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¹ This paper uses unit record data from Journeys Home: Longitudinal Study of Factors Affecting Housing Stability (Journeys Home). The study was initiated and is funded by the Australian Government Department of Social Services (DSS). The Department of Employment has provided information for use in Journeys Home and it is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to DSS, the Department of Employment or the Melbourne Institute. In addition, this paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.

² This paper has received useful feedback from colleagues and participants in seminars at Infrastructure Victoria.

Abstract

In this paper we take the first steps to providing parameters for use in the cost benefit analysis of investments in social housing by estimating its effects on outcomes for individual residents. This is done by applying statistical matching methods to the Journeys Home dataset to provide new estimates of the impacts of social housing on employment, education, health, incarceration and homelessness. We find placing an individual, vulnerable to becoming homeless, in social housing means they are less likely, compared with other similarly individuals not in social housing, to become homeless. Hence, social housing is providing an important 'safety net' for people vulnerable to homelessness. We also find that in the short run individuals in social housing have similar outcomes in terms of employment, education, physical and mental health, and incarceration to similarly disadvantaged individuals not in social housing. These results are potentially due to strict targeting of individuals into relatively limited available spots in social housing and the averaging across cohort specific effects. The long run impacts, for some cohorts, may differ but analysing this requires longer datasets.

Introduction

Social housing is rental housing managed by governments (public housing) or by community sector organisations (community housing) to assist certain individuals and families on low incomes in obtaining secure and affordable accommodation that they would otherwise not be able to access through the private market. As it is thought that a 'lack of adequate and affordable housing contributes to housing stress and homelessness, and is detrimental to people's physical and mental health (SCRGSG 2017, G.11)' it is generally assumed that providing social housing to vulnerable individuals and families will result in improvements in life outcomes. However, there currently isn't a generally accepted set of parameters valuing these improvements that is immediately usable in cost benefit analysis when investing in social housing (Infrastructure Victoria, 2016b).³ As part of Infrastructure Victoria's research program on improving the measures of the costs and benefits associated with infrastructure, we have sought to estimate some effects on individuals of being in social housing as a first step to generating parameters for use in cost benefit analysis.

Hence, in this paper we provide new estimates of the impacts of being in social housing on a number of outcomes highlighted in Infrastructure Victoria (2016b) as important for social participation and wellbeing: employment, education, physical and mental health and the likelihood of incarceration and homelessness. We apply a quasi-experimental approach to compare outcomes of each of these dimensions for social housing residents with similar individuals chosen by matching methods. It is the outcomes of the control group that provides the counterfactual required for estimating the treatment effect or impact of being in social housing. A suitable control group is essential as there is limited provision of social housing in Australia, compared with Europe (Scanlon et al, 2015), so it is

³ See Australia Transport Council (2006) for an example of parameters for cost benefit analysis for transport projects.

rationed to the most disadvantaged. The primary dataset we draw on to construct the treatment and control groups is Journeys Home which surveys a nationally representative sample of Centrelink income support recipients, identified as being vulnerable to homelessness, and tracks them via six waves over a three-year period. Using this dataset, we compare outcomes of people in social housing with the outcomes of similar people not living in social housing over the same period.

We find that placing an individual, from Journeys Home, in social housing means they are much less likely, compared with other vulnerable individuals not in social housing, to become homeless. Hence, it is providing a 'safety net' for people vulnerable to homelessness which is an important benefit. We also find that in the short run individuals in *Journeys Home* living in social housing have similar outcomes in terms of employment, education, physical and mental health, and incarceration to similar individuals not in social housing. This is potentially due to strict targeting of individuals into relatively limited available spots in social housing and averaging across cohort specific effects. However, this work also highlights that there may be dimensions not captured in Journeys Home or other datasets like HILDA that may be affected by being in social housing. In particular, we do not specifically observe the long run impacts of being in social housing or the impacts, in general, of going into social housing on children.

In the next section we provide more background on the social housing system in Australia. This is followed by a review of the literature on the impacts of going into social housing within Australia. We then introduce the data, approach to modelling and discuss identification. This is followed by the results and a conclusion.

1. Background and Literature

2.1 Social Housing in Australia

Before proceeding, it is important to define the nature of social housing that we are considering. We are focussing on public housing, managed by the government, and community housing, managed by not-for-profit agencies. This housing is one part of a suite of policies aimed at supporting low income and vulnerable Australians. We treat this as a distinct objective from that of providing affordable housing which includes housing for first-home buyers or lower-middle income Australians.

To understand the results, it is worth noting four features about social housing in Australia (Groenhart, 2015; Productivity Commission, 2016; SCRGSG, 2017, Chapter 18).

1. Social housing is primarily delivered through public housing, owned and operated by state governments. There is a growing community housing sector which features non-government organisations (usually non-profit) operating social housing.

2. Despite being managed by state governments, funding for social housing is primarily derived from the Commonwealth Government of Australia. And this funding is part of a suite of policies, at both the commonwealth and state levels, aimed at encouraging access to more affordable and social housing. This can include rental subsidies and inclusionary zoning.

3. Like other welfare policies in Australia, social housing tends to be highly targeted. Although supply and selection processes vary across states and territories demand outstrips supply across the country, with strict and lengthy selection processes in all states and territories required for being granted access to social housing. Selection is increasingly being targeted to particular priority groups. Therefore, nationwide, residents are a particularly select and disadvantaged group of the population.

4. Exit rates from social housing tend to be relatively low and policies towards social housing have varied over the years. Hence, at any point in time, social housing includes a diverse set of residents. Different residents may have entered under different circumstances at different times. In addition, even while remaining in social housing, their circumstances may have changed e.g. transitioning from the labour force into retirement as they age.

The selection process implies that, in theory, it would be best if the control group is constructed by applying a similar selection process to similar individuals. As we do not observe the rules guiding the selection process for each state over time, we instead try to mimic this by modelling selection into social housing as a function of a range of characteristics, both historical and current.

2.2. What does the literature show on the impact of social housing?

As social housing systems across countries differ so much in terms of their relative size and in how housing is allocated we primarily focus on the Australian literature. But for comparison, we also consider some examples from the international literature, with attention to how the social housing systems may differ. The main literature on the quantitative impact of social housing is summarised in Table 1. In general, the results of this literature caution us to not to systematically expect significant changes from placing individuals in social housing – especially over short periods of time. Research finds that being in social housing does reduce the probability of becoming homeless. However, multiple studies find that being in social housing has either no effects or negative effects on employment. There is also relatively little evidence on the effects on health or education. We now review these results in more detail.

Beginning with the effects on employment, three types of data have been used to estimate the impact of social housing on employment – data collected administratively on residents in social housing and applicants for social housing; HILDA and Journeys Home; customised surveys yielding quantitative and qualitative data. Examples of analyses based on all three types of data are summarised in Table 1.

The work of the Productivity Commission (2015) is based on two types of administrative data: people on income support payments (ISP) from Centrelink identified as being in public housing and administrative data on public housing residents and applicants to go into public housing for South Australia and Western Australia.

In the raw Centrelink data, public housing residents are, on average, less likely to be employed than other income support payment recipients. However, no significant differences are found after controlling for observable characteristics and, using panel data techniques, unobservable characteristics. For example, among the observable characteristics, in comparison with other ISP recipients, public housing tenants are more likely to be disability support pensioners, older and, if a jobseeker, classified as facing significant barriers to getting work. Public housing tenants are also likely to have other characteristics that are typically associated with lower rates of employment but not observed directly in the data for this study, for example, drug and alcohol problems, mental health issues and criminal records. As long as these traits remain fixed over time, the panel data techniques will take into account these ‘unobserved’ effects. And when applied, there is no significant difference in employment outcomes for public housing residents.

With the administrative data from South Australia and Western Australia, a control group is constructed to examine the employment effects of entering social housing. The control group is those who remain on the waiting list. Significant positive effects on

employment are found for those entering public housing using a difference-in-difference model.⁴ The Productivity Commission is reluctant to interpret this as strong evidence of a positive impact due to limitations of the data which bias the results towards finding a positive outcome. That being said, some additional analysis using this data finds a positive relationship between employment and housing stability, consistent with a positive effect from entering social housing.

The second set of data utilised is from general population based surveys, like HILDA or Journeys Home. Feeny et al. (2012), analysing participants in labour market programs in HILDA, find no significant impact of being in public housing on employment outcomes. Wood, Ong and Dockery (2009) use the ABS Surveys of Income and Housing Costs to analyse participation rates for men and women. For men, declining participation rates from social housing residents are primarily associated with men in social housing having less human capital amongst other characteristics making them less employable. For women, the results are not as clear. Cigdem-Bayram et al (2017) simulates the effect of providing additional employment incentives to public housing residents but finds they have little effect on employment.

The final type of studies are more qualitative being based on case studies, interviews and customised surveys and as such are not necessarily representative of a broader population. Hulse and Saugeres (2008) highlight the barriers to taking up employment facing the 105 public housing residents interviewed in their sample at several sites in Victoria and New South Wales. Phibbs and Young (2005) report the results of two surveys of between

⁴ Dockery et al. (2008) perform the same sort of analysis using data for Western Australia and get similar results which they interpret as primarily evidence of welfare lock-in though they do recognise some positive effects of employment.

150 to 180 public housing residents in Brisbane. They found mixed responses regarding employment outcomes after going into public housing.

There is relatively little evidence on other outcomes such as health or education. Phibbs and Young (2005) find survey respondents reported improvements in health and the education of their children. Wood et al (2016) examined the effects of entering public housing in WA on health service usage of those formerly homeless. They find significant positive outcomes following entering social housing for health service usage (in that usage of health services declines once in social housing) for those formerly homeless. Although this work has an important advantage of measuring a health related outcome, it has three limitations. The most important of these is that there is no counterfactual in the analysis so we don't know what the health service usage was for those that didn't manage to enter social housing. In addition, health service use may not always be a good proxy for health. In some cases, people moving out of homelessness may be better off with more extensive treatment for certain health conditions like mental illness. Finally, social housing is not solely for the formerly homeless which limits the extent to which the findings can be generalised to other social housing residents.

There has been one study that looks at the effect of public housing on homelessness. Johnson, Scutella, Tseng and Wood (2017), who apply a different approach and focus on modelling the transition in and out of homelessness, confirm the protective effect of social housing. Those in public housing, in particular, are substantially less likely to enter homelessness than similarly vulnerable people in the private rental market.

