

Measuring the impact of social housing placement on wellbeing

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Evidence from linked survey and administrative data



Attribution

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Table of contents

Summary	5
Introduction	6
Background	7
Data	8
Method	10
Results	12
Conclusion	18
References	20
Annex	21

Summary

This paper explores the impact of a social service – social housing – on people’s wellbeing. It does this by using a novel method to link administrative records and survey data. This work builds on work by the New Zealand Social Investment Agency (SIA) and reduces some of the limitations associated with the earlier work.

The analysis identifies two key findings. Given the experimental nature of this analysis and data limitations, both findings should be treated with caution:

- **Housing conditions generally improve for people placed in social housing.** Both mould/damp and crowding conditions improve with placement in social housing. There is some more limited evidence that social housing placement reduces the proportion of people who rate their household condition as ‘poor’. However, there was no improvement for whether the house is cold.
- **Life satisfaction improves for people placed in social housing.** Survey respondents were asked to rate their life satisfaction on a five-point scale, and people score higher on this measure after social housing placement. We don’t find evidence for changes in other wellbeing outcomes, such as feeling unsafe walking at night.

Administrative data from the Housing New Zealand social housing dataset and the New Zealand General Social Survey (NZGSS) are linked via the Integrated Data Infrastructure (IDI) to identify differences in wellbeing outcomes for people before and after placement in social housing. Specifically, we use administrative data from the Housing New Zealand social housing dataset to identify people who applied for and were placed in social housing, and then use the interview date from the NZGSS to identify whether they were interviewed before or after placement in social housing. The outcomes for the two groups are then assessed across the SIA’s wellbeing framework. This analysis builds upon SIA’s previous work **by adding an extra year of survey data and by improving the rate at which administrative records are successfully linked to survey responses**. This in turn improves the reliability of the results.

The main findings hold once we control for differences between the before- and after-placement groups in age, ethnicity and income. However, with the data available it is not possible to demonstrate unambiguously that being placed in social housing was the cause for the differences observed between the groups.

The analysis also highlights some of the key challenges in working with linked survey and administrative data. One main limitation is the small sample size. The number of people placed in social housing who are also interviewed in the NZGSS in the same year is small. Related to this is bias in the sample of people surveyed in the NZGSS. People who need social housing are often harder to find or ineligible for questioning before they are in social housing (e.g. due to homelessness). As such, our before-placement sample is about half the size of our after-placement sample. This difference in sample size is evidence that household surveys such as the NZGSS systematically under-sample some groups of high policy interest; in this case people with high housing need. Given the importance of household surveys to understanding social and economic outcomes, there is scope for improvement here, to fully capture the nature of important public policy issues.

Introduction

The ability to measure the impact of social services is a fundamental requirement if policy decisions are to be informed by evidence. However, ‘gold standard’ measures of programme impact achieved through randomised controlled trials are time consuming, often expensive, and may raise ethical issues around access to services. This paper explores the use of linked administrative records and survey data to measure the impact of a social service – social housing – on peoples’ wellbeing. In doing so it builds on experimental work by the New Zealand Social Investment Agency (2018a) but addresses some of the key limitations associated with this work in terms of data linkage.

In measuring the impact of a social service, we would ideally like to know the overall effect of the service on people’s wellbeing. This reflects that social services typically aim to achieve some wellbeing outcome (e.g. health, safety, and income adequacy) and that the fiscal cost to government of service provision is a poor proxy on its own of service impact. The state also has an interest in any potential spillovers to other important wellbeing outcomes. In practice, however, measuring impact is difficult to do. New Zealand’s Integrated Data Infrastructure (IDI) contains good measures of service usage and can capture individual trajectories over time. However, administrative data is poor at capturing the outcomes of service usage. Since 2016, Statistics New Zealand has progressively incorporated the main household surveys into the IDI. These surveys – particularly the New Zealand General Social Survey (NZGSS) – capture detailed information on wellbeing outcomes but lack data on service usage and provide only a cross-sectional ‘snapshot’ of peoples’ circumstances.

A novel method is used to create synthetic estimates of the change in wellbeing outcomes associated with placement into social housing. Specifically, we use administrative data from the Housing New Zealand social housing dataset to identify people who applied for and were placed in social housing, and then use variation in interview date for the New Zealand General Social Survey to identify a ‘before’ and ‘after’ group with respect to placement in social housing. Wellbeing outcomes for the two groups are then assessed across all twelve dimensions of the Social Investment Agency’s (SIA) wellbeing framework (Social Investment Agency, 2018b).

This remainder of this paper is organised in five sections. The background section provides an overview of the policy context for the research and briefly reviews earlier work in the area. This section is followed by a discussion of the datasets that form the basis of the analysis. A detailed description of the approach used to create synthetic estimates of the change in wellbeing outcomes is provided in the method section. This discusses both the identification strategy and main limitations associated with the method. The results section presents the findings from the research and highlights where these differ from earlier analysis. Finally, the conclusion discusses the policy relevance of the research and highlights some of the opportunities associated with using linked survey and administrative data to better understand how social services affect peoples’ wellbeing.

