Housing and wellbeing for Māori in Te Tai Tokerau

A look at the numbers

Haratua 2019

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Use of IDI data from Statistics New Zealand

Access to the data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the author, not Statistics NZ.

The results in this report are not official statistics, they have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand.

The opinions, findings, recommendations, and conclusions expressed in this report are those of the authors, not Statistics NZ, Ministry of Justice, Ministry of Health, Department of Corrections, Inland Revenue Department, and New Zealand Police.

Access to the anonymised data used in this study was provided by Statistics NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this report have been confidentialised to protect these groups from identification.

Careful consideration has been given to the privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

The results are based in part on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

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1   Introduction

This research project examines which health, economic and social outcomes are associated with the different housing circumstances of Māori living in Te Tai Tokerau. The project fits into a wider research study being undertaken by Te Puni Kōkiri, Ministry of Social Development, and Housing New Zealand to establish the level of housing need in Te Tai Tokerau, and in particular which housing circumstances are associated with outcomes that generate relatively larger fiscal costs to the New Zealand Government. Outcomes are measured based on a range of health, economic and social indicators.

It is anticipated this research project will help Te Puni Kōkiri, Ministry of Social Development, and Housing New Zealand allocate its funding resources more efficiently to resolve housing and other needs. In addition, it will provide Te Puni Kōkiri, Ministry of Social Development, and Housing New Zealand with an established process that can be applied to other regions in New Zealand to improve funding allocation in those regions.

As of the 2013 Census, the Māori population in Te Tai Tokerau is 44,930. For this project 2013 Census data has been used to individually identify people of Māori ethnicity who were usually resident in Te Tai Tokerau. 40,500 qualifying individuals could be identified from the census data to make up the total study population.

For those individuals, their social outcomes were identified using data from the Ministry of Social Development (MSD), Ministry of Justice (MOJ), New Zealand Police, and the Department of Corrections. Each of these sources present useful information that can be linked to individuals based on their housing situation at the time of the 2013 census using Statistics New Zealand's Integrated Data Infrastructure (IDI).

The seven housing groups examined were:

- Owner = Individuals living in owner-occupied private dwellings

- Renter = Individuals living in rented private dwellings

- No heating = Individuals living in private dwellings which use no fuel for heating

- No telecom = Individuals living in private dwellings which have no access to telecommunications

- Overcrowded = Individuals living in private dwellings which are overcrowded and in need of an extra bedroom to cater for all occupants

- Severely overcrowded = Individuals living in private dwellings which are severely overcrowded and in need of at least two extra bedrooms to cater to all occupants

- No fixed abode = Individuals living in mobile dwellings, improvised dwellings or sleeping rough[1].

The number of different housing situation groups has been limited to seven, as this ensured that the population within each group was sufficient to produce robust results.   The available information for each group was explored, focussing on the use of public services and infrastructure with the objective of determining a high level cost of benefit from each group.

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[1] These arrangements are considered private rented dwellings where they overlap with other groups.

Figure 1.1 Population size for each housing group
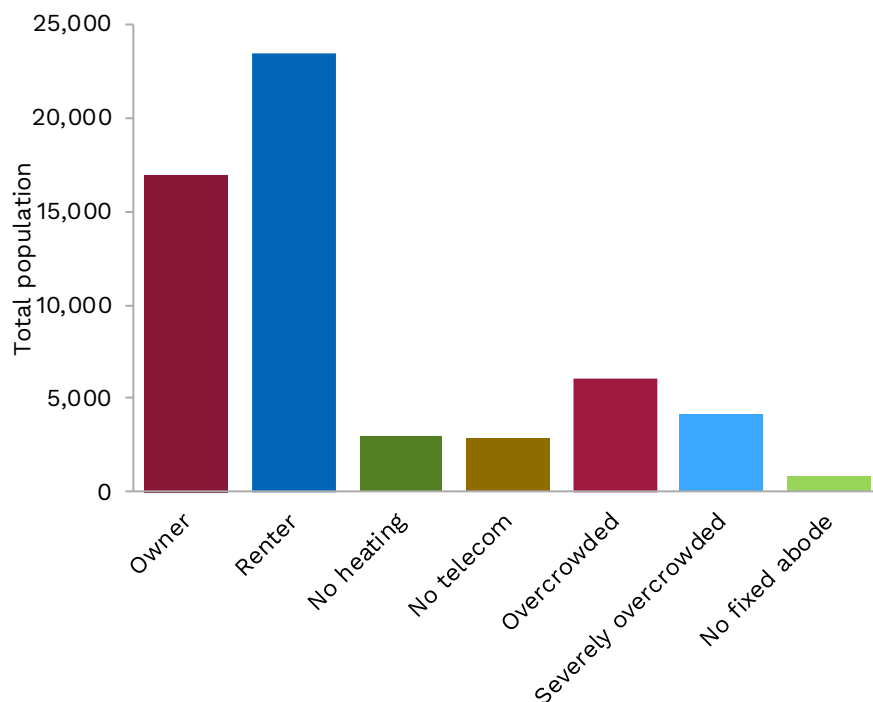
The overall population size of each group can be seen in Figure 1.1. The largest group is the renter group with around 23,500 individuals, followed by the owner group with 17,000 individuals. The remaining groups are relatively small; 850 individuals who have no fixed abode, while 3,000 do not use any fuel for heating and have no telecom. It is important to note that an individual could be part of more than one group, as an individual could live in a rented dwelling with no telecommunications access.

2   Summary of findings

Table 2.1 presents a summary of the net fiscal impact of individuals based on their housing situation. The tax paid, less the Government spending on welfare payments, hospitalisations and corrections forms the net fiscal benefit (cost) of the group. Welfare payments includes all welfare payments from MSD including the accommodation supplement temporary additional support. Pension income for individuals over 65 years old are not included as welfare payments.

However, it is important to note that these categories of tax and expenditure costs are only a subset of an individual's impact on the fiscal accounts. There are a range of other taxes (e.g. GST) and costs (e.g. transport, education, civil defence) where data is not readily available to assign to individuals; or where by their very nature (e.g. transport infrastructure) it is inappropriate to assign to individuals. Consequently, the absolute value of the net benefit (cost) is not as informative as the *relative* magnitudes of the impacts compared across the different housing groups.

The findings are the average value over the financial years 2015 to 2018, divided by the group population.

Table 2.1 Summary of average per person annual tax and service costs ($)

	Tax Paid	Welfare	Health	Corrections	Net Fiscal
Owner	4,860	2,050	1,030	230	1,560
Renter	3,480	5,160	1,050	530	-3,260
No heating	3,800	6,730	1,110	720	-4,760
No telecom	2,720	6,480	1,190	760	-5,700
Overcrowded	3,800	6,790	950	690	-4,630
Severely overcrowded	3,220	7,410	900	970	-6,060
No fixed abode	2,890	4,550	1,630	1,570	-4,860

- Of the seven housing situations analysed, individuals living in owner-occupied houses had the only net fiscal benefit.

- Individuals in severely overcrowded housing had the largest net fiscal cost of $6,060, just ahead of no telecom which had a net fiscal cost of $5,700.

- After the owner-occupied group, individuals with no heating and living in an overcrowded dwelling had the highest average total income with $22,700 for overcrowded and $22,600 for no heating. This results in these groups paying the most tax.

- Severely overcrowded and no heating had the highest welfare payments with $7,410 for severely overcrowded and $6,730 for no heating. These groups also had very high rates of unemployment.

- Not having a fixed abode had an annual average public hospital cost of $1,630 per individual, around $440 a year ahead of the no telecom subgroup with $1,190.

- Individuals living in severely crowded dwellings had the lowest average hospitalisation costs of the seven groups, costing just $900 per year for hospitalisations.

- For outcomes relating to criminal convictions, not having a fixed abode had an annual average sentence costs of $1,570 per individual, around $600 a year ahead of the severely crowded

subgroup which had sentence costs of $970. At the other end of the groups was $230 for owner and $530 for renter.