We will also briefly cover the international literature. This is not only useful for comparisons but also, potentially, to suggest how impacts might be different if social housing in Australia was provided on a larger scale as suggested by, for example,

Infrastructure Victoria (2016a). Fitzpatrick and Stephens (2007) and Scanlon et al (2015) distinguish between roughly two groups of countries in terms of their provision of social housing. One group, whom Scanlon et al (2015) term universalist, provide social housing on a substantial scale (between 20 to 30 per cent of the housing stock) for a wide variety of households. The other group, whom Scanlon et al (2015) refer to as dualist, provide social housing, on a much smaller scale, specifically for low-income households. This latter group includes Australia and the United States.

Unfortunately, there are no broad studies of the impact of social housing for universalist systems. Most studies that have been done are on the United States. US housing policies, including social housing, have most recently been reviewed in Olsen and Zabel (2015). This review concludes that housing assistance, including social housing, tends to reduce employment participation. There have been relatively few studies on the impacts on health which have mainly found no significant or substantial effects. There doesn't appear to have been a study of the effect of social housing specifically on homelessness.

Another set of useful evidence has come from a set of programs that provide housing (not necessarily social housing), accompanied by more intensive support services, for the chronically homeless – referred to as “Housing First” (Kertesz and Johnson, 2017). Kertesz and Johnson’s review reports, subject to some concerns about how the programs were carried out and evaluated, that this approach appears to reduce the extent of homelessness but that it has been hard to find statistically significant positive effects on physical or mental health. They suggest the latter may be because either that benefits may take longer to arrive than the typical evaluation period (1-2yrs) or that the sample includes significant numbers of people whose condition is unlikely to improve, even with housing.

2. Econometric framework and data

In this section, we introduce the econometric framework used to analyse these questions. This is followed by an introduction of the two datasets we use to estimate the impacts and analyse their robustness. We conclude with a discussion of the threats to identification when estimating the impacts and how we attempt to deal with them.

3.1 Econometric framework

We adopt a quasi-experimental approach to estimating the impact of social housing. The first step is to characterise living in social housing as a treatment. The next step is to construct a control group for those observed in social housing. Outcomes are then compared so to estimate the average treatment effect on the treated (ATET) as follows:

$$\begin{aligned} \text{ATET}_{\text{SH}} &= E[(Y_{\text{SH}i} - Y_{0i}) | T_i = \text{SH}] = E[(Y_{\text{SH}i}) | T_i = \text{SH}] - E[(Y_{0i}) | T_i = \text{SH}] \\ &= E[(Y_{\text{SH}i}) | X=x, T_i = \text{SH}] - E[(Y_{0i}) | X=x, T_i = 0] \end{aligned}$$

where: $Y_{\text{SH}i}$ refers to the outcome of each i social housing resident while in social housing, and Y_{0i} provides the counterfactual, i.e. the outcome of each social housing resident i if they hadn't been subject to the treatment. Since the counterfactual outcome for each individual is not observed, it is not possible to calculate $E[(Y_{0i}) | T_i = \text{SH}]$. This is replaced by the average outcome of the matched non-treated (control) group $E[(Y_{0i}) | X=x, T_i = 0]$. Then we can estimate the ATET.

In addition to comparing residents and non-residents of social housing, we also compare the ATET for entrants into social housing with matched individuals who do not enter social housing. As discussed in more detail below, this is to address the threat to identification by including in the treatment group individuals selected into social housing under different selection processes (or with a different time to be affected by living in social housing) such that they have different unobservable characteristics.

Note though that the interpretation of the results from these two approaches is subtly different. When comparing residents with non-residents, the differences will be in the probability of achieving each outcome relative to that in the control group. When comparing entrants with non-residents, the way to interpret these values is that the estimates represent a net gain in the outcome in question for entrants to social housing relative to the matched control group. A negative treatment effect therefore represents a net loss in the outcome relative to the control group; that is that either the improvement in the outcome was smaller than the average improvement for the control group or that there was a larger deterioration in the outcome in question for entrants than there was for the control group on average.

3.2 Data Sources

There is no survey that is designed to focus on social housing residents accompanied with a matching control group. Instead we draw on two surveys which include, to differing degrees, individuals who are in social housing and those who are potentially eligible for living in social housing.

The primary data source for this paper is Journeys Home. Journeys Home (hereafter JH) is a nationally representative longitudinal survey of a sample of particularly disadvantaged adults. The sample is drawn from a population of Centrelink customers that have been identified as vulnerable to being homeless. There are six waves between 2011 and 2014. For further detail of the JH survey see Wooden et al (2012) and Scutella, Tseng and Wooden (2017).

The individuals represented in the JH survey are likely to be more similar to individuals who recently entered social housing, due to their particular vulnerability.

However they may not necessarily be representative of most social housing residents per se. In particular, it does not include any children or youth under the age of 18 years old.

Therefore, to check the robustness of our results, we also use the HILDA dataset. HILDA is a nationally representative household longitudinal survey of individuals who are at least fifteen years old. The survey features fifteen waves between 2001 and 2015. Although the survey includes a wide range of questions relevant to our research questions, not all questions are asked in all waves. For further detail on the HILDA survey see Watson and Wooden (2012). The individuals in the HILDA survey are drawn from the general public so, they are less likely to be similar in terms of their unobservable characteristics in terms of their vulnerability to those entering and living in social housing. HILDA also does not include any children or youth under the age of 18.

3.2.1 Outcomes, treatment and control groups

The treatment analysed in this paper is residing in social housing, as defined in Table 2. If a person lives in either public or community housing, then they are recorded as living in social housing.

The outcomes we consider are also defined in Table 2. The outcomes fall into four groups consistent with the approach taken in Infrastructure Victoria (2016b). These are employment, education, physical and mental health. In addition, we take advantage of the focus of JH on people at risk of homelessness to consider two additional outcomes: homelessness and incarceration.

The outcomes, as measured, differ to the extent that they can quickly respond to treatment. Employment and some of the health measures can potentially change relatively quickly as a response to entering social housing. The level of education will be affected by decisions made in the past, though it can improve.

For the main Journeys Home analysis, the control group is selected from all surveyed individuals not in social housing at the time. No further restrictions are undertaken because, to be surveyed in Journeys Home, the individual must have been determined to be at least vulnerable to becoming homeless. As being homeless is one of the factors (but not the only factor) that can result in an individual obtaining priority access to housing, this makes it more likely that individuals in Journeys Home have the required characteristics that would make them, at least in principle, eligible for social housing.

The specific control group is constructed using a Nearest Neighbour method. Specifically, each individual in the treatment group is matched to its nearest neighbour by minimising a weighted function of the differences between selected covariates using the Mahalanobis Distance Method(MDM).⁵ These covariates are listed in Table 3.

The first step of our robustness analysis is to construct an alternative control group using Propensity Score Matching (PSM).⁶ There are three stages in propensity score matching:

1. Estimate the probability of being observed in the treatment group by using a probit. This is referred to as the propensity score. The set of variables we use in the probit are the same covariates that were used previously as listed in Table 3.
2. Use a rule to construct matching observations for the treatment observations, subject to the treatment and controls having a common support. This is done with replacement. Because JH (and HILDA) are longitudinal surveys we also need to confine matching within waves to avoid potential issues with unobservable

⁵ To do this we use the Stata `teffects nmatch` command.

⁶ To do this we use the user written `Psmatch2` command with kernel estimator, and bootstrap the standard errors.

characteristics varying over time and practically to prevent matching individuals with themselves over time.

3. Check the extent to which the resulting treatment and control groups are similar in the mean values of their observable characteristics (this is referred to as balancing). If they are not sufficiently similar, then change the specification in stage 1 and start again until the treatment and control groups are balanced.

The second step of our robustness analysis is apply the same steps above to, where available, equivalent variables from HILDA. The list of outcome variables, covariates, definitions, descriptive statistics and preliminary results are reported in Tables A.4 to A.8 in the appendix. Although we analyse the HILDA dataset following the same steps as outlined above for the JH dataset there are three important differences. First, HILDA does not include variables that measure homelessness or incarceration, so the analysis of these outcomes can only be done with JH. Second, the set of covariates in JH is more specific to those that are particularly vulnerable to homelessness. This enables better matching of individuals between the treatment and control groups. This is another reason why we use JH for the main analysis and HILDA for robustness. Third, the control sample from JH is from all individuals not in social housing at each point in time whereas that from HILDA is restricted to low-income renters. These are individuals in private rental with income of less than \$40,000 at any point during the sample period.

3.2.2. Descriptive Statistics

Definitions and descriptive statistics on the variables from JH listed in Table 3 are presented in Table 4 and Table A.1 in the appendix. Table 4 primarily includes the variables for which there is a substantial difference between the treated and control samples and Table A.1 contains the rest. Comparing Tables 3, 4 and A.1 shows that for many covariates

there are not substantial differences, on average, between the treatment and control groups. So the discussion for the remainder of this section focuses on those variables in Table 4 for which there are substantial differences.

Table 4 demonstrates that, in terms of their demographics and human and social capital, social housing residents tend to be older, are more likely to be Aboriginal or Torres Strait Islanders, have lower levels of education, be more likely to have a long-term health condition or disability, and not be in the labour force than their counterparts not in social housing. In terms of their history of adversity, they are more likely to have been in state care as a child (30 per cent vs 25 per cent) and have had a history of sleeping rough (81 per cent vs 65 per cent) than similarly vulnerable non-social housing residents. In terms of risky behaviour, social housing residents are slightly more likely to have injected illegal substances in the last six months. Finally, in terms of their financial experience, they also tend to have a more extensive history on Centrelink income support payments with social housing residents on average spending 78 per cent of the previous five years on income support compared to 63 percent of the previous 5 years on income support for non-residents, and substantially longer current spells on payments (74 months vs 49 months). They also tend to have smaller debts and are less likely to be on the Newstart or youth allowances but more likely to be on a disability support pension.

3.3 Identification

There are three sets of threats to identification of the treatment effects from our approach. Each set can result in there being unobserved heterogeneity amongst the treatment group. If the treatment group pools individuals with different personal characteristics and different lengths and types of treatment, a single estimate of the treatment effect is potentially biased and inconsistent.

