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IZA DP No. 15678

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ABSTRACT

Making It Home? Evidence on the Long-Run Impact of an Intensive Support Program for the Chronically Homeless on Housing, Employment and Health*

Interventions that combine unconditional permanent housing with support services, known as Housing First approaches, generally improve housing outcomes for people who have experienced chronic homelessness. However, little is known about their long-run outcomes or the consequences of ending such services. We investigate both aspects by examining the long-run effects of an intensive support program on the housing, employment, and health outcomes of chronically homeless people in Australia. Evaluating the three-year program over six-years using a randomised controlled trial, we document substantially higher rates of housing and better employment outcomes during the program period for the treated group, but no substantial changes in health. Three years after the program ends, we observe no significant differences between the treatment and control group with respect to any outcomes, including housing. Our results imply that stable housing is a necessary but not sufficient condition to overcome multiple sources of economic and social disadvantage.

JEL Classification: R28, I38, I12

Keywords: homelessness, Housing First, social policy, RCT, employment, health

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1 Introduction

Homelessness is an extreme form of socioeconomic disadvantage that imposes substantial costs on individuals and society. At the individual level, homelessness correlates strongly with poor mental and physical health, high rates of substance misuse, and substantially higher mortality (e.g. Barrow et al., 1999; Fazel et al., 2008; Hwang, 2000). The societal costs range from direct costs on shelter facilities, to indirect costs that include government spending on health care, welfare, and justice costs related to homelessness (e.g., Latimer et al., 2017; Culhane, 2008). The majority of these costs are incurred by a small subset of the homeless population, often referred to as the chronically homeless. This group includes individuals who have been homeless for long periods of time, often cycling between the street, institutions, and poor quality temporary accommodation, and is characterised by high rates of substance misuse, poor mental health, traumatic experiences, and social exclusion.

The predominant model for addressing chronic homelessness worldwide currently is the Housing First approach, which emerged in the US in the early 1990s (e.g., Evans et al., 2021; O'Flaherty, 2019). The key characteristic of Housing First models is the absence of preconditions for permanent housing, which clearly distinguishes Housing First models from traditional models that have a narrow crisis focus with a strong emphasis on short-term housing interventions. Extant evidence demonstrates that Housing First approaches produce superior housing outcomes compared to treatment-as-usual approaches (for related literature, see Appendix B). However, the existing literature does not document whether these improvements persist over time or what happens once intensive support services are withdrawn.

Our paper uses a randomised controlled trial (RCT) to study the long-term impact of an intensive support program, the Journey to Social Inclusion (J2SI), on the housing and non-housing outcomes of chronically homeless individuals. We make the following contributions. First, we examine the outcomes of a new intensive support program aimed at ending chronic homelessness. This intervention draws on many of the core principles from Housing First approaches,

such as immediate access to housing without preconditions, but combines several other components in one treatment package. These include a very low case load, a three-year support period, the provision of therapeutic and mental health support, the provision of a skills development program, and a focus on chronically homeless individuals, regardless of mental health or substance abuse issues. Taken together, to the best of our knowledge, no existing Housing First model or traditional service offered a similar package of integrated services provided over a three-year period of intensive support.

Second, we follow individuals for six years after random assignment, and we observe their outcomes for up to three years after the abrupt end of the program. Examining outcomes three years after the end of the program provides unique insights into what happens when intensive support services are withdrawn. It needs to be stressed that following homeless individuals for such a long time is notoriously difficult as the population we study is relatively small, very mobile and thus very difficult to track (e.g., see Evans et al., 2021). Within this context, a limiting though inherent factor is the small sample size which affects the precision, though not the internal validity, of our estimates.

Third, most studies that use RCTs to evaluate homelessness interventions originate from the US. However, the economic, social, and institutional contexts of the US may not be comparable to other countries, particularly countries with stronger social safety nets and universal health insurance. We contribute the first rigorous Australian evaluation using an RCT to this small literature. Australia is an interesting point of comparison as its public expenses on social protection, which includes universal health insurance, lie somewhere between the US and Northern Europe (ILO, 2017).

Fourth, we examine the effect of the program on important secondary non-housing outcomes, particularly employment and health. Although previous studies have examined these outcomes as well, we uniquely examine these outcomes at nine points in time over a period of six years after random assignment. Although many interventions aim at improving these non-housing outcomes, extant evidence suggests they have little impact, although many studies have

low statistical power (Evans et al., 2021). With the same caveat in mind, we still provide new long-run evidence on these important non-housing outcomes.

To preview our results: During the support period, the program significantly improved the housing outcomes of the treated group—largely driven by improvements in public housing—alongside some significant improvements in employment outcomes. We find no substantial improvements in health outcomes. Six years after randomisation, around two thirds of all individuals are housed, but we observe no differences between the treatment and control groups with respect to housing. This convergence in housing rates is largely driven by improvements in housing for the control group. The point estimates suggest no long-run effects on non-housing outcomes. Taken together, our results imply that an intensive support and housing intervention helps boosting housing rates in the short run but may not be sufficient to overcome multiple sources of economic and social disadvantage in the long-run.

2 Homelessness interventions in Australia

2.1 Traditional support programs

Australia's Specialist Homelessness Services (SHS) system is the principal response to homelessness in Australia. In 2009, when J2SI started, more than 1,500 SHS across the country supported an estimated 219,900 people (Australian Institute of Health and Welfare, 2011). Homelessness agencies operating within the SHS system range from small stand-alone agencies to large NGOs with multiple funding streams. The Australian SHS is based on a multistage continuum of housing coupled with case management and shares some characteristics with usual care in the US.[1] SHSs undertake intake and assessment but, unlike the US, there are no emergency shelters in Australia. Instead, short-term crisis accommodation facilities provide all residents with case management support and their own room generally for up to six weeks. Like the US,

[1]What constitutes usual care, or services that people would normally get, varies. In the US, usual care can be case management or clinical services provided by health programs (including Veterans) or by homelessness services that are part of 'Continuum of Care' (CoCs) models where regions coordinate housing and support funding for people experiencing homelessness.

transitional housing is a key component of the SHS system, but fewer than one third of people supported by SHS agencies were accommodated in crisis or transitional accommodation, with the majority (71%) receiving support services only (Australian Institute of Health and Welfare, 2011).

All SHSs provide case management and other support services to a range of groups at risk of, or currently experiencing, homelessness. Case managers take responsibility for coordinating various forms of support to achieve agreed upon objectives outlined in a case plan. In 2009, the average length of support provided by SHS agencies was 64 days and most people (73%) were assisted only once (ibid). Funded caseloads are high as caseworkers typically support up to 48 people over a 12-month period. Although the SHS is nationwide, as in other countries, practices may differ within programs between states and regions. However, since J2SI was administered in a single location, the variation in usual care that might occur in multisite studies is not an issue here.

The approach underpinning SHS was developed in the 1980s. While there have been refinements in subsequent years, including funding for a small number of congregate and scattered site Housing First approaches across the country, the core operational model retains a strong focus on short-term interventions. Therefore, the counterfactual model against which we compare the J2SI intervention is being eligible for these SHS services, to which all control group members have access.

2.2 The J2SI program

Sacred Heart Mission (SHM), a service provider in inner City Melbourne, designed and implemented the J2SI program between 2009 and 2012. The program aimed at providing chronically homeless individuals with skills that aid in their successful transition out of homelessness into mainstream life. To achieve this objective, J2SI practices explicitly focused on services that improve participants' residential stability, physical and mental health, and their social and economic participation. J2SI followed a harm minimisation principle and did not require participa-

tion in drug or alcohol treatment services.

Although the development of the J2SI model was informed by evidence supporting the efficacy of Housing First, some important modifications were made. First, each J2SI case worker provided individualised support to four clients for three years irrespective of the client's housing status. The low case load and long duration were in recognition that intensive case management produces superior results than standard forms of case management for people with severe, enduring, and complex needs (King, 2006). The 4:1 client:staff ratio over three years was a considerably lower staff to participant ratio and longer period of support than offered by SHS, but also quite different from other intensive case management (ICM) programs provided by Housing First. These typically have client:staff ratios of approximately 20:1 to 15:1 (Nelson et al., 2007; Stergiopoulos et al., 2015; Srebnik et al., 2013). In contrast to Housing First approaches, involvement with the J2SI case worker was mandatory and not optional.

