

EVIDENCE ON THE RELATIONSHIP BETWEEN UNAFFORDABLE HOUSING AND POOR HEALTH

Emma Baker¹, Kate Mason³, Rebecca Bentley³, Shelley Mallett²

¹*University of Adelaide, Adelaide, South Australia, Australia,* ²*Hanover Welfare Services, Melbourne, Victoria, Australia,* ³*University of Melbourne, Melbourne, Victoria, Australia*

ABSTRACT

Following the recent Global Financial Crisis, the role of Australian Governments in providing assistance to households unable to access, afford, or maintain adequate housing has come increasingly into focus. Australia is experiencing ongoing and substantial housing affordability decline, and our cities have some of the world's highest rates of housing un-affordability. Housing affordability directly affects the type, quality, and security of housing that individuals can access. This paper examines the relationship between poor health and poor housing affordability for Australians, to answer two essential questions for Australian policy makers: Does poor health lead to unaffordable housing? And does unaffordable housing affect people's health? Analysis was based upon two large Australian datasets, the Household, Income and Labour Dynamics in Australia (HILDA) Survey and the General Social Survey, (GSS). We highlight the populations most vulnerable to affordability-related poor health such as lone parents and their children and older renters. This study contributes empirical evidence, allowing us to examine if there is a fundamental bi-directional relationship between poor housing affordability and health even when demographic and socio-economic factors have been, to a large extent, accounted for.

INTRODUCTION – HOUSING AFFORDABILITY AND HEALTH

The Universal Declaration of Human Rights (1948 Article 25) allocates to all people “the right to a standard of living adequate for the health and wellbeing of himself and his family”, and identifies housing as a central component of that standard of living. Like other similar policy and legislative documents, the Universal Declaration is based upon the intuitive understanding that housing and health are related, but 60 years after the Declaration, surprisingly little is still known of the detail of that relationship. This paper examines an important and overarching part of the housing and health relationship, the way that housing affordability and health are related. How exactly are housing and health related? Are there particular aspects of housing - e.g. affordability, quality, tenure- that are related to health? This paper considers the relationship between one overarching dimension of housing- affordability - and its relationship with health and well being. We focus on the bi-directional housing affordability and health relationship for Australians to establish how housing affordability may influence health, and how health may influence housing affordability.

Among the essential housing rights afforded by the Universal Declaration, housing affordability has a dominant role. Affordability directly affects the quality, security, and appropriateness of the housing that individuals are able to obtain. Further, housing costs, which are commonly the largest household expenditure for Australians (ABS, 2007), also affect the ability of low income households to meet other essential needs (such as food security Kirkpatrick and Tarasuk, 2011; or health care Pollack et al 2010). The necessity to meet housing costs means that many households “trade off” essential needs to meet their housing costs, this impacts on the broader lives of the individuals within them, most critically, on the ability to secure employment or education, access basic services and maintain their connections to family and friends. It should be further noted that housing is “both a consumption and an investment good” (Mandic and Cirman 2011) that can be transferred inter-generationally, this means that current inequalities of access to affordable housing can be compounded over time (and inherited by subsequent generations).

The importance of housing as a central determinant of the health and wellbeing of individuals has been well established (though we note, not fully elucidated) across academic and policy literatures, and a connection between these two major areas of Australian life predates the shape of much government expenditure and welfare policy.

A number of studies have examined and established a clear relationship between housing affordability and health (for example, Bentley et al, 2011; Shaw et al. 1999; Taylor et al. 2007; Ford and Burrows 1999). Some focus on the particular health effects of affordable housing, for example, recent work by Bentley, et al

(2011) found a small but significant causal relationship between housing affordability and mental health. Importantly, in this longitudinal study of more than 15,000 Australians a mental health effect from housing affordability was only found for individuals living in low incomes households. Similarly, Taylor et al. (2007) found a relationship between mental health and the pressures of meeting housing costs, especially for heads of households. Their study is additionally interesting as they established a gender-related difference in the health effects. The impact of housing affordability on health has also been observed in qualitative work. For example, Hulse and Saugeres (2008) who found that housing affordability impacts on mental health resulting in heightened stress and anxiety, and in the earlier longitudinal research by Nettleton and Burrows (1998) they found an association between mental health and mortgage indebtedness.