The first set of threats to identification is that we may not have adequately captured how individuals select themselves into social housing. The matching is done based on characteristics observable in the data. Although we are able to match a control group using a rich array of covariates, there are likely to be other unobservable personal characteristics leading to individuals being selected into social housing. People need to apply and we can't observe the decision making process underlying this. It could be that those who are more motivated to improve their lot apply (and thus motivated to improve their lot in life regardless of getting into social housing or not). Alternatively, as getting into social housing is so difficult, it could also be that only those with the most challenging of circumstances apply.

The second set of threats results from not being able to fully capture the process by which individuals are selected. The selection processes used by housing departments to allocate individuals into social housing undoubtedly differs across states. There is no way of knowing if this biases the results in any way. Selection processes have also changed over time. There has been a shift from public housing being primarily provided for low income workers to being provided for those with the greatest need for housing (Groenhart, 2015). We cannot, though, control for these changes in selection processes over time as we do not observe how long individuals have been in social housing.

In addition, once people have applied they will almost certainly spend some time on a waiting list. One advantage of this process is that any positive results are less likely to confuse treatment effects with recovery from temporary negative shocks leading to selection into the program, otherwise known as Ashenfelter's dip.

The third set of threats to identification come from the possibility that it takes time for the effects of living in social housing to occur even if individuals have identical

unobservable characteristics upon entering. This may be in part due to accessing services that they have not been able to do so while, for example, homeless. Though in Australia it is generally not the case in public housing, and to some extent in community housing, that there is strict and exclusive tying of housing and services. This means individuals in the control group with similar needs to those in social housing may also be accessing similar services. But, again, without observing how long an individual has been in social housing, we cannot directly control for this.

We adapt our methodology in two ways to deal with these threats to identification. First, to allow for the time it takes for benefits from social housing to occur, we consider the value of the dependent variable, i.e. the outcome, at $t+1$ whereas the treatment and any controls are at t .⁷ So we allow for a six month to year-long lagged effect. Limitations on the survey length for Journeys Home and the size of the treatment group prevent a more flexible analysis of the timing of effects.

Second, to reduce potential problems of different unobservable characteristics associated with different cohorts and different treatment effects from being in social housing for different periods of time we also analyse differences in changes in outcomes. Specifically, we consider changes in outcomes associated with changes in treatment status i.e. the changes in outcomes following moving into social housing. Note we are no longer able to compare outcomes for homelessness as the treated individuals, by definition, cannot be homeless. There is a further limitation on these results in that we can only measure short run impacts. This is due to the combination of the observation periods being only six to twelve months and our not being able to observe how long the individual has been in social housing after entry but before being observed.

⁷ This is also done to break the connection between the covariates used to identify a control group and the outcomes of interest.

3. Results

Results are presented in three stages. First, we analyse if the matching process selects a set of individuals for the control group that resemble the treatment group in social housing. Once we have established that we are confident that we have a suitable set of treatment and control groups, we then compare the differences in outcomes. Finally, we analyse the robustness of our results.

4.1 Characteristics of pre and post matched samples

Tables 5 and 6 demonstrate that the matching process has yielded a set of individuals for the control group similar to those in social housing in terms of their observable characteristics. The first three columns of Table 5 demonstrate that for multiple covariates, before matching, there are clear differences in the characteristics of social housing residents (the treated) with the control group as discussed in section 3.2.2. The fourth column demonstrates that these differences become much less apparent for most of these covariates once matching is performed. The standardised differences in the majority of cases are much closer to zero after matching than they were before matching.

Table 6 reports the results of a similar analysis for entrants to social housing. Again, the matching procedure appears to perform quite well with most covariate standardised differences closer to zero after matching than before being matched.

4.2 Main results

The estimated treatment effects of residing in social housing, using the Journeys Home data, are presented in Table 7. Here we see that the only outcome for which social housing has a statistically significant positive impact is in reducing the likelihood of becoming homeless. We obtain the same size and significance of effect regardless of the method used for constructing a control group. This treatment effect is also large; in the

period following social housing the probability of being homeless is around 0.13 lower for social housing residents relative to similar individuals not in social housing, who feature a homelessness rate of about 0.2. Thus social housing is providing people with more housing stability which is an important outcome. And the robustness of this result is supported by Johnson et al. (2017) finding a similar result despite applying a substantially different approach to the same data. However, as we now demonstrate, this stability doesn't seem to be translating to changing other outcomes.

We find no statistically significant robust impacts on employment, education, self-assessed mental or physical health using either matching method. We obtain negative treatment effects on incarceration and having a long-term health condition which are statistically significant at 10 per cent and 5 per cent. However, these treatment effects are not found to be statistically significant when using propensity score matching so we do not emphasise them.

Results for employment parallel the results achieved by the Productivity Commission (2015) using the Centrelink dataset. The Productivity Commission also reports lower employment rates among social housing residents when comparing averages across treatment and control samples (as we do in Table 5). But, once matching has taken place, which is broadly analogous to controlling for observable characteristics the differences disappear. Our results differ from those found in Productivity Commission (2015) and Dockery et al (2008) using the administrative data for South Australia and Western Australia. Our results are potentially stronger as we compare contemporaneous outcomes for the treated and controls rather than use data on controls reported upon application which, given the length of time individuals remain on waiting lists, may not be up to date. This doesn't rule out the possibility of positive impacts on employment for certain cohorts

but this would require more extensive data to analyse. Unlike the more qualitative analysis of Phibbs and Young (2005) we don't find an improvement in self-assessed health outcomes. It would be interesting to explore the changes associated with other health related outcomes, like in Wood et al (2016) but this data is not available in Journeys Home.

In Table 8, which reports the results from comparing changes in outcomes for those who have entered social housing to the changes in outcomes for those who did not, we see qualitatively similar results to those of Table 7. The differences in the changes in outcomes were statistically insignificantly different from zero for most outcomes examined. The only exception is the probability of improving educational attainment if the kernel based propensity score matching method is used. In this case, the probability of improving educational attainment for those who moved into social housing is 0.023 lower than that for those who didn't move into social housing. However, the effect is not robust as using the nearest neighbour method it is not statistically significant.

Therefore, in general, the results for the narrower sample of individuals, those entering social housing, are similar to those comparing those in social housing with those not in – there are no consistently statistically significant treatment effects for education, employment, incarceration or health.

The most likely explanation for these results is that access to social housing has, for some time, being highly targeted to the most vulnerable members of society. Their situation may be such that while they are better off being in social housing, this does not translate systematically into quick differential changes in employment or education due to age, family commitments, disabilities or other issues. Similarly, the physical or mental health conditions associated with their vulnerability to homelessness may remain even after entering social housing, even though their housing situation has become more stable. Another possibility is

that there may be cohort-specific effects that are being averaged out but may emerge in a more detailed analysis of a larger dataset.

4.3 Results using HILDA

The second stage of our robustness analysis is to repeat the analysis in the preceding section using individuals from a subset of the HILDA dataset. The variables we use are summarised in Tables A.4 to A.6 – the limitations of which have already been discussed. The next step is to discuss the outcomes of the matching process, which we report in Tables A.7 and A.8.

Table A.7 in the appendix demonstrates the matching procedure works quite well for constructing a control group for social housing residents in the HILDA dataset. Table A.8 shows though that the matching procedure does not work as well when constructing a control group for those HILDA participants entering social housing. Many of the standardised differences after matching are actually further from zero than they were prior to the matching procedure. This suggests we need to be more cautious about assigning the differences in outcomes to entering social housing for this case.

The results reported in Tables 9 and 10 show that using the HILDA data does not result in finding significant improvements in outcomes arising from social housing. Indeed, Table 9 reports that for physical and mental health, social housing residents have statistically significantly worse outcomes. And this finding is largely the same regardless of the matching methods used. Table 10 though finds similar results to Table 8. All of the treatment effects are significant except for one case. Using the nearest neighbour method, we find a significantly positive effect on education. As this result is not robust to matching method we do not emphasise it.

The much more negative results for social housing using the HILDA dataset, compared with the Journeys Home dataset are suggestive of two potential limitations of using HILDA to analyse outcomes associated with social housing. First, HILDA featured fewer covariates to undertake the matching. Hence, instead of picking up the effect of social housing we are instead picking up differences in the determinants of health status that are unobservable in the HILDA dataset but have been controlled for with participants in the Journeys Home dataset. In addition, there may also be other important unobservable characteristics of individuals that differ between social housing residents and other low-income renters in the HILDA dataset which do not differ across individuals in the Journeys Home dataset.

4. Conclusion

In this study we have taken some first steps in improving the cost benefit analysis of investment in social housing by estimating the impacts of being in social housing on individuals, identified as being vulnerable to homelessness, in Australia. We apply the latest and most comprehensive datasets, Journeys Home and HILDA, for analysing social housing in Australia to consider, simultaneously, the impacts of living in social housing on employment, education, physical and mental health, incarceration and homelessness. Using these datasets enables comparing the outcomes for existing and new social housing residents with similar individuals in the private rental market.

In general, we find placing a vulnerable individual in social housing means they are less likely, compared with other individuals also at risk of homelessness not in social housing, to become homeless. This demonstrates social housing's role as a 'safety net' for vulnerable Australians. In addition, in the short run, individuals in social housing are found to have similar outcomes in terms of employment, education, physical and mental health,

and incarceration to similar individuals not in social housing. This is most likely due to the highly targeted approach to selecting residents into a relatively limited supply of social housing and the averaging across of cohort specific effects.

These results appear to be robust. The result that social housing reduces the likelihood of homelessness is robust to using different matching methods to constructing treatment and control groups. The result that social housing has no robust positive effect on other outcomes also does not vary greatly by matching methods or whether we consider new or current residents.

These results all have parallels in previous and the contemporary literature. Johnson, Scutella, Wood and Tseng (2017) utilise Journeys Home to look at factors contributing to risks of entering homelessness. Social housing here, and public housing in particular, substantially lowered the probability that the vulnerable Journeys Home sample had of entering homelessness. The Productivity Commission (2015), as well as many authors, analysing Australian and international data, also fail to find strong positive treatment effects on employment. This could be because of the trend occurring, both in Australia and internationally, of social housing increasingly being allocated to those with the greater needs that simply providing housing, while of benefit, is not enough in itself to translate into improvements in other outcomes.