Background

With relatively high levels of immigration, significant pressure on the building industry due to recent earthquakes, a long term trend towards larger houses for a given family size, and a high level of speculative demand for houses, New Zealand faces increasing challenges in housing all of its population adequately. House prices in New Zealand are currently among the highest in the world relative to incomes, and New Zealand is reported to have the highest rate of homelessness in the OECD, although that ranking partly reflects many other countries measuring homelessness much more narrowly (OECD, 2017a and 2017b). In this environment, one of the main policy levers available to influence housing outcomes for low income families is the provision of social housing. However, the impact of providing social housing on the outcomes experienced by low income families is not well understood.

Much of the existing literature on social housing outcomes in New Zealand originates from a concern with public health outcomes (e.g. Keall et al, 2010). This has built a strong body of evidence around the link between social housing and health status. However, there are limitations in terms of the breadth of outcomes considered when evaluating the impact of social housing, and much of the evidence is linked to evaluations of specific social housing sites. Beyond the public health literature there have been a number of papers looking at New Zealand's housing assistance policies more generally. This has included analysis of the interaction between the Accommodation Supplement and housing costs (Rea and Thompson, 2017) and broader analyses (e.g. Johnson, 2013). However, there is a lack of research analysing the impact of social housing provision on recipients, particularly on the representative experience of individuals placed by Housing New Zealand (HNZ) into HNZ housing stock.¹

In 2017 the Social Investment Unit examined the fiscal impact of providing social housing services (Social Investment Unit, 2017). This piece of research – the *Social Housing Test Case* – applied propensity matching techniques to create two cohorts of people from existing data that were intended to be comparable in all ways except for placement in social housing. The difference in fiscal spending between the two cohorts across different government agencies was then used to examine the outcomes of placement in social housing.

Although the *Social Housing Test Case* was successful in identifying the change in government spending associated with placement in social housing for different government agencies, it concluded that the results were not meaningful in terms of evaluating the effectiveness of social interventions. For example, being placed in social housing was associated, on average, with higher future education spending on the part of government. However, it was unclear from the analysis whether this reflected good outcomes (e.g. better school attendance from children placed in social housing) or poor outcomes (e.g. increased need from children whose social networks have been disrupted by placement in social housing).

In 2018 the SIA published a follow-on piece of work – *Measuring the wellbeing impacts of public policy: social housing* (Social Investment Agency, 2018a). This aimed to move beyond a simple descriptive approach, to instead identify the difference in wellbeing outcomes for people before

¹ Housing New Zealand is the primary provider of social housing in New Zealand.

and after being placed in social housing. This work used four waves of the New Zealand General Social Survey (NZGSS) linked to administrative data from Housing New Zealand in Statistics New Zealand's Integrated Data Infrastructure (IDI) to address three key questions:

- What impact does being placed in social housing have on housing outcomes (i.e. the quality of accommodation for social housing recipients – household crowding, temperature of residence, dampness, and the physical state of the house)?
- What impact does being placed in social housing have on other outcome domains important to the recipient's wellbeing (e.g. health, social contact, jobs)?
- What is the impact of placement in social housing on the recipient's overall subjective wellbeing?

The analysis identified significant improvements in aspects of housing conditions for people placed in social housing (mould, overall housing conditions, crowding, and satisfaction with housing) as well as improvements in overall life satisfaction and leisure time. Perceived safety appeared to deteriorate following placement in social housing. However, the analysis in the 2018 paper was subject to a number of limitations. In particular:

- The wellbeing impacts were identified for before and after, not for randomised control and treatment groups – limiting the ability to infer causality strongly
- There was a bias in the sample of people in the NZGSS – people who need social housing are often harder to find or ineligible for the survey before they are in social housing than afterwards
- The sample size for the study was small – the number of people placed in an HNZ house who are also interviewed in the NZGSS in the same year is small
- The time frame of the study was limited – long term effects were not captured by the study
- The study involved linking administrative and survey data in the IDI. A less than perfect link rate introduced an additional source of error into any analysis.

Measuring the wellbeing impacts of public policy: social housing drew on the 2008, 2010, 2012, and 2014 waves of the NZGSS. The NZGSS was linked with data from Housing New Zealand on placements in social housing between 2007 and 2015 to form an analytical dataset which then served as the basis for identifying the impact of social housing placements in terms of wellbeing. By drawing on additional data, this paper builds on the earlier SIA study by increasing the sample size and linkage rate in the IDI, and therefore the reliability of the analysis.