Studies of the relationship between dwellings quality and health are relevant as affordability is implicated in the quality of the dwelling that people can afford. For example, heating has been shown to affect physical health (Howden-Chapman et al.2007; Gemmel 2001; Naughton et al. 2002), further, warmer houses were shown by Howden-Chapman et al. (2007) to be associated with improved self-assessed health and fewer GP visits. Similarly, damp has been shown to be associated with respiratory illness (Bonney et al. 2003; Shaw, 2004; Bornehag et al. 2001; Shenassa et al. 2007). Considering the features and layout of dwellings, noise exposure was found to be related to overcrowding (Evans et al. 2003), and was statistically linked to worse mental and physical health (Howden-Chapman & Wilson 2000, pp. 140–4). Recently, Cutts et al (2011) in their study of housing insecurity found that overcrowding was associated with food insecurity for children.

Affordability is also likely to affect health indirectly via tenure. Research examining the health outcomes of tenure consistently finds owner-occupation to be the 'healthiest' tenure (for example, Smith et al. 2004, p. 579; Macintyre et al. 2001, p. 29; Macintyre et al. 2003), associated with various health benefits (Cairney & Boyle 2004, p. 161), for example higher psycho-social wellbeing (Kearns et al. 2000), and lower risk ratios for mortality (Breeze et al. 1999). In comparison, rental tenure has been associated with negative health measures, such as poorer self-reported health (Windle et al. 2006), coronary heart disease (Woodward et al. 1992) and risky health behaviours such as smoking (Kendig et al. 1998). A recent study by Pollack, Grinnin and Lynch, (2010) of housing affordability, tenure and health, not only found increased odds of poor self-rated health among individuals in unaffordable housing, but they also found that the health effects of poor affordability were heightened for individuals who were renting rather than owning. Importantly, it is likely that a substantial proportion of the explanation for these health differences is related to the way that tenure and affordability are bound together.

Finally, not only does the location of the housing that individuals occupy affect affordability, but affordability affects the location that individuals are able to access housing in. This locational effect has been shown by many authors (such as Acevedo-Garcia et al. 2004; Macintyre et al. 2003) to influence individual health by the access it provides (to social connections, or green spaces), as well as distance from perceived crime (Ross & Mirowsky 1999; Stafford et al. 2007).

This paper seeks to answer two questions, aimed at exploring the bi-directional relationship between housing affordability and health for the Australian population:

1. Does poor health lead to unaffordable housing? And
2. Does unaffordable housing influence individual health?

METHODS

This paper is based upon a quantitative analysis of two large surveys which measure aspects of housing and health in the Australian population. Though a range of datasets can be used to measure housing affordability or health across the Australian population, few reliable large-scale datasets allow the measurement of both housing affordability and health characteristics. This analysis is therefore based upon two large datasets: the General Social Survey (GSS) and the Household, Income and Labour Dynamics in Australia (HILDA) survey. Together, these provide information which allows us to explore the unaffordable housing and health relationship

The GSS is a large-scale Australian Bureau of Statistics survey specifically designed to provide reliable estimates at the national level and for each state and territory. It collects data on a range of personal and household characteristics of people aged 18 years and over resident in private dwellings, throughout non-remote areas of Australia every four years. The most recently available dataset, collected in 2006, provides data on a nationally representative sample of 13,375 households (ABS 2006). The GSS was used in this analysis to measure unaffordable housing characteristics across a number of population characteristics.

The HILDA Survey is a household-based longitudinal survey conducted annually since 2001 (Watson 2008). It collects a wide range of data on households and the individuals living within those households by surveying adult members of participating households every year via face-to-face interview and a self-completion questionnaire. For this analysis we examine demographic, socio-economic, housing and health data collected between 2001 and 2007 from 12,968 survey respondents (59,233 observations over seven survey waves). The HILDA dataset was used to examine our primary research questions on the relationships between housing and health. Because it is a longitudinal survey, the HILDA dataset also provided us with the ability to examine whether poor health in preceding years predicts current unaffordable housing, and whether unaffordable housing predicts physical or mental health after taking into account prior health status. In other words, the longitudinal nature of the data allowed us to look at possible causality in both directions between housing affordability and health.