Second, J2SI implemented a multi-disciplinary approach that integrated different therapeutic and mental health responses to address the impact of poor mental health and trauma on housing and employment (e.g. Teesson et al., 2003; Poremski et al., 2014). The integration of therapeutic and mental health responses was done in two ways. First, an onsite psychologist provided counselling services to participants. Second, case work staff were regularly trained in Trauma Informed Care (TIC) which stresses the impact of trauma and emphasises the physical, emotional, and psychological safety of people seeking assistance (Hopper et al., 2010).

Third, J2SI focused on immediate access to safe, secure, affordable, long-term housing without housing readiness conditions. At the time, chronically homeless individuals received priority access to public housing under the recurrent homelessness category; both treated and control participants met the definition of recurrent homelessness. However, a key difference in terms of service responses was the timing of applications—J2SI practice was to complete a recurrent homelessness application as soon as practicable, often within the first month. In contrast, and reflecting a housing readiness approach, existing treatment-as-usual services would typically wait for months, if not years, before submitting a priority application.

Once in public housing, the housing subsidy received by participants in both the treatment and control group was the same as for other public housing residents. The subsidy for public housing, which is called rental rebate in Australia, covers the difference between 25% of household income and the market rent of the property, which is imputed based on the private rental market in the same area. Thus, eligible individuals pay around 25% of their household income on rent, which is calculated the same way irrespective of the location of the property or if they had a previous tenancy. As housing was not formally tied to the J2SI program, the tenancy duration was independent of enrolment in the program. Thus, participants could withdraw from the J2SI program without affecting their right to remain in public housing. However, if participants moved out of public housing, voluntarily or not, they would effectively lose the subsidy and pay market rent.

Fourth, the J2SI model included an additional skills development program called BUDS (Building Up and Developing Skills). The BUDS coordinator provided opportunities for training and skill development to improve the interpersonal, practical, tenancy, and vocational skills (for further details, see Johnson et al., 2011).

Finally, J2SI focused on chronically homeless individuals, whereas existing Housing First approaches generally target a narrower subset of chronically homeless individuals with either mental health or substance abuse issues (Rog et al., 2014) and/or those on the street.

3 Experimental design and data

3.1 Eligibility, recruitment and randomisation

Individuals were eligible for the program if they were between 25 and 50 years of age and if they had slept rough continuously for more than 12 months. Individuals who had been episodically homeless for at least three years, including those who had been housed in the last six months but were at risk of further homelessness, were also eligible. Most potential participants were referred by SHM (N=77), with 27 participants referred by other homelessness agencies

in inner city Melbourne. Recruitment via SHM ensured that both service and non-service using homeless individuals were included in the sample.[2] For each potential participant, agency staff completed a comprehensive referral form that collected information on participants' socio-economic characteristics, housing history, employment, health, and drug use.

Of the 99 people initially referred, 88 people satisfied the admission criteria and provided informed consent to participate in the evaluation. We then randomly selected 40 participants to receive the J2SI program treatment; the remaining 48 participants were assigned to the control group. Due to budgetary constraints, no more than 40 individuals were allowed to participate in the treatment program.[3] We stratified randomisation by couple status to ensure that couples were spread equally across the treatment and control groups. When a member of the treatment group dropped out of the program, we recruited two additional eligible potential participants and randomly assigned one to each group. Thus, some individuals joined the trial late and were treated for less than three years.

In total, we ended up with a total sample size of 104 participants, with 48 assigned to the treatment group and 56 to the control group.

3.2 Data collection

Study participants were followed up at nine points in time over a six-year period, providing information at baseline, at six-monthly intervals during the program period, as well as one year and three years after the program had finished. For each survey, an interviewer collected information on housing, employment, health and health service utilisation, drug and alcohol use, as well as other service usage. The research team employed several approaches to stay in contact with participants to minimise attrition.

Due to the difficulties of arranging interviews with some participants, the baseline data col-

[2]While some chronically homeless individual avoid homelessness services for a variety of reasons (e.g., Snow and Anderson, 1993; Black and Gronda, 2011), they often continue to use meals programs. Thus, by recruiting participants from an agency that provides a meals program in addition to homelessness services, as SHM does, we sampled from both service and non-service using homeless individuals.

[3]The program cost $AUS 3.9m over the first three years.

lection took longer than expected and not all follow-up interviews were conducted as scheduled. Therefore, we established a protocol to ensure that at least four months had to have elapsed between subsequent surveys. As a result of these challenges, some surveys had to be reclassified to the closest six-monthly time point.

3.3 Program participation

Although all members of the treatment group were offered to participate in the J2SI program, not all took up the treatment program. We examine the distribution of treatment duration using two measures—from random assignment to last contact, and from first face-to-face contact to last face-to-face contact. Table A.1 shows that 79% of the participants were still in contact with J2SI in their final six months of the program and 73% had face-to-face contact with their caseworker in the same period. The average treatment duration from the date of random assignment to the last contact date was 963 days. However, there was substantial variation in treatment intensity and activities across individuals and over time due to their different needs and level of engagement. Parkinson and Johnson (2014) provide a detailed analysis of treatment participation patterns of those who remained in J2SI and found that 80% of them were considered to be fully engaged. As compliance with the treatment program was not 100%, our analysis provides intention-to-treat (ITT) estimates. Finally, the drop-out rate prior to the program's end among the treatment group was 16.7%, which is quite low considering the length of the program and the level of disadvantage of the target group.

As survey non-response is a serious problem for studies on homeless people, we present the response rates for each wave separately by treatment status in Table A.2. The table shows that the average response rate of the control and treatment groups was fairly high at baseline (82.1% and 72.9%, respectively) and then dropped to 62.5% and 70.8% at the 36-month survey. After six years, we still observe the housing outcomes for 62.5% of individuals in both groups. We treat deceased individuals as non-respondents in the calculation of response rates.[4] We discuss

[4]We collected information on mortality during the six-year observation period from the Victorian Registry of

the issue of potential non-random attrition in more detail below.

3.4 Methods and internal validity

To check the internal validity of our RCT, we first assess the balancing of pre-treatment characteristics using information from the referral survey, which was assessed prior to treatment assignment. Given the small sample, we use permutation-based inference to compute the standard errors (see Heckman et al., 2010). Overall, Table 1 shows few systematic or significant differences (at the 10% level) between the treated and control groups with respect to socio-demographic characteristics, employment histories, homelessness experience, income support receipt, drug and alcohol usage, physical and mental health, or immediate harm alerts. We do observe some differences as treatment participants are more likely to be immigrants, and more likely to have children. However, these characteristics do not jointly predict the treatment status (p=0.8745 from F-tests for joint significance).

Despite successful randomisation, non-random attrition may also cause imbalance of characteristics over time between the treatment and control group. However, we perform balancing tests for each follow-up survey and again cannot reject the null hypothesis from an F-test of no differences in characteristics between the treated and control group.[5] We therefore estimate the ITT of the program using simple mean differences between the treated and control groups.

Our main results are robust to several robustness checks (see Section 4.2). To account for attrition more directly, we provide results for a balanced panel of individuals, estimate additional regression models that control for potential differences in observable or unobservable characteristics, and estimate sharp bounds on the treatment effect using the Lee (2009) method; overall, our main conclusions are unchanged.

Births, Deaths and Marriages (VRBDM). The register data shows that 10 individuals had died—five from each group.

[5]The p-values from the F-tests for joint significance of pre-treatment characteristics predicting the treatment are: 0.8932 (6m), 0.8725 (12m), 0.9723 (18m), 0.9756 (24m), 0.9726 (30m), 0.8502 (36m), 0.8986 (48m), and 0.8360 (72m).

3.5 Descriptive characteristics and external validity

To assess the external validity of our sample, we compare J2SI participants with participants from the Australian Journeys Home (JH) survey. The JH survey is well suited for this comparison as it includes income support recipients flagged by the Australian social security agency as either 'homeless' or 'at-risk of homelessness' (e.g., see Wooden et al., 2012). JH interviewed individuals at six-monthly intervals for two and a half years. We focus on JH respondents who were homeless at wave 1, for which interviews took place during our program period (i.e., between September and November 2011). We also constructed an analogous sample of chronically homeless persons using a definition that matches the eligibility criteria for the J2SI program as closely as possible.