This work, in the context of previous research, is suggestive that there are several ways that research in social housing proceed. Before discussing them, it is important to note that all of them require new data that is currently not available to researchers. Probably the most important limitation of our work and the way in which future research could improve on is how the effects could vary across different groups living in social housing. For example, it may be the case that younger people may benefit in a different way by having stable

housing to support investing in education or holding stable jobs. Similarly, the effects could vary by the type of social housing. For instance, do low rise housing estates have more beneficial impacts compared to high rise estates? Does the mix of resident populations have an impact? Does the concentration of poverty in the immediate area matter? Finally, are the effects different across children, working age adults, and retired adults?

A second direction future research could take is to explore whether there are significant lags in impacts such that they are only seen for long-term residents? The Productivity Commission (2015) notes there is evidence of a link between housing stability and employment for income support recipients and that employment rates tend to increase on entry to public housing from waiting list. Matched administrative data might help analyse these questions.

Further research in both of these general directions would make a significant contribution to improving the ability of housing authorities across Australia to undertake cost benefit analysis of investments in social housing.

5. References

- Australian Transport Council (2006), *National Guidelines for Transport System Management in Australia, Volume 3: Appraisal of Initiatives*, Australian Transport Council, Canberra.
- Cigdem-Bayram, M., R. Ong and G. Wood (2017), 'A new look at the channels from housing to employment decisions', AHURI Final Report 275, Australian Housing and Urban Research Institute Limited, Melbourne.
- Dockery, A. M., R. Ong, S. Whelan and G. Wood (2008), 'The relationship between public housing wait lists, public housing tenure and labour market outcomes', AHURI Research Report No. 9.
- Feeny, S., R. Ong, H. Spong and G. Wood (2012), 'The Impact of Housing Assistance on the Employment Outcomes of Labour Market Programme Participants in Australia', *Urban Studies*, 39(4), 821-844.

- Fitzpatrick S., and M. Stephens (2007), *An International Review of Homelessness and Social Housing Policy*, Department for Communities and Local Government, UK.
- Groenhart, L. (2015), 'Employment of Public Housing Residents in Australian Cities', *Urban Policy and Research*, 33(3), 291-305.
- Hulse, K. and L. Saugeres (2008), 'Home life, work and housing decisions: a qualitative analysis', AHURI Research Paper No. 7, Australian Housing and Urban Research Institute, Melbourne.
- Infrastructure Victoria (2016a), 'Victoria's 30-year Infrastructure Strategy', available at <http://www.infrastructurevictoria.com.au/30-year-strategy>
- Infrastructure Victoria (2016b), 'From evaluation to valuation', Report available at <http://www.infrastructurevictoria.com.au/research>
- Johnson, G., Scutella, R., Tseng, Y., and Wood, G. (2017), 'How Do Housing and Labour Markets Affect Homeless Entry and Exits?', Unpublished manuscript.
- Kertesz, S. G. and G. Johnson (2017), 'Housing First: Lessons from the United States and Challenges for Australia', *Australian Economic Review*, 50(2), 220-8.
- Kessler, R., G. Andrews, L. Colpe, E. Hiripi, D. Mroczek, S-L. Normand, E. Walters and M. Zaslavsky (2002), 'Short screening scales to monitor population prevalences and trends in non-specific psychological distress', *Psychological Medicine*, 32 (6), 959-976.
- Leuven, E. and B. Sianesi (2003), 'PSMATCH2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing', <http://ideas.repec.org/c/boc/bocode/s432001.html>.
- Olsen, E. O. and J. E. Zabel (2015), 'US Housing Policy', chapter fourteen of *Handbook of Regional and Urban Economics*, edited by G. Duranton, J. V. Henderson and W. C. Strange, Elsevier, 887-986.
- Phibbs, P. and P. Young (2005), 'Housing assistance and non-shelter outcomes', AHURI Final Report No. 74, Australian Housing and Urban Research Institute, Melbourne.
- Productivity Commission (2015), *Housing Assistance and Employment in Australia*, Productivity Commission Research Paper, Canberra.
- Productivity Commission (2016), *Introducing Competition and Informed User Choice into Human Services: Identifying Sectors for Reform*, Study Report, Canberra.

- Scanlon, K., M. F. Arrigoitia and C. Whitehead (2015), 'Social Housing in Europe', *European Policy Analysis*, Swedish Institute for European Policy Studies, 17, 1-12.
- Scutella, R., Y. Tseng and M. Wooden (2017), 'Journeys Home: Tracking the most vulnerable', *Longitudinal and Life Course Studies*, 8(3), 302–318.
- SCRGSP (Steering Committee for the Review of Government Service Provision) (2017), *Report on Government Services, 2017*, Productivity Commission, Canberra.
- Watson, N. and M. Wooden (2012), 'The HILDA Survey: A Case Study in the Design and Development of a Successful Household Panel Study', *Longitudinal and Life Course Studies*, 3(3), 369–381.
- Whelan, S. (2004), 'An analysis of the determinants of labour market activities of housing assistance recipients', AHURI Final Report No. 70, Australian Housing and Urban Research Institute, Melbourne.
- Wiesel, I., H. Easthope, E. Liu, B. Judd and E. Hunter (2012), 'Pathways into and within social housing', AHURI Final Report No.186. Melbourne: Australian Housing and Urban Research Institute.
- Wood, G., R. Ong and A. M. Dockery (2009), 'The Long-run Decline in Employment Participation for Australian Public Housing Tenants: An Investigation', *Housing Studies*, 24(1), 103-126.
- Wood, L., P. Flatau, K. Zaretsky, S. Foster, S. Vallesi and D. Miscenko (2016), 'What are the health, social and economic benefits of providing public housing and support to formerly homeless people?', AHURI Final Report No.265, Australian Housing and Urban Research Institute, Melbourne.
- Wooden, M., A. Bevitt, A. Chigavazira, N. Greer, G. Johnson, E. Killackey, J. Moschion, R. Scutella, Y. Tseng and N. Watson (2012), 'Introducing Journeys Home', *Australian Economic Review*, 45(3), 368-378.

Table 1. Overview of literature

Author	Impacts considered	Data	Main results	Comments
Productivity Commission (2015)	Employment	Centrelink administrative data on all individuals receiving Income Support Payments (2000-2013)	No significant difference in employment outcomes after controlling for observable and unobservable differences	Public housing residents have lower employment rates driven, in part, by observable and unobservable differences.
Productivity Commission (2015)	Employment	Administrative data on public housing tenants and applicants in SA and WA (2004-2013)	Housing stability is associated with employment. There is no strong evidence of welfare lock on applicants	Welfare lock is where an individual reduces labour supply to stay on social housing waiting list.
Feeny et al (2006)	Employment	Individuals on labour market programs (2001-2006) HILDA	No significant effect of being in public housing	
Dockery et al (2008)	Employment	Administrative data on public housing applicants and tenants in WA (1999-2005)	Employment increases substantially upon entering social housing	Argue that the large employment effect is due substantially to ending the welfare lock effect of being on a waiting list but there is probably still a small positive effect on employment from being in public housing
Wood et al (2009)	Employment	All individuals (1982, 2002) ABS SIHC	Decline in employment for males due to characteristics, for female, unexplained.	Compares actual and average predicted employment probabilities
Cigdem-Bayram et al	Employment	All individuals 25 and over	Negligible effect on	Simulated effect of

Author	Impacts considered	Data	Main results	Comments
(2017)		HILDA (2001 – 2010)	employment participation – believe because tenants face other barriers	extension of Job Commitment Bonus to public housing tenants
Wood et al (2016)	Health	WA Department of Health data linked to a sample of individuals in public housing between 2009-2013. Supplemented with a survey of public housing tenants	Entering public housing is followed by a reduced usage (number, frequency and duration) of health care services compared to preceding 12 months.	No counterfactual group was examined
Wiesel et al (2012)	Qualitative experience of living in social housing	Interviews with 60 social housing residents	Main benefits are security of tenure and affordability	Other benefits stated to flow from this – but also some other problems.
Phibbs and Young (2005)	Health Employment Education	Survey of 150 public housing residents in Brisbane	Improvement in health found. Some positive and some negative effects Positive effects on children’s education	Survey
Hulse and Saugeres (2008)	Qualitative issues around employment	Interviews with 105 social housing residents	Highlights barriers to undertaking employment.	
Johnson et al (2017)	Homelessness	Journeys Home	Being in public housing substantially reduces the probability of becoming homeless	

Table 2. Treatment and Outcome measures

Treatment^a	Measures
Living in Social Housing	Living in Community or Public Housing, or not.
Outcomes^{bc}	
Employment	Employed vs Not employed
Education	Highest educational qualification 1 “University” to 9 “No schooling”)
Physical health	Self-assessed health (1 “Excellent” to 5 “Poor”) Activity limiting long-term health condition or disability (Yes, No)
Mental health	Kessler 6 item measure (K6) of psych distress (0-24)
Incarceration	An individual has been incarcerated in the observation period or not (i.e. between period t and t+1)
Homelessness	Homeless vs Housed ^d

a. Treatment at time t

b. Examine level of outcome at t+1

c. Examine change in outcome between t and t+1 (where 1=improvement, 0=no change, -1=deterioration) (excluding Homelessness)

d. Using cultural definition of homelessness.

Table 3. Covariates used to identify a control group by type

Type	Covariates
1. Demographic	Age, sex, ATSI, marital status, number of resident children, single parent, State, country of birth, urban vs non-urban
2. Human and social capital	Education level, long term health condition, mental health, labour force status, extent of social support, employment history (proportion of time employed since left school)
3. History of adversity	Ever in state care, family support in childhood, history sleeping rough, highest education of parents, exposure to violence
4. Risky behaviours	Ever incarcerated, ever injected illegal substances, drink alcohol at risky levels, daily smoker
5. Financial	Debt, proportion of last 5 years on Centrelink payments, duration of current spell on Centrelink payments, Centrelink payment type.