In order to assess housing affordability across individuals and their households, two measures of housing affordability were used in this analysis. The first was housing unaffordability which used the well established 30/40 rule, where individuals living in households with an income in the lowest 40 per cent of the national income distribution, and paying more than 30 per cent of equivalised disposable household income in housing costs (rent or mortgage), were classified as being in unaffordable housing. This ratio approach has been widely used in Australian research and policy, (National Housing Strategy (1992); Harding et al (2004); Commonwealth of Australia (2008); Seelig & Phibbs (2002)) and shown to be a robust measure allowing housing affordability to be examined over time (Nepal et al 2010). The HILDA dataset was used to derive this measure and the prevalence in the Australian population was estimated for 2006. A second measure, housing stress, was chosen to reflect self-reported housing affordability problems. This was based on responses to a question in the GSS, which asked respondents if they had had difficulty in paying rent or mortgage and utilities (electricity, gas, telephone bills) in the past 12 months. The prevalence of housing stress was also estimated for 2006.

In order to examine health broadly, three measures of health were used:

1. Self-assessed health: An overall measure of health, in which an individual rated his/her health on a five-point scale from 1=excellent to 5=poor.
2. and 3. Physical and Mental Health: Both assessed using the widely recognised Short Form 36 (SF-36) tool, which takes responses to 36 questions about health and collapses these to subscales measuring different aspects of health. These are then used to calculate separate summary scores for mental and physical health, both of them on a standardised scale from 0–100. A higher score reflects better health

Prevalence estimates were calculated using survey estimation commands in Stata 11.0, and weighted to the Australian population. To examine demographic and socio-economic predictors of unaffordable housing, we used logistic regression models, adjusted for age. To examine poor health as a predictor of unaffordable housing, we averaged health scores across the previous three years and then included quintiles of this average score in a logistic regression model adjusted for age, sex, country of birth, educational attainment, highest occupation level in household, disposable income and household structure. These models estimated odds ratios (and 95% confidence intervals) for the association with unaffordable housing for each quintile of health relative to the healthiest quintile (top 20% of scores). To examine unaffordable housing as a predictor of physical and mental health, we included unaffordable housing in a linear regression model of health scores adjusted for baseline health, age, sex, country of birth, educational attainment, highest occupation level in household, disposable income and household structure. Regression coefficients obtained from these models represent differences in SF-36 summary score comparing individuals living unaffordable housing with those living in affordable housing.

DESCRIPTIVE RESULTS

Based on our analysis of HILDA data, just below 6 per cent of Australian adults (around 780,000 individuals), are living in households that are both low income and paying a large proportion of income in rent or mortgage costs (Table 1). This overall prevalence is consistent with previous findings using the same measure (for example, ABS, 2004, Catalogue No. 1370.0). We further find that the prevalence of unaffordable housing is slightly higher within urban Australia, than Inner Regional areas. More remote parts of Australia have a lower prevalence. Interestingly in this table, we show that while around 6 per cent of households are strictly defined as being in unaffordable housing, much higher proportions (more than double) report that they had been unable to meet mortgage, rent or household bill payments on time in the

last 12 months. Table 1 shows that this is around 12 per cent, or almost 2 million Australians reported experiencing this form of housing stress.

TABLE 1: ESTIMATED PREVALENCE OF INDICATORS OF UNAFFORDABLE HOUSING BY SEX & LOCATION, 2006.

	Unaffordability (30/40 rule) ^a	Housing stress (unable to pay rent, mortgage, bills on time in past 12 months) ^b
All	5.6	12.1
Urban/rural		
Major city	5.90	11.97
Inner regional	5.58	11.28
Other (Outer Regional, Rural, Remote)	4.09	14.70
Estimated number of individuals in Australian population	779,764	1,853,900

^a Household Income and Labour Dynamics in Australia (HILDA) Survey

^b General Social Survey (GSS)