Table 2 provides the results. Column 1 displays the results for the J2SI participants and shows that J2SI participants are substantially disadvantaged—they have low levels of educational attainment, weak employment histories, poor health, high rates of substance abuse, and high rates of income support recipiency and of contact with the criminal justice system. Further, J2SI participants often experience homelessness at a young age and have high rates of early childhood trauma.

For comparison, columns 2 and 3 present the results for the two JH samples. Generally, the J2SI and JH samples are quite similar in many dimensions, but our experimental sample turns out to be slightly more disadvantaged in almost all dimensions. Compared to JH, a higher proportion of J2SI participants are female (51%). There are two likely explanations for this. First, J2SI did not focus on street dwelling chronically homeless individuals who are disproportionately male (Johnson et al., 2018). Second, chronically homeless women are just as likely as men to use SHMs meals program, and SHM referred the majority of participants. As a result of differences in gender composition, a larger proportion of J2SI participants have experienced sexual violence, and a smaller proportion of J2SI participants are ex-offenders or have ever been incarcerated. We will return to the JH data in Section 4 when analysing housing outcomes.

3.6 Outcome variables

We collected information on housing and non-housing outcomes during each interview. To maximise the sample size for housing outcomes after six years, we supplement the survey data with additional information from homelessness agency databases for participants that we had not interviewed. Thus, we have housing information for 65 people after six years, and survey information for 46 participants after six years.

We focus on three outcomes that we code as binary indicator variables to analyse participants' willingness to work and labour market outcomes: being in the labour force (i.e. unemployed and looking for a job), using any employment services (that aim to help an individual find a job), and reporting any form of employment.

For health outcomes, we use three measures. First, we use the Depression Anxiety Stress Scales (DASS 21), a widely used, valid and reliable tool to measure the severity of mental health problems in adults (see, e.g., Crawford and Henry, 2003; Henry and Crawford, 2005). The DASS21 contains seven questions for each of three domains of mental health—depression, anxiety, and stress. To construct an overall mental health index, we first sum the individual scores, then standardise the sum by the mean and standard deviation of the control group, and then calculate a weighted average (following Anderson, 2008) which puts less weight on strongly correlated items. Higher values on this overall index indicate worse mental health. For general health, we use self-assessed health (SAH) which is a firmly-established and valid measure of health that predicts objective health outcomes even conditional on age and other objective health indicators (e.g., see Idler and Benyamini, 1997). We use the SF-36 inventory (Ware et al., 1993), where SAH is measured on a five-point scale ranging from 1 (very good) to 5 (bad).

To calculate total health care costs for each individual, we combine information on self-reported health service usage frequencies, that is, visits to the GP and medical specialists, ambulance usages, emergency and psychiatric wards, hospital outpatient services, community mental health services, and all other health services with cost data obtained from various official

sources. We convert all nominal prices to real 2010 prices using the consumer price index.

4 Results

4.1 Main results

The first goal of J2SI relates to reducing homelessness and improving residential stability. Although J2SI is a Housing-First model, individuals are not forced to take up housing and may also lose their housing over time (e.g., by not paying rent or breaching the tenancy contract). Thus, improved housing outcomes are not a mechanical consequence of the intervention and represent an important outcome of the intervention.

Panel A in Figure 1 plots the proportion housed for the two groups over time and clearly shows that J2SI had an immediate impact on participants' housing. Starting from similarly low baseline levels, the difference in the proportion of individuals housed increases substantially within the first six months of the trial, amounting to a difference of 53.4 percentage points. Over the first 36 months, the housing situation of the treated group stabilises and, at each survey, around 80-90% of treated individuals are housed. The housing gap between treated and controls remains between 32.9 and 49.6 percentage points over the first three years and amounts to 36.8 percentage points at the completion of the program (36 months). Appendix Figure A.1 shows that these gains are largely driven by improvements in public housing. All of these differences are statistically significant at the 1% level (see Panel A, Table 3). The consistent progress we observe in housing outcomes for the control group implies that many spells of homelessness would have ended without the treatment, though at a much slower pace.

Panel B of Figure 1 combines the housing information from both the J2SI and the JH samples. As JH was ended after five waves, we can only examine the development of housing outcomes up to 30 months. This comparison is important in several respects. First, it is reassuring that we observe a very similar pattern for the group of chronically homeless individuals in the JH data set compared to the control group in J2SI. This provides us with confidence that

the steady improvements we observe for our control group can also be observed in a differently sampled (see Section 3.5), but otherwise fairly comparable, control group. Second, Panel B also suggests that the treated group did not crowd out the control group from the local public housing market. Third, as we observe such similar findings for the control groups across the two differently drawn data sets, housing spill-overs from the treated to the control group are unlikely to bias our findings.

Importantly, we are able to examine whether individuals retained their housing after the program ended. Figure 1 shows that the housing gap begins to shrink after the program ended, reducing to 21 percentage points after 48 months and completely disappearing, even reversing, by the six-year mark. The convergence in housing rates is driven by a decline in the housing rates of the treated group and a steady increase in housing rates of the control group, who continue the increasing trend observed over the course of the program. This finding is consistent with other experimental studies that also find that the housing stability of the control group improves over time relative to its original housing situation (Gulcur et al., 2003; Rosenheck et al., 2003; Goering et al., 2014).

Appendix Figure A.1 shows that we also observe a drop in public housing for the treated group after the end of the program, from which they do not recover until month 72, presumably because they have to restart from the bottom of the waiting list. However, treatment group members were still eligible for other support services and the housing subsidy—which was not formally tied to the program— which implies that some other factors besides access to housing subsidies explain the observed pattern. We argue that it is likely that the support mix provided by J2SI helped some individuals to maintain their own housing during the program, and that the observed decline in public housing among the treated group right after the program had ended emphasises the importance of providing ongoing access to support for some individuals.

Table 3 summarises the effects of the program on housing (Panel A), labour market outcomes (Panel B), and health (Panel C). With respect to employment, Table 3 shows that the program improved the willingness to work in the second and third year. In particular, we ob-

serve that a larger fraction of the treated group moved into the labour force, which includes employed individuals as well as those looking for work. The positive effect begins to emerge after 12 months and is sustained throughout the program period. These improvements in labour force participation coincide with increased use of employment services by the treatment group during the second and third year of the program. These improvements in willingness to work and service usage also translated into improved employment outcomes, at least during the second year of the program. Most of these differences are statistically significant. However, most of these jobs were of low-quality, with low pay and low job security, in manual labour-intensive occupations (e.g. cleaning, gardening, building and maintenance), which may help explain why the previous improvements in these employment outcomes between the treated and control groups disappear after the end of the program. Unfortunately, we do not have information on the use of employment services after six years. In short, the program improved willingness to work and employment service usage during the trial, but these improvements did not translate into substantial employment gains, even disappearing, after the end of the program.

Regarding the health outcomes, the results suggest no systematic improvements in mental health over time for the treatment group compared to the control group—either during or after the end of the program. In addition to mental health, we also examine self-assessed health, which shows that treated individuals report a short-run improvement in self-reported health after six months; however, this turns out to be a short-lived effect as we do not observe any meaningful differences between the two groups in subsequent surveys during the program period. We observe a small improvement in self-reported health among the treated group between 36 and 48 months, though this effect is inconsistent with the simultaneous drop in housing for the treated group and the stable mental health patterns over the same time span. Morever, we do not observe any long-run differences between the treated and control groups with respect to self-reported health after 72 months. Therefore, this result at 48 months is likely due to statistical uncertainty. Overall, our analysis indicates that the intervention did not lead to pronounced changes in physical or mental health over the course of six years.

Regarding health care costs, our results at baseline show that both groups report relatively high average health care expenses on the order of 15,000-18,000 $AUD for the past six months.[6] Second, we observe a substantial reduction in health care costs over the first four years of the trial for the treated group, but a similar decline for the control group. Therefore, we do not find any clear evidence that J2SI substantially or permanently reduced health care costs for the treated relative to the control group. This finding is consistent with the self-reported information on mental and physical health. Unfortunately, we cannot calculate health care costs in a consistent way for the 6-six-year follow-up as some information on health service utilisation components is missing.