Data

Two core datasets are used in this paper to analyse the impact of placement in social housing on wellbeing. These are the Housing New Zealand (HNZ) Social Housing Dataset and the NZGSS.

The Social Housing Dataset is drawn from HNZ transaction records, and captures information on applications, tenancies (i.e. placement in social housing), and exits from tenancies. Tenancy applications and placements can be linked to all of the individuals associated with the application,

not just the primary applicant. Information on applications and tenancies is time stamped, so it is possible to identify the dates at when an application is made and when people are placed in a house at the start of a new tenancy.

For this paper we use social housing data from 2007 through to 2017. Table 1 below gives basic descriptive statistics for the dataset in terms of the total number of applications, the number of applications resulting in a placement in social housing, and the number of people associated with each of these. Because each placement may involve a whole family, the number of people associated with applications is about 4 to 5 times greater than the number of applications. Over the period from 2007 to 2012 there is a gradual decline in the number of applications followed by an uneven increase from 2013 to 2017. In terms of placements, the trend is a stronger decline with only weak evidence of any growth towards the end of the period.

Table 1. Descriptive statistics for the HNZ Social Housing Dataset

Year	Applications	Applications resulting in placement in social housing	Total people associated with applications	Total people placed in social housing
2007	16,248	9,720	44,259	38,454
2008	16,029	9,576	45,960	37,467
2009	15,630	9,126	46,044	34,584
2010	13,722	8,238	37,209	31,431
2011	10,695	8,037	29,316	31,227
2012	7,818	6,186	21,519	22,086
2013	9,492	8,328	25,101	25,302
2014	11,724	7,290	29,718	21,087
2015	8,307	6,471	20,151	12,714
2016	11,730	6,597	24,588	11,136
2017	14,562	7,077	34,737	15,162

Source: HNZ Social Housing Database, IDI

The second dataset used in this analysis is the NZGSS. This is a household survey carried out by Statistics New Zealand and is intended to collect information on the wellbeing of the New Zealand population. The survey includes both a household questionnaire, which obtains relatively limited socio-demographic information on the whole household, and a personal questionnaire, which collects much more detailed information on the wellbeing of the respondent across a wide range of different domains. The NZGSS questions align well with the SIA's wellbeing framework (Social Investment Agency, 2018b), with the New Zealand Treasury's Living Standards Framework (Treasury, 2018), and with other international frameworks (OECD, 2011; Smith, 2018) making it possible to identify measures relating to each important aspect of wellbeing in both frameworks. Table A1 in the annex lists the wellbeing measures used from the NZGSS and the wellbeing domain they relate to.

Each wave of the NZGSS covers approximately 8,500 households. As only one person in each household responds to the personal questionnaire, there are also approximately 8,500 responses to the personal questionnaire in each wave. The NZGSS is collected every 2 years, starting in 2008. Table 2 below gives the response rate and achieved sample size for each wave of the NZGSS from 2008 to 2016, as well as the proportion of personal responses that could be linked to the IDI spine

and the resulting sample available in the IDI. The IDI spine is the dataset containing information for all people in New Zealand that is used to link administrative and survey data together for anonymised research and analysis.

Table 2. Descriptive statistics for the NZGSS

NZGSS wave	Response rate	Achieved sample	Link to the IDI	IDI sample
2008	83%	8,721	93%	8,109
2010	81%	8,553	93%	7,971
2012	78%	8,460	95%	7,995
2014	80%	8,796	93%	8,172
2016	84%	8,493	95%	8,049

Source: NZGSS 2008-2016, IDI

Earlier work published by the SIA (Social Investment Agency, 2018a) covered only four waves of the NZGSS (2008 to 2014) and achieved a link rate to the IDI of approximately 80%. In contrast, the dataset used in this paper adds an additional wave of the NZGSS (2016) and the link rate for all surveys has increased to 93% or higher. Consequently, the pooled linked NZGSS sample used as the basis for the analysis in this paper is higher than the earlier SIA work (40,296 observations compared to 27,759).

Method

At the core of this analysis is the construction of synthetic estimates of the change in wellbeing associated with placing someone in social housing. These synthetic estimates are developed by bringing together the panel data on housing applications and placements from the HNZ Social Housing Dataset with the cross-sectional observations of wellbeing outcomes contained in the NZGSS. This enables us to leverage the strengths of each dataset to obtain an estimate of the average change in wellbeing outcomes associated with placement in social housing.

It is important to note, however, that the approach adopted here does not capture all of the possible wellbeing impacts from social housing. In particular, social housing can potentially impact wellbeing in three broad ways. First, it can improve housing quality and have a direct impact on the disposable income of families in social housing. Beyond this, it can also provide recipients of social housing with indirect benefits such as a sense of security and control over their lives. Finally, social housing can also affect the wider private rental market by raising housing standards. The method used here can potentially capture the first two types of impact, but we make no attempt to capture spillovers to the wider community through the effect of competition from social housing on the private rental market.