Table 4. Variable definitions and summary statistics of social housing residents vs other (Journeys Home dataset)

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
<i>1. Demographic</i>					
<i>Age group</i>	Age determined from date of birth				
15-24 years	Equals 1 if aged 15-24 years; and 0 otherwise	0.174	0.379	0.416	0.493
25-44 years	Equals 1 if aged 25-44 years; and 0 otherwise	0.487	0.500	0.399	0.490
45+ years	Equals 1 if aged 45 years plus; and 0 otherwise	0.339	0.474	0.184	0.388
ATSI	Equals 1 if identifies as Aboriginal or Torres Strait Islander; and 0 otherwise. Options are as provided in the ABS Census	0.267	0.443	0.167	0.373
Dependent children	Number of children under 18 years living with respondent	0.628	1.090	0.363	0.796
Single parent	Equals 1 if a single parent,; and 0 otherwise	0.047	0.211	0.199	0.399
<i>2. Human and Social Capital</i>					
Tertiary	Equal 1 if has a Certificate Level 3 qualification or higher recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.276	0.447	0.340	0.474
Year 9 or below	Equals 1 if has not completed Year 10 at school and has not completed any other AQF recognised qualifications; and 0 otherwise	0.242	0.429	0.152	0.359
Activity limiting long term health condition or disability	Equals 1 if reports a long-term health condition, impairment or disability causing restrictions in everyday activities, and has lasted or is likely to last, for 6 months or more; and 0 otherwise	0.584	0.493	0.419	0.493
<i>Labour force status</i>	Determined by a series of questions from the ABS Monthly Population Survey,				

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
	with the concept of “last week” replaced by “the last 7 days” , which follow international standards on labour statistics as set out by the International Labour Organisation				
Employed	Equals 1 if employed; and 0 otherwise	0.120	0.325	0.272	0.445
Unemployed	Equals 1 if unemployed; and 0 otherwise	0.185	0.388	0.267	0.442
NILF	Equals 1 if not in the labour force (NILF); and 0 otherwise	0.696	0.460	0.461	0.499
<i>3. History of adversity</i>					
Ever in state care	Equals 1 if reported being placed in either foster care or residential care before the age of 18; and 0 otherwise	0.299	0.458	0.250	0.433
Ever slept rough	Equals 1 if have ever experienced primary homelessness; and 0 otherwise	0.814	0.390	0.649	0.477
<i>Highest educational attainment of parents</i>					
Year 10 or below	Equals 1 if parents have completed no more than year 10 at secondary school; and 0 otherwise	0.375	0.484	0.323	0.468
Year 11 or 12	Equals 1 if parents have completed Year 11 or 12 as their highest education level; and 0 otherwise	0.165	0.371	0.230	0.421
Post-school qualification	Equals 1 if parents have completed a post-school qualification as their highest education level; and 0 otherwise	0.166	0.372	0.212	0.409
Unknown	Equals 1 if the highest education level of the parents is unknown; and 0 otherwise	0.294	0.455	0.235	0.424
<i>4. Risky Behaviours</i>					

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
Injects illegal substances	Equals 1 if have injected illegal substances in last 6 months; and 0 otherwise	0.215	0.411	0.163	0.369
Ever incarcerated	Equals 1 if ever been in juvenile detention, adult prison or remand; and 0 otherwise	0.420	0.494	0.309	0.462
<i>5. Financial</i>					
Total debt	Total outstanding debt (from outstanding bills, loans and student debts)	3.005	9.667	5.275	15.267
5 year Centrelink payment history	Proportion of last 5 years on Centrelink payments	0.782	0.267	0.628	0.315
Centrelink payment duration	Duration (in months) of current Centrelink payment spell	73.959	69.775	48.901	53.875
<i>Centrelink payment type</i>					
NSA	Equals 1 if on Newstart Allowance (NSA); and 0 otherwise	0.263	0.440	0.328	0.470
YA	Equals 1 if on Youth Allowance (YA); and 0 otherwise	0.053	0.223	0.178	0.383
DSP	Equals 1 if on Disability Support Pension (DSP); and 0 otherwise	0.425	0.494	0.209	0.406
PPS	Equals 1 if on Parenting Payment Single (PPS); and 0 otherwise.	0.153	0.360	0.099	0.298

Table 5. Characteristics of treatment and control groups pre and post matching (Journeys Home dataset)

	Social housing residents	Control (Before matching)	Standardised differences (per cent)	
			Before matching	After matching
<i>1. Demographic</i>				
<i>Age group</i>				
15-20 years	0.175	0.419	-0.556	-0.250
21-44 years	0.485	0.401	0.170	0.057
45+ years	0.341	0.180	0.373	0.165
ATSI	0.259	0.165	0.231	0.230
Dependent children	0.659	0.405	0.260	0.263
Single parent	0.051	0.192	-0.442	-0.134
<i>2. Human and social capital</i>				
<i>Highest educational qualification</i>				
Tertiary	0.264	0.324	-0.131	-0.082
Year 9 or below	0.237	0.152	0.217	0.104
Activity limiting long-term health condition or disability	0.603	0.448	0.313	0.151
<i>Labour force status</i>				
Employed	0.102	0.184	-0.234	-0.003
Unemployed	0.183	0.312	-0.301	-0.161
NILF	0.715	0.505	0.440	0.144
<i>3. History of adversity</i>				
Ever in state care	0.291	0.251	0.088	0.164
Ever slept rough	0.813	0.664	0.342	0.181
<i>Highest educational attainment of parents</i>				
Year 10 or below	0.394	0.338	0.117	-0.018
Year 11 or 12	0.167	0.223	-0.140	-0.014
Post-school qualification	0.167	0.210	-0.110	-0.025
Unknown	0.271	0.229	0.097	0.053
<i>4. Risky behaviours</i>				
Injects illegal substances	0.194	0.151	0.114	0.071
<i>5. Financial</i>				
Total debt	2.919	5.332	-0.186	0.036
5 year Centrelink payment history	0.787	0.658	0.450	0.233

	Social housing residents	Control (Before matching)	Standardised differences (per cent)	
			Before matching	After matching
<i>Centrelink payment type</i>				
NSA	0.259	0.390	-0.282	-0.153
YA	0.056	0.211	-0.468	-0.234
DSP	0.439	0.225	0.466	0.164
PPS	0.173	0.122	0.146	0.129
Centrelink payment duration	72.031	46.455	0.436	0.230
Number of observations	1,339	3,873		

* Standardised difference (per cent) is the mean difference as a percentage of the average standard deviation. After matching there are 1,339 treated and 1,278 control observations

Table 6. Characteristics of treatment and control groups pre and post matching, entrants to social housing. (Journeys Home dataset)

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
<i>1. Demographic</i>				
<i>Age group</i>				
15-24 years	0.275	0.431	-0.330	-0.204
25-44 years	0.436	0.398	0.076	0.053
45+ years	0.289	0.171	0.283	0.158
ATSI	0.279	0.157	0.298	0.287
Married/defacto	0.182	0.232	-0.123	-0.065
<i>2. Human and social capital</i>				
<i>Highest educational qualification</i>				
Tertiary	0.271	0.327	-0.122	-0.066
Year 9 or below	0.211	0.148	0.164	0.111
<i>Labour force status</i>				
Employed	0.086	0.191	-0.307	-0.086
Unemployed	0.279	0.314	-0.078	-0.109
NILF	0.636	0.495	0.286	0.155
<i>3. History of adversity</i>				
Ever in state care	0.282	0.250	0.073	0.177
Ever slept rough	0.786	0.655	0.294	0.160
<i>Highest educational attainment of parents</i>				
Year 10 or below	0.393	0.334	0.124	-0.017
Year 11 or 12	0.168	0.227	-0.149	-0.043
Post-school qualification	0.161	0.214	-0.138	-0.033
Unknown	0.279	0.225	0.123	0.085
<i>4. Risky behaviour</i>				
Smokes daily	0.732	0.661	0.154	0.021
<i>5. Financial</i>				
Total debt	3.504	5.454	-0.138	0.031
5 year Centrelink payment history	0.710	0.655	0.181	0.134
<i>Centrelink payment type</i>				
NSA	0.336	0.393	-0.120	-0.061
YA	0.125	0.218	-0.249	-0.200
DSP	0.361	0.215	0.326	0.189
Centrelink payment duration	63.552	45.287	0.325	0.249
Number of observations	280	3,727		

* Standardised difference in % is the mean difference as a percentage of the average standard deviation. After matching there are 280 treated and 280 control observations.

Table 7. Differences in outcomes between social housing residents and matched control group (Journeys Home dataset)

Outcome	Measure	Average treatment effect on the treated (p-value)	
		Nearest Neighbour	PSM (kernel)
Employment	Employed/not	-0.011 (0.330)	-0.010 (0.439)
Education	Highest qualification	-0.003 (0.946)	0.050 (0.482)
Physical health	Self-assessed health (1 -5)	-0.057 (0.126)	0.029 (0.421)
	Long-term health condition (Yes/No)	0.031 (0.042)	0.026 (0.127)
Mental health	K6 score (0-24)	-0.219 (0.234)	0.176 (0.419)
Incarceration	Incarcerated/not	0.007 (0.098)	0.003 (0.434)
Homelessness	Homeless/housed	-0.130 (0.000)	-0.138 (0.000)

Table 8. Differences in changes in outcomes between entrants to social housing and matched control group (Journeys Home dataset)

Outcome	Measure	Average treatment effect on the treated (p-value)	
		Nearest Neighbour	PSM (kernel)
Employment	-1 "Becomes employed"	-0.016	-0.024
	0 "No change"	(0.492)	(0.347)
	1 "Becomes unemployed"		
Education	Highest qualification	-0.016	-0.025
	0 "No change"	(0.118)	(0.003)
	1 "Improves attainment"		
Physical health	Self-assessed health (1 -5)	0.008	0.025
	-1 "Health deteriorates"	(0.874)	(0.562)
	0 "No change"		
	1 "Health improves"		
	Long-term health condition	-0.008	0.0005
	-1 "Health deteriorates"	(0.779)	(0.988)
Mental health	K6 score (0-24)	0.075	0.053
	-1 "Mental health deteriorates"	(0.243)	(0.393)
	0 "No change"		
	1 "Mental health improves"		
Incarceration	Incarcerated	-0.0004	-0.010
	-1 "Becomes incarcerated"	(0.979)	(0.368)
	0 "No change"		
	1 "Becomes not incarcerated"		

Table 9. Differences in outcomes between social housing residents and matched control group, (HILDA dataset)

Outcome	Measure	Average treatment effect on the treated (p-value)	
		Nearest Neighbour	PSM (kernel)
Employment	Employed/not	0.008 (0.320)	-0.006 (0.605)
Education	Highest qualification	0.009 (0.690)	0.060 (0.251)
Physical health	Self-assessed health (1 -5)	0.100 (0.000)	0.125 (0.000)
	Long-term health condition (Yes/No)	0.019 (0.076)	0.029 (0.007)
Mental health	General mental health (0-100)	1.003 (0.039)	1.063 (0.013)
	K6 score (0-24)	0.555 (0.008)	0.600 (0.006)

Table 10. Differences in changes in outcomes between entrants to social housing and matched control group, (HILDA dataset)

Outcome	Measure	Average treatment effect on the treated (p-value)	
		Nearest Neighbour	PSM (kernel)
Employment	-1 "Becomes employed"	0.0002	-0.006
	0 "No change"	(0.990)	(0.692)
	1 "Becomes unemployed"		
Education	Highest qualification	0.018	0.010
	0 "No change"	(0.057)	(0.223)
	1 "Improves attainment"		
Physical health	Self-assessed health (1 -5)	0.005	0.013
	-1 "Health deteriorates"	(0.893)	(0.698)
	0 "No change"		
	1 "Health improves"		
	Long-term health condition	0.002	0.003
	-1 "Health deteriorates"	(0.903)	(0.879)
Mental health	General Mental Health	-0.022	0.012
	-1 "Mental health deteriorates"	(0.620)	(0.747)
	0 "No change"		
	1 "Mental health improves"		

A. Appendix

A.1 General data construction

Tables A.1 to A.3 contain the definitions and basic descriptive statistics for the variables from Journeys Home not reported in the body of the paper.