4.2 Robustness checks

We perform several robustness checks to check the sensitivity of our main results. First, to assess whether selective attrition biases our results, Table A.5 presents the results for a balanced panel of individuals who responded to every survey wave. Despite a considerably smaller sample size, the results from the balanced panel are consistent with our main results.

Second, to ensure that our results are not affected by any potential differences in observable or unobservable characteristics between the treated and control groups, we also estimate additional regression models: First, we control for an extensive set of pre-treatment covariates such as an individual's gender, age and its square, previous housing and employment histories, drug use status, self-reported health, and an indicator variable for having experienced domestic violence. Second, we exploit the panel dimension and run models with individual-specific fixed effects, to account for time-invariant unobserved heterogeneity, and with random-effects that allow us to additionally control for time-invariant pre-treatment characteristics. We present the results for housing outcomes in Table A.4, which shows that our conclusions remain unaffected by these specification checks.

[6] In comparison, the average recurrent health expenditures per person per year amounts to $AUD 5,796 in 2010 (AIHW 2012, Health expenditure Australia 2010-11).

Finally, we calculate sharp bounds on the treatment effect following the Lee (2009) method to account for stronger attrition among the control group. This method calculates upper and lower bounds for the treatment effect relying on a monotonicity assumption, i.e., that the assignment to the treatment affects sample selection in only one direction. In our case, this assumption implies that some individuals would have left the trial if they had not been assigned to the treatment, but that no individuals leave the trial because of being assigned to the treatment. Although inherently untestable, this assumption seems plausible in our context. The estimates presented in Table A.6 confirm that J2SI led to significant improvements in housing during the program period. The bounds for the employment outcomes are not statistically significantly different from zero in most cases, though the sign and magnitude of the bounds do support our main results that the program improved employment outcomes during the program period.

5 Conclusion and discussion

Using a rigorously conducted RCT, our paper examines how an intensive support program (J2SI) for chronically homeless individuals affected their housing, employment, and health over a six-year period. The program delivered a substantial boost in housing during the program period—largely driven by improvements in public housing—alongside a short-run boost in employment outcomes, though no systematic improvements in health outcomes. We are the first study to examine the long-run outcomes and we observe that the housing outcomes of both groups converge after the support period. The long-run housing results are largely driven by the control group, which experiences a steady improvement in housing over time. This important finding implies that chronic homelessness, although a pre-requisite for the intervention, may actually include a large transitory component and not represent a permanent equilibrium after all. Despite a short run boost in employment, we find no substantial long-run impact in employment outcomes—though we cannot rule out small effects in either direction. In part, this likely reflects the precarious and insecure work arrangements participants experienced. Our results

suggest that employment, when participants found it, was of low quality with insecure work arrangements. Moreover, additional labour income also increased the disincentives to work as government income support is means-tested.

The most likely explanation for our findings is that participants in the J2SI program have been at the margins of society for many years and that the compounding effects of long-term social exclusion are hard to overcome. For many participants, poor physical and mental health, constant exclusion from the labour market, prolonged exposure to poor living conditions, and social stigma mean that the likelihood of experiencing rapid and significant improvements in economic, health, and social outcomes are low, despite improvements in housing and access to therapeutic means. Thus, our findings chime with Fitzpatrick et al. (2013) and suggest that homelessness *per se* is not the main problem for the chronically homeless, as providing a home does not seem to be resolving their long-term outcomes. Instead, it appears that homelessness is rather a symptom of multiple sources of economic and social disadvantage. Although housing is not a sufficient condition to improve other outcomes, it appears to be a necessary and complementary condition to help improve these other outcomes as well.

Several policy implications arise from our study. First, although we do not find a statistically significant difference between the treatment and control groups at the 72 months mark, it is reasonable to conclude that the program was a success in terms of housing. While the treated group experienced a substantial housing boost during the first three years from close to 0% to around 80%, only dipping down to about 65% at 72 months, the housing rate of the control group increased steadily from about 18% housed at 6 months to to around 72% at 72 months. Thus, a large fraction of the homeless in the treatment group found housing and kept it for six years, while it took six years for people in the control group to get to the point where treatment group members were after six months.

Second, our results challenge the view that chronically homeless individuals are resistant to service interventions and incapable of maintaining their housing. Instead, we find that chronically homeless people can maintain their own housing if they have access to the right mix of

support. That we do not find any meaningful long-run improvements in non-housing outcomes is consistent with previous findings and underlines the need for larger sample size with larger statistical power. Additionally, the lack of an effect on non-housing outcomes underscores the important point that settling in and making a home represents a drawn out and complicated process for the long-term homeless (Chamberlain and Johnson, 2018). Policy makers can underestimate how challenging and complex this process can be, with the result that many interventions are insufficiently resourced to provide meaningful and much needed support during the settlement process.

Third, the abrupt decline in housing among the treated group after the program had ended emphasises the importance of providing ongoing access to support for some individuals. Furthermore, given that the rental subsidy for public housing and alternative support services were still available, the abrupt drop in public housing rates for this group highlights the importance of continuity of care with a caseworker, at least for those individuals with the highest support needs. The abrupt end to the program meant that relationships built with caseworkers over a number of years were no longer available for the treated group. Our findings raise at least two related questions: Could further support targeted towards individuals with the highest support needs have mitigated the drop in housing, and what is the right dose of support? We find no evidence to support three years as the optimal support period for this population and further research into the level, duration, and intensity of support (dosage) is required.

Although our results show that the long-term homeless can maintain their housing with the right mix of support, it is equally clear that once chronic homelessness sets in, it is challenging and costly to resolve. The individuals in our study were on average in their late 30s, and it remains an open question whether the intervention occurred too late in their lives to make a substantial difference. Thus, future programs should also target younger individuals to evaluate whether early intervention strategies aimed at preventing chronic homelessness can produce more beneficial effects in the long-run.

Finally, are the lessons learnt from our study relevant beyond the Australian setting? We are

confident that the findings from our study are relevant for the chronically homeless population in other developed countries. First, our study performs well with respect to the SANS conditions (selection, attrition, naturalness, and scalability) laid out by List (2020). Concerning selection, our comparison with data from the Journeys Home survey provides evidence that the population we study is quite representative for the group of chronically homeless in Australia. Attrition is not a problem in our setting, as shown in several robustness checks. Our natural field experiment provides a natural real-world setting. Finally, there may be some scaling issues with respect to the availability of public housing, but as our study aims at establishing initial causality (a wave 1 study in the terminology of List, 2020), scalability should not be the focus at this stage of research.

Moreover, it is re-assuring that our findings for the housing outcomes during the program period are consistent with similar results for (shorter) Housing First interventions in the US. Similarly, the housing patterns we observe for two very distinct control groups have also been observed in the US (e.g. Gulcur et al., 2003). This, in turn, indicates that findings from the US can be extrapolated to the Australian setting. This suggests that the preferences, beliefs, and constraints that drive individuals behaviour among the chronically homeless are not fundamentally different between the US and Australia. Despite some institutional differences, there are also similarities, for instance in the way public housing is subsidised. This would also indicate that our findings beyond the program period are also relevant for the US and other developed countries. We hope that future research builds upon our findings and also investigates long-run outcomes so that we can learn more about treatment effect heterogeneity, transitions between permanent and transitory homelessness, potential targeting, and the underlying mechanisms.