- The security of owning their home aligns with the opportunity to earn higher incomes, and hence pay higher taxes, receive less social welfare payments and lower sentence (convictions) costs.

- In contrast, those with no fixed abode, pay relatively little tax given their low incomes, but incur noticeably higher health and higher sentence (convictions) costs. Interestingly, this group receive relatively less in terms of social welfare payments. We presume this is in part due to their difficulty in qualifying for such payments – qualification requires a residential address, along with ability to take up employment offers and/or attend job interviews.

3   Employment status

This section discusses the seven housing groups in terms of labour force status in terms of individuals employed, unemployed and not in the labour force. The level of engagement with the labour market for each group has significant interactions with other outcomes, including income and beneficiary status. The occupations of employed people indicates the skill levels of individuals within each housing group.

3.1   Approach

As there is little information about employment status available in the IDI, these outcomes are taken from the 2013 Census. Income and employment information from Inland Revenue and the Ministry of Social Development data are considered in Section 4.

The primary labour force statistics used include the unemployment rate, labour force participation, and the proportion of people over 15 years who are employed. The labour force is defined as the share of individuals aged over 15 years old who are employed or actively seeking work. Individuals are considered to be employed if they have worked, either part time or full time, in the seven days prior to census day. People may leave the labour force if they give up looking for work, or become engaged in unpaid activities such as raising children. Figure 3.1 gives an example to demonstrate how the categories of employment and labour force are related.

Figure 3.1 Employment and labour force of working age people living in owner-occupied dwellings
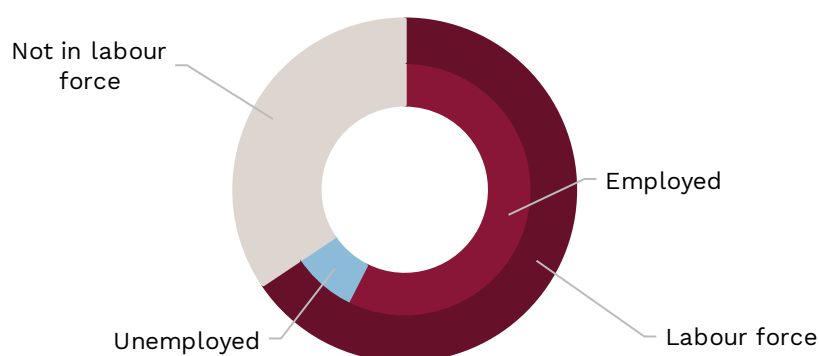
For a wider context, the unemployment rate of Māori in Te Tai Tokerau was 13.6 percent in December 2018. Of young people aged between 15 and 24 years, 31.7 percent were not in employment, education or training in Te Tai Tokerau (Ministry of Business, Innovation and Employment, 2017). These young people may or may not be part of the labour force, depending if they are actively seeking work.

3.2   Findings

All of the housing groups have a difference in economic outcomes, with the largest contrast associated with degrees of overcrowding. For people living in owner-occupied homes the

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unemployment rate was approximately half as high as the average across all groups of 20 percent. Every other housing group had an unemployment rate above the average, with the highest rate of 40 percent in the overcrowded group.

Figure 3.2 Unemployment rate by housing group, 2013 Census
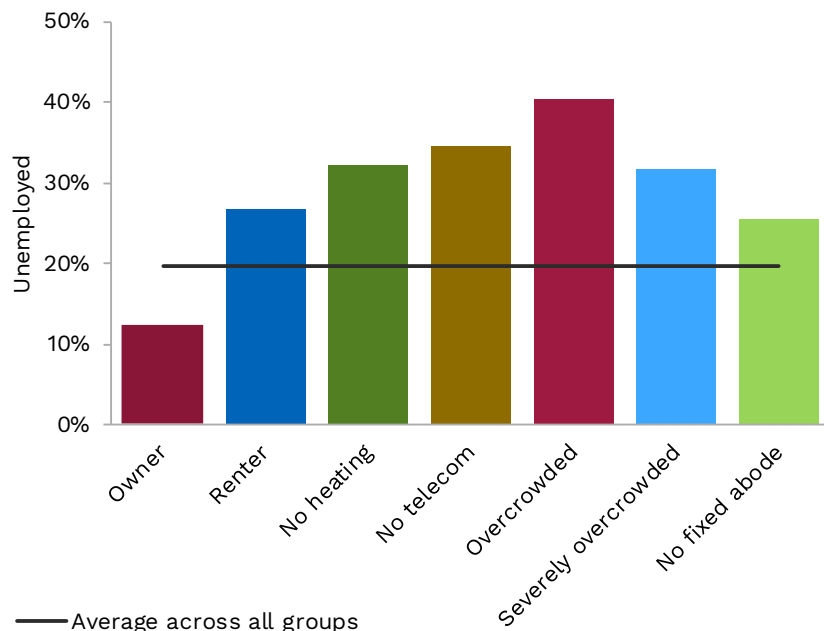
While the unemployment rate for severely overcrowded people is lower than for those who need only one additional bedroom, Figure 3.3 demonstrates that this is due to a difference in the size of the labour force in these two groups. The severely overcrowded group has a smaller proportion of the population in employment, the smallest of all the housing groups.

Average incomes across the groups is heavily influenced by the share of each adult population who are either unemployed or not in the labour force.

Figure 3.3 Share of employment status by housing group, 2013 census
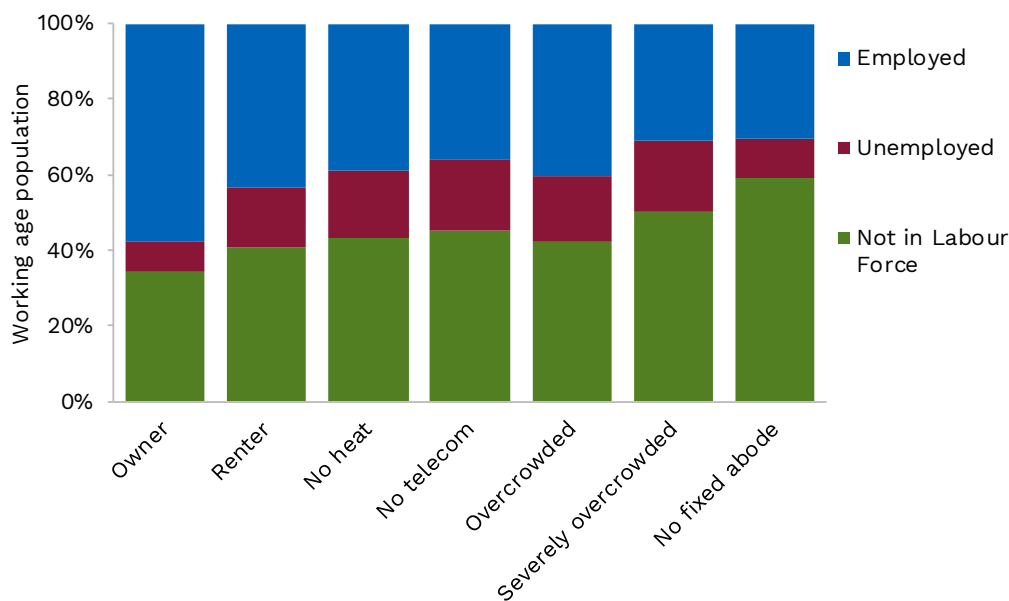
3.2.1   Tenure

Living in an owner-occupied home is positively correlated with income, predominantly from work, as these people are approximately half as likely to be unemployed as those who are renting. Also, their occupations are more likely to be in high-skilled jobs, including managers, professionals, and trades, as shown in Figure 3.4.