To create the synthetic transition estimates we first use the HNZ social housing dataset to obtain a sample of successful social housing applications. This sample consists solely of people who were associated with an application for and were placed in social housing so that, in principle, everyone in the sample has been equally exposed to the social policy intervention in question (provision of social housing). We then match all the people attached to these successful applications to the NZGSS to identify those who were interviewed for the NZGSS within a window spanning 15

months² before to 12 months after their placement in a HNZ house. This gives us a sample that includes people interviewed for the NZGSS before being placed in social housing and people interviewed after being placed in social housing. Although the NZGSS is a cross-sectional survey, interviewing takes place over a 12 month period so that, having made an application, whether the applicant is interviewed before or after they are placed in a house is essentially random. Because all applicants in the original sample were successful (i.e. the HNZ sample is restricted to applicants who did go on to be placed in a social house), we can interpret differences in the results for before and after interviews as representative of the situation of people before and after being placed in HNZ social housing.

It is important to note that we cannot interpret the transition into social housing as causing any difference in outcomes between these two groups without making some assumptions about what would have occurred, in terms of counterfactual wellbeing outcomes if the individual had not been placed in a HNZ house. However, even the observations of what happened before and after the transition represent a significant improvement on straight cross-sectional descriptions of wellbeing outcomes for people in different housing situations and, combined with other information, improves the evidence available to policy makers in important ways.

While the methodology used to develop synthetic transitions is, in principle, robust, there are a number of assumptions that must hold for the synthetic transitions to provide a good estimate of the impact of being placed in social housing. Two of these are of particular concern:

- Because the NZGSS is a household survey, it is disproportionately less likely to collect information on people in situations of severe housing need. This means that the synthetic transitions may not represent equivalent populations for the before and after groups.
- People applying for social housing are likely to be in a particularly difficult situation. For some of them this will improve regardless of whether they receive social housing, implying that a simple before/after comparison will overestimate the impact of social housing (Ashenfelter, 1978). More generally, wellbeing outcomes may not be stable over the period of the transition for reasons unrelated to social housing placement.

We were not able to test for both of these methodological issues due to data and time constraints. However, it was possible to test whether the differences in outcomes between the before and after groups remain significant after controlling for differences in the demographic characteristics of the groups. This provides some degree of confidence as to whether differences in the probability of a person being interviewed in the NZGSS before and after placement in social housing leads to any systematic bias in the results.

It would be possible to provide some test of whether the before/after comparison overestimates the impact of providing social housing by estimating the time trend for the after group and before group separately for each outcome. This could then be added into a regression testing whether there is a significant difference in the relevant outcome between the before/after groups. The separate time trend variables for before and after the transition would capture any systematic

² The window is unbalanced because there is a lower linkage rate between the HNZ Social Housing Dataset and the NZGSS before placement compared to after placement. The NZGSS is a household survey, and it is thus disproportionately less likely to interview people who are not in stable housing circumstances. The consequences of this bias are discussed later in the paper.

variation in wellbeing outcomes not associated with the discrete event of being placed in social housing. However, this analysis was not possible within the scope of the existing project.

Results

The process of creating synthetic transitions requires identifying the subset of people who both were placed into social housing and interviewed in the NZGSS within a relatively narrow window of time. As a result, the final sample size is relatively small. Table 3 below presents the final synthetic transition sample of 201 observations. This is only a small proportion of the initial datasets, but is sufficient for valid statistical inference provided that the impacts are of a reasonable size. Small or marginal effects, however, will not show up as statistically significant due to a lack of statistical power.

A second point to note from table 3 is that the bias between the before and after groups discussed earlier in the method section is clearly evident. Even with a slightly larger window for the before group (15 months) than the after group (12 months), the before group is only 60% of the size of the after group.

Table 3. The synthetic transition dataset

Variable	Before	After	Before (%)	After (%)
GSS2008	21	33	28%	26%
GSS2010	15	15	20%	12%
GSS2012	21	30	28%	24%
GSS2014	12	33	16%	26%
GSS2016	S (<6)	15	<8%	12%
1 adult	39	90	52%	71%
2 adults	27	30	36%	24%
3+ adults	9	S (<6)	12%	<6%
Female	51	87	68%	69%
Male	24	39	32%	31%
15-24yrs	18	36	24%	29%
25-39yrs	33	48	44%	38%
40-59yrs	18	27	24%	21%
60+yrs	6	15	8%	12%
European	33	57	44%	45%
Māori	33	57	44%	45%
Pacific	18	24	24%	19%
Total	75	126	100%	100%

