., 2003, Macintyre et al., 2003; Moloughney, 2004).

These results have important connections to policy. Canada is one of the few countries in the world that does not have a national housing policy, and the right to adequate housing as enshrined by the United Nations has largely been excluded from national human rights law (United Nations Human Rights Council, 2009). Issues of housing affordability have the potential to become a larger problem for Canadian society in the coming years as current agreements with housing providers end. This exposes more people to the risk of living in unaffordable housing and the associated negative health effects. With these connections between housing and health, there is a health-based argument for creating a national housing policy that includes more affordable and social housing.

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