Figure 3.4 Occupations as a percentage of employed, by tenure, 2013 Census

3.2.2   No fixed abode

Employment outcomes for people with no fixed abode are varied. There is a high rate of unemployment for this group at 26 percent, and 48 percent of individuals are not in the labour force. This may be due to some individuals being unable to access housing, while others may be wealthy and making a lifestyle choice. With low labour force participation and high unemployment, the level of employme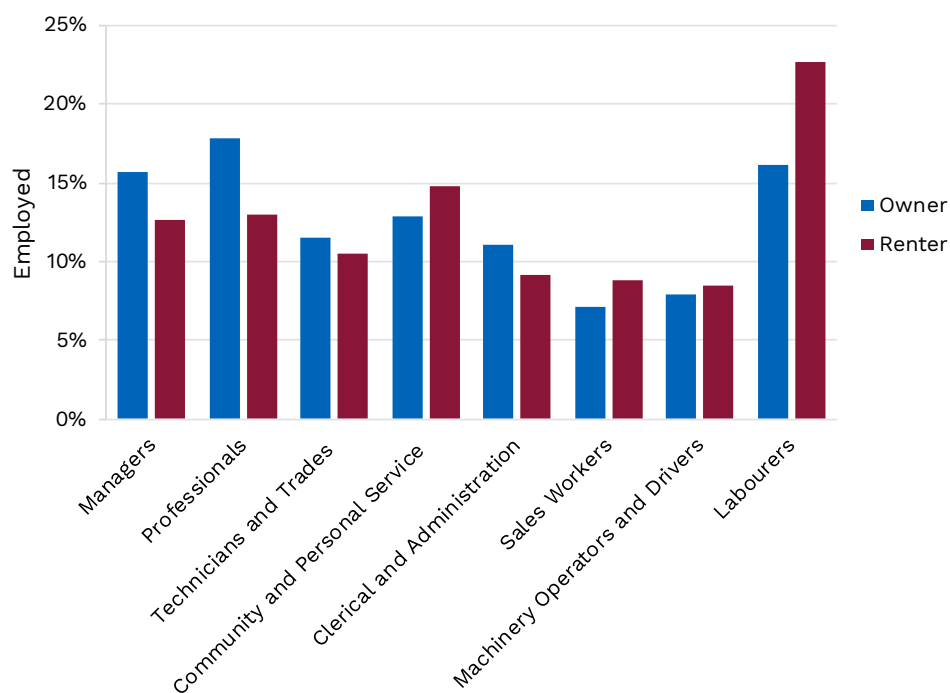nt for this group is very low; less than one third of individuals aged over 15 years old are employed. For some this may be due to a lack of skills, the restrictions of a criminal record. Alternatively they may be enjoying a mobile retirement or on an extended holiday. The section on incomes demonstrates the spectrum of financial situations across this group.

In this group only around 33 percent of employed individuals aged over 15 are managers, professionals and trades workers, while 25 percent are employed as labourers.

3.2.3   Crowding

There is a significant difference in the employment outcomes of those living in either crowded or severely crowded households to those who are not crowded. The unemployment rate for people living in crowded households is 30 percent, while those with severe crowding unemployment is 38 percent. This is high compared to an average of 17 percent for those living in households that are not crowded.

Of individuals aged over 15 years old and living in overcrowded dwellings, around 40 percent are in employment, while only 32 percent of those living in a severely overcrowded dwellings are employed.

31 percent of employed individuals aged over 15 in overcrowded housing are managers, professionals and trades workers, while 28 percent are labourers, in the overcrowded housing group. For those in the severely overcrowded dwellings, the proportion employed as managers, professionals and trades workers is 27 percent, while 29 percent are employed as labourers.

3.2.4   No telecommunications access

Employment situations for people living in private dwellings with no access to telecommunications are also poor, with very high unemployment rates, and a large group of individuals not in the labour force. Around 31 percent of individuals in this group are not in the labour force, while another 31 percent are under 15 (and therefore have no labour force status). The section on incomes demonstrates the variety of situations in this group. There is a very high rate of unemployment at 35 percent of the labour force within this group, while 36 percent of individuals aged over 15 are employed.

For this housing group 32 percent of those employed are labourers, while 29 percent are managers, professionals, or trades workers.

3.2.5   No heating

Employment outcomes for people living in private dwellings with no fuel for heating are varied. Although 29 percent of individuals in this group are not in the labour force, and a further 33 percent are under 15 (and therefore have no workforce status). This group also has a high rate of unemployment at 32 percent of the labour force while only 39 percent of individuals aged over 15 are in employment.

4   Income and welfare outcomes

In this section the data available in the IDI on welfare payments provided by the Ministry of Social Development (MSD) and income as recorded by the Inland Revenue Department (IRD) are analysed.

4.1   Approach

Individual people have been linked to their total taxable income, and welfare payment information. This includes which welfare payments they receive, for how long, and the daily rate. Using this information reliable estimates have been constructed of the annual taxable income and cost of welfare payments for the study groups.

4.2   Findings

Incomes varied across the housing types. Those living in an overcrowded home and those without access to telecommunications had the lowest incomes, and received the largest amount of welfare payments.

Figure 4.1 Annual average income (2015-2018), by housing group
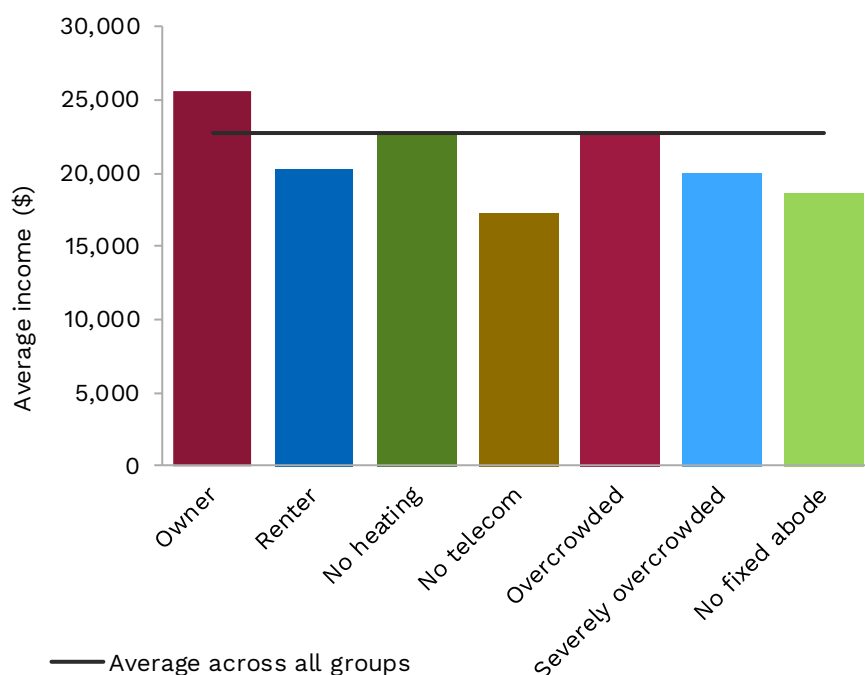
On average, Māori in Te Tai Tokerau receive an income of $22,500 per year from all sources. Of all of the housing groups presented in Figure 4.1, the most positive income levels are received by individuals living in owner-occupied homes. People in households with no heating, and households that are overcrowded (need one extra bedroom) receive the same amount as the population average of $22,500 per year. Households with no telecommunication have the lowest income, receiving just $17,000 per year.

Levels of welfare payments give a more detailed picture. Owner-occupied dwellings had the lowest welfare payments at just over $2,000, roughly half the overall average of $4,000. Second lowest welfare payments were received by those in the no fixed abode group, which at $4,500 is significantly below those without heating, telecom, or overcrowding. This may be because some in this group have

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difficulty satisfying the welfare payments criteria due to their precarious living situation, while others are not in need of assistance.

All of the other groups had welfare payments above $5,000. The highest welfare payments rates are received by individuals living in the severely crowded dwellings (needing two or more extra bedrooms), receiving an average of $7,400.

