Housing in greater Christchurch after the earthquakes

Trends in housing from the Census of Population and Dwellings 1991–2013

Rosemary Goodyear
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1 Purpose and summary

Purpose

This report describes the changes that have occurred in housing and the effects of housing changes on the population in the greater Christchurch area as a result of the Canterbury earthquake sequence that began in September 2010. Research overseas has shown that after a major disaster housing issues increase, particularly for vulnerable populations such as low-income households, some ethnic minorities, and one-parent families.

Media and researchers expect housing issues have increased sharply, with rental affordability and an increase in homelessness seen as major issues for greater Christchurch: “Rental rises in Christchurch have surged to an eight-and-a-half-year high as the housing shortage refuses to loosen its grip on the city” (*The Press*, 1 November 2012). And “A surge in homelessness in Christchurch among people with mental health issues has become an ‘extreme concern’ to the city’s health professionals” (*The Press*, 18 October 2013).

MBIE (2013) estimated that the population facing severe housing deprivation may have increased by between 68 and 113 percent since the earthquakes.

The content of this report reflects consultation with local councils and central government agencies, in particular the Canterbury Earthquake Recovery Authority (CERA) and the Ministry of Business, Innovation and Employment (MBIE). CERA is responsible for monitoring social recovery in greater Christchurch. ‘Greater Christchurch’, under the Canterbury Earthquake Recovery Act, means the districts of the Christchurch City Council, the Selwyn District Council, and the Waimakariri District Council, and includes the adjacent coastal marine area. Since 2011, the then-Department of Building and Housing (later incorporated into MBIE in 2012) have been monitoring housing recovery.

This report will explore the following questions:

- What is the extent of the decline in residential housing stock in greater Christchurch? How has this varied by type of dwelling?
- Has there been a change in the tenure mix of dwellings?
- Have the earthquakes led to increased housing problems in greater Christchurch, particularly for lower-income people? In particular:
  - Has there been a decline in rental affordability?
  - Has household crowding increased?
  - Has there been an increase in people living in ‘temporary’ housing types such as private dwellings in a motor camp, mobile dwellings, improvised dwellings, or shelters?
  - Has there been a change in the characteristics of people living in situations that can be characterised as housing deprived?

While there been considerable interest in whether the earthquakes have led to an increase in homelessness, this is not an easy question to answer from census data alone. Therefore, this report does not estimate homelessness but does focus on types of housing associated with severe housing deprivation, such as boarding houses and temporary dwellings. Research on severe housing deprivation (Amore et al, 2013) used a combination of administrative data sources and census data to develop estimates of homelessness.
While this report largely focuses on descriptive analysis, multivariate analysis has been applied to data on crowding to see whether changes in crowding between 2006 and 2013 were significant.

**Concepts used in this report**

**Identifying low-income populations**

There is currently no official definition of poverty or of low income. Researchers such as Bryan Perry use a combination of different thresholds to define poverty, such as 60 or 50 percent of median equivalised household income.

Other approaches are simply to take the bottom quintile (or bottom two deciles) of equivalised household income distributions. The latter approach is used here, as household income information is collected in bands from the census and therefore lacks the precision to produce a threshold measure. Equivalised household information is used, as it is difficult to accurately compare the affordability situation of households because households may vary considerably in size.

Jensen Equivalised Annual Household (JEAH) income is the equivalisation scale used here. While a number of different equivalisation scales have been developed, the JEAH income measure is widely used for poverty measures in New Zealand. For example, JEAH equivalised income is one of the components making up the New Zealand Deprivation Index and is used in the Ministry of Social Development's Social Report. The distribution of JEAH income by quintile enables us to compare how households in the lower JEAH income quintiles fared in 2013, compared with 2006.

There are limits in measuring housing affordability using income alone, as Perry (2013) notes:

> The level and quality of financial and physical assets, assistance from support networks and government services, and special demands on the household budget can all have significant positive or negative effects on living standards, over and above the effect of current income. As these factors fall differently across different households, households with the same or similar equivalised incomes can have different living standards. For these reasons, current household income, even when adjusted for household size and composition, can only be a rough indicator of actual household living standards.

In greater Christchurch there is a further complication, as some homeowners may be still paying a mortgage on their damaged home while renting. We do not have any information on their situation. While we cannot give a complete picture of rental affordability, we can look at how it has varied over time.

**The 2009 definition of homelessness**

Although this paper does not attempt to estimate the numbers of homeless people in greater Christchurch, it uses the New Zealand definition of homelessness (Statistics New Zealand 2009) and the work of Amore et al (2013) to identify types of housing associated with severe housing deprivation. The 2009 definition defines homelessness as ‘living situations where people with no other options to acquire safe and secure housing: are without shelter, in temporary accommodation, sharing accommodation with a household, or living in uninhabitable housing’.

**Note on cancellation of 2011 Census**

A census had been scheduled to take place in March 2011, but was abandoned because of the February 22, 2011 earthquake. "The Government Statistician decided that a census could not be successfully completed in 2011 given the national state of emergency and the probable impact on census results." As a result, the gap between censuses was seven years, rather than the usual five-year interval. This means time series comparisons should be done with care.
Summary

- The dwelling stock has changed.
- The number of occupied private dwellings declined in Christchurch city between 2006 and 2013.
- Housing issues have increased as a result of the earthquakes, but the effects have been smaller than anticipated.
- There has been a small but significant rise in household crowding
- The numbers of people living in 'other private dwellings', which includes private dwellings in a motor camp, mobile dwellings not in a motor camp, increased from just under 1,500 people in 2006 to just over 2,200 people

The changes in housing are as follows.

Change in dwelling stock

- The number of occupied private dwellings has declined in Christchurch city by 3.2 percent between 2006 and 2013 compared with a 6.9 percent increase between 2006 and 2013.
- The number of unoccupied dwellings increased sharply between 2006 and 2013, with an 88.4 percent increase in Christchurch city and a 77.7 percent increase in Waimakariri district, compared with 25.9 percent in Selwyn district.
- The rise in the number of unoccupied dwellings was largely the result of more empty dwellings, particularly in Christchurch city where the number of empty dwellings increased from 5,841 in 2006 to 14,556 in 2013. This is a 149 percent increase since 2006.
- The largest increase in private occupied dwellings was in temporary dwelling types (including private dwellings in motor camps, mobile dwellings, and improvised dwellings or shelters).
- The number of dwellings owned by the household that was living in them in Christchurch city declined by around 8 percent compared with a 4 percent rise in the numbers of dwellings that were not owned.

Small rise in number of people living in crowded households

- In 2013, 5,103 households were crowded, with 25,572 people living in a crowded household.
- The percentage of crowded households and people increased very slightly between 2006 and 2013: from 3.2 to 3.3 percent of households, and from 6.1 to 6.3 percent of people.
- The number of people living in severely crowded conditions in greater Christchurch has risen slightly: from 5,688 people in 2006, to 6,357 people in 2013 (or from 1.4 to 1.6 percent of people in households).
- The increase in crowding, although small, contrasts with a slight decline nationally (from 5.2 percent of households in 2006, to 5.0 percent in 2013).
- The odds of being crowded have increased 10.5 percent in greater Christchurch between 2006 and 2013 compared with the rest of New Zealand, after accounting for ethnicity.
Increase in number of people living in temporary dwellings

- The number of people living in temporary dwellings (consisting of private dwellings in a motor camp, mobile dwellings not in a motor camp, and improvised dwelling or shelter) in greater Christchurch has increased by around 50 percent between 2006 and 2013, compared with a 24 percent increase in the Auckland region.

CERA well-being survey shows issues with housing most severe in Christchurch city

- While census does not collect information on housing quality, census collectors noted that a number of people were living in badly damaged housing.

- The CERA well-being surveys found that living day-to-day in a damaged house as a result of the earthquakes was a moderate to major issue for around 16 percent of people in greater Christchurch in the 2013 survey, down from 22 percent of people in greater Christchurch in 2012.

- The survey found that just over one-third (35 percent) of respondents in Christchurch city found that living day-to-day in a damaged house had a negative effect on them, compared with 15 percent of people in Selwyn and 13 percent in Waimakariri district.

- The survey also showed that in 2013 around 15 percent of people in Christchurch city had trouble finding rental accommodation.

Rents in relation to household incomes have remained largely unchanged

- Median weekly rents increased in greater Christchurch at a faster rate than in New Zealand overall between 2006 and 2013 (once adjusted for inflation, this is a 13.1 percent increase, compared with 9.4 percent nationally).

- Selwyn district experienced the greatest increase in median weekly rents of any territorial authority between 2006 and 2013.

- Around half of the households in the lowest Jensen annual equivalised household income quintile paid 49 percent or more of their before-tax income on rent.

- Median weekly rents in relation to median before tax weekly household incomes remained largely unchanged between 2006 and 2013 in greater Christchurch

- Median rents took around one-quarter of median before-tax weekly household incomes in both 2006 and 2013. The rise in median household incomes largely offset the rise in rents.

Median household and personal incomes have risen in greater Christchurch

- Median household incomes in greater Christchurch rose by 14.4 percent in real terms between 2006 and 2013, compared with a 4.1 percent rise nationally.

- The number of households in the lowest Jensen equivalised household income quintile fell by around 17 percent in Christchurch city between 2006 and 2013.
2 Introduction

Natural disasters and housing

There has been a considerable body of research on the effects of natural disasters on populations and on housing. Researchers (Quarantelli 1982, 1999) have identified four phases of housing recovery in the aftermath of a disaster: emergency shelter, temporary shelter, temporary housing, and permanent housing. Research has shown that lower-income people tend to be the most affected by disasters and take longer to ‘transition through the stages of housing, sometimes remaining for long periods of time in severely damaged homes’ (Girard and Peacock (1997) quoted in Lindell and Prater (2003)).

Other disasters in recent years include the 1994 Northridge earthquake in the United States (6.7 magnitude), the 1995 Great Hanshin earthquake in Japan (7.3 magnitude) and the 1999 Chi-Chi earthquake in Taiwan (7.3 magnitude). Weather events have also resulted in widespread property damage, with hurricanes Andrew (1992) and Katrina (2005) devastating housing and displacing thousands of people in the United States.

The devastation caused by these disasters varied in scale but all affected population and housing. The Great Hanshin earthquake severely damaged or destroyed around 15 percent of dwellings in the largest city, Kobe, and caused over 6,000 deaths. The Northridge earthquake killed 57 people and substantially damaged or destroyed 65,000 dwellings (around 5 percent of dwellings in the area). In Taiwan, the Chi-Chi earthquake killed over 2,000 people. Approximately 44,000 dwellings were destroyed and a further 41,000 dwellings were badly damaged. Hurricane Andrew left roughly 175,000 people homeless. Hurricane Katrina killed 1,836 people, flooded 80 percent of New Orleans, and is estimated to have destroyed around 275,000 homes. The US Census Bureau (2011) found that in 2009, more than 65,000 housing units in the Gulf area were still uninhabitable because of hurricane damage. Of those, about two-thirds have been or are scheduled to be levelled, condemned, or demolished.

Housing reconstruction and recovery proved challenging in these areas and some common themes emerged. Certain types of houses proved more problematic to replace. While reconstruction of single-unit dwellings occurred relatively rapidly, there were particular issues with multi-storey and multi-unit dwellings. In Kobe, new construction started relatively quickly after the earthquake and the number of housing units was estimated to have recovered within three years (Hirayama, 2000). However, housing ended up over-supplied in some areas, while the cheaper inner-city wooden housing was more difficult to replace, leading to housing problems for low-income people within the inner city. In Northridge (Wu and Lindell 2003), housing recovery was largely paid for by insurance. Housing recovery peaked within three to seven months after the earthquake, but rebuilding multi-storey buildings that had multiple owners was very complex. Rebuilding these types of dwellings took far longer.

Experts estimate that it can take five to 10 years for communities to recover from the effects of a major seismic event. An urban planning expert, Rob Olshansky (2005) noted after Hurricane Katrina:

The most relevant lesson from Kobe, Los Angeles and other places is that it will be five to 10 years before the community fully recovers. And the first two to three years, there’s going to be chaos and despair. It’s going to feel like the residents are never going to get out of it . . . [But after major disasters of all kinds] people almost always rebuild in the same place because economic and social networks are what makes a city. There are usually some improvements and changes, but by and large, it will be the same place.
In each of these areas, recovery for low-income people lagged behind their more prosperous neighbours. Since disasters can lead to housing shortages if many homes have been damaged or destroyed, lower-income workers also find it more difficult to find and afford accommodation in a post-disaster area. Grieve and White and Grieve (2014) note that “It was not possible for vulnerable populations to achieve full recovery to the same level and at the same rate as the rest of the population.”

Studies also found that women (particularly female-headed households), the elderly, and ethnic minorities were disproportionately affected by disasters (Fothergill 1999; 2004) (Levine et al, 2007). Levine et al (2007) note that “housing affordability (or, rather, the lack of it) surfaces as both a pre-displacement and post-displacement problem”.