Source: NZGSS 2008-2016, HNZ Social Housing Dataset, IDI

Although the lower sample size for the before group raises some issues around sample bias, table 3 also provides some reassurance that the before and after samples are not too different. There is relatively little difference between the composition of the before and after groups in terms of gender, age, and ethnicity. Differences are observable in the proportions of each sample picked up in different NZGSS survey waves, but it is difficult to see a pattern other than random fluctuation. In contrast, it is very clear that the before group contains more people from households containing 2 or more adults than the after group. However, this difference is likely to reflect signal rather than noise: one of the key housing outcomes that placement in social housing should address is household crowding and we would expect to see fewer adults in the household post-placement.³

Before looking at synthetic transitions into social housing it is useful to obtain a picture of how housing outcomes vary by housing tenure. Table 4 below uses five indicators of housing quality from the NZGSS, and administrative data from the IDI to examine variation in housing quality across different types of housing tenure.⁴ The five indicators used are whether the house is mouldy, cold, in poor condition (such as in need of maintenance), or crowded as well as an overall subjective evaluation of satisfaction with housing. In each case the table reports the proportion of the population experiencing poor outcomes with respect to the indicator.

A clear pattern is visible across all five housing quality indicators. People living in their own home with no housing subsidy have the lowest incidence of poor housing quality, followed by people living in non-subsidised rental accommodation. The population living in rental accommodation subsidised through the accommodation supplement have poorer outcomes, while the worst outcomes are associated with social housing. While social housing is associated consistently with poorer outcomes across all five indicators, the gap is particularly apparent for whether the house is cold (42.6% compared to 34.7% in subsidised rental accommodation and 26.2% for non-subsidised rentals) and household crowding (31.1% compared to 16.1% for subsidised rental accommodation and 11.4% for non-subsidised rentals).

Table 4. Housing quality and tenure

Indicator	Social housing (income-related rent)	Accommodation Supplement - renting	Non-subsidised - renting	Non-subsidised - own home
House is mouldy	23.7%	21.3%	14.0%	4.2%
House is cold	42.6%	34.7%	26.2%	11.7%
House is in poor condition	16.0%	14.2%	9.8%	3.7%
House is crowded	31.1%	16.1%	11.4%	3.4%
Dissatisfied with housing	32.3%	28.2%	23.3%	8.5%

Source: NZGSS 2008-2016, HNZ Social Housing Dataset, IDI

³ Although table 3 examines most of the main demographic differences between the before and after groups it would be possible to use the wider IDI to look at differences in client need as reflected in social service usage prior to placement in social housing. This is beyond the scope of this paper, but represents a potentially informative line of further inquiry.

⁴ The housing tenures considered including subsidised private sector renting (accommodation supplement), social housing, non-subsidised renting, and non-subsidised own home. Subsidised home owners are excluded as this group is very small.

The pattern of poor housing quality associated with social housing might raise the question of whether the provision of social housing works effectively as a policy intervention. However, it is important not to move directly from descriptive tables to causal inference. The tenant group for social housing is very different from the other groups looked at in table 4 as the selection process for accessing social housing in New Zealand selects strongly for those in greatest need. This is where looking at transitions into social housing is valuable.

Table 5 below presents the proportion of the population with poor housing outcomes from the ‘before’ and ‘after’ groups created through the synthetic transitions. As discussed under the methodology section, both the ‘before’ and ‘after’ groups are sampled from people who both applied for and were placed in social housing, meaning that the difference between the two snapshots is the equivalent to observing the average impact of a transition in a true panel dataset.

It is immediately evident from table 5 that the changes in housing quality associated with moving into social housing are very different from what one might expect based on the descriptive picture presented in table 4. Table 5 shows that being placed into social housing is associated with a statistically significant fall in the proportion of people living in a mouldy house (23.3% to 9.4%), in a house that is in poor condition (27.3% to 5.1%), or in a crowded house (20.5% to 7%). These are all large changes. The proportion of people dissatisfied with their housing also falls (38.2% to 24.1%). This decline is smaller than is the case for the physical housing characteristics and is significant only at the 10% level. Interestingly, the proportion of people reporting that their house is cold after being placed in social housing falls by a smaller amount than the other outcomes and this change is not statistically significant.

Table 5. Synthetic transition analysis of housing quality.

Outcome	Before	After	t-statistic	Degrees of freedom	p-value
House is mouldy	23.3%	9.4%	-2.48	111	0.015
House is cold	45.2%	38.3%	-0.95	147	0.343
House is in poor condition	27.3%	5.1%	-3.39	72	0.001
House is crowded	20.5%	7.0%	-2.56	105	0.012
Dissatisfied with housing	38.2%	24.1%	-1.72	106	0.087

Source: NZGSS 2008-2016, HNZ Social Housing Dataset

The picture presented in table 5 is largely consistent with the SIA’s earlier analysis (Social Investment Agency, 2018a). The only notable difference is the change in the proportion of the population dissatisfied with housing was significant ($p=0.044$) in the earlier analysis but is marginally not significant ($p=0.087$) in the expanded sample. Beyond the fact that most aspects of housing conditions improve with placement in social housing, the most interesting observation from table 5 is that whether the house is cold or not does not improve by a statistically significant amount. In considering this result it is worth noting that the other dimensions of housing quality considered are largely properties of the house, while whether the house is cold or not depends partly on the house (e.g. insulation) but also partly on tenant decisions around heating which are a function of tenant income.