Figure 4.2 Annual average welfare payments received (2015-2018), by housing group
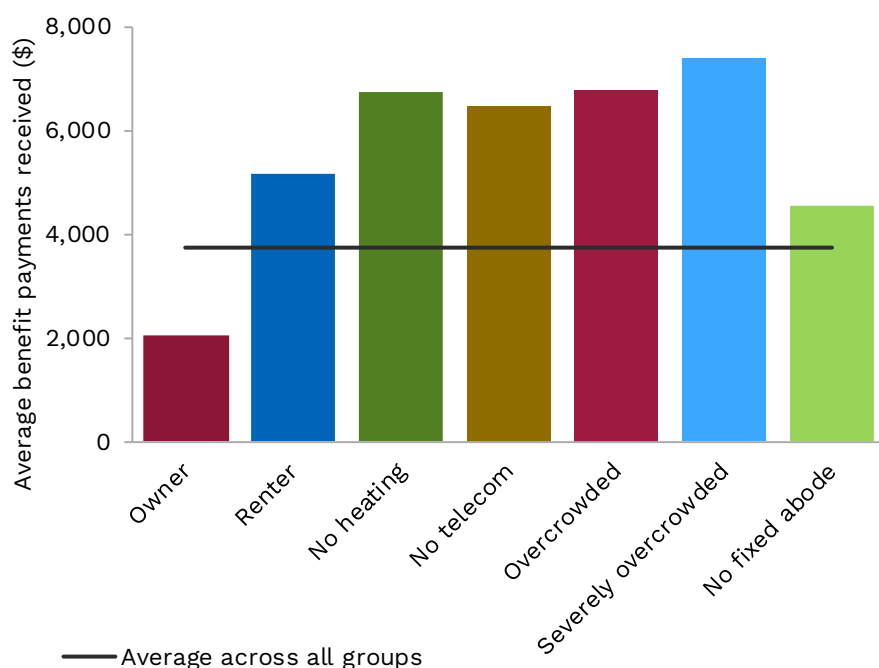
4.2.1 Tenure

Living in an owner-occupied home is positively correlated with income, predominantly from work as these people are approximately twice as likely as those living in rented accommodation to be employed. Their occupations are more likely to be in the higher skill jobs including managers, professionals and trades, which also typically results in higher income levels.

In line with the income finding, those living in owner-occupied homes also received 60 percent less in welfare payments than those living in rented accommodation.

4.2.2 No fixed abode

Income outcomes for people living in no fixed abode are varied, but on average they earned $8,000 less than those who live in a house. Despite the high rate of unemployment and low labour force participation, some people living in no fixed abode do have considerable earnings.

Some at the lower end of the scale may be unable to access housing. In 2013, 10 percent of this group had zero or negative income. At the top end, six percent of people had an income over $50,000, indicating that for some, living in a non-traditional dwelling may be a lifestyle choice.

4.2.3   Crowding

There is a stark contrast in income levels for individuals living in overcrowded houses compared with individuals in homes which are not crowded. On average, individuals in overcrowded homes earn $5,800 less per year than individuals in non-crowded homes. The difference is even larger for occupants of severely crowded houses, earning $8,600 less.

There is also a significant difference in welfare payments based on the level of crowding. Individuals in severely crowded homes receive an average of $7,400 in welfare payments, double the amount received by individuals in non-crowded homes.

Table 4.1 Income and welfare payment summary by degree of crowding ($)

	Not Crowded	Overcrowded	Severely overcrowded
Average income	27,879	22,697	20,071
Average work income	21,853	16,027	13,277
Median income bracket	20,001–25,000	15,001–20,000	10,001–15,000
Average benefit payments	3,706	6,792	7,410

4.2.4   No telecommunications access

Individuals living in private dwellings with no telecommunications access have the lowest average income of the seven groups, earning just $17,000 per year, $6,000 less than those who have access to telecommunications in their dwellings. Few individuals living in a dwelling with no telecommunications access have high incomes; just two percent of individuals over 15 received $50,000 or more in 2013. Eight percent of these individuals over 15 in this group had zero or negative income.

4.2.5   No heating

Income for people living in private dwellings with no heating are widely varied, but on average they earned $4,000 less than those who did heat their dwellings.

Despite the high rate of unemployment and people not in the labour force, some people living in a dwelling using no fuel for heating do have considerable earnings, with six percent of individuals over 15 earning at least $50,000 in 2013. However, more than twice as many individuals over 15 had zero or negative income.

5 Health outcomes

This section discusses the health outcomes of the seven household groups using data from the Ministry of Health. There are a multitude of variables that impact on health outcomes, for both physical and mental wellbeing. Within the IDI, frequency of contact with a Primary Health Organisation (PHO), and hospital admission costs were selected as indicators of health outcomes, providing a proxy for the prevalence of negative health outcomes. That is, a higher hospital cost indicates a poorer health outcome, whereas more frequent primary healthcare visits often correlates with lower hospital costs indicating better health outcomes.

This relationship appeared to hold true across most living situations, with the possible exception of those who were under 65 years of age with no access to telecommunications. Other factors such as living remotely or access to transport may be influencing their access to healthcare.

5.1 Approach

The health data used was of records of admissions to public funded hospitals. This data gives information on admissions to a publicly funded hospitals in the period between 1 April 2014 and 31 March 2018.

The Costweight estimation method has been used to estimate hospital care costs. This method takes into account the length of time each person was in hospital, the type of treatment they received, and other primary drivers of healthcare costs. For each of these people, on each of their visits (as some had multiple visits), a Costweight multiplier was extracted which was then multiplied by the official annual Ministry of Health Costweight number to give an estimate of the cost of their healthcare.

Visits to General Practitioners (GPs) are not explicitly counted in the IDI. As the funding is based on enrolments, each quarter PHOs report the individuals enrolled, and the date of their last visit to their GP. The number of quarters in a financial year where they have visited a GP are counted. This does not provide the total visits but provides an indication of the frequency of GP visits, with a maximum of four per year.

Using the IDI matching approach described previously individual people were matched to their health sector interaction in terms of public hospital admissions and GP visits, to get an estimate of the healthcare demand behaviour, and total costs of each population group.

Although the study group consists of Māori people usually resident in Te Tai Tokerau at the time of the 2013 Census, the hospital admissions and PHO visits may have occurred anywhere in New Zealand during the sample period.

5.2 Findings

Public hospital costs were much higher for individuals living in no fixed abode than any other group, costing 60 percent more than the average across all groups. Individuals in crowded and severely crowded dwellings had the lowest average hospital costs. There is no significant difference in hospitalisation rates of owners and renters. Having no fuel for heating only results in a minor increase in hospital costs.

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Figure 5.1 Annual average public hospital costs (2015-2018), by housing group
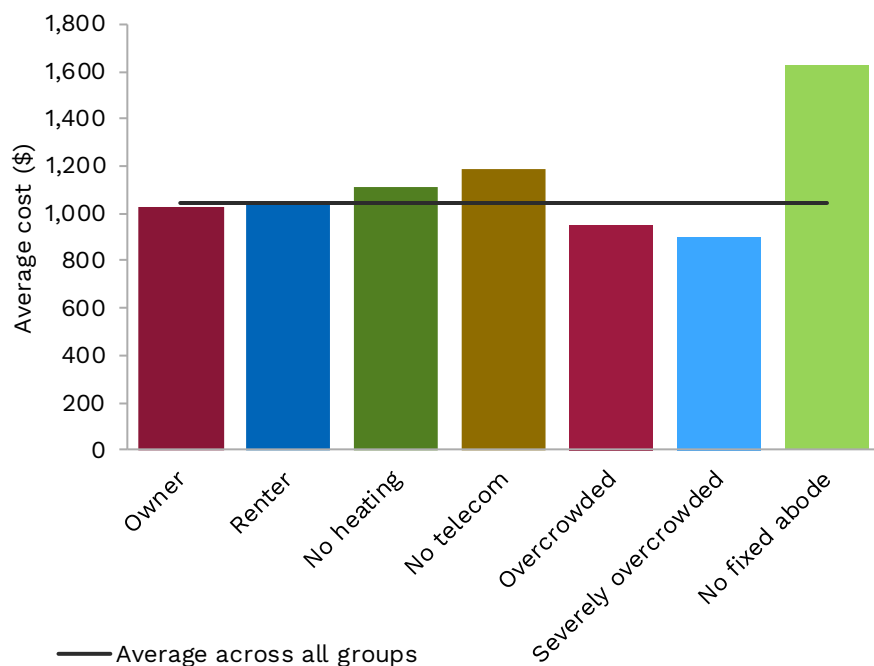
There appears to be an inverse relationship between average number of GP visits and hospitalisation cost. In most cases, groups with higher than average hospital visits had lower than average GP visits.