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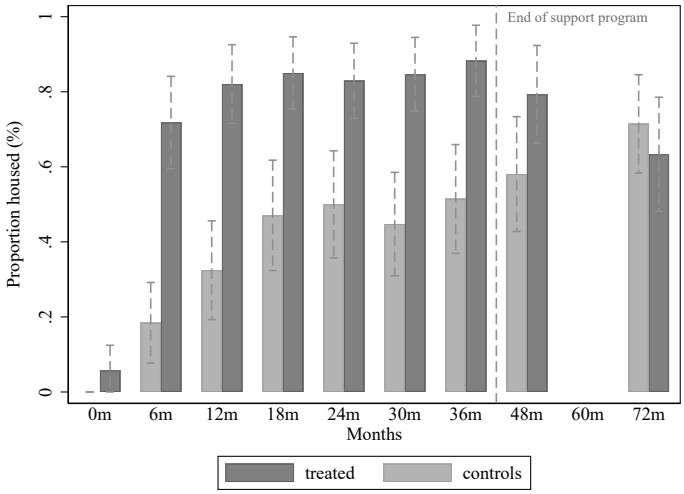
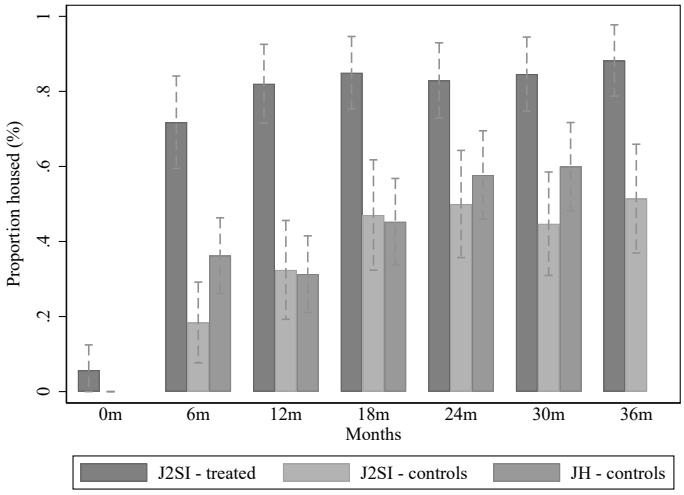
6 Figures and Tables

Figure 1: Housing outcomes

Panel A: Housing outcomes from J2SI program



Panel B: Housing outcomes for J2SI and Journeys Home data



Notes: Panel A shows the proportion of individuals who were securely housed at the time of each survey, separately by treatment status. No information collected at 60 months. Panel B shows the proportion of individuals in J2SI and Journeys Home who were securely housed at the time of each survey. Panel B only covers the first 36 months as Journeys Home is available every 6 months for up to 30 months. 95% confidence intervals shown in both panels. *Source:* Own calculations.

Table 1: Covariate balancing

	controls	treated	difference	p-value
Female	0.50	0.48	-0.02	0.847
Age	37.18	37.34	0.16	0.912
Immigrant	0.11	0.21	0.10	0.186
Couple	0.14	0.13	-0.02	1.000
Have children	0.29	0.40	0.11	0.301
Have resident children	0.11	0.06	-0.04	0.503
Employment experience:				
Last employment within 2 years	0.14	0.10	-0.04	0.774
Last employment more than 2 years ago	0.25	0.40	0.15	0.138
Last employment unknown	0.13	0.23	0.10	0.197
Never employed	0.16	0.10	-0.06	0.568
Don't know	0.32	0.17	-0.15	0.111
Out-of-home care history				
Never in foster or residential care	0.61	0.60	0.00	1.000
Ever in foster or residential care	0.30	0.27	-0.03	0.829
Missing out-of-home care information	0.09	0.13	0.04	0.752
Incarceration history				
Never incarcerated	0.52	0.56	0.04	0.701
Ever incarcerated	0.39	0.38	-0.02	1.000
Incarceration unknown	0.09	0.06	-0.03	0.720
Numbers of years since first slept rough				
5 years or less	0.11	0.15	0.04	0.768
6 to 10 years	0.30	0.29	-0.01	1.000
More than 10 years	0.52	0.54	0.02	0.845
Missing first slept rough information	0.07	0.02	-0.05	0.369
Numbers of moves in the past 5 years				
5 times or less	0.20	0.21	0.01	1.000
6 to 10 times	0.34	0.31	-0.03	0.837
11 to 20 times	0.27	0.25	-0.02	1.000
More than 20 times	0.14	0.15	0.00	1.000
Unknown	0.05	0.08	0.03	0.703
Not on income support	0.00	0.04	0.04	0.205
Income support				
On New Start Allowance	0.34	0.29	-0.05	0.672
On disability support pension	0.55	0.65	0.09	0.418
On other types of income support	0.11	0.02	-0.09	0.121

continued on next page

Table 1 (continued)

	controls	treated	difference	p-value
Drug usage				
No drug user	0.30	0.31	0.01	1.000
Drug user	0.63	0.69	0.06	0.537
Drug user status unknown	0.07	0.00	-0.07	0.122
No alcohol problem	0.61	0.69	0.08	0.428
With alcohol problem	0.30	0.31	0.01	1.000
Alcohol problem unknown	0.09	0.00	-0.09	0.059
Hospitalisation				
Never hospitalised	0.43	0.38	-0.05	0.692
Ever hospitalised	0.48	0.56	0.08	0.438
Hospitalisation information unknown	0.09	0.06	-0.03	0.720
Mental illness (told by health professionals)	0.82	0.92	0.10	0.258
Intellectual disability	0.21	0.17	-0.05	0.621
Self rated health				
Good	0.11	0.19	0.08	0.271
Average	0.30	0.33	0.03	0.838
Bad	0.50	0.40	-0.10	0.328
Missing	0.09	0.08	-0.01	1.000
Case worker alerts for immediate harm				
Allergies	0.09	0.10	0.01	1.000
Anaphylaxis	0.02	0.04	0.02	0.592
Carrying weapon	0.02	0.00	-0.02	1.000
Epilepsy	0.09	0.08	-0.01	1.000
Gambling	0.07	0.10	0.03	0.728
Self harm	0.13	0.19	0.06	0.423
Suicidal ideation	0.21	0.21	-0.01	1.000
Suicidal / homicidal	0.05	0.02	-0.03	0.630
Victim of sexual assault	0.21	0.21	-0.01	1.000
Perpetrator of sexual assault	0.00	0.04	0.04	0.211
Recent history of violence	0.25	0.27	0.02	0.831
Acute mental health symptoms	0.38	0.44	0.06	0.548
If referred from Sacred Heart Mission	0.73	0.75	0.02	1.000
N	56	48		
P-value from F-test that all above variables are jointly 0				0.8745

Notes: This table presents the means of characteristics measured at referral for the control and treated groups, the mean difference, and the associated permutation-based p-value (using 999 repetitions).

Table 2: Characteristics of J2SI participants and samples in Journeys Home

	J2SI participants	Journeys Home	
		Chronic homeless persons aged 25-50	All homeless persons
Average age	37.3	37.7	36.2
% of people:			
Female	51.0	23.7	31.5
Couple	13.5	12.1	8.5
Immigrant	15.4	5.4	13.4
Have children	33.7	54.3	35.9
Have resident children	8.7	6.6	8.8
Highest level of education			
Post-school qualification	4.5	16.5	27.9
Year 12	9.0	5.5	10.6
Year 10 and 11	40.4	38.5	36.4
Less than Year 10	46.1	39.6	25.1
Employment history			
Never employed	17.9	7.5	7.1
Employed in recent 2 years	12.5	29.0	45.1
Ever lived in foster or residential care	32.3	22.8	17.4
Ever incarcerated	41.7	60.2	43.0
Sexual violence (ever)	61.0	41.3	32.4
Currently sleeping rough	18.3	17.2	9.9
Ever slept rough	100.0	88.2	71.0
Self-rated health			
good to excellent	15.8	47.3	55.1
fair	34.7	31.2	27.8
poor	49.5	21.5	17.1
Drug usage			
Used drug in last 6 months	85.7	53.3	47.6
Used drug weekly in the last 6 months	75.9	38.7	30.0
Drank alcohol daily	6.8	14.0	11.1
Income support			
Not on income support	1.9	3.2	6.0
On DSP payment	59.6	50.5	33.1
On NSA payment	31.7	50.5	47.8
On other income support payments	6.7	4.3	8.7
Numbers of individuals	104	93	435

Notes: This table provides descriptive statistics for the same variables for three different groups: the first column presents the descriptive statistics for our J2SI sample using baseline data. The second and third columns use information from the the first wave of 'Journeys Home' which is based on a representative sample of Australians at the risk of homelessness. The second columns presents the statistics for individuals who are chronically homeless and aged 25-50, the third columns uses all homeless individuals in 'Journeys Home'.