While social housing is clearly targeted primarily at improving housing outcomes, it is of interest to consider whether the provision of social housing has an impact on other aspects of people’s wellbeing. Twelve wellbeing measures from the NZGSS not directly relating to housing outcomes

are presented in table 6 below. The table shows the proportion of the population experiencing poor outcomes in each area with the exception of health, broken down by housing tenure. For health outcomes (means scores on the SF-12 physical and mental health scales⁵) a higher score indicates better wellbeing.

The pattern of wellbeing outcomes by housing tenure (table 6) is similar to that for housing quality outcomes (table 4) where home owners and non-subsidised renters are concerned. People in their own home have better outcomes across all outcomes than people in other circumstances, and those in non-subsidised rental accommodation are better off than those in either subsidised rental or social housing. However, in contrast to the picture for housing outcomes, there is no clear picture as to whether the renters receiving the accommodation supplement or those in social housing experience poorer wellbeing outcomes. While people in social housing appear marginally more likely to feel unsafe walking alone at night and are more likely to be unable to access green space, they have better outcomes in terms of life satisfaction, feeling lonely or isolated, voting, and free time.

Table 6. Wellbeing outcomes and housing tenure

Indicator	Social housing (income-related rent)	Accommodation Supplement - renting	Non- subsidised - renting	Non- subsidised - own home
Low life satisfaction	24.1%	28.7%	13.7%	9.1%
Material deprivation	59.1%	58.6%	23.2%	9.3%
Unemployed	12.1%	13.8%	3.5%	2.1%
Feels lonely or isolated	22.6%	29.0%	19.4%	12.1%
Feels unsafe walking alone at night	57.6%	50.2%	42.0%	43.1%
Did not vote in last general election	29.4%	42.7%	43.9%	18.5%
Unable to express culture	21.4%	23.5%	17.8%	12.5%
Mental health SF12 mean score	46.1	43.8	49.6	51.0
Physical health SF12 mean score	46.6	48.7	51.6	49.7
No qualifications	39.3%	27.2%	14.3%	18.0%
Unable to access natural spaces	18.1%	11.9%	6.6%	4.0%
Not enough free time	31.9%	42.5%	45.5%	44.0%

Source: NZGSS 2008-2016, HNZ Social Housing Dataset, IDI

⁵ SF-12 stands for 12-Item Short Form Survey. The SF-12 mental and physical health scales are validated survey instruments designed to measure mental and physical health in a household survey.

Table 7 below presents the results of the synthetic transitions into social housing across the same 12 wellbeing measures presented in table 6. There is a clear increase in mean life satisfaction associated with transitions into social housing (from 3.6 to 3.9 on a 5-point scale where 5=*very satisfied*), suggesting that moving into social housing is seen as an improvement in the wellbeing of social housing recipients by the people affected. The change in life satisfaction associated with the transition is also evident if we look at the change in the proportion of people reporting low life satisfaction (37.0% to 23.4%). This provides a useful consistency check on the results: it would be odd if people deliberately chose to move into circumstances that lowered their life satisfaction. Beyond the improvement with self-assessed satisfaction with life, however, table 7 generally provides little evidence to suggest the presence of large spillover effects from improvements in housing to other aspects of wellbeing.

The small sample size resulting from the use of survey data to identify the impact of social housing placement may be one reason why there are no significant spillover effects to other areas of wellbeing identified. In fact, there are differences between the before and after groups with respect to some outcomes that might be meaningful in a larger sample and could become greater over time. In particular, the small increases in the proportion of the population feeling lonely or isolated and the proportion feeling unsafe walking alone in their neighbourhood at night are both relatively intuitive (e.g. moving to a new area that might be less familiar or away from friends and family). In the other direction, the improvement in physical health outcomes is consistent with a substantial scientific literature (e.g. Keall et al, 2010) and is closer to statistical significance than is the case for any of the other outcomes (except life satisfaction). However, the small sample size associated with identifying people placed in social housing in the NZGSS means that none of these changes reach the conventional 0.05 level of statistical significance.