Contrary to expectations, some United States (US) studies have found significantly higher housing and population growth in US counties affected by disasters such as hurricanes and flooding. Schultz and Elliott (2012) modelled a range of variables and discovered that a county experiencing $1 million in disaster damage during the 1990s experienced housing growth that was an average of 3 percentage points higher than a county experiencing no such disaster damage during the decade. Median family incomes in counties affected by disaster experienced a percentage growth 2 percentage points higher than in counties not affected by a disaster. Their study also confirmed increasing income inequalities after disasters. They suggested that one factor may be inequalities in private insurance:

middle-and upper-class residents who can afford private insurance coverage, especially on properties located in higher-valued neighborhoods, typically receive financial windfalls from governmental assistance and personal insurance claims that not only help them to restore their housing and businesses but also, in many cases, actually upgrade them.

It is important to remember that at the time of the 2013 Census, greater Christchurch was still in a transitional state between the last two phases of temporary and permanent housing. Some people were still living in temporary housing such as the government temporary accommodation villages. Others were living in short-term rental accommodation while dwellings were being rebuilt and repaired. Other people had settled in permanent housing. Much housing has yet to be replaced. This paper will discuss what the 2013 Census shows about housing in greater Christchurch two years post-quake.

The Canterbury earthquakes

On 4 September 2010, Canterbury residents awoke at 4.35am to experience a magnitude 7.1 earthquake centred near Darfield. This was the first in a series of earthquakes that rocked the region over the subsequent months and years. The 6.3 earthquake on February 22, 2011, was centred in the Port Hills and caused the most damage. This earthquake resulted in the deaths of 185 people. It was followed by a 6.4 earthquake on 13 June 2011 and a 6.0 earthquake on 23 December 2011. As at December 2013, there had also been over 50 quakes of magnitude 5 and thousands of smaller aftershocks (Canterbury Quake Live).
There was widespread damage to housing as a result of the earthquake sequence, partly because of the shallowness of the quakes and proximity of the major shakes to the city, and also because of the nature of the soil under some parts of Christchurch and surrounding districts. The intensity of the ground-shaking in some areas was extremely high, with peak vertical accelerations measured in the Heathcote Valley exceeding two times that of gravity. Rockfall and cliff collapse also damaged dwellings in the hill suburbs of the Port Hills.

By comparison, peak accelerations in the 1994 Northridge earthquake were 0.5- to 1.0g (g means times gravity), with some areas exceeding 1g vertical accelerations. In Kobe, the peak accelerations were around 0.8g.

Widespread liquefaction occurred in some parts of the city and in some areas within the Waimakariri district. After extensive geotechnical testing and consultation, the government declared some residential areas to be ‘red zoned’, either because of the risk of liquefaction and lateral spreading (on flat land) or because of rockfall risk and proximity to unstable cliffs (in the Port Hills).

Red zoning meant that the Crown would buy these properties and the Canterbury Earthquake Recovery Authority (CERA) would manage the process on behalf of the Crown. By May 2012, the number of red-zoned properties was calculated at over 7,000 dwellings.

By mid-2013, CERA estimated that the earthquakes had resulted in around 16,000 properties being severely damaged and over 9,000 becoming uninhabitable. In total, there were over 171,000 properties in greater Christchurch with a dwelling claim to the Earthquake Commission. To put this in perspective, the 2013 Census recorded a total residential dwelling stock of 183,792 dwellings in greater Christchurch – meaning that over 90 percent of dwellings received some damage.
CERA (2012) and the Ministry of Business, Innovation and Employment (2013) studied the effects of the earthquake sequence on housing using a range of survey and administrative data while waiting for 2013 Census data. The 2013 Census of Population and Dwellings offers the first comprehensive look at the effect of these disasters on the housing stock in the greater Christchurch area.
3 The 2013 Census: Some issues to be aware of when looking at the data

A census is a snapshot of population and dwellings on a particular day. Christchurch at the time of the 2013 Census was still a dynamic environment with ongoing mobility of population. Dwelling demolitions and rebuilds were still in process. As at the end of November 2013, CERA calculated that demolition of red-zone properties was about half-completed.

Statistics NZ recognised there would be greater challenges in conducting a census in the post-quake environment and developed a strategy for collection. This strategy is detailed in Appendix 1. Below is a synopsis of some of the census collection staff’s findings. These comments have been included because they are relevant to an understanding of the data.

What the collectors found

Red zone areas proved difficult for collectors

The census manager for red-zoned and central-city collection areas noted that in the red zones: “between first contact in the area and census day, there was a big movement out of the area,” and expected that by the time the data was published these areas would look very different to census day.

There were several challenges in negotiating streets in the red zones. The area manager commented that it was a difficult environment for collectors to operate in, with many landmarks destroyed. When CERA demolished red-zone dwellings, they removed all letterboxes. This made establishing numbers and locations of dwellings more difficult for collectors.

There were higher numbers of empty dwellings than expected

All vacant private dwellings that were damaged by the Canterbury earthquakes of 2010 and 2011 were classified as ‘Unoccupied, empty’. This included dwellings where the occupants had moved out while their home was being repaired, and dwellings that were scheduled for demolition but were still standing at the time of the 2013 Census. People moving out for earthquake repairs may have contributed to the number of empty dwellings in areas where there was not significant earthquake damage (such as Burnside).

Collectors found slightly higher numbers of empty dwellings than may have been expected in some of the new suburban areas of Wigram and Sockburn. Data evaluation staff suspected that this was due to houses that were under construction appearing complete and ready for habitation – as there were not as many dwellings under construction as expected.

There was very little information about the number of demolished private dwellings outside of the red zones, as many private dwellings did not need consent to be demolished (and are therefore not included in council demolition data) and there were quite a few demolitions immediately after the February earthquake. Therefore, collectors were surprised by the extent of damage on the hill suburbs and by the number of empty dwellings in parts of Christchurch outside the red zones.
People were living in a greater variety of accommodation than in previous censuses

Collectors also noted that they found people living in holiday homes and in non-private dwellings. Collecting forms from non-private dwellings such as hotels, motels, and camping grounds proved challenging at times. They observed that some people were also living in badly damaged homes. Information on housing quality is not measured in the census, so this information is not indicated in census data. Collectors also noted that people living in the central business district were very transient.

Altogether, carrying out a census in the greater Christchurch area was more challenging than in previous years.

**Figure 2**
Understanding dwelling data in the census
4 Change in housing stock in greater Christchurch

How has residential housing stock in greater Christchurch changed between 2006 and 2013?

This is a complicated question to answer, as the baseline population we are comparing with was from 2006, seven years ago and over four years before the first major earthquake in September 2010. Over that time, the number of dwellings would have increased, because greater Christchurch had experienced a steady growth in population before the quakes. Population estimates show that Christchurch city itself had experienced an average 1.0 percent growth in population from 2006 to 2010, but subsequently experienced an estimated 2.5 percent and 1.5 percent decrease in the 2010–11 and 2011–12 years, respectively. Waimakariri and Selwyn districts had experienced average annual growth of 1.9 and 3.1 percent a year, respectively, in the four years leading up to the earthquakes.

The total number of dwellings includes some dwellings that would not be considered part of the residential housing stock, such as non-private dwellings and dwellings in motor camps. Residential housing stock is therefore defined as permanent private occupied dwellings and unoccupied dwellings. In this context, permanent private occupied dwellings consist of flats, houses, units, and apartments. Improvised dwellings, dwellings in a motor camp, and mobile dwellings not in a motor camp are excluded, as they are not considered to be part of housing stock.

In absolute terms, residential housing stock increased between 2006 and 2013 in the greater Christchurch area. In 2006, the total residential dwelling stock in the greater Christchurch area was 172,857. This number is made up of 161,289 permanent private occupied dwellings and 11,568 dwellings where residents were away or where the dwelling was recorded as empty. In 2013, the census recorded a total residential dwelling stock of 183,792 dwellings in greater Christchurch. Of these dwellings, 162,843 were occupied and 20,949 were unoccupied (includes empty dwellings and residents away). Some of these dwellings could have been very damaged and awaiting demolition. If they were still standing, they were counted as part of housing stock.

Table 1

| Residential dwelling stock(1) in greater Christchurch, 2006 and 2013 Censuses |
|-----------------------------|----|----|--------|
| Area                        | 2006 | 2013 | Percentage change |
| Waimakariri district        | 16,554 | 19,827 | 19.8 |
| Christchurch city           | 143,664 | 147,516 | 2.7 |
| Selwyn district             | 12,636 | 16,446 | 30.2 |
| Total, greater Christchurch | 172,857 | 183,792 | 6.3 |

1. Includes permanent private dwellings, dwellings where residents are away, or empty dwellings. Excludes dwellings under construction.

In 2013, total includes dwellings awaiting demolition.

Source: Statistics New Zealand
It is complicated attempting to calculate the actual decline in housing stock after the earthquakes and March 2013. Housing stock is subject to additions (when dwellings are built) and attrition (when dwellings are demolished). Although we have accurate building consents data, we can only estimate how long it takes dwellings to be completed after a building consent has been issued. We can use national figures as a guideline. The Quarterly Building Activity Survey estimates that nationally, most (86 percent) of the total building work for residential new dwellings and domestic outbuildings is done in three quarters (nine months), on average. Ninety-three percent is completed in five quarters (15 months), and 100 percent of the work is carried out within eight quarters (two years).

Building consent data shows that between 1 April 2006 and 31 March 2013, 19,279 building consents were issued for the greater Christchurch area: 11,055 in Christchurch city, 4,057 in Waimakariri district, and 4,167 in Selwyn district. We do not know if all consents issued in greater Christchurch went ahead, and whether some houses built since 2006 came down due to the quakes.

**Figure 3**

Building consents for new dwellings in greater Christchurch

Year ended March 2007 to year ended March 2013

Note the decline in building consents as a result of the global financial crisis in 2008.

Since March 2013 building consents have increased markedly, especially in Christchurch city, which had a further 2,692 residential consents from April 2013 to the end of February 2014.

However, as figure 3 shows, new dwelling growth has been heaviest to the south and west of the city and in the surrounding districts of Selwyn and Waimakariri.
Given there can be a time lapse between issuing consents and completing a dwelling, any estimate of the housing stock before the earthquake sequence began can only be approximate. We do not have good figures for demolitions. Calculating the actual overall decline is further complicated by the red-zone process. Not all red-zoned properties had
been settled by March 2013. It has been estimated that around 2,000 dwellings had been demolished by March 2013 and a further 6,000 demolitions were expected.1

MBIE (2013) have estimated that after taking into account new houses being built, the total housing stock reduced by a net 11,500, or 6.2 percent of the previous housing stock, between the fourth quarter of 2010 when earthquake sequence started and the fourth quarter of 2012. This estimate assumed that houses made uninhabitable because of the earthquakes were not able to be occupied and therefore were no longer ‘housing stock’. Note that the definition of housing stock is slightly different than the definition used in this paper as it includes non-private dwellings and does not exclude ‘other private dwellings’.

**Has the number of private occupied dwellings declined in greater Christchurch between 2006 and 2013?**

Occupied dwellings can be either private or non-private. Non-private dwellings include institutions, boarding houses, and camping grounds (excluding private dwellings within motor camp complexes) and have not been included in the following count as they will be dealt with in a separate section.

Counting private occupied dwellings is slightly different to counting housing stock, as the occupied dwelling count includes improvised dwellings, private dwellings in a motor camp, and mobile homes not in a motor camp, as well as more permanent dwellings. Census collectors are required to decide whether a dwelling is occupied. They look for signs of occupation such as washing on the line, and may talk to neighbours to establish whether a dwelling is occupied or not.

Greater Christchurch experienced a modest growth of 1.2 percent in the number of private occupied dwellings between 2006 and 2013 – from just over 162,200, to around 164,200 dwellings. The decline of around 3 percent of private occupied dwellings in Christchurch city was offset by rapid growth in the surrounding districts.