Residents of owner-occupied dwellings visited GPs more than any other group, as well as having lower than average hospital costs.

Figure 5.2 Annual average number of GP visits (2015-2018), by housing group
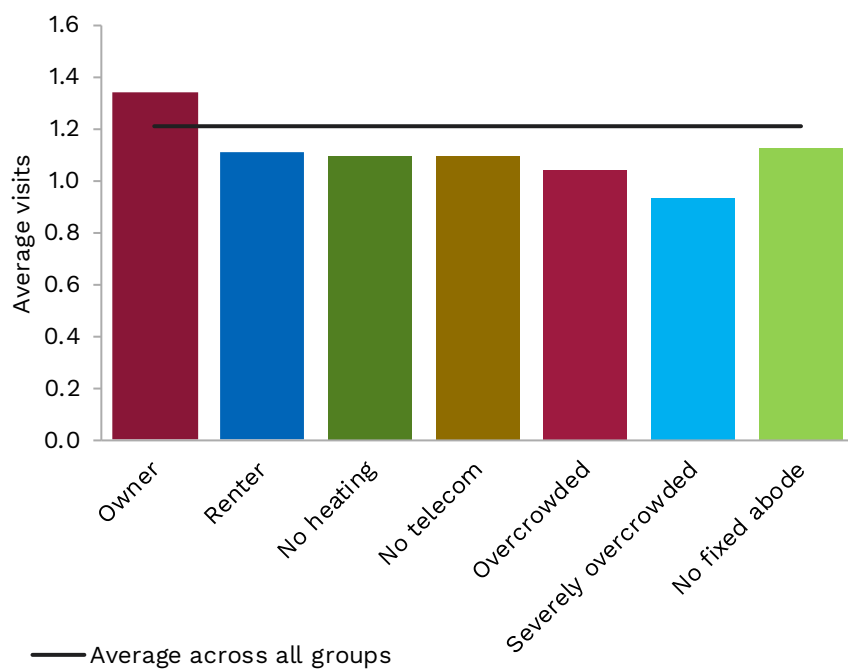
5.2.1 Tenure

Individuals who live in owner-occupied homes were found to visit their doctor more often and use the hospital less than those who are renting. This relationship was particularly strong for those aged over 65 years old with the highest rate of doctor's visits and the lowest hospital care costs for owner-occupied dwellings. This would imply that those living in owner-occupied homes have more positive health outcomes.

5.2.2 No fixed abode

People living in no fixed abode had outcomes that indicate poorer health than those with a more secure living arrangement. The data indicates that people living in mobile homes or improvised shelters visit the doctor less, and have higher hospital costs, with the exception of those over 65 years old. This group had substantially lower hospital costs than all other age brackets and the lowest of all housing indicators. This same sub-group visited their GP provider less often, with the lowest count of GP visits of all ages and housing indicators.

5.2.3 Crowding

In dwellings which were calculated as needing one extra bedroom, people visited their GP fewer times than individuals in uncrowded dwellings, with 55 percent visiting at least once per year. Despite the lower GP visits, they also had a lower average public hospital costs at $948 compared to individuals in uncrowded dwellings at $1,080.

Individuals requiring two or more additional bedrooms visited their GP even less often than those requiring one bedroom with 50 percent visiting at least once per year. Again despite this low rate of GP visits their average hospital costs were slightly lower than average at $899.

The effect does appear to vary substantially by age, young people in this population group had far fewer GP visits and lower hospital costs than their uncrowded peers. At the same time adults living in crowded households had some of the highest hospital costs of any housing factor. In addition overcrowding was the only housing factor examined which was associated with higher hospital costs for those aged over 65.

5.2.4 No telecommunications access

People with no access to telecommunications accessed primary healthcare less than people with telecommunications access, with 1.09 GP visits compared to 1.2 for the rest of the population group. Overall, just 54 percent of this subgroup went at least once to the GP per year, compared to 60 percent for the rest of Māori in Te Tai Tokerau.

As a result, the hospital costs were higher than average, costing $1,185 compared with individuals with access to at least one form of telecommunications at $1,030. This indicates that the lack of access to telecommunications or the factors which lead to the lack of access to telecommunications may result in worse health outcomes.

5.2.5 No heating

People living without any form of heating in their home visited their GP slightly less often than the average of 1.2 times a year, with individuals in this housing group going around 1.1 times a year. On average, only 54 percent of individuals in this group went at to the GP at least once per year. This lower GP visitation is associated with a slightly higher average public hospital cost of $1,109 per individual per year.

6 Corrections and justice outcomes

In this section the incidence and costs to the Government through the Department of Corrections, Ministry of Justice and the New Zealand Police are explored.

6.1 Approach

Data from the IDI from the Ministry of Justice, New Zealand Police, and the Department of Corrections was collected. Linking these sources to the 2013 Census, allowed us to count how many Māori usually resident in Te Tai Tokerau at the time of the 2013 Census were convicted and sentenced during the fiscal years between 1 April 2014 and 31 March 2018. Additionally, cost information for sentence types was used to calculate the total cost of sentences for each housing group. This information was used to calculate an estimate of costs to the Government.

The incidence of corrections outcomes can flow two ways: some housing outcomes can result in a higher likelihood to commit crimes, while people that are sentenced to a crime are also more likely to have poor housing outcomes due to income constraints that arise from being convicted and sentenced. Analysis in this section makes no attempt to separate these two mechanisms.

People who are convicted of a crime and sentenced are less desirable for private landlords and tend to be users of social renting services.

Individuals that are convicted of an offence, but do not receive a sentence supervised by the Department of Corrections are not attributed a fiscal cost.

Using data from the New Zealand Police the frequency of any individual being a victim of a crime, and if the offender is known to the victim at the time of the offense can be examined.

6.2 Findings

The total sentence costs, and sentence cost per conviction varies widely across the housing groups. The average sentence costs for Māori in Te Tai Tokerau is $400 at a rate of four convictions for every 100 people.

Living in an owner-occupied dwelling had much lower costs than other housing types, costing just $200 per year on average, while individuals living in no fixed abode had sentence costs of $1,600. Living in a severely crowded dwelling also resulted in corrections costs significantly higher than average, costing $900.

Despite total costs of those living in no fixed abode being the highest of all groups, the groups with the highest conviction rate were the severely overcrowded, and no access to telecommunications groups. This could indicate either a difference in the severity of offenses, or that lower cost sentences, such as home detention, are not available to those without a fixed dwelling. The no telecommunications group does overlap to some extent with the other two groups.

Figure 6.1 Annual average sentence costs (2015-2018), by housing group
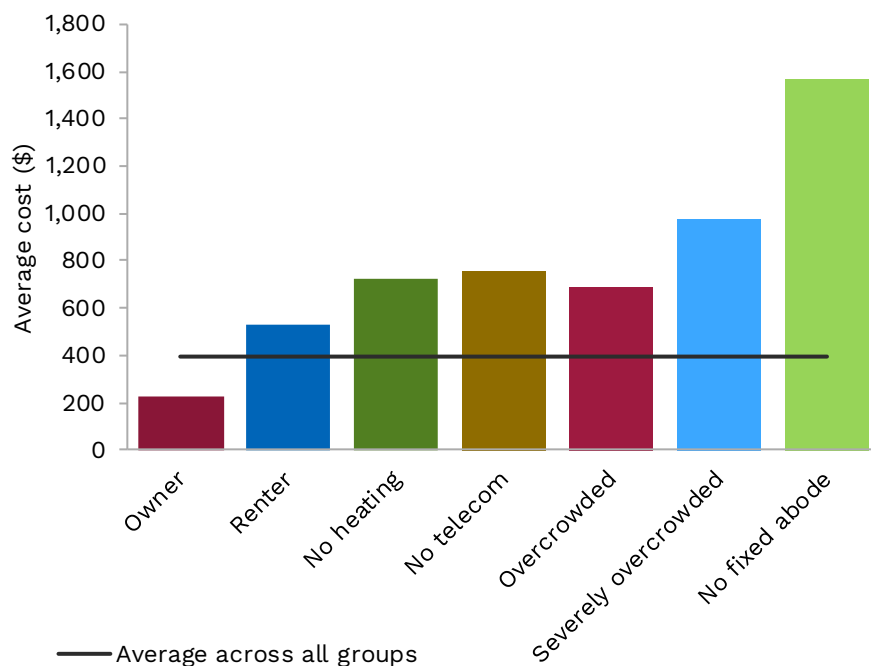
6.2.1   Tenure

People living in owner-occupied dwellings had the lowest rates of convictions. This in turn results in having the lowest annual sentence costs of the housing groups. On average, this group cost only $200 per year in sentence costs, half of the average cost for the whole Māori population of Te Tai Tokerau.