Table 7. Synthetic transition analysis of wellbeing outcomes

Outcome	Before	After	t-statistic	Degrees of freedom	p-value
Mean life satisfaction	3.6	3.9	2.17	160	0.031
Low life satisfaction	37.0%	23.4%	-1.99	134	0.049
Poor material wellbeing	71.2%	71.9%	0.10	149	0.923
Unemployed	12.3%	13.5%	0.24	155	0.814
Feels lonely or isolated	30.1%	34.4%	0.62	154	0.537
Feels unsafe walking at night	60.3%	64.8%	0.64	147	0.524
Did not vote in last general election	45.0%	49.5%	0.54	126	0.590
Unable to express cultural identity	24.7%	25.0%	0.05	150	0.957
Mean SF12 Mental health score	42.5	42.7	0.06	149	0.949
Mean SF12 Physical health score	45.5	47.3	0.93	146	0.352
No qualification	42.5%	41.4%	-0.15	149	0.885
Unable to access to natural space	78.2%	77.8%	-0.13	117	0.896
Not enough free time	54.5%	60.8%	0.71	115	0.479

Source: NZGSS 2008-2016, HNZ Social Housing Dataset

The picture presented by the synthetic transitions differs from the cross-sectional descriptive picture for both housing and broader wellbeing outcomes. The synthetic transition analysis is

undoubtedly closer to capturing the true impact of placement in social housing on the outcomes of social housing clients than the cross-sectional descriptive analysis. However, as discussed in the methodology section, the synthetic transitions are not without limitations. In particular, it is important to test whether the conclusions are robust to the existence of bias in the composition of the before and after groups due to the NZGSS under-sampling some parts of the population before receipt of social housing. Although there is little evidence of significant bias between the before and after groups in terms of measurable demographic characteristics (table 3), it is also desirable to see whether the most important results are robust to controlling for these differences.

Table 8 below reports on the results of a series of regressions⁶. The dependent variables are the outcomes for which a significant change was observed in tables 5 and 7 (life satisfaction, mould, and crowding), as well as the outcome relating to cold housing. The independent variables are a series of demographic controls⁷ plus a dummy variable for being in the 'after' group. The demographic variables control for potential compositional differences between the before and after groups (in age, gender, ethnic group and income), so if the 'after' group dummy variable is significant this provides good evidence that the changes between the before and after groups are not simply a compositional effect. Poor housing condition was not included in this analysis as the question only occurs in some waves of the NZGSS and the sample size is therefore too small for meaningful regression analysis.

The results of the regressions are fairly clear, and largely confirm that the results reported in tables 5 and 7 are not sensitive to the difference in composition between the before and after groups. For all three of the measures that showed a significant change in tables 5 and 7 (life satisfaction, mould, crowding), being in the after group is associated with a significant change (an increase in life satisfaction, a decrease in the probability of reporting mould, or that the house is crowded). Cold, which was not significant in table 5 remains insignificant in table 8.

Table 8. The impact of moving into social housing controlling for compositional differences in the before and after groups

	Life Satisfaction		Mould		Cold		Crowding	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Age	-0.026	0.275	0.037	0.649	-0.015	0.768	0.216	0.305
Age ²	0.000	0.299	0.000	0.632	0.000	0.830	-0.004	0.262
Sex	-0.159	0.333	0.620	0.263	0.104	0.759	0.143	0.827
Māori	0.201	0.207	0.184	0.701	-0.513	0.121	0.894	0.176
Pacifica	0.095	0.611	-0.265	0.673	0.278	0.470	1.698	0.012
Log HH income	0.100	0.210	-0.364	0.145	-0.080	0.637	1.545	0.005
Wave	0.075	0.174	-0.075	0.656	0.267	0.022	-0.177	0.407
After group	0.339	0.026	-1.047	0.017	-0.399	0.204	-1.198	0.036

⁶ The regressions are run as generalised linear models with robust standard errors (multiple regression for the life satisfaction ratings, logistic regressions for the housing quality variables which are binary).

⁷ The demographic controls are largely standard to the life satisfaction literature and include both age and age² to account for the 'u-shaped' relationship between age and life satisfaction.

The number of demographic control variables in the regressions is relatively high compared to the sample size, which could reduce the reliability of the estimates (Smeden et al, 2016). We are not overly concerned as these regressions are primarily a robustness check of the before-after comparisons in tables 5 and 7.

Conclusion

Obtaining evidence of the impact of social housing on client outcomes is challenging. Administrative records focus on service usage rather than wellbeing outcomes, while the main survey datasets containing good outcome measures are cross-sectional in nature and cannot easily capture individual transitions. The synthetic transitions approach examined here goes some way to addressing these limits by leveraging off the respective strengths of both types of data.

The key results from a synthetic transition analysis of placement in social housing is clear: housing quality is better for people post-placement. Although in one sense unsurprising, this result is in stark contrast to the picture that emerges from a simple descriptive look at the relationship between housing outcomes and tenure status using the same source datasets, where social housing scores worst on all housing quality measures. There is also evidence that the overall life satisfaction of people placed in social housing is higher post-placement than before.