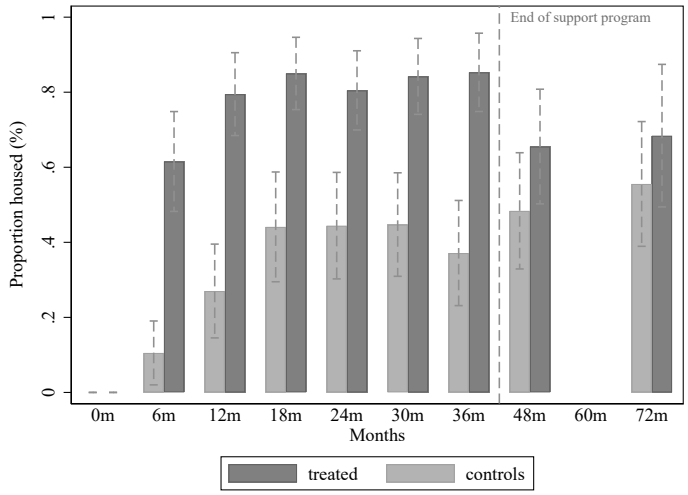
Table 3: Main results

	0 m	6 m	12 m	18 m	24 m	30 m	36 m	48 m	72 m
Panel A: Housing									
Housed at interview	0.057	0.534***	0.496***	0.379***	0.329***	0.399***	0.368***	0.212	-0.081
Control group mean	0.000	0.184	0.324	0.471	0.500	0.447	0.514	0.581	0.714
P-value	0.181	0.000	0.000	0.001	0.003	0.000	0.002	0.105	0.589
N	81	77	76	74	77	77	69	60	65
Panel B: Labour market outcomes									
Employed	-0.015	-0.001	0.152*	0.146*	-0.014	0.156*	0.004	-0.030	-0.074
Control group mean	0.043	0.026	0.027	0.029	0.139	0.054	0.143	0.065	0.074
P-value	1.000	1.000	0.057	0.064	1.000	0.074	1.000	1.000	0.485
N	81	77	76	74	76	75	69	60	45
In labour force	0.047	0.018	0.326***	0.378***	0.225**	0.392***	0.182	0.080	-0.037
Control group mean	0.239	0.316	0.135	0.147	0.250	0.108	0.171	0.161	0.148
P-value	0.793	1.000	0.002	0.002	0.045	0.000	0.107	0.524	0.750
N	81	77	76	74	76	75	69	60	45
Used employment services	0.053	-0.053	0.174*	0.228**	0.276***	0.366***	0.258***	0.041	n.a.
Control group mean	0.261	0.263	0.108	0.147	0.139	0.108	0.086	0.097	n.a.
P-value	0.626	0.691	0.088	0.036	0.009	0.001	0.008	0.708	n.a.
N	81	76	76	74	77	75	67	60	n.a.
Panel C: Health outcomes									
Mental healh index	-1.954	-1.175	-0.252	0.360	-3.181	0.303	-3.849	-0.839	-1.025
Control group mean	19.524	17.451	17.933	15.262	15.857	15.110	18.755	14.602	17.644
P-value	0.427	0.636	0.918	0.874	0.154	0.900	0.166	0.764	0.751
N	79	74	75	72	73	71	66	60	44
Self-assessed health	0.261	-0.553**	-0.144	-0.028	0.018	0.053	0.150	-0.402*	0.092
Control group mean	3.739	3.974	3.811	3.765	3.657	3.684	3.600	3.677	3.593
P-value	0.264	0.023	0.577	0.926	0.968	0.876	0.547	0.099	0.811
N	80	76	76	72	75	76	67	60	46
Health care costs	3022.427	-2619.378	-4431.293	-1839.798	-8764.508	5761.765	367.453	-4058.628	n.a.
Control group mean	1.6e+04	1.5e+04	1.3e+04	1.1e+04	1.7e+04	5834.224	5779.159	1.0e+04	n.a.
P-value	0.656	0.683	0.393	0.776	0.300	0.136	0.864	0.537	n.a.
N	81	77	76	74	77	77	69	60	n.a.

Notes: This table presents the unadjusted mean differences between the treated and control groups at six-monthly intervals for each outcome, alongside the control group mean, the permutation-based p-value (using 999 repetitions), and the sample size for each outcome. $*$ *p<0.10, ** p<0.05, *** p<0.01.*

Appendix A: Supplemental Figures and Tables

Figure A.1: Public housing



Notes: Panel A shows the proportion of individuals who were in public housing at the time of each survey, separately by treatment status. No information collected at 60 months.
Source: Own calculations.

Table A.1: Distribution of program participation

Treatment duration	From random assignment date to last contact		From first face-to-face contact to last face-to-face contact	
	count	%	count	%
$<$ 3 months	3	6.3	5	10.4
3-5 months	1	2.1	1	2.1
6-11 months	0	0.0	1	2.1
12-23 months	2	4.2	1	2.1
24 -29 months	4	8.3	5	10.4
30-36 months	38	79.2	35	72.9
All	48	100%	48	100%
Average treatment duration	963 days		862 days	

Notes: Own calculations.

Table A.2: Survey response rates

	0 m	6 m	12 m	18 m	24 m	30 m	36 m	48 m	72 m
Control group (n=56)	82.1	67.9	66.1	60.7	64.3	67.9	62.5	55.4	48.2 (62.5)[a]
Treated group (n=48)	72.9	81.3	81.3	83.3	85.4	81.3	70.8	60.4	39.6 (62.5)[a]

Notes: This table reports the response rates for each survey. For the calculation of the rates, we count deceased individuals as non-respondents. [a] *For 72 months, we additionally report the combined response rate (survey and housing data) in parentheses.*

Table A.3: Covariate balancing among 72-months sample

	controls	treated	difference	p-value
Female	.49	.4	-.086	.626
Age	36.6	36.59	-.008	.996
Immigrant	.09	.2	.114	.275
Couple	.23	.07	-.162	.101
Have children	.31	.43	.119	.461
Have resident children	.09	.07	-.019	1
Employment experience:				
Last employment within 2 years	.17	.17	-.005	1
Last employment more than 2 years ago	.29	.43	.148	.315
Last employment unknown	.14	.23	.09	.546
Never employed	.23	.13	-.095	.357
Don't know	.17	.03	-.138	.103
Out-of-home care history				
Never in foster or residential care	.6	.6	0	1
Ever in foster or residential care	.29	.37	.081	.553
Missing out-of-home care information	.11	.03	-.081	.379
Incarceration history				
Never incarcerated	.51	.57	.052	.803
Ever incarcerated	.34	.4	.057	.81
Incarceration unknown	.14	.03	-.11	.185
Numbers of years since first slept rough				
5 years or less	.11	.1	-.014	1
6 to 10 years	.34	.3	-.043	.782
More than 10 years	.51	.6	.086	.621
Missing first slept rough information	.03	0	-.029	1
Numbers of moves in the past 5 years				
5 times or less	.17	.23	.062	.772
6 to 10 times	.4	.3	-.1	.447
11 to 20 times	.2	.2	0	1
More than 20 times	.14	.2	.057	.731
Unknown	.09	.07	-.019	1
Income support				
Not on income support	0	.07	.067	.203
On New Start Allowance	.4	.37	-.033	.813
On disability support pension	.54	.53	-.01	1
On other types of income support	.06	.03	-.024	1

continued on next page

Table A.3 (continued)

	controls	treated	difference	p-value
Drug usage				
No drug user	.29	.3	.014	1
Drug user	.63	.7	.071	.585
Drug user status unknown	.09	0	-.086	.243
No alcohol problem	.66	.67	.01	1
With alcohol problem	.26	.33	.076	.615
Alcohol problem unknown	.09	0	-.086	.243
Hospitalisation				
Never hospitalised	.43	.37	-.062	.786
Ever hospitalised	.43	.6	.171	.219
Hospitalisation information unknown	.14	.03	-.11	.185
Mental illness (told by health professionals)	.83	.9	.071	.497
Intellectual disability	.23	.23	.005	1
Self rated health				
Good	.14	.17	.024	1
Average	.31	.37	.052	.788
Bad	.46	.4	-.057	.778
Missing	.09	.07	-.019	1
Case worker alerts for immediate harm				
Allergies	.09	.13	.048	.695
Anaphylaxis	0	.07	.067	.212
Carrying weapon	.03	0	-.029	1
Epilepsy	.11	.1	-.014	1
Gambling	.06	.13	.076	.425
Self harm	.11	.2	.086	.476
Suicidal ideation	.23	.23	.005	1
Suicidal / homicidal	.06	.03	-.024	1
Victim of sexual assault	.17	.27	.095	.382
Perpetrator of sexual assault	0	0	0	1
Recent history of violence	.2	.33	.133	.247
Acute mental health symptoms	.34	.43	.09	.603
If referred from Sacred Heart Mission	.77	.8	.029	1
N	35	30		
P-value from F-test that all above variables are jointly 0				0.8360

Notes: This table presents the means of characteristics measured at referral for the control and treated groups, the mean difference, and the associated permutation-based p-value (using 999 repetitions).