People living in owner-occupied homes had the lowest victimisation rate of any group, at 2.6 per 100 people, compared to the average for the entire Māori population in Te Tai Tokerau of three people per one hundred. This group were also much less likely to know the offender than those who live in rented dwellings. Renters were offended against by someone they knew 31 percent of the time, whereas those who live in owned dwellings knew the offender only 18 percent of the time.

6.2.2   No fixed abode

Sentence costs for those living in no fixed abode were on average more than four times higher than the average for Māori in Te Tai Tokerau. This is due to a high conviction rate of seven convictions per 100 people, as compared to four per 100 people for all Māori in Te Tai Tokerau. This would tend to suggest that criminal convictions may be a factor in being unable to access housing, and that a lack of housing accessibility may contribute to negative outcomes, including an increased crime rate. Information on income levels and access to welfare payments presented in Section 4 should be considered along with this finding.

People in this group are slightly more likely than average to be a victim of crime, with an annual victimisation rate of 3.6 people per one hundred.

6.2.3   Crowding

Individuals in overcrowded dwellings had an average conviction rate of 3.5 per one hundred people, while individuals in severely overcrowded dwellings had average conviction rate of eight per one hundred people. Comparing these to four per one hundred people for all Māori in Te Tai Tokerau, shows that while individuals in overcrowded dwellings had a similar rate to the total population, those in severely overcrowded dwellings had a conviction rate twice as high. Similarly to the group without permanent housing, this higher conviction rate maybe resulting in some individuals living in severely overcrowded dwellings, rather than or in addition to the relationship being the other way around.

This higher rate of convictions partially explains the higher sentence costs for this population, with an average cost of $688 per individual for those in overcrowded dwellings and $974 per individual for those in severely overcrowded dwellings. In both cases the sentence costs are much higher than the average cost per individual of $394 for the entire Māori population in Te Tai Tokerau.

Individuals living in overcrowded dwellings are slightly more likely to be a victim of crime, with a victimisation rate of 3.6 people per one hundred, compared to three people per one hundred for the entire Māori population in Te Tai Tokerau. This is worse for individuals in a severely overcrowded dwelling, who have a victimisation rate of 3.7 per one hundred people.

6.2.4   No telecommunications access

Individuals in dwellings with no telecommunications access have an average conviction rate of eight per one hundred people, on a par with those in severely crowded dwellings and higher than those in no fixed abode. This higher rate of convictions partially explains the higher sentence costs for this population, with an average cost of $756 per individual. This is almost twice as high as the average cost per individual of $394 for the entire Māori population in Te Tai Tokerau.

Individuals in this housing group are also slightly more likely to be a victim of crime, with a victimisation rate of four per one hundred people, compared to three per one hundred people for all Māori in Te Tai Tokerau.

6.2.5   No heating

Individuals in dwellings with no fuel for heating have average sentence costs of $756 per individual. This is almost twice as high as the average cost per individual of $394 for the entire Māori population in Te Tai Tokerau.

Individuals in this housing group are also more likely to be a victim of crime, with a victimisation rate of four per one hundred people, compared to three per one hundred people for the remainder of the Māori population in Te Tai Tokerau.

7   Net fiscal summary

This section summarises the results of the fiscal estimate calculations and the scenarios modelled. There are four main areas of fiscal impact covered:

- Health – namely, hospitalisation costs
- Corrections – namely, prison and community sentence costs
- Costs of MSD welfare payments
- Tax paid to the Government.

These amounts are measured on a per capita basis: i.e. the total cost divided by the number of people in that housing group. This measure takes into account the different incidence rates of outcomes, such as going to hospital or a prison sentence, for each sub population.

7.1   Findings

Except for those living in owner-occupied dwellings, each of the other housing groups had a substantial negative fiscal cost. This means that on average for those groups, the cost of hospitals, corrections and welfare payments, was higher than the amount of tax collected. The average fiscal cost for Māori in Te Tai Tokerau is $1,000.

Having no access to telecommunications and living in a severely crowded dwelling had the largest net fiscal cost of the housing groups, at approximately $6,000 per person. These results compare to residents of owner-occupied dwellings who make an average net fiscal contribution of $1,600 per year.

Figure 7.1 Annual average fiscal benefit (cost) (2015-2018), by housing group
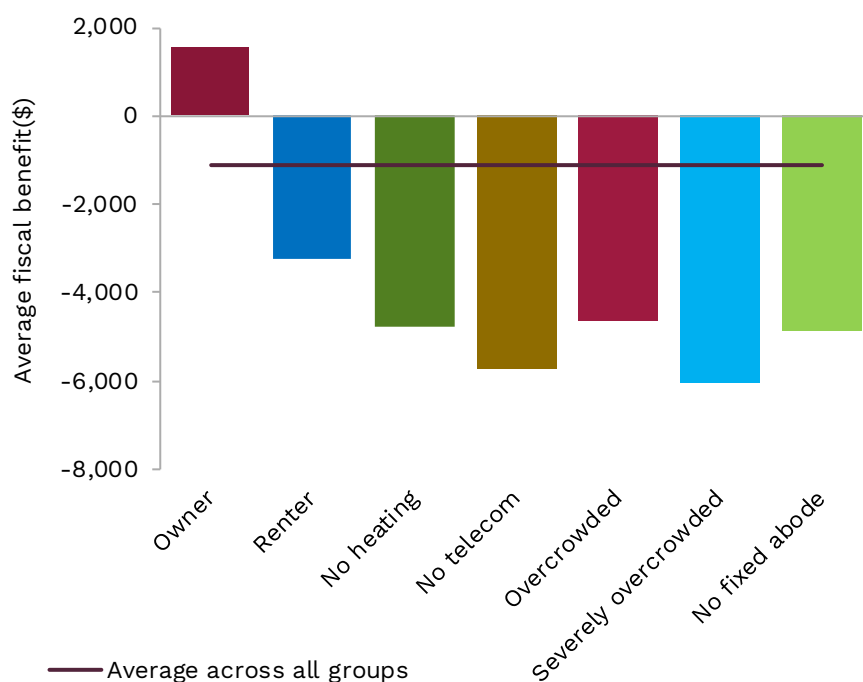
8 Methodology

This section explains the methodology used to determine the total population and population groups for this project, and the methodology used to construct and choose the variables used for the analysis.

8.1 Population group

This project is restricted to Māori living in Te Tai Tokerau, this set the bounds of the total study population. To define this total population group the 2013 Census Individual and Dwelling responses were used to define individuals who are usual residents in Te Tai Tokerau, and indicated they were of Māori ethnicity. This provided a total population group of approximately 40,500 individuals.

As the overall objective of this project is to look at economic costs and benefits associated with different housing situations, this total population has been divided into groups. These groups are defined as:

- Owner-occupied dwellings or rented dwellings (collectively "tenure")

- No fixed abode (including improvised shelters and rough sleeping)

- Overcrowded private dwellings

- Dwellings with no access to telecommunications

- Dwellings which do not use any fuel for heating.