While it is relatively well established that around 6 per cent of the Australian population are classified as being in unaffordable housing, what is less well established is the makeup of that 6 per cent. The following table (Table 2) highlights the variation of prevalence across age and tenure for the Australian population. Most striking in this table is the very high proportion of private renters, across all age cohorts, who are in unaffordable housing. A quarter of young private renters, and more than half of all older renters are both low income and paying high proportional costs for their housing. Many public renters, who would be expected to be largely protected from unaffordable housing costs by the capping of rents in many jurisdictions, are nevertheless shown to be vulnerable to unaffordable housing. Across each age cohort there was a proportion of public renters in unaffordable housing, but this was most pronounced among older public renters, where prevalence was 13 per cent higher than for the whole older population. Compared to the prevalence of unaffordable housing for renters, those in ownership/with mortgages are substantially less likely to be in unaffordable housing. Within this group, those aged 65+ were about 9 times less likely than others in the same age cohort to be in unaffordable housing

TABLE 2: ESTIMATED PREVALENCE OF HOUSING UNAFFORDABILITY BY TENURE TYPE & AGE GROUP, 2006

Age (years)	% IN UNAFFORDABLE HOUSING			
	Owner	Private rental	Public rental	All
18-24	2.49% (1.22 - 4.99)	24.73% (20.32 - 29.74)	6.51% (2.19 - 17.82)	9.13% (7.39 - 11.23)
25-64	3.03% (2.30 - 3.97)	14.04% (11.17 - 17.49)	7.31% (4.10 - 12.70)	5.30% (4.39 - 6.40)
65+	0.50% (0.19 - 1.27)	50.17% (36.86 - 63.46)	17.72% (11.56 - 26.21)	4.66% (3.56 - 6.08)

Beyond tenure, a number of socio-economic and demographic factors appear to influence the prevalence of unaffordable housing. Table 3 shows age-adjusted odds ratios for the association between each of a number of such factors, and unaffordable housing. (Findings in bold are differences between groups that are less than 5% likely to be due to chance.) For example, women are shown to have one third greater odds of experiencing unaffordable housing than men; migrants from non-English speaking countries have double the odds of those born in Australia. Aboriginal and Torres Straight Islanders (ATSI) have almost twice the odds of experiencing unaffordable housing than the non-ATSI population, although this difference is not statistically significant, possibly due to their underrepresentation in the sample. Of particular interest in this table are the results examining household structure where very high odds ratios are evident. Compared to couple households with children, single parent households have nine times the odds of being in unaffordable housing, and the odds for those living alone are 7-fold higher. Such stark differences are also evident when

employment is used as a predictor. Compared to people in permanent full-time employment, all other categories within the workforce were more likely to be in unaffordable housing, and the odds of experiencing unaffordable housing were 15-fold higher for the currently unemployed. Educational attainment and occupational status were also similarly strong predictors of being in unaffordable housing.

TABLE 3: DEMOGRAPHIC AND SOCIO-ECONOMIC PREDICTORS OF UNAFFORDABLE HOUSING

Demographic predictor	Unaffordable Housing OR (95% CI)	Socio-economic predictor	Unaffordable Housing OR (95% CI)
Sex		Employment arrangements	
Male	1.00	Permanent FT	1.00
Female	1.38 (1.13, 1.69)	Permanent PT	2.46 (1.79, 3.39)
Country of birth		Casual FT	3.52 (2.22, 5.56)
Australia	1.00	Casual PT	6.87 (5.18, 9.12)
Main English speaking	1.08 (0.78, 1.50)	Fixed term	1.54 (1.04, 2.29)
Other	2.04 (1.52, 2.72)	Labour hire	2.48 (1.33, 4.62)
Indigenous status		Self-employed	4.56 (3.12, 6.65)
Non-ATSI	1.00	Unemployed (excl. NILF)	15.27 (10.82, 21.56)
ATSI	1.97 (0.97, 4.02)	Educational attainment	
Household structure		Bachelor or higher	1.00
Couple + child	1.00	Diploma, Certificate or Yr 12	3.14 (2.36, 4.17)
Couple	0.92 (0.71, 1.17)	Yr 11 or below	5.14 (3.78, 6.99)
Single + child	9.13 (6.93, 12.02)	Highest occupation in household	
Single	7.02 (5.39, 9.13)	Professional	1.00
Other	1.07 (0.62, 1.82)	White collar	2.26 (1.84, 2.78)
		Blue collar	3.53 (2.81, 4.44)
		Not in labour force	17.22 (13.58, 21.83)

Relative odds (95% confidence intervals) ; adjusted only for age
Associations significant at 95% level are in bold

ANALYTICAL RESULTS 1

This part of the analysis was focussed on the first research question: Does poor health lead to unaffordable housing? We examined general self assessed health, as well as mental health and physical health alongside individual housing affordability to determine if there was an association between health status and housing affordability outcomes. We anticipated that those with worse health across the measures would be more likely to experience poor housing affordability.