A.2 Robustness analysis using the HILDA dataset

In this section we go through the steps required to do the robustness analysis of our results using the HILDA dataset. In general the datasets have similarly defined variables but there are important differences. Table A.4 reports the definitions of the outcome and treatment variables (analogous to Table 2). Table A.5 reports the list of covariates used in the regression to construct the propensity scores for matching (analogous to Table 3) and Table A.6 the covariate definitions and descriptive statistics of these variables (analogous to Table 4). Tables A.7 and A.8 show the pre- and post- matching sample characteristics (analogous to Tables 5 and 6).

Table A.1. Variable definitions and summary statistics of social housing residents vs other. (Journeys Home dataset)

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
<i>1. Demographic</i>					
Male	Equals 1 if male; and 0 if female	0.501	0.500	0.549	0.498
Married/defacto	Equals 1 if married or in a defacto relationship; and 0 otherwise	0.233	0.423	0.232	0.422
<i>State of residence</i>					
NSW	Equals 1 if resides in NSW; and 0 otherwise	0.203	0.403	0.201	0.401
Victoria	Equals 1 if resides in Victoria; and 0 otherwise	0.182	0.386	0.224	0.417
Queensland	Equals 1 if resides in Qld; and 0 otherwise	0.223	0.416	0.277	0.448
South Australia	Equals 1 if resides in SA; and 0 otherwise	0.078	0.268	0.068	0.252
Western Australia	Equals 1 if resides in WA; and 0 otherwise	0.104	0.305	0.109	0.312
Tasmania	Equals 1 if resides in Tasmania; and 0 otherwise	0.027	0.163	0.058	0.233
Northern Territory	Equals 1 if resides in NT; and 0 otherwise	0.102	0.302	0.048	0.214
ACT	Equals 1 if resides in ACT; and 0 otherwise	0.081	0.273	0.014	0.119
Resides in urban area	Equals 1 if geo-coded address is defined as ‘major urban’ or ‘other urban’ according to the Australian Statistical Geography Standard (ASGS) Section of State classification; and 0 otherwise. The ASGS classification can be found at ABS (2011), Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas. Australian Bureau of Statistics, Canberra. Cat No	0.966	0.182	0.939	0.240

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
	1270.0.55.001.)				
<i>Country of birth</i>					
Born in Australia	Equals 1 if born in Australia; and 0 otherwise	0.869	0.338	0.880	0.324
Born in English speaking country	Equals 1 if born in main English speaking country; and 0 otherwise	0.067	0.250	0.057	0.232
Born in non-English speaking country	Equals 1 if born in non-main English speaking country; and 0 otherwise	0.064	0.246	0.063	0.242
<i>2. Human and Social Capital</i>					
<i>Highest educational qualification</i>					
Year 12 or equiv	Equals 1 if highest educational qualification is Year 12 or equivalent; and 0 otherwise	0.113	0.317	0.111	0.314
Year 10 or 11	Equals 1 if highest education qualification is Year 10 or 11; and 0 otherwise	0.360	0.480	0.388	0.487
Psychological distress	As measured by Kessler 6-item scale. Respondents were asked to rate how much of the time over the last four weeks they felt: 'so sad nothing could cheer you up'; 'nervous'; 'restless or fidgety'; 'without hope'; 'that everything was an effort'; and 'worthless'. Each of the six items is rated from zero to four yielding a total score of 0 to 24				
Low	Equals 1 if K6 score of (0-7); 0 otherwise	0.744	0.437	0.781	0.413
Mild to moderate	Equals 1 if K6 score of (8-12); 0 otherwise	0.193	0.395	0.167	0.373
Serious	Equals 1 if K6 score of (13-24); 0 otherwise	0.064	0.244	0.051	0.221

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
Employment history	Proportion of time employed since first leaving full-time education	0.370	0.295	0.405	0.307
Social support	<p>An index averaging across the following 4 items, with each rated on a scale ranging from 1 “Strongly agree” to 5 “Strongly disagree”:</p> <ul style="list-style-type: none"> i) You often need help from other people but can’t get it? ii) You have someone you can lean on in times of trouble? (reversed) iii) There is someone who can always cheer you up when you are down? (reversed) iv) You often feel very lonely? 	3.381	0.820	3.541	0.820
<i>3. History of adversity</i>					
<i>Experiences in childhood</i>					
Family support	<p>An index averaging across the following 4 items, with each rated on a scale ranging from 1 “Never true” to 5 “Very often true”:</p> <ul style="list-style-type: none"> i) You knew there was someone to take care of you and protect you? ii) You felt loved? iii) People in your family looked out for each other? vi) Your family was a source of strength and support? <p>Based on a selection of items on childhood environment from the Adverse Childhood Adversity Study undertaken by the Centers of Disease Control and Population within the U.S. Government Department of Health and Human Services</p>	3.563	1.247	3.770	1.150
Experienced abuse or violence as a child	Equals 1 if reported anyone has used physical violence or force or sexual violence against them in childhood; and 0 otherwise.	0.648	0.478	0.631	0.483
Experienced abuse or	Equals 1 if opted out of questions on history of violence; and 0 otherwise.	0.101	0.302	0.081	0.273

Variable	Definition	Social housing residents		Other respondents	
		Mean	Standard deviation	Mean	Standard deviation
violence as a child (opt out)					
Recent violence	Equals 1 if reported anyone has used physical violence or force or sexual violence against them in the last 6 months; and 0 otherwise	0.170	0.375	0.173	0.378
Recent violence (opt out)	Equals 1 if opted out of questions on physical or sexual violence in last 6 months; and 0 otherwise	0.058	0.233	0.049	0.217
<i>4. Risky Behaviours</i>					
Risky drinker	Equals 1 if consumes 2 or more drinks a day on average; and 0 otherwise	0.535	0.499	0.586	0.493
Smokes daily	Equals 1 if smokes cigarettes daily; and 0 otherwise	0.692	0.462	0.661	0.473
<i>5. Financial</i>					
Not currently on payments	Equals 1 if not currently on a Centrelink income support payment; and 0 otherwise	0.036	0.186	0.140	0.347
PPP	Equals 1 if on Parenting Payment Partnered; and 0 otherwise	0.021	0.145	0.013	0.115
AP	Equals 1 if on Age Pension; and 0 otherwise	0.018	0.134	0.008	0.088
Other	Equals 1 if on another Centrelink income support payment; and 0 otherwise	0.031	0.174	0.025	0.155

Table A.2. Characteristics of treatment and control groups pre and post matching

	Social housing residents	Control (Before matching)	Standardised differences (per cent)	
			Before matching	After matching)
<i>1. Demographic</i>				
Male	0.488	0.536	-0.096	-0.081
Married/defacto	0.205	0.229	-0.056	0.038
<i>State of residence</i>				
NSW	0.196	0.203	-0.017	-0.025
Victoria	0.187	0.222	-0.085	-0.017
Queensland	0.217	0.277	-0.140	-0.190
South Australia	0.082	0.073	0.034	0.083
Western Australia	0.098	0.107	-0.029	0.058
Tasmania	0.028	0.065	-0.174	0.011
Northern Territory	0.103	0.043	0.232	0.095
ACT	0.087	0.010	0.369	0.128
Resides in urban area	0.963	0.946	-0.085	0.083
<i>Country of birth</i>				
Born in Australia	0.871	0.888	-0.051	-0.128
Born in English speaking country	0.064	0.056	0.035	0.096
Born in non-English speaking country	0.065	0.057	0.035	0.079
<i>2. Human and social capital</i>				
<i>Highest educational qualification</i>				
Year 12 or equivalent	0.121	0.107	0.043	0.169
Year 10 or 11	0.372	0.409	-0.076	-0.113
<i>Psychological distress</i>				
Low	0.733	0.766	-0.076	-0.105
Mild to moderate	0.198	0.180	0.046	0.063
Serious	0.069	0.054	0.063	0.088
Social support	3.358	3.513	-0.190	-0.129
Employment history	0.373	0.388	-0.049	-0.035
<i>3. History of adversity</i>				
Family support	3.575	3.772	-0.165	-0.123
Experienced abuse or violence as a child	0.655	0.644	0.023	0.003
Experienced abuse or violence as a child	0.080	0.063	0.065	0.138

	Social housing residents	Control (Before matching)	Standardised differences (per cent)	
			Before matching	After matching
<hr/>				
(opt out)				
Recent violence	0.168	0.183	-0.039	0.084
Recent violence (opt out)	0.044	0.039	0.024	0.057
<i>4. Risky behaviours</i>				
Ever incarcerated	0.394	0.312	0.172	0.092
Risky drinker	0.532	0.592	-0.119	-0.104
Smokes daily	0.690	0.666	0.051	-0.065
<i>5. Financial</i>				
Not currently on payments	0.002	0.002	-0.0003	0.034
PPP	0.025	0.017	0.057	0.000
AP	0.017	0.005	0.119	0.041
Other	0.028	0.029	-0.003	0.021
<hr/>				
Number of observations	1,339	3,873		
<hr/>				
* Standardised difference (per cent) is the mean difference as a percentage of the average standard deviation. There are 1339 and 1278 matched treated and control observations.				

Table A.3. Characteristics of treatment and control groups pre and post matching, entrants to social housing.