Apart from the Owners and Renters groups, an individual can be part of multiple groups as they overlap to some extent. For example an individual maybe living in a rented caravan (no fixed abode), with no access to telecommunications (no access to telecommunications), and with no fuel to heat their caravan (dwellings which do not use any fuel for heating) would be part of four of the different population groups.

The objective of these sub population groups is to determine which housing characteristics or situations have the strongest relationship to the overall economic costs and benefits to the New Zealand Government.

It is important that the housing groups are non-exclusive as some of the housing situations affect only a small proportion of the total population. This approach maximises the size of the group populations, which therefore maximises the number of data points available for each group.

Tenure

Tenure is the sum of two groups, those who live in owner-occupied dwellings, including trusts (owner), and those who live in non-owned dwellings (renter). To split the population the Census Dwelling questions "Do you, or anyone who lives here, hold this dwelling in a family trust?", "Do you, or anyone else who lives here, own or partly own this dwelling (with or without a mortgage)?" have been relied upon.

These questions identify dwellings that are owned by a trust, along with those that are owner-occupied. Combining the answers from these questions allows us to identify each dwelling in Te Tai Tokerau that is owned by a trust or is owner-occupied. All other living situations are defined as rented.

berl *Making sense of the numbers*

With all the dwellings in Te Tai Tokerau allocated to one of these two groups, the IDI was then used to link all the individuals in the total population to their 2013 Census Dwelling. This allows us to then split the total population into the two tenure groups; owner and renter. Renter includes individuals living in an improvised shelter or rough sleeping.

Overall around 17,000 individuals live in owner-occupied dwellings, while around 23,500 individuals live in rented dwellings in Te Tai Tokerau.

Dwelling type

For dwelling type, the occupied dwelling type – level 3 variable derived from the 2013 Census Dwelling form - was used. This variable separates dwellings into three main categories, the first category was private houses, townhouses or apartments; the second category was no fixed abode (such as dwelling in a motor camp, mobile dwelling not in a motor camp, improvised dwelling or rough sleeper); the third category was occupied non-private dwellings (hospitals, prisons, hotels, camps, Marae, etc) As with the tenure variable the IDI was used to link the dwelling types to the individual records of the study population.

The second category, those living in no fixed abode, was a total of 843 individuals. Analysing this sub group allows an examination of the outcomes and economic costs of individuals who live in non-house dwellings, or in some cases have no dwelling in which to sleep.

Crowding

The crowding variable is a derived variable calculated using the Canadian National Occupancy Standard (see Section 8.1.2 for further details) methodology. In order to calculate this variable for Te Tai Tokerau the following information was used:

- Age of each dwelling occupant from the 2013 Census
- Sex of each dwelling occupant from the 2013 Census
- Family role of each dwelling occupant from the 2013 Census
- Bedroom count for each private non-visitor dwelling in the 2013 Census.

As is noted in the methodology households which require one extra bedroom are considered to be overcrowded, and households which require two or more additional bedrooms are severely overcrowded. Households which require no extra bedrooms or have spare bedrooms are classified as not crowded.

Of the total study population, around 6,100 individuals lived in an overcrowded household in 2013, and a further 4,100 individuals lived in a severely overcrowded household. The remaining 30,300 individuals lived in non-overcrowded households. The economic costs and benefits associated with living in overcrowded and severely overcrowded households are then analysed.

Telecommunications access

The telecommunications access variable can be split into two groups: those who have access to telecommunications via mobile phone, landline, fax or internet access in their dwelling, and those who do not have access to any of these.

This information was gathered from the 2013 Census Dwelling form question "Mark as many spaces as you need to show which of these are available here in this dwelling:

- A cellphone / mobile phone (that is here most or all of the time)

- A telephone

- Fax access

- Internet access

- Or none of these."

Economic costs and benefits associated with living in dwellings with no telecommunication access can then be assessed. The 2013 Census did not ask about access to electricity or running water. The telecommunications access is proposed as a proxy for a more general access to services in the dwelling. 2,820 individuals lived in a dwelling within no telecommunications access as at the 2013 Census.

Fuel for heating

The fuel for heating variable can be split into two groups: those who use one or more fuel types to heat their dwelling, and those who do not use any. The 2013 Census Dwelling form question "Mark as many spaces as you need to show which of the following are ever used to heat this dwelling:

- Don't ever use any form of heating in this dwelling

- Electricity

- Main gas

- Bottled gas

- Wood

- Coal

- Solar heating equipment

- Other fuel."

The total population is allocated to two groups, the first is those individuals who live in a dwelling in which "don't ever use any form of heating in this dwelling" was ticked, and the remaining individuals who use one or more fuel types.

Economic costs and benefits associated with living in dwellings with no heating can then be assessed. The group who lived in a dwelling within no heating had 2,960 individuals as at the 2013 Census.

8.1.1   Linking in the IDI

In order to track individuals' housing factors and their tenure in the Integrated Data Infrastructure (IDI) it was necessary to link multiple IDI tables together. Statistics New Zealand (SNZ) have derived a variable called snz_uid for each individual to track or match that individual across multiple datasets (matching).

For all variables except tenure this ID number was used to find each individual in the total study population across multiple tables.

To identify only Māori people who live in Te Tai Tokerau the address information from the 2013 Census was used. This was done by linking the dwelling ID from the dwelling table to the household table and then to the individual. Individuals who were not usually resident in Te Tai Tokerau were then excluded, even if they were in Te Tai Tokerau on the night of the 2013 Census.

8.1.2   Canadian National Occupancy Standard

The Canadian National Occupancy Standard (CNOS) was used to calculate which of the households in the population group were overcrowded. This method was chosen as it has been previously used to analyse overcrowding using census data in New Zealand, which enables direct comparison of results.

Statistics New Zealand analysed four possible overcrowding methodologies in a report from 2011[2]. They concluded that of these four, CNOS was the most applicable to the New Zealand setting, although it notes that there is no 'ideal' index.

All measures of overcrowding imply that the assumptions around appropriate household organisations are those of the dominant culture. It may be that the target population have differing perspective on what constitutes overcrowding. For this research it is not possible to undertake self-reporting of crowding. A study published in the New Zealand Medical Journal identified the CNOS as having a high correlation to studies which used self-reporting as the crowding evaluation tool[3] somewhat alleviating concerns around cultural appropriateness.

The CNOS is based on the number, age, sex and interrelationships of household members. The conditions used to calculate the CNOS are:

- No more than two people shall share a bedroom

- Parents or couples may share a bedroom

- Children under five years of age of the same or opposite sex may share a bedroom

- Children under 18 years of age of the same sex may share a bedroom

- A child from five to 17 years of age should not share a bedroom with a child under five years of age of the opposite sex

- Single adults 18 years of age and over and any unpaired children require separate bedrooms.

Households which exceed these criteria, and require one extra bedroom are considered to be overcrowded. Households which require two or more additional bedrooms are severely overcrowded.

Statistics New Zealand used the CNOS after the 2013 Census to determine the number of New Zealanders living in crowded and severely overcrowded conditions in New Zealand[4]. These numbers are summarised here and show that:

- Around 10 percent of New Zealanders live in crowded conditions (398,300 people in 74,124 households)

- Children are over represented in crowded households. Over half of crowded households have two or more children (at least one child aged between five and 14 years) living in them

- Two in five Pacific people (38 percent), one in five Māori (20 percent), and Asian (18 percent) people live in crowded households. This compares to one in 25 Europeans (4 percent)

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[2] Goodyear, RK, Fabian, A, & Hay, J (2011). Statistics New Zealand

[3] Schluter, P, Carter, S, & Kokaua, J (2007). *Journal of the New Zealand Medical Association*

[4] Statistics New Zealand (2018). Living in a crowded house: Exploring the ethnicity and well-being of people in crowded households.

- For the lowest household income quintile, 15 percent of households are crowded; for the highest household income quintile just 2 percent of households are crowded.

8.2   Variables analysed

For this project, the primary focus has been on economic/fiscal costs and benefits to the New Zealand Government from the individuals within the target population. Much of Government spending is unable to be linked to individuals, or is evenly spread across the population, limiting the number of variables that can be analysed in this way.