As shown in Table 4, worse health is related to a higher prevalence of being in unaffordable housing. Compared to almost 10 per cent of individuals with Excellent/Very good health, almost 15 per cent of individuals with health rated as Fair/Poor were in unaffordable housing. These results were even more pronounced when we considered self assessed general health in relation to the prevalence of housing stress. Here almost one third of individuals who rated their health as Fair/Poor had been unable to pay one or more bills, rent or mortgage in the preceding year, compared with only a fifth with Excellent/Very good health.

TABLE 4: UNAFFORDABLE HOUSING AND SELF-ASSESSED GENERAL HEALTH

	Self-assessed general health (% of people)		
	Excellent/Very good	Good	Fair/Poor
Affordability			
Unaffordability (30/40 rule) (a)	9.7	5.0	14.5
Housing stress (unable to pay rent,	20.1	14.2	32.9

mortgage, bills on time in past 12 months)^b

^a Prevalence estimates from HILDA (2006) using population weights.

^b General Social Survey (GSS)

The previous section highlighted some specific population groups with much higher prevalence of living in unaffordable housing (for example, single parents, the unemployed). We therefore, in this analysis, attempt to control for those socio-economic and demographic effects, and isolate a health/housing affordability relationship, independent of such compositional effects. In Figure 1 we show the relative odds of being in unaffordable housing by prior average mental health (SF-36 Mental Component Summary (MCS) score 3-year averages). We find that, compared to those in the top 20 per cent of the mental health distribution over the previous three years, those reporting the poorest mental health (in the bottom 20 per cent) had almost double the odds of being in unaffordable housing (OR=1.78, 95% CI: 1.23 – 2.58), independent of demographic and socio-economic factors. All other quintiles had ORs greater than 1, but 95% confidence intervals did not exclude the null (i.e. were not statistically significant) (Figure 1). Somewhat interestingly, when the analysis was repeated for prior average physical health (SF-36 Physical Component Summary (PCS) score 3-year averages) we found no evidence of an association between prior physical health and housing affordability (not shown).