**Table 2**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>9,627</td>
<td>11,604</td>
<td>13,602</td>
<td>15,918</td>
<td>18,654</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>109,965</td>
<td>119,244</td>
<td>126,054</td>
<td>134,730</td>
<td>130,428</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>6,837</td>
<td>8,025</td>
<td>9,327</td>
<td>11,562</td>
<td>15,147</td>
</tr>
<tr>
<td>Total, greater Christchurch</td>
<td>126,435</td>
<td>138,873</td>
<td>148,983</td>
<td>162,207</td>
<td>164,229</td>
</tr>
</tbody>
</table>

**Note:** All cells have been randomly rounded to base 3.

**Source:** Statistics New Zealand

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1 Based on an estimate from published figures from CERA and discussion with CERA staff. In October 2012, CERA reported that 1,200 dwellings had been demolished (http://www.stuff.co.nz/the-press/news/christchurch-earthquake-2011/7920727/Red-zone-clearance-to-accelerate-next-year). The September 2013 release reported that 3,012 dwellings had been demolished (http://www.stuff.co.nz/the-press/news/christchurch-earthquake-2011/9322794/Red-zone-demolition-behind-schedule). In total, roughly 8,000 homes in the residential red zone are expected to require demolition (http://www.stuff.co.nz/the-press/news/christchurch-earthquake-2011/9322794/Red-zone-demolition-behind-schedule). Most of these homes were in Christchurch city, with a smaller number of red-zoned properties in Waimakariri district.
Use of temporary dwellings has increased

There has been considerable difference in growth or decline for different types of dwellings. In Christchurch city, separate houses and joined dwellings declined by just under 5 percent but ‘other’ private dwellings increased around 39 percent. Selwyn and Waimakariri districts experienced growth in all dwelling types but ‘other’ private dwellings increased by 78.0 and 60.2 percent, respectively. The ‘other occupied private dwelling’ category includes dwellings that can be defined as temporary: private dwellings in motor camps, mobile dwellings not in a motor camp, and improvised dwellings and shelters. The category also includes roofless or rough sleepers, but the number of people in this category collected in the census was very small, with only 27 recorded nationwide.

The number of temporary dwellings in greater Christchurch was fairly small, with 1,386 such dwellings in 2013 compared with 915 in 2006 (from 0.6 to 0.8 percent of all occupied private dwellings). Waimakariri district had the highest proportion of temporary occupied private dwellings and experienced the greatest increase: from 1.8 percent of all private occupied dwellings in 2006, to 2.5 percent in 2013.
Number of apartments declines by almost two-thirds since 2006

The dwelling type with the largest percentage decline has been apartment buildings in Christchurch city, which were mainly located in the central city. The term ‘apartment’ used here applies to the category ‘two or more flats/units/townhouses/apartments/houses joined together in a four–or–more–storey building’. These dwellings were hard hit by the earthquakes. In 2006, there were 582 apartments in Christchurch city, with 993 people in households. In 2013, this number had fallen to 201 dwellings. By 2013, 354 people lived in an apartment in Christchurch city.

Internationally, in areas hard hit by earthquakes, multi-unit dwellings with multiple owners have proved complicated to repair and replace. This situation also seems to have
occurred in New Zealand, with the Earthquake Commission advising claimants in 2013 ‘If your property is a multi-unit building – in that a wall, roof foundation, or garage is shared with a neighbouring dwelling – your EQC building claim may take longer to process than solo dwellings.’

Building consent data shows that the number and proportion of consents for multi-unit dwellings fell in 2010 and 2011 (to just over 5 percent of all new residential buildings), but increased in 2012 and 2013. These building consent figures relate to all apartments where there are 10 or more units joined together and do not provide storey information.

Which areas (area units) have experienced the greatest decline in the number of occupied private dwellings?

The following tables show dwelling change by area unit. Area units are statistical geographies and do not exactly correspond with suburbs but provide much more detail than is available at city or district level. Not surprisingly, the area units with the greatest decline in the number of occupied dwellings were in the central city and red zoned areas. Because no area units or meshblocks (the smallest statistical geographic unit) exactly align with CERA red zones, it is impossible to state the exact decline in red-zoned areas. The Burwood and Cathedral Square area units experienced the greatest decline in the number of occupied private dwellings, falling by 63.5 and 60.7 percent, respectively.

Table 4

Area units in greater Christchurch with greatest percentage decline in number of occupied private dwellings
2001–13 Censuses

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burwood</td>
<td>1,074</td>
<td>1,143</td>
<td>417</td>
<td>6.4</td>
<td>-63.5</td>
</tr>
<tr>
<td>Cathedral Square</td>
<td>303</td>
<td>420</td>
<td>165</td>
<td>38.6</td>
<td>-60.7</td>
</tr>
<tr>
<td>Kaiapoi East</td>
<td>825</td>
<td>837</td>
<td>366</td>
<td>1.5</td>
<td>-56.3</td>
</tr>
<tr>
<td>Hagley Park</td>
<td>813</td>
<td>897</td>
<td>459</td>
<td>10.3</td>
<td>-48.8</td>
</tr>
<tr>
<td>Dallington</td>
<td>1,365</td>
<td>1,386</td>
<td>738</td>
<td>1.5</td>
<td>-46.8</td>
</tr>
<tr>
<td>Courtenay</td>
<td>207</td>
<td>318</td>
<td>174</td>
<td>53.6</td>
<td>-45.3</td>
</tr>
<tr>
<td>Avonside</td>
<td>1,302</td>
<td>1,314</td>
<td>723</td>
<td>0.9</td>
<td>-45.0</td>
</tr>
<tr>
<td>Avondale</td>
<td>1,674</td>
<td>1,689</td>
<td>945</td>
<td>0.9</td>
<td>-44.0</td>
</tr>
<tr>
<td>Bexley</td>
<td>1,470</td>
<td>1,563</td>
<td>885</td>
<td>6.3</td>
<td>-43.4</td>
</tr>
<tr>
<td>Pines-Kairaki Beach</td>
<td>315</td>
<td>339</td>
<td>204</td>
<td>7.6</td>
<td>-39.8</td>
</tr>
<tr>
<td>Rawhiti</td>
<td>1,872</td>
<td>2,076</td>
<td>1,488</td>
<td>10.9</td>
<td>-28.3</td>
</tr>
</tbody>
</table>

Note: All cells have been randomly rounded to base 3.

Source: Statistics New Zealand

The number of empty dwellings in greater Christchurch has more than doubled since 2006

Unoccupied dwellings included dwellings where residents were away and empty dwellings. Dwellings under construction are not included in the total as these are not yet ready for habitation. The number of unoccupied dwellings increased in greater Christchurch by just over 80 percent between 2006 and 2013. The increase was driven by the large number of empty dwellings in 2013, particularly in Christchurch city where the number of empty dwellings increased by 149 percent between 2006 and 2013. These empty dwellings will include many dwellings that were awaiting demolition.
Table 5

Unoccupied dwellings and dwellings under construction in greater Christchurch
2006 and 2013 Censuses

<table>
<thead>
<tr>
<th>Area</th>
<th>Residents away</th>
<th>Empty dwelling</th>
<th>Total unoccupied dwellings</th>
<th>Dwelling under construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>375</td>
<td>462</td>
<td>952</td>
<td>1,245</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>3,587</td>
<td>2,220</td>
<td>5,941</td>
<td>14,556</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>471</td>
<td>368</td>
<td>732</td>
<td>1,152</td>
</tr>
<tr>
<td>Greater Christchurch</td>
<td>4,443</td>
<td>3,986</td>
<td>7,425</td>
<td>16,063</td>
</tr>
<tr>
<td>New Zealand</td>
<td>45,122</td>
<td>40,982</td>
<td>110,151</td>
<td>141,266</td>
</tr>
</tbody>
</table>

Percentage of New Zealand total in greater Christchurch

|                     | 9.0 | 8.1 | 6.5 | 12.0 | 7.3 | 11.3 | 10.4 | 15.2 |

Notes: All data has been randomly rounded to base 3.

Source: Statistics New Zealand

Which areas have the greatest numbers/proportions of empty dwellings?

The greatest percentage increases in unoccupied dwellings were in area units that included red zone housing: Kaiapoi North East (1,400 percent), Avondale (944 percent), Dallington (861 percent), and Burwood (662 percent). However, there were also areas outside the red zones with substantial numbers of empty dwellings. While small numbers of properties were red-zoned due to rockfall danger or cliff proximity on the Port Hills, housing outside these pockets of red zoning still sustained considerable damage in the February quake. For example, the number of empty dwellings in Mt Pleasant increased by just under 400 between 2006 and 2013.
Figure 8

**Numerical increase in unoccupied dwelling count**
By selected greater Christchurch area unit
2006-2013 Censuses

<table>
<thead>
<tr>
<th>Area unit</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexley</td>
<td></td>
</tr>
<tr>
<td>Avondale</td>
<td></td>
</tr>
<tr>
<td>Dallington</td>
<td></td>
</tr>
<tr>
<td>Avonside</td>
<td></td>
</tr>
<tr>
<td>Burwood</td>
<td></td>
</tr>
<tr>
<td>Mt Pleasant</td>
<td></td>
</tr>
<tr>
<td>Rawhiti</td>
<td></td>
</tr>
<tr>
<td>Avon Loop</td>
<td></td>
</tr>
<tr>
<td>Moncks Bay</td>
<td></td>
</tr>
<tr>
<td>Kaiapoi East</td>
<td></td>
</tr>
<tr>
<td>Travis</td>
<td></td>
</tr>
<tr>
<td>Richmond South</td>
<td></td>
</tr>
<tr>
<td>Aranui</td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistics New Zealand

**Percentage increase in unoccupied dwelling count**
By selected greater Christchurch area unit
2006-2013 Censuses

<table>
<thead>
<tr>
<th>Area unit</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiapoi North East</td>
<td></td>
</tr>
<tr>
<td>Avondale</td>
<td></td>
</tr>
<tr>
<td>Courtenay</td>
<td></td>
</tr>
<tr>
<td>Dallington</td>
<td></td>
</tr>
<tr>
<td>Kaiapoi East</td>
<td></td>
</tr>
<tr>
<td>Bexley</td>
<td></td>
</tr>
<tr>
<td>Burwood</td>
<td></td>
</tr>
<tr>
<td>Avonside</td>
<td></td>
</tr>
<tr>
<td>Rapaki Track</td>
<td></td>
</tr>
<tr>
<td>Travis</td>
<td></td>
</tr>
<tr>
<td>Mt Pleasant</td>
<td></td>
</tr>
<tr>
<td>Styx</td>
<td></td>
</tr>
<tr>
<td>Aranui</td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistics New Zealand
5 Changes in home ownership and renting

Home ownership falls in Christchurch city, but remains largely unchanged in Selwyn and Waimakariri districts

New Zealand has had a well-documented decline in the percentage of households that own their own home. The 2013 Census results showed that this trend was continuing, with ownership rates falling to 64.8 percent (down from 66.9 percent in 2006), a decline of just over 2 percentage points. In territorial authorities close to Christchurch, changes in home ownership have varied. In Christchurch city, the decline has been greater than that experienced nationally (from 67.6 to 64.8 percent, a decline of just under 3 percentage points), but Waimakariri and Selwyn districts had a minimal decline in rates of home ownership. Home ownership rates in Ashburton, which is just under an hour from Christchurch, have declined by over 5 percentage points.

Figure 9

Marked decline in number of owned dwellings in Christchurch city

Christchurch city has had one of the most marked declines nationally in numbers of dwellings that are owned by the households living in them, a decline of around 8 percent since 2006. This decline compares with a 3.2 percent decline in the number of occupied private dwellings in Christchurch city.

1. Includes dwellings owned with or without mortgage or in a family trust.
   Source: Statistics New Zealand

3 Nationally, only Wairoa, Opotiki and Kawerau districts have experienced a sharper decline in the numbers of owned dwellings, of 8.1, 8.9, and 12.2 percent, respectively.
The large number of empty homes may be part of the reason for the decline in the numbers of households that owned their dwellings. The census does not collect dwelling information for empty dwellings, so we do not know if they were owned by the household living in them. However, we also know that the population of surrounding Selwyn and Waimakariri districts has increased, while the population of Christchurch city has declined, which suggests that some homeowners may have moved to neighbouring districts. *Quick Stats about Greater Christchurch* (Statistics New Zealand 2014a) showed that 10,074 people who lived in Christchurch city in 2008 were at an address in Selwyn or Waimakariri district at the 2013 Census, and had been there for two years or less. Of these: 1,548 were in Rangiora, 1,425 were in Rolleston, and 762 were in Kaiapoi. The demand for rental housing in Christchurch city may also have encouraged some homeowners to rent out rather than sell their properties.