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
<i>1. Demographic</i>				
Male	0.543	0.537	0.012	-0.019
Dependent children	0.425	0.402	0.027	0.149
Single parent	0.164	0.193	-0.076	0.074
<i>State of residence</i>				
NSW	0.171	0.206	-0.087	-0.041
Victoria	0.182	0.225	-0.107	-0.042
Queensland	0.261	0.279	-0.040	-0.129
South Australia	0.096	0.072	0.089	0.110
Western Australia	0.096	0.107	-0.035	0.071
Tasmania	0.039	0.067	-0.124	0.042
Northern Territory	0.107	0.038	0.267	0.098
ACT	0.046	0.007	0.249	0.021
Resides in urban area	0.957	0.945	-0.057	0.103
<i>Country of birth</i>				
Born in Australia	0.893	0.887	0.019	-0.104
Born in English speaking country	0.061	0.056	0.021	0.063
Born in non-English speaking country	0.046	0.057	-0.048	0.082
<i>2. Stock of human and social capital</i>				
<i>Highest educational qualification</i>				
Yr 12 or equivalent	0.089	0.109	-0.066	0.080
Yr 10 or 11	0.418	0.408	0.020	-0.072
Activity limiting Long term health condition or disability	0.496	0.445	0.102	0.094
<i>Psychological distress</i>				
Low	0.771	0.765	0.015	-0.043
Mild to moderate	0.154	0.182	-0.077	-0.041
Serious	0.075	0.053	0.092	0.140
Social support	3.336	3.525	-0.242	-0.210
Employment history	0.378	0.388	-0.032	-0.027
<i>3. History of adversity</i>				
Family support	3.736	3.773	-0.033	-0.043
Experienced abuse or violence as a child	0.636	0.645	-0.019	-0.048
Experienced abuse or violence as a child (opt out)	0.054	0.065	-0.047	0.083

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
Recent violence	0.182	0.183	-0.003	0.076
Recent violence (opt out)	0.032	0.040	-0.042	0.034
<i>4. Risky behaviours</i>				
Injects illegal substances	0.146	0.152	-0.015	0.043
Risky drinker	0.600	0.592	0.017	-0.032
Ever incarcerated	0.396	0.306	0.191	0.153
<i>5. Financial</i>				
Centrelink payment type				
Not currently on payments	0.000	0.002	-0.070	.
PPS	0.118	0.122	-0.011	0.018
PPP	0.021	0.016	0.039	0
AP	0.018	0.004	0.133	0.053
Other	0.021	0.030	-0.051	0.020
Number of observations	280	3,727		

* Standardised difference in % is the mean difference as a percentage of the average standard deviation

Table A.4. Outcome measures for HILDA

Outcome^{ab}	Measures
Employment	Employed vs Not employed
Education	Highest educational qualification (1 “Postgrad” to 9 “Year 11 or below”)
Physical health	Self-assessed health (1 “Excellent” to 5 “Poor”) Long-term health condition or disability (Yes, No)
Mental health	Kessler 6 item measure (K6) of psych distress (0-24) Inverted SF-36 general mental health (0-100)
Incarceration	N/A.
Homelessness	N/A.

Table A.5 Covariates used to identify a control group from the HILDA dataset

Type	Covariates
1. Demographic	Age, sex, ATSI, marital status, number of resident children, single parent, State, country of birth, urban vs non-urban
2. Human and social capital	Education level, long term health condition, mental health, labour force status
3. History of adversity	Parents occupation
4. Risky behaviours	N/A
5. Financial	Real gross income, SEIFA decile

Table A.6 Variable definitions and summary statistics of social housing residents vs other. HILDA

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
<i>1. Demographic</i>					
<i>Age group</i>	Age determined from date of birth				
15-20 years	Equals 1 if aged 15-21 years; and 0 otherwise	0.175	0.380	0.286	0.452
21-44 years	Equals 1 if aged 21-44 years and 0 otherwise	0.276	0.447	0.347	0.476
45+ years	Equals 1 if aged 45 years plus and 0 otherwise	0.549	0.498	0.367	0.482
Male	Equals 1 if male and 0 if female	0.390	0.488	0.390	0.488
ATSI	Equals 1 if identifies as Aboriginal or Torres Strait Islander; and 0 otherwise. Options are as provided in the ABS Census	0.126	0.332	0.063	0.242
Married/defacto	Equals 1 if married or in a defacto relationship; and 0 otherwise	0.407	0.491	0.555	0.497
Dependent children 0-4 years	Number of dependent children 0-4 years	0.160	0.497	0.259	0.603
Dependent children 5 - 9 years	Number of dependent children 5-9 years	0.153	0.490	0.189	0.513
Dependent children 10-14 years	Number of dependent children 10-14 years	0.147	0.463	0.161	0.488
Dependent children 15-24 years	Number of dependent children 15-24 years	0.064	0.273	0.070	0.310
Single parent	Equals 1 if a single parent; and 0 otherwise	0.162	0.368	0.139	0.346

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
<i>State of residence</i>					
NSW	Equals 1 if resides in NSW; and 0 otherwise	0.302	0.459	0.271	0.444
Victoria	Equals 1 if resides in Victoria; and 0 otherwise	0.182	0.386	0.181	0.385
Queensland	Equals 1 if resides in Qld; and 0 otherwise	0.204	0.403	0.272	0.445
South Australia	Equals 1 if resides in SA; and 0 otherwise	0.168	0.374	0.098	0.298
Western Australia	Equals 1 if resides in WA; and 0 otherwise	0.065	0.247	0.095	0.293
Tasmania	Equals 1 if resides in Tasmania; and 0 otherwise	0.047	0.213	0.052	0.223
Northern Territory	Equals 1 if resides in NT; and 0 otherwise	0.005	0.070	0.008	0.090
ACT	Equals 1 if resides in ACT; and 0 otherwise	0.026	0.159	0.022	0.147
Resides in urban area	Equals 1 if geo-coded address is defined as ‘major urban’ or ‘other urban’ according to the Australian Statistical Geography Standard (ASGS) Section of State classification; and 0 otherwise. The ASGS classification can be found at ABS (2011), Australian Statistical Geography Standard (ASGS): Volume 1 – Main Structure and Greater Capital City Statistical Areas. Australian Bureau of Statistics, Canberra. Cat No 1270.0.55.001.)	0.958	0.201	0.877	0.328
<i>Country of birth</i>					
Born in Australia	Equals 1 if born in Australia; and 0 otherwise	1.000	0.000	1.00	0.000
Born in English speaking country	Equals 1 if born in main English speaking country; and 0 otherwise	0.000	0.000	0.00	0.000
Born in non-English speaking country	Equals 1 if born in non-main English speaking country; and 0 otherwise	0.000	0.000	0.000	0.000

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
<i>2. Human and social capital</i>					
<i>Highest educational qualification</i>					
Post-graduate	Equal 1 if has a postgraduate -masters or doctorate recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.005	0.074	0.015	0.120
Graduate	Equal 1 if has a Grad diploma or grad certificate recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.019	0.136	0.017	0.130
Bachelor	Equal 1 if has a Bachelor or Honours degree recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.050	0.217	0.078	0.268
Advanced	Equal 1 if has an Advanced Diploma or Diploma recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.044	0.204	0.042	0.202
Certificate	Equal 1 if has a Certificate Level 3 or 4 qualification recognised by the Australian Qualifications Framework (AQF); and 0 otherwise	0.160	0.367	0.178	0.382
Year 12 or equivalent	Equals 1 if completed high school and does not have a post-school qualification (Certificate Level 3 or higher) or has completed a Certificate Level I or II qualification with at least Year 10 schooling completed; and 0 otherwise	0.124	0.329	0.157	0.364
Year 11 or below	Equals 1 if has not completed high school or its equivalent; and 0 otherwise	0.599	0.490	0.513	0.500
Long term health condition or disability	Equals 1 if reports a long-term health condition, impairment or disability, and has lasted or is likely to last, for 6 months or more; and 0 otherwise	0.550	0.498	0.367	0.482
GMH	Inverted general mental health (GMH) score ranging from (0-100) where a higher score refers to worse mental health	32.875	19.821	30.095	19.377
<i>Labour force status</i>	Determined by a series of questions from the ABS Monthly Population Survey, with the concept of “last week” replaced by “the last 7 days” , which follow international				

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
	standards on labour statistics as set out by the International Labour Organisation				
Employed	Equals 1 if employed; and 0 otherwise	0.319	0.466	0.431	0.495
Unemployed	Equals 1 if unemployed; and 0 otherwise	0.073	0.260	0.096	0.295
NILF	Equals 1 if not in the labour force; and 0 otherwise	0.608	0.488	0.474	0.499
<i>3. History of adversity</i>					
Fathers occupation	Father's occupation 1-digit ANZSCO 2006				
Never worked	Equals 1 if father never worked; and 0 otherwise	0.011	0.103	0.006	0.079
Managers	Equals 1 if father's occupation was a manager; and 0 otherwise	0.160	0.367	0.207	0.405
Professionals	Equals 1 if father's occupation was a professional, and 0 otherwise	0.075	0.263	0.104	0.305
Technicians and Trades Workers	Equals 1 if father's occupation was a Technician or Trades Worker; and 0 otherwise	0.254	0.435	0.218	0.413
Community and Personal Service Workers	Equals 1 if father's occupation was a Community or Personal Service Worker; and 0 otherwise	0.044	0.206	0.056	0.230
Clerical and Administrative Workers	Equals 1 if father's occupation was a Clerical or Admin Worker; and 0 otherwise	0.052	0.223	0.038	0.190
Sales Workers	Equals 1 if father's occupation was a Sales Worker; and 0 otherwise	0.027	0.163	0.046	0.208
Machinery Operators and Drivers	Equals 1 if father's occupation was a Machinery Operator or Driver; and 0 otherwise	0.181	0.385	0.174	0.379
Labourers	Equals 1 if father's occupation was a Labourer; and 0 otherwise	0.196	0.397	0.151	0.359
Mothers occupation	Mother's occupation 1-digit ANZSCO 2006				