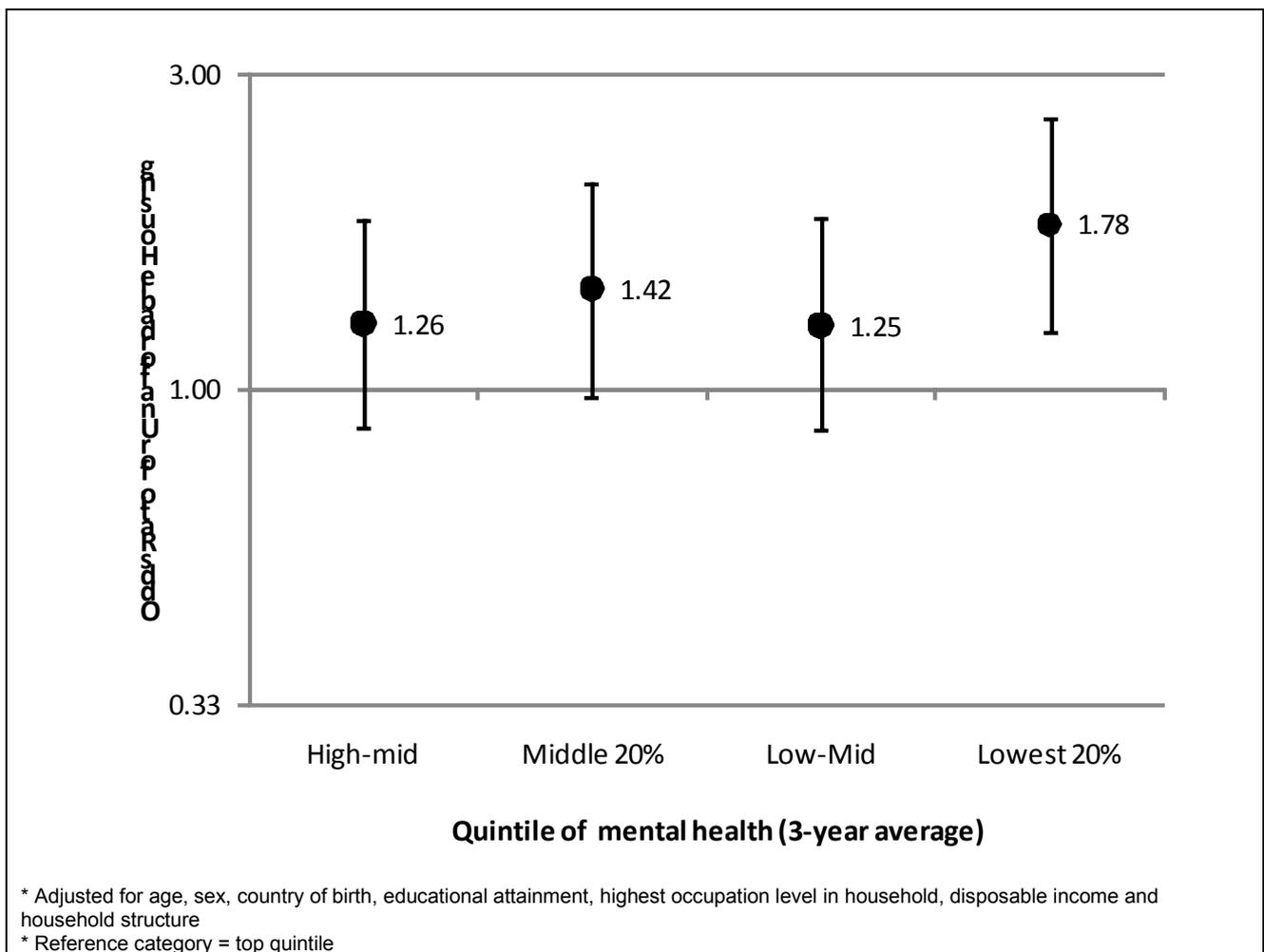


FIGURE 1: RELATIVE ADJUSTED* ODDS OF BEING IN UNAFFORDABLE HOUSING ASSOCIATED WITH PRIOR AVERAGE MENTAL HEALTH (QUINTILES OF 3-YEAR AVERAGE OF SF-36 MCS SCORE)

ANALYTICAL RESULTS 2

In order to examine the relationship in the reverse direction, our second research question sought to establish the degree to which unaffordable housing might be an independent predictor of mental and

physical health. Table 5 presents the results of the regression analysis. Models were adjusted on the basis of the results of the earlier analysis, which showed some groups especially predisposed to poor housing affordability. Adjustment allowed us to control for these factors and look at the extent to which housing affordability is an independent predictor of health (i.e. to isolate the effect of housing affordability above and beyond other influences). In this analysis we also controlled for the effect of baseline health (i.e. mental or physical health in the previous year) to isolate the effect of housing affordability on current health independent of an individual's prior health status. Following these adjustments, a highly significant relationship between mental health and unaffordable housing was evident, overall, as well as for men and women separately.

We found that individuals living in unaffordable housing had, on average, an SF-36 mental health score 1.16 points lower than individuals not in unaffordable housing (95% CI: -1.55 to -0.77). This association was stronger for women than for men, but remained statistically significant at the 95% level for both genders. The association with physical health was of a smaller magnitude (-0.47, fully adjusted). Stratified by gender, adjustment for socioeconomic factors and household structure attenuated any statistically significant associations that existed in unadjusted models. Similar to the results of the previous analysis discussed, though a small effect was observed for physical health, once results were stratified by gender, we found no significant results for physical health.