**Sharp increase in the number of households that were renting in districts neighbouring Christchurch city**

The 2013 Census showed the number of households that rented in greater Christchurch increased by around 9 percent between 2006 and 2013. The increase was fairly modest in Christchurch city, just 6.5 percent, but jumped in neighbouring Selwyn and Waimakariri districts by 36.1 percent and 26.0 percent, respectively. There were over 900 more renting households in Ashburton district, an increase of 42.7 percent since 2006. Hurunui district recorded a 28.6 percent increase in renting households.
### Table 6

**Number of dwellings not owned and not held in a family trust, rent payments made**

By selected territorial authority area

2006 and 2013 Censuses

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>2,286</td>
<td>2,880</td>
<td>594</td>
<td>26.0</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>36,828</td>
<td>39,222</td>
<td>2,394</td>
<td>6.5</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>1,788</td>
<td>2,433</td>
<td>645</td>
<td>36.1</td>
</tr>
<tr>
<td>Total, greater Christchurch</td>
<td>40,902</td>
<td>44,535</td>
<td>3,633</td>
<td>8.9</td>
</tr>
<tr>
<td>Hurunui district</td>
<td>777</td>
<td>999</td>
<td>222</td>
<td>28.6</td>
</tr>
<tr>
<td>Ashburton district</td>
<td>2,145</td>
<td>3,060</td>
<td>915</td>
<td>42.7</td>
</tr>
<tr>
<td>Timaru district</td>
<td>3,312</td>
<td>3,936</td>
<td>624</td>
<td>18.8</td>
</tr>
<tr>
<td>Auckland region(1)</td>
<td>130,227</td>
<td>154,347</td>
<td>24,120</td>
<td>18.5</td>
</tr>
<tr>
<td>Total New Zealand</td>
<td>388,275</td>
<td>453,132</td>
<td>64,857</td>
<td>16.7</td>
</tr>
</tbody>
</table>

1. On 1 November 2010, Auckland Council became a unitary authority, when Auckland regional council area and seven territorial authority areas – Rodney district, North Shore city, Waitakere city, Auckland city, Manukau city, Papakura district, and Franklin district – amalgamated. For the purposes of time series, 2006 data for these seven territorial authorities have been incorporated under Auckland.

**Note:** All cells have been randomly rounded to base 3.

**Source:** Statistics New Zealand

### Decrease in number of social housing units in greater Christchurch as a result of earthquake damage

While the number of households renting has increased, census and administrative data show that the number of social housing units has fallen. Social housing is defined as housing belonging to local councils or Housing New Zealand Corporation. There will be a small number of other social housing types, such as housing supplied by non-governmental organisations, which currently do not have a category in the official classification.

Examining the change in social housing is made more complex because of an undercount of Housing New Zealand properties, nationally and in Canterbury. It is impossible to calculate an exact undercount, as dwelling information (such as sector of landlord) is not collected if a dwelling was empty or residents were away. Therefore, administrative data and census data will not exactly align. MBIE (2013) using tenancy bond data and other administrative data, calculated that as at December 2012, the Christchurch City Council had 2,210 total units (a decline of 439, or 17 percent on pre-earthquake numbers) and Housing NZ had 5,441 total units (a decline of 330, or 6 percent pre-earthquake). Housing New Zealand (Annual Report 2011/2012) calculated that around 97 percent of its housing had sustained some damage in the earthquakes. Currently, Housing New Zealand plans to build an extra 700 units by the end of 2015.4

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Census figures show a decline in social housing in greater Christchurch of 0.1 percent for Housing New Zealand and 11.7 percent in local authority housing between March 2006 and March 2013. Note that the undercount for Housing New Zealand properties was estimated to be considerably higher in 2006 than in 2013, which will affect comparisons over time. The decline for Housing New Zealand properties is likely to be greater than census figures suggest.

Figure 11

![Percentage change for selected sector of landlord categories](image)

Sector of landlord refers to the person or organisation that households rented their dwelling from.

1. Note that in 2006 there was an estimated undercount of 25 percent nationally. In 2013, this undercount was estimated to be approximately 18 percent. It is not possible to give exact figures, as some tenants could have been absent on census night.

Source: Statistics New Zealand
Population declines in Christchurch city since the February earthquake but grows in surrounding districts

As outlined in QuickStats about greater Christchurch (Statistics New Zealand, 2014a), the population of greater Christchurch increased from 424,935 people at the time of the 2006 Census, to 436,056 people in the 2013 Census (an increase of 2.6 percent). A decline of 2.0 percent in the population in Christchurch city (from 348,459 people in 2006 to 341,469 in 2013) was offset by rapid growth in population in the surrounding districts of Selwyn and Waimakariri. Selwyn grew by 32.6 percent to 44,595 people (compared with 33,642 in 2006) and Waimakariri district by 16.7 percent to 49,989 people (compared with 42,834 in 2006).

Population estimates show that the population of Christchurch city had been growing by about 1 percent per year before the earthquakes and fell sharply immediately after the February 2011 earthquake. The surrounding districts grew, partly because they absorbed some of the displaced population from Christchurch city (see QuickStats about greater Christchurch for a discussion of internal migration).

Figure 12

Percentage change in estimated population
For Waimakariri, Selwyn, and Christchurch territorial authorities
Year ended June, 2006–13

Taking greater Christchurch as a whole, census results show population growth of 2.6 percent between 2006 and 2013, compared with a decline in dwelling stock. As a result, one would expect some evidence of pressure on housing: either an increase in people living in temporary dwellings, an increase in occupancy rates/crowding, more complex households as families and others move in together, or more people living in non-private dwellings.

Occupancy rates have remained largely unchanged

Occupancy rate is defined as the total number of occupants usually resident in households divided by the total number of households. This gives the average number of people per dwelling or simply the average household size. This definition relates only to people who usually reside in private dwellings, hence visitors are excluded. At a broad level, occupancy rates describe the relationship between housing stock and the changing social structure. The change in occupancy rates since the 1960s (when occupancy rates were 3.52 people per dwelling in 1966) reflects the growth in one-person households and the decline in the birth rates from baby boom levels.
Occupancy rates remained largely unchanged in greater Christchurch, except for a small rise in Selwyn district from 2.8 to 2.9 people per household. Christchurch city and Waimakariri district remained unchanged (at 2.5 and 2.6 people per household, respectively, in both 2006 and 2013).

Before the earthquakes, occupancy rates had been lower than the national average in Christchurch city. Potentially, therefore there was some capacity to accommodate extra people within the dwelling stock. Increased occupancy rates do not necessarily result in an increase in crowding but can indicate delayed household formation and an increase in people sharing accommodation. In the following sections we will see whether housing pressure has resulted in an increase in crowding and more pressure on rental affordability. The higher occupancy rates in Selwyn are largely as a result of more families with children.

**Figure 13**

Occupy rates\(^{(1)}\)

For greater Christchurch territorial authorities and New Zealand

1996 to 2013 Censuses

1. Occupancy rate is the total number of people in households divided by the total number of households.

Source: Statistics New Zealand
Have the earthquakes led to increased housing problems in greater Christchurch?

Research overseas has shown that natural disasters disproportionately affect housing for low-income people and vulnerable households, such as sole-parent families. If international experience is replicated here, then we would expect housing to become less affordable, potentially leading to increases in crowding and people living in temporary housing (such as improvised or mobile dwellings), particularly for those on low incomes.

The following section looks at the distribution of incomes in greater Christchurch, using a measure that equivalises household income to characterise the proportion of low-income and potentially vulnerable households. Equivalisation adjusts household income according to the size of households and age of household members.

Why use an equivalisation measure?

Bryan Perry (2013), who has written extensively on household income inequality in New Zealand, supports the use of equivalisation measures because:

Equivalising is a means of standardising household incomes in terms of household size and composition so that the relative material well-being of households of different sizes and compositions can be more sensibly compared. The adjustment also makes comparisons over time more realistic because it takes into account the changes over time in the composition and average size of households.

Without equivalisation it is difficult to accurately compare household incomes, because of variations in the number of people per household. A one-person household with an annual income of $100,000 is obviously in a much better financial position than a 15-person household with the same income.

Perry (2013) notes there is no universally accepted set of equivalence scales and there has been some debate in New Zealand as to which set of equivalence scales is appropriate (see Easton, 2002). However, both Perry and New Zealand Deprivation Researchers (Salmond, Crampton, and Atkinson) prefer the Revised Jensen scale 1988 (JEAH income) as a measure of income equivalisation. Poverty researchers (Stephens et al) note that it is the best available measure to determine poverty.

The measure used here is the Revised Jensen scale 1988, known as Jensen Equivalised Annual Income (JEAH). For more information see the appendix. Using this measure we can show the distribution of equivalised household income and identify the proportion of low-income households in greater Christchurch. Some caveats must be applied to the use of household income data from the census; these are discussed in more depth in the section on rental affordability. However, it is important to note the high non-response for household income. For greater Christchurch non-response was 13.0 percent, slightly lower than the national non-response rate of 15.0 percent. While household surveys, such as the Household Economic Survey and the New Zealand Income Survey have more accurate income data, their sample sizes are not sufficient to generate income data at territorial authority level or below.

Distribution of equivalised household income in greater Christchurch compared with New Zealand

JEAH incomes were slightly higher for the territorial authorities in greater Christchurch than for New Zealand overall. Households in Selwyn district had lower proportions of
households in the lowest JEAH equivalised income quintiles, as Figure shows. Household income information was missing for around 1 in 8 households in Waimakariri and Selwyn districts and 1 in 7 households in Christchurch city. Figure shows the distribution of Jensen income quintiles for greater Christchurch, compared with New Zealand and Auckland.

**Figure 14**

![Distribution of JEAH income quintiles for selected territorial authorities and New Zealand, 2013 Census](source: Statistics New Zealand)

The lowest JEAH quintile includes households where incomes, once adjusted by the number and ages of people in the household, were under $32,349 annually (equivalised to the rate for a two-person household). This includes populations defined under the New Zealand deprivation index as deprived (households with an equivalised household income of less than $26,837) and some households that would not be defined as deprived (with incomes more than $26,837 but less than $32,349).

There were around 51,500 households in the lowest two income quintiles in greater Christchurch. In Christchurch city there were around 19,600 households in quintile 1. Christchurch city had a higher proportion of households in the very lowest equivalised household income quintile (17.6 percent of households) than either Selwyn (10.6 percent of households) or Waimakariri (14.9 percent of households). These lower-income households are likely to be more vulnerable to changes in rents.

**Who was in the lowest JEAH income quintile and has this changed since 2006?**

In 2013, when the lowest JEAH income quintile was disaggregated by household composition, around 60 percent of households consisted of either one person (41.4 percent) or one parent with children (19.8 percent). In contrast, only 15.3 percent of households in quintile 5 fell into this category (13.1 percent were one-person households and 2.2 percent were one-parent-with-children households).

---

5 Quintiles have been calculated using the actual distribution of income based on a dollar threshold for each household. Therefore the numbers of households in each quintile are not even, with quintile 4 having the largest number of households (287,650) and quintile 3 the lowest number (237,847). The number of households for which no household income information was available is high, at 233,877 households. The boundaries for JEAH quintiles in 2013 were: quintile 1 – less than $32,349; quintile 2 – between $32,349 and $48,583, quintile 3 – between $48,583 and $69,069; quintile 4 – between $69,069 and 104,010, and quintile 5 – $104,010 and over.
As figure 15 shows, in 2013 there were more people with European and Other ethnicities usually resident in households in the highest JEAH income quintile, (22.2 and 2.7 percent respectively). In contrast, only 12.8 percent of people with European ethnicity were living in households in the lowest JEAH income quintile.

**There were fewer households in the lowest JEAH quintiles in 2013**

The number and proportion of people in the lowest two income quintiles in greater Christchurch fell between 2006 and 2013. In 2006, there were just over 56,240 households in the lowest two JEAH income quintiles. Christchurch city saw the largest decline in households in JEAH household income quintile 1 (lowest), of 17.7 percent.

Several factors may have contributed to this decline in the lowest equivalised JEAH income quintile in greater Christchurch. Low-income households may have been more likely to leave Christchurch city after the earthquakes. For example, 2013 Census data shows a 9.2 percent reduction in the number of one-parent-with-children households. The 2013 Census also shows a reduction in numbers of people accessing means-tested benefits, particularly domestic purposes benefits.
Research into the response of Māori to the earthquakes (Lambert 2013) uses data from Ministry for Social Development. This data showed that after the earthquakes there was a large transfer of Māori who were on sickness, invalid, or domestic purposes benefits, with many not returning, at least up until February 2012.

Evidence from the New Zealand Deprivation Index shows that the number of highly deprived area units in greater Christchurch has fallen. In 2006, four area units – Aranui, Phillipstown, Waltham, and Linwood – had been defined as falling into category 10 (most deprived), but in 2013, only one area unit, Aranui, fell into this.
It is also possible that higher employment rates boosted the incomes of some households. Median household incomes in greater Christchurch have risen at a higher rate than for New Zealand overall (a growth of 14.4 percent in real terms compared with a rise of 4.1 percent for New Zealand). Schultz and Elliott (2012) had noted an increase in family incomes in areas affected by disasters.
Table 7

Median annual household income\(^{(1)}\) from all sources
For selected areas
2006 and 2013 Censuses

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>50,900</td>
<td>60,700</td>
<td>68,800</td>
<td>35.2</td>
<td>13.3</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>48,200</td>
<td>57,500</td>
<td>65,300</td>
<td>35.5</td>
<td>13.6</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>62,500</td>
<td>74,500</td>
<td>85,100</td>
<td>36.2</td>
<td>14.2</td>
</tr>
<tr>
<td>Total, greater Christchurch</td>
<td>49,600</td>
<td>59,100</td>
<td>67,600</td>
<td>36.3</td>
<td>14.4</td>
</tr>
<tr>
<td>Auckland</td>
<td>63,400</td>
<td>75,600</td>
<td>76,500</td>
<td>20.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Total, New Zealand</td>
<td>51,400</td>
<td>61,300</td>
<td>63,800</td>
<td>24.1</td>
<td>4.1</td>
</tr>
</tbody>
</table>

1. A household's total income from all sources in the 12 months ending 31 March 2006 and 31 March 2013.
2. Consumers price index inflation was 19.2 percent between Quarter 1 of 2006 and Quarter 1 of 2013.