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
Never worked	Equals 1 if mother never worked; and 0 otherwise	0.290	0.454	0.216	0.412
Managers	Equals 1 if mother's occupation was a manager; and 0 otherwise	0.053	0.224	0.068	0.252
Professionals	Equals 1 if mother's occupation was a professional; and 0 otherwise	0.089	0.284	0.125	0.330
Technicians and Trades Workers	Equals 1 if mother's occupation was a Technician or Trades Worker; and 0 otherwise	0.044	0.205	0.053	0.225
Community and Personal Service Workers	Equals 1 if mother's occupation was a Community or Personal Service Worker; and 0 otherwise	0.101	0.301	0.114	0.317
Clerical and Administrative Workers	Equals 1 if mother's occupation was a Clerical or Admin Worker; and 0 otherwise	0.099	0.299	0.123	0.328
Sales Workers	Equals 1 if mother's occupation was a Sales Worker; and 0 otherwise	0.058	0.233	0.080	0.271
Machinery Operators and Drivers	Equals 1 if mother's occupation was a Machinery Operator or Driver; and 0 otherwise	0.019	0.137	0.023	0.149
Labourers	Equals 1 if mother's occupation was a Labourer; and 0 otherwise	0.248	0.432	0.199	0.399
<i>5. Financial</i>					
Real gross income (\$)	Real gross individual annual income /10,000 deflated by the Consumer Price Index	1.278	2.388	1.947	3.216
ABS SEIFA IRSD decile					
1	IRSD Lowest decile	0.322	0.467	0.152	0.359
2	Second decile	0.164	0.370	0.138	0.345
3	Third decile	0.164	0.370	0.126	0.332
4	Fourth decile	0.070	0.256	0.107	0.309

Variable	Definition	Social housing residents		Other low-income renters	
		Mean	Standard deviation	Mean	Standard deviation
5	Fifth decile	0.077	0.267	0.110	0.313
6	Sixth decile	0.061	0.239	0.095	0.294
7	Seventh decile	0.036	0.186	0.073	0.260
8	Eighth decile	0.037	0.188	0.085	0.278
9	Ninth decile	0.042	0.201	0.065	0.247
10	Highest decile	0.027	0.164	0.048	0.214

Table A.7. Characteristics of treatment and control groups pre and post matching, HILDA

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
<i>1. Demographic</i>				
<i>Age group</i>				
15-20 years	0.175	0.286	-0.265	-0.062
21-44 years	0.276	0.347	-0.155	0.180
45+ years	0.549	0.367	0.371	-0.106
Male	0.390	0.390	0.000	0.082
ATSI	0.126	0.063	0.218	0.292
Married/defacto	0.407	0.555	-0.299	-0.072
Dependent children 0-4 years	0.160	0.259	-0.180	0.048
Dependent children 5 - 9 years	0.153	0.189	-0.071	0.165
Dependent children 10-14 years	0.147	0.161	-0.028	0.189
Dependent children 15-24 years	0.064	0.070	-0.022	0.185
Single parent	0.162	0.139	0.062	0.241
<i>State of residence</i>				
NSW	0.302	0.271	0.070	-0.123
Victoria	0.182	0.181	0.001	0.080
Queensland	0.204	0.272	-0.160	-0.162
South Australia	0.168	0.098	0.207	0.149
Western Australia	0.065	0.095	-0.109	0.093
Tasmania	0.047	0.052	-0.023	0.041
Northern Territory	0.005	0.008	-0.040	0.043
ACT	0.026	0.022	0.025	0.094
Resides in urban area	0.958	0.877	0.296	-0.001
<i>Country of birth</i>				
Born in Australia	1.000	1.000		
Born in main English speaking country	0.000	0.000		
Born in non-main English speaking country	0.000	0.000		
<i>2. Human and social capital</i>				
<i>Highest qualification</i>				
Post-graduate	0.005	0.015	-0.092	0.006
Graduate	0.019	0.017	0.013	0.030
Bachelor	0.050	0.078	-0.117	0.132
Advanced	0.044	0.042	0.006	0.148
Certificate	0.160	0.178	-0.047	0.092
Year 12 or equivalent	0.124	0.157	-0.097	0.116
Year 11 or below	0.599	0.513	0.174	-0.261

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
Long term health condition or disability	0.550	0.367	0.374	0.076
GMH	32.875	30.095	0.142	0.131
<i>Labour force status</i>				
Employed	0.319	0.431	-0.233	0.058
Unemployed	0.073	0.096	-0.083	0.110
NILF	0.608	0.474	0.273	-0.109
<i>3. History of adversity</i>				
Fathers occupation				
Never worked	0.011	0.006	0.047	0.051
Managers	0.160	0.207	-0.122	-0.100
Professionals	0.075	0.104	-0.102	0.056
Technicians and Trades Workers	0.254	0.218	0.084	0.015
Community and Personal Service Workers	0.044	0.056	-0.054	0.105
Clerical and Administrative Workers	0.052	0.038	0.072	0.127
Sales Workers	0.027	0.046	-0.098	0.051
Machinery Operators and Drivers	0.181	0.174	0.019	-0.018
Labourers	0.196	0.151	0.117	-0.078
Mothers occupation				
Never worked	0.290	0.216	0.170	-0.127
Managers	0.053	0.068	-0.063	0.090
Professionals	0.089	0.125	-0.117	0.062
Technicians and Trades Workers	0.044	0.053	-0.044	0.074
Community and Personal Service Workers	0.101	0.114	-0.042	0.066
Clerical and Administrative Workers	0.099	0.123	-0.075	0.068
Sales Workers	0.058	0.080	-0.087	0.088
Machinery Operators and Drivers	0.019	0.023	-0.024	0.010
Labourers	0.248	0.199	0.118	-0.110
<i>5. Financial</i>				
Real gross income	1.278	1.947	-0.236	0.090
ABS SEIFA IRSD decile				
1	0.322	0.152	0.409	0.007
2	0.164	0.138	0.071	-0.059
3	0.164	0.126	0.107	0.052
4	0.070	0.107	-0.130	-0.009
5	0.077	0.110	-0.114	-0.061
6	0.061	0.095	-0.129	0.017

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
7	0.036	0.073	-0.163	0.015
8	0.037	0.085	-0.203	-0.014
9	0.042	0.065	-0.103	0.050
10	0.027	0.048	-0.109	0.041
Number of observations	3856	6766		

* Standardised difference in % is the mean difference as a percentage of the average standard deviation

Table A.8. Characteristics of treatment and control groups pre and post matching, entrants to social housing, HILDA

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
<i>1. Demographic</i>				
<i>Age group</i>				
15-20 years	0.270	0.287	-0.038	0.039
21-44 years	0.290	0.353	-0.136	0.194
45+ years	0.440	0.360	0.164	-0.203
Male	0.403	0.388	0.031	0.089
ATSI	0.086	0.060	0.100	0.182
Married/defacto	0.454	0.565	-0.222	-0.070
Dependent children 0-4 years	0.219	0.263	-0.076	0.115
Dependent children 5 - 9 years	0.152	0.192	-0.082	0.176
Dependent children 10-14 years	0.125	0.164	-0.085	0.180
Dependent children 15-24 years	0.043	0.073	-0.108	0.115
Single parent	0.141	0.139	0.005	0.176
<i>State of residence</i>				
NSW	0.288	0.269	0.042	-0.126
Victoria	0.192	0.180	0.030	0.061
Queensland	0.256	0.274	-0.040	-0.078
South Australia	0.112	0.097	0.050	0.095
Western Australia	0.066	0.098	-0.118	0.082
Tasmania	0.059	0.052	0.032	0.073
Northern Territory	0.010	0.008	0.017	0.014
ACT	0.018	0.023	-0.036	0.048
Resides in urban area	0.882	0.877	0.014	-0.082
<i>Country of birth</i>				
Born in Australia	1.000	1.000	.	.
Born in main English speaking country	0.000	0.000		
Born in non-main English speaking country	0.000	0.000		
<i>2. Human and social capital</i>				
<i>Highest qualification</i>				
Post-graduate	0.008	0.015	-0.068	0.019
Graduate	0.016	0.017	-0.010	0.018
Bachelor	0.080	0.078	0.008	0.137
Advanced	0.045	0.042	0.013	0.129
Certificate	0.168	0.179	-0.028	0.101
Year 12 or equivalent	0.165	0.156	0.023	0.106
Year 11 or below	0.518	0.512	0.012	-0.274

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
Long term health condition or disability	0.451	0.359	0.189	0.008
GMH	32.318	29.869	0.124	0.160
<i>Labour force status</i>				
Employed	0.365	0.437	-0.148	0.034
Unemployed	0.118	0.094	0.080	0.225
NILF	0.517	0.469	0.095	-0.160
<i>3. History of adversity</i>				
<i>Fathers occupation</i>				
Never worked	0.005	0.007	-0.023	0.005
Managers	0.229	0.205	0.057	-0.004
Professionals	0.104	0.104	0.001	0.041
Technicians and Trades Workers	0.200	0.220	-0.048	-0.064
Community and Personal Service Workers	0.054	0.056	-0.008	0.121
Clerical and Administrative Workers	0.046	0.037	0.049	0.094
Sales Workers	0.048	0.045	0.013	0.096
Machinery Operators and Drivers	0.152	0.176	-0.066	-0.062
Labourers	0.162	0.150	0.031	-0.059
<i>Mothers occupation</i>				
Never worked	0.285	0.209	0.176	-0.045
Managers	0.061	0.069	-0.033	0.056
Professionals	0.122	0.125	-0.011	0.039
Technicians and Trades Workers	0.067	0.052	0.064	0.104
Community and Personal Service Workers	0.091	0.116	-0.081	0.031
Clerical and Administrative Workers	0.117	0.124	-0.021	0.031
Sales Workers	0.048	0.083	-0.141	0.044
Machinery Operators and Drivers	0.014	0.023	-0.066	0.008
Labourers	0.195	0.199	-0.010	-0.137
<i>5. Financial</i>				
Real gross income	1.935	1.949	-0.004	0.194
<i>ABS SEIFA IRSD Decile</i>				
1	0.189	0.148	0.109	-0.047
2	0.141	0.138	0.008	-0.085
3	0.139	0.125	0.043	0.035
4	0.070	0.111	-0.141	-0.052
5	0.080	0.113	-0.113	-0.041
6	0.091	0.096	-0.016	0.046

	Social housing residents	Control (before matching)	% standardised differences (before matching)	% standardised differences (after matching)
7	0.064	0.074	-0.039	0.036
8	0.099	0.083	0.056	0.059
9	0.077	0.064	0.049	0.071
10	0.050	0.048	0.007	0.032
Number of observations	625	6141		

* Standardised difference in % is the mean difference as a percentage of the average standard deviation