Table A.4: Sensitivity checks for housing outcomes

	0 m	6 m	12 m	18 m	24 m	30 m	36 m	48 m	72 m
Panel A: Baseline (bl)	0.057	0.534***	0.496***	0.379***	0.329***	0.399***	0.368***	0.212*	-0.081
P-value	0.196	0.000	0.000	0.001	0.005	0.000	0.001	0.099	0.602
R-squared	0.033	0.287	0.252	0.163	0.123	0.175	0.160	0.052	0.007
N	81	77	76	74	77	77	69	60	65
Panel B: bl plus controls	0.062*	0.480***	0.476***	0.296**	0.294**	0.347***	0.351**	0.215	-0.120
P-value	0.095	0.000	0.000	0.014	0.015	0.006	0.010	0.125	0.366
R-squared	0.310	0.565	0.556	0.413	0.332	0.393	0.302	0.352	0.365
N	81	77	76	74	77	77	69	60	65
Panel C: bl plus FEs	0.041	0.496***	0.472***	0.361***	0.279**	0.349***	0.318***	0.149	-0.110
P-value	0.257	0.000	0.000	0.001	0.012	0.001	0.004	0.215	0.353
N	656	656	656	656	656	656	656	656	656
Panel C: bl plus REs	0.060	0.532***	0.504***	0.391***	0.317***	0.388***	0.357***	0.184	-0.077
P-value	0.148	0.000	0.000	0.000	0.002	0.000	0.000	0.106	0.502
N	656	656	656	656	656	656	656	656	656
Panel E: bl plus RE and controls	0.041	0.515***	0.485***	0.371***	0.296***	0.367***	0.339***	0.163	-0.093
P-value	0.462	0.000	0.000	0.000	0.003	0.000	0.001	0.150	0.396
N	656	656	656	656	656	656	656	656	656

*Notes: This table presents the differences in housing outcomes between the treated and control groups at six-monthly intervals for each outcome for different specifications. P-values in Panels A and B are based on permutation inference methods (using 999 repetitions). In Panels C to E, we pool all time periods and interact the treatment dummy with the survey dummies; in these regressions, standard errors are clustered at the individual level. * p<0.10, ** p<0.05, *** p<0.01.*

Table A.5: Main results for balanced panel

	0 m	6 m	12 m	18 m	24 m	30 m	36 m	48 m	72 m
Panel A: Housing									
Housed at interview	0.000	0.607***	0.536***	0.274**	0.190	0.321**	0.321**	0.232	-0.036
Control group mean	0.000	0.250	0.417	0.583	0.667	0.583	0.583	0.625	0.750
P-value	1.000	0.000	0.001	0.069	0.179	0.028	0.027	0.100	1.000
N	45	45	45	45	45	45	45	45	45
Panel B: Labour market outcomes									
Employed	-0.048	0.015	0.140	0.140	-0.065	0.202	-0.003	-0.095	-0.095
Control group mean	0.048	0.048	0.048	0.048	0.191	0.048	0.191	0.095	0.095
P-value	1.000	1.000	0.303	0.289	0.649	0.137	1.000	0.493	0.534
N	37	37	37	37	37	37	37	37	37
In labour force	0.170	0.027	0.310*	0.530***	0.262	0.482**	0.137	0.060	-0.065
Control group mean	0.143	0.286	0.191	0.095	0.238	0.143	0.238	0.191	0.191
P-value	0.254	1.000	0.088	0.000	0.163	0.005	0.488	0.677	0.687
N	37	37	37	37	37	37	37	37	37
Used employment services	-0.033	-0.083	0.175	0.342**	0.375***	0.517***	0.367**	-0.025	n.a.
Control group mean	0.333	0.333	0.125	0.208	0.125	0.083	0.083	0.125	n.a.
P-value	1.000	0.720	0.255	0.018	0.005	0.000	0.011	1.000	n.a.
N	44	44	44	44	44	44	44	44	n.a.
Panel C: Health outcomes									
Mental healh index	-6.001	-2.854	-4.597	-0.686	-4.660	-3.691	-5.967	-1.127	-1.356
Control group mean	21.110	18.973	19.637	15.463	15.652	16.439	18.480	14.378	16.161
P-value	0.119	0.412	0.175	0.853	0.124	0.291	0.115	0.739	0.698
N	36	36	36	36	36	36	36	36	36
Self-assessed health	-0.176	-0.661**	0.109	0.109	-0.042	-0.031	0.028	-0.644**	0.300
Control group mean	4.000	4.191	3.714	3.714	3.571	3.619	3.619	3.762	3.524
P-value	0.599	0.041	0.768	0.778	1.000	1.000	1.000	0.025	0.471
N	38	38	38	38	38	38	38	38	38
Health care costs	-2520.544	-8140.110	-10523.699	-7149.408	-10638.255	824.639	1293.941	-1946.692	n.a.
Control group mean	1.7e+04	1.5e+04	1.6e+04	1.3e+04	1.9e+04	4174.340	4610.179	8570.144	n.a.
P-value	0.809	0.233	0.121	0.283	0.513	0.618	0.452	0.954	n.a.
N	49	49	49	49	49	49	49	49	n.a.

Notes: This table uses a balanced sample and presents the unadjusted mean differences between the treated and control groups at six-monthly intervals for each outcome, alongside the control group mean, the permutation-based p-value (using 999 repetitions), and the sample size for each outcome. $*$ *$p<0.10$,* ** *$p<0.05$,* *** *$p<0.01$.*

Table A.6: Results during the program period using Lee (2009) attrition bounds

	6m		12m		18m		24m		30m		36m		72m	
	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB	LB	UB
Panel A: Housing														
Housed at interview	0.478***	0.675***	0.455***	0.676***	0.324***	0.529***	0.273**	0.500***	0.368***	0.553***	0.352***	0.486***	-0.256	-0.038
	(0.114)	(0.146)	(0.112)	(0.078)	(0.119)	(0.087)	(0.118)	(0.085)	(0.109)	(0.082)	(0.108)	(0.115)	(0.263)	(0.147)
Panel B: Labour market outcomes														
Employed	-0.026	0.004	-0.027	0.194**	-0.029	0.211**	-0.139**	0.023	-0.000	0.198**	-0.110	0.024	-0.095	0.000
	(0.026)	(0.040)	(0.027)	(0.084)	(0.029)	(0.093)	(0.058)	(0.092)	(0.144)	(0.093)	(0.162)	(0.094)	(0.068)	(.)
In labour force	-0.114	0.083	0.203	0.432***	0.201	0.574***	0.069	0.366**	0.293**	0.491***	0.095	0.229*	-0.079	0.111
	(0.150)	(0.127)	(0.138)	(0.132)	(0.149)	(0.154)	(0.150)	(0.146)	(0.132)	(0.132)	(0.152)	(0.126)	(0.124)	(0.076)
Used employment services	-0.184	-0.018	0.009	0.239**	-0.005	0.368***	0.083	0.412***	0.261*	0.459***	0.214	0.281**	n.a.	n.a.
	(0.152)	(0.110)	(0.146)	(0.111)	(0.163)	(0.138)	(0.148)	(0.134)	(0.134)	(0.130)	(0.144)	(0.115)	n.a.	n.a.
Panel C: Health outcomes														
Mental healh index	-3.903	1.058	-3.288	2.587	-4.916	4.152	-6.767***	-1.100	-2.118	2.007	-4.740	-3.396	-3.288	2.587
	(2.988)	(3.048)	(3.254)	(3.177)	(3.489)	(3.382)	(2.526)	(2.917)	(3.159)	(3.129)	(4.662)	(3.516)	(3.254)	(3.177)
Self-assessed healh	-0.816**	-0.224	-0.450	0.230	-0.412	0.299	-0.357	0.376	-0.158	0.360	0.067	0.267	-0.450	0.230
	(0.342)	(0.319)	(0.340)	(0.271)	(0.346)	(0.289)	(0.257)	(0.283)	(0.314)	(0.259)	(0.316)	(0.315)	(0.340)	(0.271)
Health care costs	-11035.579**	-66.206	-9736.651**	-2606.307	-9626.471**	1601.891	-14200.811*	-6109.428	-1993.273	8020.087*	-1561.235	1187.001	n.a.	n.a.
	(4982.224)	(6948.927)	(4359.461)	(5496.041)	(4046.414)	(7038.110)	(7994.752)	(8382.242)	(2263.927)	(4578.273)	(2506.400)	(2303.077)	n.a.	n.a.