For this project, there are three focus areas: health, corrections and justice, and income and welfare payments.

Health

Within the health area, Ministry of Health public hospital cost and the GP visit variables were used. The public hospital cost variable shows the cost of treating an individual at a public hospital. This has been used as a proxy for health costs to the Government. The GP visits variable indicates the number of times an individual has gone to see their GP. No funding cost can be associated with individual GP visits because GPs are part of Primary Health Organisations (PHO) and PHOs are funded per person enrolled with the PHO, not on an individual visit basis.

Corrections and justice

Within the corrections and justice area, the Department of Correction's entry, exit and daily costings linked to individuals who are sentenced, and the Ministry of Justice counts of convictions per individual have been used. From the Department of Corrections data, an annual cost to the Government from the individual's sentence was calculated, while the Ministry of Justice conviction counts provided an indication of the level of interaction with the justice area.

Income and welfare payments

Within the Income and Welfare payment area, the Ministry of Social Development (MSD) welfare payments linked to individuals who receive a welfare payment from MSD. This includes all three tiers of welfare payments available in the IDI. The first tier includes the primary welfare payment, the second tier includes additional costs including accommodation supplements and the third tier is for one-off expenses.

The total taxable income of individuals reported to the Inland Revenue Department (IRD), and the total tax paid to the Government by individuals have been used.

8.2.1   Note on terminology

Specific definitions of data and variable terms are provided in the appendix.

For health fiscal costs, all per capita numbers relate to total costs divided by the total number of people in the relevant population.

For all other fiscal costs and for PAYE fiscal revenue all per capita numbers relate the relevant total divided by the number of people aged 15 and over in the relevant population.

All data is for the Māori population in the Te Tai Tokerau region, with annual averages calculated from data for the three fiscal years 2016-2018.

Appendix A   References

BERL (2017). Fiscal costs of different housing tenure groups – Social renting to housing security independence. Wellington: BERL

Goodyear, RK, Fabian, A, & Hay, J (2011). *Finding the crowding index that works best for New Zealand* (Statistics New Zealand Working Paper No 11–04). Wellington: Statistics New Zealand

Ministry of Business, Innovation and Employment (2017). *Māori in the Labour Market*. Wellington: Ministry of Business, Innovation and Employment

Schluter, P, Carter, S, & Kokaua, J (2007). Indices and perception of crowding in Pacific households domicile within Auckland, New Zealand: findings from the Pacific Islands Families Study. *Journal of the New Zealand Medical Association*, 120 (1,248)

Appendix B   Variable definitions and construction

Household tenure

Household tenure refers to the ownership structure of the dwelling in which the household lives. It can be either owner-occupied or rented. Owner-occupied dwellings are defined as a dwelling that is either owned by members of that household, or is held in a family trust.

To determine owner-occupied dwellings lived in by the sample population the tenure codes from the household census were used. The codes that were used to determine an owner-occupied dwelling were:

10 – dwelling owned or partly owned, mortgage payments not defined.

11 – dwelling owned or partly owned, mortgage payments made.

12 – dwelling owned or partly owned, mortgage payments not made.

30 – held in family trust, mortgage payments not further defined.

31 – held in family trust, mortgage payments made.

32 – held in family trust, mortgage payments not made.

If the dwelling form indicates any of these fields the dwelling is considered to be owner-occupied.

Other dwellings, or if the response to these questions was don't know, unidentifiable or not stated are considered to be rented.

Housing type

Household or dwelling type can be split into three main categories occupied private fixed dwellings, occupied private mobile or no fixed abode and occupied non-private dwellings. Statistics New Zealand occupied dwelling type level 2 provide a summarised breakdown of these categories. The occupied private fixed dwellings are comprised of codes:

10 – Occupied private dwelling not further defined (nfd)

11 – Separate house

12 – Two or more flats/units/townhouses/apartments/houses joined together.

Occupied private mobile or no fixed abode are comprised of code:

13 – Other occupied private dwellings.

And occupied non-private dwellings are comprised of codes:

20 – Occupied non-private dwelling nfd

21 - Institution

22 – Other occupied non-private dwelling.

Statistics New Zealand occupied dwelling type level 3 codes shows at the most detailed level what dwellings are included in the no fixed abode group.

1311 – Dwelling in a motor camp

1312 – Mobile dwelling not in a motor camp

1313 – Improvised dwelling or shelter

1314 – Roofless or rough sleeper.

Access to telecommunications

In the 2013 Census Dwelling form occupants of a dwelling are asked about their access to different forms of telecommunications, such as mobile phone, landline, fax, or the internet. The Statistics New Zealand variable Telecommunications systems, no access to, was used, which has the following codes for the variable:

00 – No access to telecommunication systems

77 – Response unidentifiable

99 – Have access to telecommunication systems, or not stated.

The 00 code identifying dwellings which do not have access to telecommunication systems, has been relied upon rather than calculating the groups from all responses. While the second approach would have garnered a large population group, it would have included dwellings with no response, which would have diluted the strength of results.

Use of fuel to heat the dwelling

In the 2013 Census Dwelling form, occupants of a dwelling are asked about fuels used to heat their dwelling. The Statistics New Zealand variable fuel type has the following codes:

11 - Electricity

12 – Mains gas

13 – Bottled gas

14 - Wood

15 - Coal

17 – Solar power

18 – No fuels used in this dwelling

19 – Other fuel(s)

77 – Response unidentifiable

99 – Not stated.

The code 18 was used to identify dwellings that did not use any fuel for heating as a proxy for people living without heating.

Tax paid and gross income

Information on PAYE tax collected by IRD was linked to individuals within the study population. Gross income and PAYE tax deductions for the period 1 April 2014 and 31 March 2018 according to the return date. The gross income and tax deductions during this period were added up for each person to produce a total gross income and total tax paid for that period.

Individual IR3 returns are restricted in the IDI data and were not available for use in this project. This means that for individuals working as contractors their provisional withholding tax returns were used

as a proxy. Individuals who own their own business and do not pay themselves a wage or salary have no information available, therefore their tax paid and income are omitted.

MSD welfare payments

The daily rate, and length of time paid, for each welfare payment a person received during the study period enabled a calculation of total welfare payment cost. Dividing the result by four gave an average annual estimate for MSD welfare payment costs.

Corrections

Corrections costs were calculated using the total sentence length of all individuals sentenced during the study period. Although some sentences were longer than the study period, the Government has effectively committed to paying these costs. So in the interests of proper accounting they are included.

Ministry of Justice count of convictions

For each individual who received a conviction during the study period, the charge ID and charge outcome date for each charge resulting in a conviction was extracted.

As a person can be convicted of multiple offences stemming from a single incident the number of times in each year a person had a different charge outcome date was counted. This allowed a count of the number of times each year a person had a new conviction. Assuming all charges from a single incident will have a single outcome date, it is assumed that convictions for different dates relate to different incidents.

Counts were confined to convictions rather than the wider scope of charges to provide context to the sentence costs variable. This variable provides an idea of the number of crimes or criminal events that have led to the sentence costs.

Ministry of Health (MOH) costs

Costweight code and the Costweight amount variables were extracted for individual with health events during the study period.

The Costweight code was then matched with a Costweight measure provided by the MOH and multiplied to give an estimated cost for each health event for each person. This information was further aggregated to give an estimated cost for each individual during the study period.

Ministry of Health Primary Health Organisation (PHO) data

Quarterly PHO enrolments data was extracted for all quarters during the study period which includes the date at which each individual last saw their GP at the PHO in which they are enrolled.

Using this date information the number of quarters in each year that the individual had been to see their GP was calculated. Because the data is quarterly, and only the last visit for each quarter is recorded, the maximum number of times an individual is calculated as visiting their GP in a single year was four.

While the variable is limited by the quarterly nature of the data, it does provide a valuable indicator of the number of visits an individual makes to their GP each year. Comparing this variable with the public hospital discharge costs can provide insight into their use of primary versus hospital level care.