TABLE 5: UNAFFORDABLE HOUSING AS AN INDEPENDENT PREDICTOR OF MENTAL & PHYSICAL HEALTH, BY GENDER

	Adjusted* mean difference in SF-36 health score associated with unaffordable housing (95% confidence interval)
<i>Mental health</i>	
All	-1.16 (-1.55, -0.77)
Males	-0.59 (-1.17, -0.01)
Females	-1.26 (-1.80, -0.72)
<i>Physical health</i>	
All	-0.47 (-0.81, -0.13)
Males	-0.18 (-0.70, 0.33)
Females	-0.40 (-0.87, 0.07)

* Adjusted for age, country of birth, baseline mental/physical health, educational attainment, highest occupation level in household, disposable income and household structure.

** Associations significant at 95% level are in bold

DISCUSSION AND CONCLUSION

This paper has sought to explore two important questions affecting Australians and the formulators of policy within this jurisdiction:

1. Does poor health lead to unaffordable housing? And
2. Does unaffordable housing influence individual health?

We first note that there are strengths and limitations of this initial study. The basic analysis is based upon two large and high quality national datasets, one longitudinal and one cross-sectional, allowing us to model change in mental health predicted by change in housing affordability, as a result we are able to infer cause as well as control for confounding. We also note that housing affordability is a closely related to income, an issue we have more extensively explored in other published research (Bentley et al 2011) where we found a small but significant association between poor housing affordability and mental health for low to moderate income groups in Australia but not for high income groups.

While the effect sizes estimated in this paper are modest, we nonetheless argue that small effects are still of public health importance when they are experienced by large numbers of people. Our understanding of the relationship between unaffordable housing and health might be sharpened with more comprehensive measures of poor housing affordability; for example, indicators which take into account mortgage or rent arrears, generational wealth, tenure, transport costs associated with location of housing and the cost of heating and cooling housing. We also note that our analysis is based upon a dichotomous exposure

measure. Though we are mindful of the importance of assessing exposure using a policy relevant measure, we also note its limitation in revealing variation either side of the 30% cut-off.

Overall, our findings show clear evidence of a bi-directional relationship between housing affordability and health in Australia. We find that health appears to influence affordable housing outcomes, and housing affordability predicts health outcomes. Importantly our findings also hold when other confounding factors have been accounted for. While this overall finding may confirm many people's intuitive belief about the housing affordability and health relationship, the value of this research rests in the detail of the relationship. Our descriptive results add to a growing pool of research that shows unaffordable housing to be unevenly experienced in Australia, with some groups especially vulnerable. These findings provide new information on the dramatic scale of vulnerability among Australians, and key indications for policy makers and service providers. Striking among these findings, we see that more older private renters live in unaffordable housing than live in affordable housing. Further, children living with a single parent are nine times more likely than children living with two parents to be in unaffordable housing.

While only around 6 per cent of the population are classified strictly as experiencing unaffordable housing (based upon the 30/40 rule), a much higher proportion (around 1 person in every 8) experienced housing-related financial hardship. This finding highlights the importance of housing as a principle household expenditure, and as previous research has well established, high housing costs are likely to cause lower income individuals to trade-off other essential non-housing expenditures (Thomson, H. et al, 2003; Anderson et al 2003). It also suggests that well established 30/40 definition of unaffordable housing may fail to capture a number of households for whom housing costs are a cause of disadvantage.

Also of particular interest in these findings is the dominance of mental health rather than physical health in the interaction with affordability. Across both of the research questions (directions of the relationship), this finding may be unsurprising. We suggest that one partial explanation may be a slight bias in the protections provided by the welfare system towards individuals with physical, rather than mental health problems. The gender stratified results also show that Australian women experience a greater relative mental health effect of being in unaffordable housing than men. This has obvious implications as women are also much more likely to be in unaffordable housing.

This study reinforces the role of housing affordability in the provision of a standard of living adequate for health and wellbeing. Overall, this research provides robust, current evidence of a fundamental bi-directional connection between housing affordability and health (especially mental health). While this may be an intuitive 'no-brainer' to many in the research and policy community, it is a bi-directional connection that is often missing at the policy and program level in Australia. This work reinforces the idea that housing really is health's business, and health is housing's business. This means that responses to address the problems of poor housing affordability in Australia need to be aimed at both traditional housing affordability measures (such as rent or mortgage assistance), but also at broader more integrated health and housing services that may minimise cost burdens, improve mental health, or even provide residential security.

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