Note: This time series is irregular. Because the 2011 Census was cancelled after the Canterbury earthquake on 22 February 2011, the gap between this census and the last one is seven years. The change in the data between 2006 and 2013 may be greater than in the usual five-year gap between censuses. Be careful when comparing trends.

Median household income has been rounded to the nearest $100.

Source: Statistics New Zealand

People in greater Christchurch, particularly males, have experienced a higher-than-average increase in income between 2006 and 2013. The median annual personal income for males in Selwyn district in 2013 was $47,200. This was over $10,000 more than the national median of $36,500, and had increased by 30.4 percent since 2006. Consumer price index inflation between the first quarter of 2006 and the first quarter of 2013 was around 19 percent.
Figure 19

Annual median personal income by sex
For greater Christchurch territorial authorities and New Zealand
2013 Census

Source: Statistics New Zealand
Evidence of housing pressures from sources other than the census

Some research has already been published that looks at the impact of the Canterbury earthquakes on housing. CERA looked at housing issues in their 2012 and 2013 well-being surveys and in their 2013 well-being index. MBIE published a report on housing pressures in greater Christchurch in 2013. There has also been some research investigating the challenges of providing workers’ accommodation in Christchurch (Chang-Richards, 2013).

Evidence from these sources suggests there has been an increase in housing problems in greater Christchurch. CERA carried out a well-being survey in 2012 and 2013, with 2,381 and 2,438 respondents in the greater Christchurch area, respectively. Results from both surveys suggested that the most negative results of the earthquakes relating to housing had occurred in Christchurch city.

Respondents to the CERA well-being surveys in Christchurch city faced greater housing issues as a result of the earthquakes

In 2012, 55 percent of respondents in Christchurch city reported that living in a damaged house had a negative impact on their lives (compared with around one-third in Selwyn (39 percent) and Waimakariri (33 percent)). By 2013, this had fallen to just over one-third (35 percent) of people in Christchurch city (compared with 15 percent in Selwyn district and 13 percent in Waimakariri district). Six percent of respondents in Christchurch city in 2013 said that living in a damaged house was having a major impact on their day-to-day lives.

Poor housing quality was also of greater concern in Christchurch city. In 2013, 21 percent indicated they were living in a poor-quality house as a result of the earthquakes, with 5 percent (compared with 1 percent of people in Selwyn and Waimakariri districts) stating that poor housing quality was having a major impact on their lives.

The well-being survey highlighted difficulties for people in finding rental accommodation. In 2012 in Christchurch city, 17 percent of respondents had difficulty finding rental accommodation (compared with just under 10 percent in Selwyn and Waimakariri districts). This fell slightly by 2013, with 15 percent of people in Christchurch city facing difficulty finding suitable rental accommodation. Issues over finding suitable rental accommodation were more prevalent in Christchurch city, with 11 percent of people saying the impact is moderate or major, compared with 4 percent in Selwyn and Waimakariri districts.

In 2013, 7 percent of people in Christchurch city (compared with 8 percent in 2012) thought their house was too small for the number of people in the household. Corresponding numbers in Waimakariri district were 3 percent in 2013, compared with 4 percent in 2012. Percentages fell much more sharply in Selwyn district; just 1 percent of respondents in 2013 thought their house too small, compared with 5 percent in 2012. The survey showed that in 2013, renters, people in temporary housing, Pacific and Asian peoples, people with low-to-moderate incomes (under $60,000), people with disabilities, and people aged 65 and over reported the lowest sense of well-being.

The Housing Pressures in Christchurch Report (MBIE 2013) suggested that housing affordability decreased in greater Christchurch after the earthquakes, resulting in increasing numbers of people living in insecure housing and in severe housing deprivation. Chang-Richards et al (2013) have also shown that construction workers and displaced homeowners are placing increasing pressure on commercial accommodation throughout Christchurch city.

Research from MBIE and CERA (Wellbeing Index 2012) shows that house prices have increased in greater Christchurch at a higher rate than for New Zealand overall. MBIE
Housing in greater Christchurch after the earthquakes

collects tenancy bond data, which has also shown sharp price rises in rents from new bonds lodged since mid-2010. Increases in median rents in greater Christchurch have occurred at a faster rate than in other New Zealand regions. The source of this data is the Tenancy Bond database, which is administered by MBIE under the Residential Tenancies Act 1986. Under this Act, any landlord who wishes to require a bond from their tenant must lodge that bond with MBIE. The bond is held in trust during the tenancy and is refunded on the agreement of tenant and landlord, or (in the event of a dispute) an order by the Tenancy Tribunal. MBIE collects some basic tenancy information when the bond is lodged, including weekly rent paid and number of bedrooms.

Figure 20

Evidence of housing pressures from the 2013 Census

Rents in relation to household incomes

Note on comparing with other sources

Evidence from the census may not always align exactly with other sources. The census aims to count every person and dwelling in New Zealand, whether information from other sources may be a sample or a subset of the total. Information about rents from tenancy bond data and census will not align exactly because not all rental properties have bonds lodged against them. Tenancy bond data includes just under 90 percent of rented dwellings in greater Christchurch (comparing census totals with tenancy bond totals). Tenants may not have to pay a bond if they rent from friends and family, or if they are very long-term tenants. Therefore mean and median rents from the census, even when social housing is excluded, are likely to be lower than those recorded in tenancy bond data of private rentals. Median rents from Tenancy Bond Data are also for new bonds lodged.

Census data on rents

Note that special advice was given to people in Canterbury around rent payments. The guide notes indicated that if rent was being paid by the insurance company, the household should ‘Mark ‘no’ for question 11’. The median rent paid by households for all rental dwellings in greater Christchurch in 2013 was $300 per week, compared with $280 per week in New Zealand. This was still lower than the median weekly rent of $320 in the four cities of Wellington (Porirua, Upper Hutt, Lower Hutt, and Wellington city) and $350 in Auckland in 2013. However, weekly rents in greater Christchurch have increased at a faster rate than those in Auckland or New Zealand overall since 2006.
Housing in greater Christchurch after the earthquakes

The following tables and figures look at change in greater Christchurch compared with Auckland region and New Zealand between 2001 and 2013. Median rents have been adjusted for inflation. Figure 21 shows that median rents increased in greater Christchurch between 2001 and 2006 and then again between 2006 and 2013 once adjusted for inflation. They have become closer to that for Auckland.

Figure 21

<table>
<thead>
<tr>
<th>Area</th>
<th>Median rent (inflation adjusted) 2001–2013 Censuses</th>
</tr>
</thead>
</table>

Source: Statistics New Zealand

High rents do not necessarily mean that rent is unaffordable, as affordability depends on the relationship between rents and incomes. An area may have high rents, but if incomes are also high then the people who live there may still consider rents affordable.

Rents in relation to household incomes

It is possible to generate rental affordability indicators based on the census. This is an approach used by some researchers in Australia. Ford (2013) uses the census to explore the spatial distribution of housing affordability in Melbourne. He notes that although census data has less depth than specific household surveys, affordability calculations show broadly similar results to data from household surveys.

Limitations of census data for calculating rental affordability

Some caveats must be applied. These indicators cannot really tell us whether renting was considered affordable by the household, but allows us to compare how rental affordability in greater Christchurch varies over time and in relation to other areas. Some households in greater Christchurch will still be paying a mortgage on a damaged house but are renting elsewhere. These households will have much greater constraints on affordability, but we have no information about their situation. Household income itself is a blunt measure, as a household’s financial situation differs according to whether they have debts and liabilities or savings.

Household income has high non-response in the census. If personal income information is missing for an individual 15 years and over in a household then household income is allocated to not-stated unless the combined incomes fall in the highest income bracket of $150,001 or more. This situation results in higher non-response rates for total income for families and households, especially for larger and more complex households.

The census asked how much rent households pay and the period the amount applies to.
Rent information is collected as dollar amounts and output as weekly rent. Income is annual, so to calculate this indicator, annual household income has been divided by 52 to create a nominal weekly amount. Income information is only collected and presented in bands, so there is no information about the actual dollar value of income for households. People are asked for their annual income before tax, so the income measure collected in the census is gross (pre-tax) rather than net (after tax) income. Medians or means for income are calculated using midpoints for each range, which have been determined by using information from household surveys.

While the income bands are fairly narrow at the lower end of the income range (e.g., $0 to $5,000), the last three income bands are much broader ($70,001 to $100,000, $100,001 to $150,000, and $150,001 and over). This means that such measures will be less precise for higher-income households. The introduction of additional bands in 2013 means that calculations made on 2013 data are likely to be slightly more precise than those made on 2006 data.

The two indicators used here look at rent as a proportion of gross household income (calculated using the midpoints for each income band) and Jensen equivalised weekly gross household income after rent is deducted. Weekly household income has been rounded to the nearest $50. The after-housing-cost income has been adjusted by the number of adults and children in the household (see appendix for an explanation about how equivalised incomes are calculated). Medians and distributions will be explored for both these measures to see whether rental affordability has declined after the earthquakes.

The following table looks at rental affordability for the different territorial authorities in greater Christchurch, compared with Wellington city and Auckland. Christchurch city had the fourth-highest median rent at the time of the 2013 Census, but ranked 21st for the percentage of household income spent on rent.

The Jensen weekly equivalised household incomes stated here are for income that has been equivalised after housing costs. Waimakariri and Christchurch city are very close to the New Zealand average but Selwyn district appears more affordable, largely because of higher incomes.
Table 8

Median rents, rent-to-income, and equivalised after-housing-costs income
By territorial authorities with highest median rents
For households in rented dwellings, 2013 Census

<table>
<thead>
<tr>
<th>Area</th>
<th>Median rent ($)</th>
<th>Percentage of household income spent on rent</th>
<th>Median JEAH equivalised gross household income after housing costs ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All rented</td>
<td>Private landlord, business, or trust</td>
<td>All rented</td>
</tr>
<tr>
<td></td>
<td>dwellings</td>
<td>All rented dwellings</td>
<td>dwellings</td>
</tr>
<tr>
<td>Wellington city</td>
<td>370</td>
<td>390</td>
<td>25</td>
</tr>
<tr>
<td>Auckland</td>
<td>350</td>
<td>380</td>
<td>28</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>300</td>
<td>320</td>
<td>26</td>
</tr>
<tr>
<td>Tauranga city</td>
<td>300</td>
<td>310</td>
<td>29</td>
</tr>
<tr>
<td>Hamilton city</td>
<td>290</td>
<td>300</td>
<td>27</td>
</tr>
<tr>
<td>Porirua city</td>
<td>250</td>
<td>300</td>
<td>24</td>
</tr>
<tr>
<td>Lower Hutt city</td>
<td>270</td>
<td>300</td>
<td>26</td>
</tr>
<tr>
<td>Nelson city</td>
<td>290</td>
<td>300</td>
<td>31</td>
</tr>
<tr>
<td>Waimakariri district</td>
<td>290</td>
<td>300</td>
<td>26</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>280</td>
<td>290</td>
<td>19</td>
</tr>
<tr>
<td>Total, New Zealand</td>
<td>280</td>
<td>300</td>
<td>26</td>
</tr>
</tbody>
</table>

Note: ordered by median rent for private landlord, business or trust.

Source: Statistics New Zealand

Rental affordability for Christchurch and Waimakariri districts is similar to the New Zealand average, for both the approximate percentage of household income spent on rent and for median equivalised income left after rent. Rental housing in Selwyn, however, is more affordable, as household incomes are higher. This is despite Selwyn having the highest increase in median rents (up 75 percent since 2006).

When distributions of rental affordability are examined, however, it is clear that households in the lowest Jensen equivalised income quintiles face considerable housing affordability problems. In 2013, over half of these households were paying around half their incomes in rent, as figure 23 shows. Again, this was very similar to the national average.
Rental affordability in greater Christchurch has declined slightly since 2006, as the following figures show. However, this is mainly because of a decline in Selwyn district, whereas rental affordability has improved slightly in Waimakariri district and Christchurch city.

The likely reason for this slightly improved affordability is the overall increase in household income among households in greater Christchurch.

Evidence from other sources reinforces this picture. The Household Economic Survey (HES) is designed to produce national estimates of housing costs and expenditure, so subnational estimates must be treated with caution. However, evidence from HES also suggests a slight improvement in housing affordability between the year ended June 2009 and year ended June 2013.
Data from the census shows that median rents are slightly higher (around $20 extra) for recent renters (households who had lived at their usual residence for two years or less).