However, perhaps of greatest interest is the outcome that does not change. People placed in social housing are not significantly less likely to report that the house is cold compared to those not placed. The fact that placement in social housing was associated with no significant change in household temperature while all other aspects of housing quality measured improve suggests that the drivers of household temperature are different from those associated with mould, crowding, or maintenance. In particular, it is tempting to suggest that levels of income may have an important impact on household warmth over and above factors associated with housing quality such as insulation.

The main findings discussed above are robust to controls for demographic differences in the before and after samples. This provides relatively weak evidence for a large causal impact from social housing placement to mould, crowding, and life satisfaction. However, stronger causal inference runs up against the limits of the sample size and dataset. It is also important to note that any effects on wellbeing occurring post-transition but as a result of placement in social housing (such as gradual improvements to health status) are not captured by this methodology.

More generally, the use of linked survey and administrative data to generate synthetic transitions adds a useful tool to the toolkit for programme evaluation. In one sense, the social housing example investigated here should be a powerful example of the utility of the approach. The number of people placed in social housing each year in New Zealand is such that the synthetic transition sample is low for meaningful quantitative analysis using such linking to the NZGSS.⁸

⁸ Approximately 20,000 transitions per year is required to obtain a synthetic transition dataset with 200 observations in total using pooled NZGSS data. This represents transitions affecting roughly 0.5% of the New Zealand population aged 15+.

Beyond this, the fact that people applying for social housing often lack a permanent residence adds a potentially important selection bias between the before and after samples in terms of NZGSS responses. Despite these challenges, the synthetic transitions produce intuitively plausible and statistically significant results.

Applied to policy areas where the sample size is larger, and which are unaffected by the selection bias into the NZGSS associated with social housing, the analysis of synthetic transitions is potentially a useful complement to other approaches to evaluating policy impact. This is particularly the case where the main source of evidence used to evaluate the impact of a policy is based on measures of service usage such as those contained in the IDI. Here the risk is that, even with a good way to identify intervention and comparison groups, the analysis fails to provide a meaningful evaluation of the impact of a social service because the administrative data lacks good outcome measures. While there will be some specific instances where future service usage is a plausible indicator of the value of a programme (e.g. rehabilitation services in the context of the justice system), there will be others where this is simply not the case (e.g. medical interventions for the population aged 65 or older). The ability to measure the outcomes of social programmes is therefore of high value and complements analysis based on administrative data alone.

Finally, the paper highlights an important gap in New Zealand's existing social statistics and an approach to addressing this. The difference in size between the before and after groups in the synthetic transitions dataset is evidence that household surveys such as the NZGSS systematically under-sample some groups of high policy interest: in this case people with high housing need. Given the importance of large-scale household surveys in understanding social and economic outcomes, this is a source of some concern, particularly if the issue is wider than just the population with high housing needs. However, this paper also highlights the value of linking survey and administrative data to compensate for the limitations of each data source on its own. This applies to the explicit focus of this paper – obtaining information on the outcomes of social service transitions – but also in terms of building a better understanding of the strengths and limitations of each dataset.

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Annex

Table A1. Wellbeing measures from the NZGSS used in the analysis

Dimension of wellbeing	Indicator	Value	95% confidence interval - lower bound	95% confidence interval - upper bound
Subjective wellbeing	Low life satisfaction	12.47%	12.07%	12.88%
Subjective wellbeing	Mean life satisfaction score (1 to 5; 5 = <i>very satisfied</i>)	4.14	4.13	4.15
Housing	House is mouldy	8.25%	7.88%	8.62%
Housing	House is cold	17.80%	17.28%	18.33%
Housing	House is in poor condition	6.40%	5.99%	6.82%
Housing	House is crowded	7.28%	6.85%	7.71%
Housing	Dissatisfied with housing	14.09%	13.50%	14.67%
Safety	Feels unsafe walking alone at night	44.24%	43.62%	44.87%
Jobs and earnings	Unemployed	3.87%	3.58%	4.15%
Social connectedness	Feels lonely or isolated	15.62%	15.14%	16.10%
Income and living standards	Material deprivation	18.52%	18.00%	19.05%
Civic engagement and governance	Did not vote in the last general election	26.02%	25.49%	26.56%
Ūkaipōtanga/cultural identity	Unable to express culture	15.06%	14.57%	15.56%
Health	Mental health SF12 mean score	49.89	49.75	50.02
Health	Physical health SF12 mean score	49.79	49.68	49.90
Knowledge and skills	No qualifications	18.91%	18.40%	19.42%
Environmental quality	Unable to access natural spaces	5.84%	5.42%	6.27%
Leisure and free time	Not enough free time	43.36%	42.55%	44.18%
Income and living standards	Mean equivalised net monthly household income 12 months before interview	\$3,086	\$3,052	\$3,119
Income and living standards	Mean equivalised net monthly household income 12 months after interview	\$3,043	\$3,010	\$3,076