Notes: We calculate the lower and upper bounds using the methodology of Lee (2009) using the Stata command leebounds *produced by Tauchmann (2014).*

Appendix B: Related Literature

Homelessness remains a major social policy challenge even in the wealthiest countries in the world, particularly during the current COVID-19 pandemic (e.g., OECD, 2019, 2020). In the US, a point-in-time count in January 2019 estimated there were 568,000 homeless individuals, with around two thirds staying in emergency shelters or transitional housing and about one third on the street or in other places not fit for human habitation (Henry et al., 2019). Across the European Union (EU), at least 700,000 individuals were homeless in 2019 according to the same criteria, representing a 10% increase over the last ten years (FEANTSA, 2019). Recognising the growing challenge, the EU included 'Housing and assistance for the homeless' as one of its European Pillar of Social Rights in 2017.

For many years, the most widespread response to deal with homelessness was the 'continuum of care model' that required chronically homeless individuals to go through a series of stages and demonstrate they were 'housing ready' before they were offered an opportunity to occupy their own independent dwelling (e.g., see Johnsen and Teixeira, 2010). In the early 1990s, difficulties assisting the chronically homeless with mental health and/or substance abuse issues to secure and maintain housing raised questions in the US about the appropriateness of this model.

Housing First approaches, as pioneered by Pathways to Housing in New York (Tsemberis, 1999), subsequently emerged as an effective alternative. Housing First approaches require no preconditions for housing and combine affordable housing and voluntary community-based support services to help chronically homeless individuals, with a serious mental health and/or substance abuse issue, leave homelessness and lead more stable lives.

Housing First approaches have been examined extensively, particularly in the US and to a lesser extent Europe and Canada. The majority of studies, however, use simple pre/post comparisons for a single group and report that Housing First has a positive impact across a range of dimensions including social and economic outcomes. Such non-experimental studies form

the basis of many claims about the efficacy and economic efficiency of Housing First. However, due to selection bias, findings from non-experimental studies are likely to overestimate the social and behavioural impact of Housing First, as well as any potential cost reductions. In light of the potential biases in non-experimental studies, we focus the following literature review on quasi-experimental and experimental studies.[7]

Generally, most quasi-experimental and experimental studies indicate that Housing First approaches produce better housing outcomes than traditional 'continuum of care' approaches (Kertesz and Johnson, 2017). These studies demonstrate that Housing First participants spend significantly less time homeless and more time housed compared to those receiving traditional services (Aubry et al., 2015; Tsai et al., 2010; Pearson et al., 2009; Stefancic and Tsemberis, 2007; Caton et al., 2007; Rosenheck et al., 2003; Gulcur et al., 2003).

While improved housing stability is a notable and consistent finding, the extant literature suggests, however, that Housing First approaches have less impact on clients' behavioural, health, and social needs (Kertesz and Johnson, 2017). Most studies have found few differences in patterns of substance and alcohol use between Housing First and continuum services, and where differences are observed, they have not always been statistically significant (Aubry et al., 2015; Tsemberis et al., 2004; Padgett et al., 2006; O'Connell et al., 2009; Pearson et al., 2009). Similarly, studies that examine mental health conditions report minimal improvements, with little difference between Housing First and traditional approaches (Goering et al., 2014).

Some studies also examine the impact of Housing First on individuals' quality of life, social functioning and community integration. The results are ambiguous, with some studies suggesting significant improvements in quality of life and community functioning (Aubry et al., 2015; Goering et al., 2014), while others do not, reporting that social isolation and loneliness are common outcomes (Padgett, 2007; Yanos et al., 2007). Several studies examine the extent to which consumers are satisfied with the services provided to them. These studies consistently report

[7]For more detailed literature reviews of economic studies on Housing First, see Evans et al. (2021), O'Flaherty (2019), Caton et al. (2007), Culhane and Metraux (2008) and Ly and Latimer (2015).

that people are more satisfied with Housing First than traditional services (Siegel et al., 2006) and also report greater choice (Greenwood et al., 2005; Tsemberis and Eisenberg, 2000).

Finally, a number of studies have examined the cost offsets associated with Housing First interventions, measured by reductions in emergency department and inpatient use, justice system involvement and the use of other welfare services. Despite some variations, most studies report a decline in usage relative to a control group (e.g., Gulcur et al., 2003; Sadowski et al., 2009; Larimer et al., 2009; Basu et al., 2012; Srebnik et al., 2013) resulting in annual net cost savings of up to $29,388 per person (Larimer et al., 2009). While Housing First is linked to important cost offsets as a result of reduced hospitalisation, acute treatment and involvement with criminal justice system, some studies report that cost savings do not equal the cost of providing Housing First services (Culhane et al., 2002; Rosenheck et al., 2003; Culhane and Metraux, 2008). In an experimental study of over 2000 chronically homeless individuals, Goering et al. (2014) found considerable variation based on the level of client need. For every $10 invested in Housing First, they estimate cost-savings of $9.32 among high needs clients (32% of the sample) and $3.42 for modest needs clients (68% of the sample). The authors note, however, that significant cost savings were achieved for the 10% of participants with the highest cost at entry - for this group, they estimate savings of $21.72 for every $10 invested in Housing First. Thus, their findings suggest that Housing First can be cost-effective by targeting the highest cost service users. However, a limitation to these cost-benefit studies is that they tend not to differentiate between average and marginal costs and they do not consider the potentially large benefits for the family and friends of homeless individuals (see O'Flaherty, 2019).[8]

In summary, the quasi-experimental and experimental evidence indicates that Housing First approaches are more effective than traditional approaches at improving housing stability, reducing the use of expensive health services, and improving consumer satisfaction. The over-

[8]Due to the inherent issues in quantifying these social benefits, we refrain from providing any back-of-the-envelope calculations. In our case, it is also likely that any cost-benefit analysis would overestimate the costs of the program, as the attrition rate is higher among the control group and we are therefore more likely to observe high-cost events (hospital admissions, ambulance usage, imprisonment) for the treated group compared to the control group.

whelming evidence from RCTs is that supportive housing has little impact on other non-housing outcomes such as health or labour market outcomes, with the exception of one case management program in Chicago (see Sadowski et al., 2009). All of these studies, however, focus on outcomes during the support period and do not examine the long-term results of Housing First on the outcomes of the chronically homeless.

Housing First approaches are also referred to as Permanent Supportive Housing (PSH) and Supportive Housing. However, there are inconsistencies and ambiguities in the way Housing First, PSH, and Supportive Housing are defined (Allen et al., 2020). For some, Housing First is a 'species of PSH' (O'Flaherty, 2019, p.2), but for others 'supportive housing is a housing first strategy' (Evans et al., 2021, p.16). Housing First was originally tied to permanent scatter-site housing (Padgett et al., 2016), but now Housing First can be a 'congregate format' (Somers et al., 2017, p.2). For some, there appears to be no meaningful difference at all (USICH, 2017). We are not in a position to resolve these definitional tensions. Rather, we use 'Housing First approach' as an umbrella term throughout the paper to assist readers and position the J2SI study in the relevant literature, namely studies that examine interventions for chronically homeless individuals that reverse the traditional 'continuum of care' approach.