People mitigate the effects of a tight rental market in different ways. Young people may remain at home for longer, or people may move in with other families or rent inadequate housing. The following section looks at rental affordability for crowded households and different household types.

**Rental affordability for crowded households**

Having more people in the household can be an effective way of reducing the cost of renting, but can also lead to household crowding. Almost half of severely crowded households were in the lowest rent-to-household-income quintile — that is, they were paying a low proportion of their income in rent. However, larger and more complex households such as severely crowded households have high rates of non-response, so the figure below is indicative only.
Crowded households, particularly households where families were sharing with others, experienced lower rent-to-household-income ratios. One-parent households who were crowded but did not share with others faced the greatest rental affordability problems.

Rent more affordable for households living in temporary dwellings
In 2013, just under one-third of households in temporary dwellings (354 households) made rental payments for their dwelling. Of these, rent-to-household-income quintiles could be calculated for 282 households. Figure 28 shows that households living in temporary dwellings were more concentrated in lower rent-to-household-income quintiles in 2013. Although this form of accommodation may be affordable, it may be of inadequate quality.
People living in temporary dwellings

*Has there been an increase in people living in ‘temporary’ occupied dwellings since 2006?*

In this context, ‘temporary’ means private dwellings in a motor camp, mobile dwellings not in a motor camp, improvised dwellings or shelters, and roofless or rough sleepers. Improvised dwellings or shelters are structures that are not necessarily erected for human habitation but are occupied. For example, shacks, garages, and private vehicles other than those designed as, or converted into, dwellings. Due to the very small number of roofless or rough sleepers recorded (only 27 nationally), this category has been combined with improvised dwelling or shelter. The term has been used here to distinguish these types of dwellings from more permanent housing stock.6

Not all people living in temporary dwellings will be in housing need, as some people, such as ‘grey nomads’, may choose to live in mobile dwellings to suit their lifestyle. “Grey nomads’ is a term commonly applied to ‘older people who retire to caravans and motorhomes in places such as Nelson and Tasman, rather than to conventional houses or retirement homes’.7 People who choose this type of accommodation may not regard it as ‘temporary’. Most of households in ‘temporary dwellings’ reported low incomes, but a small proportion had incomes of $100,001 or more.

Figure 29 shows that in greater Christchurch the number of people living in temporary dwellings increased by around 50 percent between 2006 and 2013. The percentage increase was particularly high in Selwyn and Waimakariri districts. This contrasts with modest increases in the temporary dwellings categories in Auckland, which has well-documented housing affordability issues. Numbers are relatively small, however, with just over 2,200 people in greater Christchurch living in temporary accommodation in 2013.

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6 Amore (2013) provides a comprehensive look at categories of homelessness and applies income tests to determine the number of people in this situation who are in severe housing deprivation.

Figure 29

**Percentage change in numbers of people**

By selected private occupied dwelling type for greater Christchurch, Auckland, and New Zealand

2006–2013 Censuses

1. Mobile dwellings not in a motor camp and dwellings in a motor camp have been combined for time series purposes.
2. Note: this graph excludes occupied dwellings not further defined.
3. Source: Statistics New Zealand

Table 9

**People living in temporary dwellings**

For greater Christchurch, Auckland region, and New Zealand

2006 and 2013 Censuses

<table>
<thead>
<tr>
<th>Area</th>
<th>Private dwelling in a motor camp and mobile dwelling not in a motor camp</th>
<th>Improvised dwelling or shelter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>323</td>
<td>0.3</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>324</td>
<td>0.2</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>120</td>
<td>0.4</td>
</tr>
<tr>
<td>Greater Christchurch</td>
<td>1,110</td>
<td>0.3</td>
</tr>
<tr>
<td>Auckland region</td>
<td>2,004</td>
<td>0.2</td>
</tr>
<tr>
<td>Total, New Zealand</td>
<td>11,118</td>
<td>0.3</td>
</tr>
</tbody>
</table>

1. These categories have been combined for time series purposes. In 2013, there was better identification of dwellings in a motor camp.
2. Improvised dwellings or shelters are structures that are not necessarily erected for human habitation but which are occupied. For example, sheds, garages, and private vehicles other than those designed as, or converted into, dwellings.
3. Includes a very small number of rateless or rough sleepers.

Source: Statistics New Zealand

**Have the characteristics of people living in this type of private dwelling changed?**

The characteristics of people living in these temporary types of accommodation in greater Christchurch have changed slightly since 2006. There has been a small increase in the number of families living in such accommodation and a change in the age distribution.

As table 10 shows, the age distribution of people living in this type of accommodation has changed over time. The main increase in the age distribution of people living in private dwellings in a motor camp / mobile dwelling not in a motor camp was for people aged 5 to 9 years, 25 to 29 years, and 60 to 64 years. The proportion of 5- to 14-year-olds, 40- to
44-year-olds, and 60- to 64-year-olds living in improvised dwellings increased the most between 2006 and 2013.

The age distribution varies by temporary dwelling type. Less than 10 percent of people living in private dwellings in motor camps / mobile dwellings not in a motor camp were aged less than 15 years in both 2006 and 2013, while over two-thirds were aged 40 years or over. The age distribution of people living in improvised dwellings or shelters was more erratic, with peaks for the population aged 45 to 49 years, 20 to 24 years, and people aged 40 to 44 years.

Table 10

People living in private temporary(1) dwellings, by age group
For greater Christchurch
2006 and 2013 Censuses

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Dwelling in a motor camp/mobile dwelling not in a motor camp</th>
<th>Improvised dwelling or shelter/rootless or rough sleeper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2013</td>
</tr>
<tr>
<td>0–4</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>5–9</td>
<td>30</td>
<td>66</td>
</tr>
<tr>
<td>10–14</td>
<td>42</td>
<td>60</td>
</tr>
<tr>
<td>15–19</td>
<td>36</td>
<td>63</td>
</tr>
<tr>
<td>20–24</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>25–29</td>
<td>30</td>
<td>84</td>
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<tr>
<td>30–34</td>
<td>51</td>
<td>87</td>
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<td>35–39</td>
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<td>40–44</td>
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<td>45–49</td>
<td>102</td>
<td>135</td>
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<td>50–54</td>
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<td>174</td>
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<td>55–59</td>
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<td>189</td>
</tr>
<tr>
<td>60–64</td>
<td>108</td>
<td>210</td>
</tr>
<tr>
<td>65+</td>
<td>195</td>
<td>339</td>
</tr>
<tr>
<td>Total, greater Christchurch</td>
<td>1,110</td>
<td>1,704</td>
</tr>
</tbody>
</table>

Note: All cells have been randomly rounded to base 3.

Source: Statistics New Zealand

In 2013 in greater Christchurch, there were increased numbers and slightly higher proportions of people aged 60 years and over living in private dwellings in a motor camp, or mobile or improvised dwellings. This could reflect people moving out for a prolonged period while their damaged houses were repaired. The higher proportion of older people in the improvised dwelling category could also be influenced by the fact that ‘sleepouts’ are coded to the improvised dwelling category as generally these do not contain cooking facilities or bathrooms and therefore are not considered to have all the facilities required for housing adequacy.

Census data shows that a higher proportion of people living in these temporary types of accommodation in greater Christchurch had been living at their usual address for two years or less than for New Zealand as a whole (in 2013).
Generally, households living in temporary accommodation had lower incomes than households in separate houses. Almost one-quarter of these households had incomes of $20,000 or less, compared with 6 percent of households in separate houses. Households in joined dwellings also had lower incomes than households in separate houses.
Around half (51.4 percent) of households in temporary dwelling types were one-person households. However, people living in one-person households made up just under a third (29.0 percent) of people living in this type of accommodation.

Table 11
Households and people living in temporary dwellings
2013 Census

<table>
<thead>
<tr>
<th>People and households in 'temporary dwellings'</th>
<th>One-family household (with or without other people)</th>
<th>Two-or-more-family household (with or without other people)</th>
<th>Other multi-person household</th>
<th>One-person household</th>
<th>Total stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Households</td>
<td>564</td>
<td>45.2</td>
<td>9</td>
<td>0.7</td>
<td>33</td>
</tr>
<tr>
<td>People</td>
<td>1,440</td>
<td>65.0</td>
<td>54</td>
<td>2.4</td>
<td>81</td>
</tr>
</tbody>
</table>

**Note:** All cells have been randomly rounded to base 3.

**Source:** Statistics New Zealand

Just over 1,400 people in families were living in these temporary accommodation types in 2013. This represents just 0.4 percent of all people in families in greater Christchurch. This was slightly more (in number and proportion) than in 2006, when just over 900 people in families were living in temporary private dwellings. Most of these were in couple-only families. Figure 32 shows that the proportion of people in families living in temporary dwellings increased between 2006 and 2013 – although it remained very small.
**Figure 32**

Percentage of people in families who were living in temporary dwellings

By family type, for greater Christchurch

2006–2013 Censuses

Source: Statistics New Zealand

**Table 12**

Occupied private dwelling types in greater Christchurch

By numbers and percentage of people in each family type

2013 Census

<table>
<thead>
<tr>
<th>Occupied private dwelling type</th>
<th>Couple without children</th>
<th>Couple with child(ren)</th>
<th>One parent with child(ren)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Permanent dwellings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied separate house</td>
<td>84,255</td>
<td>28.6</td>
<td>172,842</td>
<td>58.7</td>
</tr>
<tr>
<td>Two or more flats /units / townhouses / apartments / houses joined together</td>
<td>14,496</td>
<td>43.0</td>
<td>11,148</td>
<td>33.1</td>
</tr>
<tr>
<td>Occupied private dwelling not further defined</td>
<td>1,392</td>
<td>34.0</td>
<td>1,800</td>
<td>44.0</td>
</tr>
<tr>
<td>Total permanent dwellings</td>
<td>100,146</td>
<td>30.2</td>
<td>185,790</td>
<td>55.9</td>
</tr>
<tr>
<td>Other occupied private dwelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dwelling in a motor camp / mobile dwelling not in a motor camp</td>
<td>624</td>
<td>56.8</td>
<td>327</td>
<td>29.8</td>
</tr>
<tr>
<td>Improvised dwelling or shelter / roofless or rough sleeper</td>
<td>123</td>
<td>34.5</td>
<td>183</td>
<td>51.3</td>
</tr>
<tr>
<td>Total other occupied private dwellings</td>
<td>750</td>
<td>51.7</td>
<td>510</td>
<td>35.1</td>
</tr>
<tr>
<td>Total</td>
<td>100,896</td>
<td>30.2</td>
<td>186,303</td>
<td>55.9</td>
</tr>
</tbody>
</table>

**Note:** All cells have been randomly rounded to base 3.

**Source:** Statistics New Zealand

Slightly higher proportions of families live in these types of accommodation in greater Christchurch than Wellington city and Auckland.
Table 13

Number and percentage of people in families living in temporary dwellings
2013 Census

<table>
<thead>
<tr>
<th>Family type</th>
<th>Four cities of Wellington</th>
<th>Greater Christchurch</th>
<th>Auckland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of people in that family type living in temporary dwellings</td>
<td>Percentage of people in that family type living in temporary dwellings</td>
<td>Number of people in that family type living in temporary dwellings</td>
</tr>
<tr>
<td>Couple without children</td>
<td>156</td>
<td>0.2</td>
<td>750</td>
</tr>
<tr>
<td>Couple with child(ren)</td>
<td>195</td>
<td>0.1</td>
<td>510</td>
</tr>
<tr>
<td>One parent with child(ren)</td>
<td>72</td>
<td>0.2</td>
<td>192</td>
</tr>
<tr>
<td>Total</td>
<td>423</td>
<td>0.1</td>
<td>1,455</td>
</tr>
</tbody>
</table>

Note: All numbers have been randomly rounded to base 3. Numbers may vary slightly from those published in other tables because of rounding.

Source: Statistics New Zealand

In 2013, around half of people aged 15 and over living in private dwellings in a motor camp or mobile dwellings not in a motor camp in greater Christchurch were working full-time, a proportion largely unchanged from 2006. The number of construction workers living in private dwellings in a motor camp or mobile dwellings not in a motor camp increased from 57 to 201 people.

In conclusion, there has been a small increase in numbers and some change in the type of people living in ‘temporary’ private dwellings in greater Christchurch since 2006. The characteristics of people living in this type of accommodation also appear different to Auckland and Wellington, with more families and full-time workers living in this type of accommodation. This is not surprising given the decline in the number of dwellings, rent increases, and workers moving in temporarily for the rebuild.

Decline in non-private dwellings in greater Christchurch

The number of occupied non-private dwellings decreased in greater Christchurch directly after the earthquakes. Consequently, certain types of non-private accommodation such as motels and camping grounds have reported higher occupancy rates since the earthquakes. Evidence from other research (Chang-Richards et al, 2013) shows that post-earthquake occupancy rates in motels rose from around 40 to 50 percent pre-earthquakes to 80 to 95 percent post-earthquakes. Earthquake-related-business travellers and displaced residents contributed to this increase.

It is difficult to compare non-private numbers between 2006 and 2013 because changes in the overall number of non-private dwellings, and in certain types of non-private dwellings (eg night shelters, residential and community care facilities), are believed to be partly due to improvements in identifying these dwellings. There is also believed to be an undercount of boarding houses nationally as these can be difficult to identify.
Types of non-private dwellings associated with insecure housing and severe housing deprivation

Some types of non-private dwellings are usually included in any count of severe housing deprivation – people who are usually resident in boarding houses or motor camps, or staying in emergency accommodation such as night shelters. The census collects information about these non-private dwelling types. Information about other types of emergency accommodation catering to the homeless is usually obtained from administrative data (MBIE 2013, Amore 2013).

Researchers from the Anglican Life and Social Justice Unit (2012) researched boarding houses/one-person bedsits in inner-city East Christchurch. They expressed concern about the loss of this form of low-cost accommodation, which pre-earthquake largely catered for vulnerable people, such as single men with mental health/addiction problems. They estimated that around 19 bedsit units and 80 low-cost single-room flats were lost from the inner city as a result of the earthquakes. The researchers noted that this type of accommodation was not included in tenancy bond data, as bonds are often not lodged for properties at the lower end of the market.

Because of the interest in low-cost housing, such as boarding houses, some numbers have been included here. Be careful when comparing these numbers over time, for the reasons outlined in the previous section.

Christchurch was the only territorial authority in greater Christchurch to have dwellings classified as boarding houses. The 2013 Census recorded 15 boarding houses in Christchurch city, which housed 297 people. In 2006, the census counted 24 boarding houses, which housed around 207 people. Research suggests (MBIE, 2013; Anglican Life, 2012) that pressure on this type of accommodation is resulting in lower-income people finding it more difficult to access.

Census data on income seems to support this. In 2006, of people aged over 15 years usually resident in boarding houses in Christchurch (that stated their incomes), 54.0 percent had an annual income of $5,000 or less. This is compared with 2 percent nationally. By 2013, in contrast, people in boarding houses in Christchurch city had a higher percentage of people with personal incomes of $30,000 or more compared with other selected cities such as Wellington and Auckland.
Figure 33

**Income distribution for people usually resident in boarding houses**

*By selected cities*

*2006 Census*

Source: Statistics New Zealand

Figure 34

**Income distribution for people usually resident in boarding houses**

*By selected cities*

*2013 Census*

Source: Statistics New Zealand
People in boarding houses in Christchurch in 2013 also had higher rates of full-time employment than those in comparable cities.

**Figure 35**

![Work and labour force status for people usually resident in boarding houses](image)

People usually resident in motor camps

A small number of people in the non-private dwelling type ‘motor camp/camping ground’ indicated they were living there. The motor-camp owner has to tell the census collector whether people are usually resident or just visiting. Usual residents are given a dwelling form but visitors are not. In some cases, the owner may not have known whether people were usually resident or not and would not have given them a dwelling form, therefore they were not recorded in the category ‘private dwelling in a motor camp’. Just under one-third of people in this category indicated they had lived at this address for less than one year. Information about this group has been included separately.

At the time of the 2013 Census, 99 people in greater Christchurch indicated that their usual residence was in a motor camp but were included in the non-private dwelling count. Around 40 percent of these people had an annual income of $20,000 or less and only 14 percent had an annual income of $50,001 or more.

If this population is added to the number of people in a private dwelling in a motor camp, in total the number of people living in motor camps in greater Christchurch in 2013 rises to 1,000.
Figure 36

**Distribution of annual personal income**
For people living in non-private motor camp complex in greater Christchurch
2013 Census

Source: Statistics New Zealand
Has there been a change in levels of crowding in the greater Christchurch area?

Researchers expected an increase in crowding and homelessness after the earthquakes. For example, the *Housing Pressures in Greater Christchurch* report (MBIE, 2013) anticipated a rise in numbers of people living in severely crowded accommodation and people living without shelter (or in temporary accommodation).

How is crowding measured?

The Canadian National Occupancy Standard (CNOS) has been used for most of the analysis on crowding in this report. CNOS provides the best fit for the New Zealand social context, although it may not fully align with all social and cultural norms (Goodyear, Fabian, & Hay, 2012). It is important to remember that while cultural norms about how crowding is perceived may vary, the same levels of physiological stress as a result of crowding occur for different ethnic groups regardless of whether they perceive themselves as crowded (Lepore, Evans, & Palsane, 1991).

Information from CNOS covers severe crowding to underusing bedrooms. The level of crowding according to this standard can be measured consistently over time (from 1986 onwards in New Zealand). Under CNOS the following criteria apply.

- There should be no more than two people per bedroom; parents or couples share a bedroom.
- Children aged less than five years, either of same or opposite sex, may reasonably share a bedroom.
- Children aged less than 18 years, of the same sex, may reasonably share a bedroom.
- A child aged five to 17 years should not share a bedroom with one aged under five of the opposite sex.
- Single adults aged 18 years and over, and any unpaired children, require a separate bedroom.

It is likely that any estimate of crowding from the census will be conservative. Households may be subject to temporary crowding if they host people who cannot find accommodation, but these people may not regard that dwelling as their usual residence. They will not be included when the crowding index is calculated. If some information is missing, such as the number of bedrooms, then crowding cannot be calculated. Crowding could not be calculated for just under 4 percent of households in greater Christchurch.

Households are defined as crowded if they required at least one extra bedroom according to these criteria. If two or more bedrooms are required then the household is considered severely crowded.

Small rise in the number and proportion of crowded households in greater Christchurch

In 2013, 5,103 households and 25,572 people were crowded in greater Christchurch, as the following tables show.
Between 2006 and 2013, the number of crowded households increased very slightly in the greater Christchurch area, from 4,958 to 5,103 (3.2 to 3.3 percent of households). Most of the increase in crowding occurred within Christchurch city (from 3.5 to 3.6 percent) and Waikarariki district (1.9 to 2.2 percent). This increase, although small, contrasts with a slight national decline in crowding from 5.2 to 5.0 percent of households.

The number of people living in crowded households in greater Christchurch also increased slightly, from 24,438 to 25,572 (6.1 to 6.3 percent of people in households). Levels of crowding were higher in Christchurch city and Waikarariki district than in the previous two censuses, although lower than in the mid-1990s, which was a time of higher unemployment. It is likely that levels of crowding were higher than this in the months following the February 22 earthquake in 2011 and had reduced by the 2013 Census.

Table 14

<table>
<thead>
<tr>
<th>Area</th>
<th>Severely crowded</th>
<th>Two or more extra bedrooms needed</th>
<th>Crowded One extra bedroom needed</th>
<th>Total crowded</th>
<th>No extra bedrooms needed and more space</th>
<th>One spare bedroom</th>
<th>Two or more bedrooms</th>
<th>Total stated</th>
<th>Not stated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariki district</td>
<td>435</td>
<td>1,542</td>
<td>1,574</td>
<td>6,005</td>
<td>16,204</td>
<td>20,577</td>
<td>47,072</td>
<td>1,002</td>
<td>43,072</td>
<td></td>
</tr>
<tr>
<td>Christchurch city</td>
<td>5,708</td>
<td>15,734</td>
<td>22,140</td>
<td>82,176</td>
<td>112,000</td>
<td>96,830</td>
<td>314,535</td>
<td>12,549</td>
<td>322,072</td>
<td></td>
</tr>
<tr>
<td>Selwyn district</td>
<td>213</td>
<td>942</td>
<td>1,156</td>
<td>6,402</td>
<td>11,260</td>
<td>20,055</td>
<td>41,883</td>
<td>1,029</td>
<td>40,854</td>
<td></td>
</tr>
<tr>
<td>Total, greater Christchurch</td>
<td>6,357</td>
<td>15,215</td>
<td>25,572</td>
<td>87,440</td>
<td>114,500</td>
<td>137,552</td>
<td>404,956</td>
<td>14,021</td>
<td>390,935</td>
<td></td>
</tr>
</tbody>
</table>

Note: All cells have been randomly rounded to base 3.

Source: Statistics New Zealand

Table 15

<table>
<thead>
<tr>
<th>Area</th>
<th>Severely crowded</th>
<th>Two or more extra bedrooms needed</th>
<th>Crowded One extra bedroom needed</th>
<th>Total crowded</th>
<th>No extra bedrooms needed and more space</th>
<th>One spare bedroom</th>
<th>Two or more bedrooms</th>
<th>Total stated</th>
<th>Not stated</th>
<th>Total</th>
</tr>
</thead>
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<tr>
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<td>390,935</td>
<td></td>
</tr>
</tbody>
</table>

Note: All cells have been randomly rounded to base 3.

Source: Statistics New Zealand

Between 2006 and 2013, the number of crowded households increased very slightly in the greater Christchurch area, from 4,958 to 5,103 (3.2 to 3.3 percent of households). Most of the increase in crowding occurred within Christchurch city (from 3.5 to 3.6 percent) and Waikarariki district (1.9 to 2.2 percent). This increase, although small, contrasts with a slight national decline in crowding from 5.2 to 5.0 percent of households.

The number of people living in crowded households in greater Christchurch also increased slightly, from 24,438 to 25,572 (6.1 to 6.3 percent of people in households). Levels of crowding were higher in Christchurch city and Waikarariki district than in the previous two censuses, although lower than in the mid-1990s, which was a time of higher unemployment. It is likely that levels of crowding were higher than this in the months following the February 22 earthquake in 2011 and had reduced by the 2013 Census.
Severe crowding (where households require two or more bedrooms) rose within greater Christchurch, and was higher than in the 1990s. However, the numbers of households and people that were severely crowded were very small. Around 9 out of 10 severely crowded households in greater Christchurch (867 out of 966 households) were located in Christchurch city. In total, 6,357 people were living in a severely crowded household in greater Christchurch at the time of the 2013 Census.
Crowding also increased more markedly for households in the lowest JEAH income quintile in greater Christchurch, with a 29.3 percent increase in this category, compared with an overall increase of 3.0 percent. Note that for around one-third of crowded households in greater Christchurch there was no household income information. Around 9 percent of households where household income was not stated were crowded.

The odds of being crowded in greater Christchurch have increased since 2006

To measure the significance of the increase in crowding in greater Christchurch compared with other areas in New Zealand, some multivariate analysis techniques were applied to the data. When multivariate analysis techniques were applied to the data, the
odds of being crowded increased by 10.5 percent from 2006 to 2013 (from 0.882 to 0.975) in greater Christchurch compared with the rest of New Zealand, after accounting for ethnicity. Ethnicity proved the most important factor in explaining differences in crowding. This is similar to the findings of research carried out in the United States. A study in California (Moller et al, 2002) noted that black, American Indian, Asian, and Hispanic populations in the United States had much higher levels of crowding. This difference remained significant even when controlling for factors such as low income.

Compared with Auckland, the odds of being crowded in greater Christchurch increased 4.8 percent (from 0.769 to 0.806). Compared with the rest of the South Island, in greater Christchurch the odds of being crowded increased 16.2 percent (from 1.395 to 1.621). In other words, people in greater Christchurch have 1.621 times greater odds of being crowded than people in the rest of the South Island, after accounting for ethnicity. Not accounting for ethnicity, severe crowding odds increased 14.5 percent for Christchurch city compared with the Auckland region.

**Crowding has intensified in some area units**

Although crowding has only increased by a marginal amount in greater Christchurch, crowding has intensified in some area units, particularly within Christchurch city. Crowding has always been unevenly distributed across the city. Aranui, which was the most crowded area unit in 2006, had a rise in people living in a crowded household, from 20.9 to 26.1 percent. The number of households in that area unit fell from 1,578 in 2006 to 1,380 in 2013. Aranui also had the largest number of people living in a crowded household in greater Christchurch in 2013 (888 people), followed by Sockburn (717 people), and Linwood (708 people). Other areas experienced substantial rises in the number of people living in crowded households: Southbrook rose from 12 to 54 people, Islington from 123 to 261 people, and Edgeware from 222 to 393 people. The percentage of people living in crowded households in Riccarton South went from 6.3 to 19.3 percent (27 to 87 people).

**Figure 41**

<table>
<thead>
<tr>
<th>Area Unit</th>
<th>Percent of People Living in Crowded Households (2006)</th>
<th>Percent of People Living in Crowded Households (2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aranui</td>
<td>26.1%</td>
<td>26.1%</td>
</tr>
<tr>
<td>Riccarton South</td>
<td>21.9%</td>
<td>25.6%</td>
</tr>
<tr>
<td>Linwood</td>
<td>18.7%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Wharenpui</td>
<td>15.9%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Riccarton West Area unit</td>
<td>12.6%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Philliupstown Hillmorton</td>
<td>9.3%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Jellie Park</td>
<td>7.9%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Upper Riccarton</td>
<td>7.4%</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

Source: Statistics New Zealand

Households in temporary dwellings experienced an increase in crowding

Households in ‘temporary’ dwellings experienced a sharp increase in crowding between 2006 and 2013. This was particularly notable in the improvised dwelling or shelter category, where the proportion of crowded households rose from 9.5 percent in 2006 to 14.2 percent in 2013.
As well as an increase in the absolute proportion of crowded households, crowding appears to have increased for households in temporary dwellings. The mean number of usual occupants in severely crowded households in temporary dwellings increased from just over four people in 2006 to just over five people in 2013.

Have the characteristics of crowded households in greater Christchurch changed?

Generally, the characteristics of crowded households have remained stable in greater Christchurch. For example, around two-thirds of crowded households rented, and one-third owned their dwelling outright or in a family trust. These proportions have changed little since 2006.

Households with other people and other families were the most likely to be crowded. These households also tended to be the most crowded, with one-parent families living with others having the highest rates of crowding in greater Christchurch. Since 2006, the number of multi-family households (with or without other people) in greater Christchurch
Housing in greater Christchurch after the earthquakes increased. This household type made up 2.5 percent of households (3,921) in 2013 – up from 1.7 percent (2,724) in 2006.

**Figure 45**

*Crowding by household composition for greater Christchurch 2013 Census*

![Crowding by household composition for greater Christchurch 2013 Census](image)

Note: some household types – couple-only and one-person households – cannot be considered crowded.
Source: Statistics New Zealand

**Crowding highest among Pacific peoples**

Housing deprivation, in particular crowding, had been higher for some ethnic groups in Christchurch prior to the Canterbury earthquakes. In the last few censuses, Pacific peoples experienced the highest rates of crowding in New Zealand. They were also the population group with the highest rates of crowding within greater Christchurch. In 2013, just under 3 percent (10,881 people) of people in greater Christchurch identified as Pacific. Almost one-third of Pacific peoples in greater Christchurch were living in crowded living conditions in 2013.

**Figure 46**

*Crowding in greater Christchurch compared with New Zealand By ethnic group (total response)*

![Crowding in greater Christchurch compared with New Zealand By ethnic group (total response)](image)

1. Middle Eastern/Latin American/African. Numbers are too small to show in Waimakirri district.
Source: Statistics New Zealand

**Crowding decreased for people of Pacific and Middle Eastern/Latin American/African ethnicities**

Crowding, however, actually declined slightly among Pacific peoples and people with Middle Eastern/Latin American/African ethnicities between 2006 and 2013, but increased slightly for people with Asian and ‘other’ ethnicities.
Figure 47

Crowding in greater Christchurch by ethnic group
2006–2013 Censuses

Note that the composition of the ‘other’ category has changed between 2006 and 2013. In 2006, a media campaign resulted in a huge increase in the number of people writing ‘New Zealander’ as their ethnicity (which is included in the category ‘other’). But this number fell sharply in 2013 – from just under 430,000 people in 2006 to around 66,000 people in 2013.

Source: Statistics New Zealand

The following graphs show the ethnic composition of each CNOS category in 2006 and 2013. In these graphs, European and ‘other’ are combined to reduce the number of categories.
These graphs very clearly show the ethnic differences. For example, although Asian people made up 7.9 percent of the population of greater Christchurch, they were 22 percent of the severely crowded population. In contrast, people with European or other ethnicities were 39 percent of the severely crowded population, but 90 percent of the population with two or more bedrooms spare.

Relative inequalities emerge further when rates of crowding are compared for different ethnicities by JEAH income quintiles. Crowding is more concentrated in lower-income quintiles, as figure 48 shows. The information presented here is for the Canterbury district health board, which includes the Hurunui and Ashburton districts as well as greater Christchurch.
Figure 50

Percentage of households that were crowded, by JEAH income quintile
Based on ethnicity of oldest person in the household
For Canterbury District Health Board, 2013 Census

Crowding increases most for pre-schoolers and people aged 30 to 34 years

Figure 51

The change in the age structure of the population, particularly the decline in the number of children, may have slightly dampened the earthquakes' effect on crowding. If the age structure of the population in greater Christchurch had remained the same in 2013 as in 2006, then we would have expected to see 1,000 more people living in a crowded household. This is calculated by applying the 2013 rate of crowding to the 2006 population structure.

Is there evidence of pressure on accommodation leading to increased crowding, or hosting other families/people?

Crowding measures that are based on the usual residents of a household might miss some temporary crowding. This may occur when people stay in households but do not consider themselves usual residents in the households. If hosting occurs on a long-term or regular basis, households may experience increased crowding and pressure on household resources. Researchers have hypothesised that ethnic groups such as Māori
or Pacific peoples that have a tradition of hosting friends and family may experience much more severe crowding than if only usual residents are taken into account.9

Research has also shown that people in the most-crowded households may be more reluctant to disclose their living conditions (Rankine, 2005). There has been anecdotal evidence of increased ‘couch surfing’ in greater Christchurch because of the difficulties of finding rental accommodation. To test whether this was actually occurring, it is necessary to use a simpler index – the people per room index – and to count all people present on census night, not just usual residents. The Canadian National Occupancy Standard requires information about the ages and couple status of people in a household. The people per room measure divides the number of people by the number of rooms. This means it can be calculated for people who were present on census night as well as usual residents.

It should be noted that this index generates a much lower number of crowded households than the Canadian National Occupancy Standard (Goodyear, Fabian, & Hay, 2012).

**Figure 52**

<table>
<thead>
<tr>
<th>Area</th>
<th>People per room (census night population)</th>
<th>People per room (usual residents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waimakariri district</td>
<td>1.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Christchurch city</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Selwyn district</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Greater Christchurch</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

1. Includes all census night occupants but excludes absentees.
2. Includes all usual residents (including absentees) and excludes visitors to the household.
Source: Statistics New Zealand

There is some very slight evidence to suggest that some couch surfing may be occurring in greater Christchurch. Census-night crowding appears very slightly higher in Christchurch city and Selwyn districts than when crowding is measured for usual residents.

The supposition that there might be some variation between usual-resident crowding and census-night crowding for different ethnic groups did not occur. When census-night crowding was compared with usual-resident crowding for different ethnic groups, the difference was very small: much less than half a percent. For Māori in greater Christchurch, for example, census-night crowding for the people-per-room measure was 6.5 percent, compared with 6.4 percent for the usual resident population.

It is likely that much more crowding and hosting of people and families occurred in the months after the February 2011 earthquake, but reduced by the time of the 2013 Census.

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9 The Government Reference Group for Rheumatic Fever Prevention is currently investigating this possibility.
What have been the major changes in housing in Christchurch?

Estimating the actual dwelling loss caused by the earthquakes is complex. Census data shows that between 2006 and 2013, residential dwelling stock actually increased in greater Christchurch by just under 11,000 permanent dwellings. Most of this increase occurred in Waimakariri and Selwyn districts, with Christchurch city having just a 2.7 percent increase in residential dwelling stock.

This number disguises the total dwelling loss, since there was a sharp increase in the number of empty dwellings in Christchurch city (from 5,841 to 14,556 empty dwellings – a 149 percent increase) and in Waimakariri district (552 to 1,245 empty dwellings – a 126 percent increase). Selwyn district had a lower increase (732 to 1,152 empty dwellings – a 57 percent increase).

The large number of empty dwellings includes some dwellings that were waiting on demolition, such as dwellings in the residential red zone and severely damaged dwellings outside the red zone. However, it also includes holiday homes and dwellings vacated for repair. At the time of the 2013 Census, red-zone demolitions were only partially completed – around 2,000 dwellings had been demolished and a further 6,000 demolitions were expected. MBIE (2013) estimated that the eventual loss of residential dwelling stock as a result of the earthquakes is around 6 percent.

The loss of residential housing stock occurred over a period of two or three years rather than immediately after the earthquakes, which is likely to have eased the effects of the loss. Although some homes were destroyed or uninhabitable directly after the earthquakes, much of the loss occurred because of red-zoning. This gave people time to make decisions about their housing.

**Amount of social housing has decreased due to earthquake damage**

Both census and administrative data record a decline in the amount of social housing, particularly council housing, within greater Christchurch. This is due to earthquake damage. As a result, there has been a reduced capacity to house low-income people, especially in Christchurch city. The city council and Housing New Zealand have committed to replacing damaged units.

**The number and proportion of households that own their dwelling declined within Christchurch city**

Christchurch city saw a decrease in the number of households that did not own their dwelling and a small increase in the number of households that did not own the dwelling they were living in. Christchurch city had one of the largest falls in the numbers of households that owned their dwelling, at around 8 percent. In contrast, Selwyn and Waimakariri districts have only experienced a very small decrease in the proportion of owned dwellings.

**Rapid growth in population and dwellings has occurred in districts neighbouring Christchurch city**

Building consents and population growth show that the most rapid population growth and new building has occurred in the surrounding districts of Selwyn and Waimakariri. These districts have grown rapidly both in terms of housing and population since the quakes, exacerbating an existing trend of higher growth in districts close to Christchurch city.
There has been a rise in median household incomes in greater Christchurch and a decline in the number of household in the lowest JEAH income quintile

The number of households in the lowest JEAH income quintile has fallen in greater Christchurch, particularly within Christchurch city, where the number declined by around 17 percent. A combination of factors may have caused this decline. It is possible that low-income people left Christchurch city in greater numbers, or that people have taken advantage of new employment opportunities. The growth in incomes may have mitigated some of the negative effects of housing changes. These have mainly been felt in Christchurch city and Waimakariri district. Selwyn district, which had substantially higher incomes, experienced fewer housing issues as measured by census data.

There has been a small increase in housing issues in greater Christchurch, particularly in Christchurch city

Christchurch city itself has been hardest hit, with a decline in population and an even greater decline in housing stock. Given the loss of residential housing stock, and international experience of housing issues after disasters, we would expect to see an increase in housing problems as a result of the earthquakes. This is to some extent confirmed in the data although the effects are not large. It is possible that the effects were much larger in the months following the February 2011 earthquake. The housing situation in greater Christchurch had likely settled somewhat by the time of the 2013 Census. Pre-earthquake inequalities in housing situations have persisted.

Boarding houses have long been a cheap and accessible type of accommodation that have tended to be mostly occupied by low-income people. It is difficult to compare numbers of boarding houses between censuses as this type of accommodation is often hard to identify and is believed to be an undercount. However, there appears to have been a decline in the number of boarding houses in Christchurch city, which has been confirmed by independent research into low-cost housing by Anglican Life (2012). Moreover, census data suggests the characteristics of people in this type of accommodation have changed. People in boarding houses in Christchurch city in 2013 had slightly higher incomes than in 2006. They were also more likely to be employed full-time than those in boarding houses elsewhere in New Zealand.

Rent-to-household-income ratios have not changed much

For households that were renting and that stated their household incomes, rent-to-household-incomes remained largely unchanged in Christchurch city or Waimakariri district, but declined in Selwyn district. Although greater Christchurch experienced a rise in rents that was greater than the national average, household incomes also rose at a greater than average rate. Since 2006, all JEAH income quintiles in greater Christchurch, except the highest quintile, experienced a small decline in rental affordability.

Rising incomes are likely to have reduced the effects of rising rents, but households in the lowest household-income quintile are experiencing considerable rental affordability issues. Over half of households in this quintile pay around half of their gross household income on rent. This is similar to the national average. Households appear to have dealt with rental affordability issues by using strategies such as sharing accommodation with others, or living in dwellings that are too small to accommodate the needs of their households. These strategies reduce rental costs, but the household trades housing quality and adequacy for affordability.

Number of households and people living in temporary dwellings has increased

Census data shows that the largest increase in type of private occupied dwelling has been in ‘temporary dwellings’. This includes private dwellings in a motor camp, mobile dwellings not in a motor camp, and improvised dwellings or shelters. The number of households occupying ‘temporary’ dwellings increased by around 50 percent between 2006 and 2013. While the number of people living in these dwelling types in greater Christchurch remained fairly small, it increased from just under 1,500 people in 2006 to
around 2,200 people in 2013. The proportion of people in families living in these dwellings was higher than in Auckland, which has well-documented housing issues.

**Crowding has risen slightly in greater Christchurch, in contrast with a slight decline nationally**

The numbers of crowded households and people in greater Christchurch have increased slightly. Most of the crowded households were in Christchurch city. In total, 25,572 people were living in a crowded dwelling in 2013, compared with 24,438 people in 2006. Some area units experienced sharp increases in crowding: for example, the number of people living in a crowded household in Aranui rose from 20.9 percent to 26.2 percent. In Riccarton South, the number of people crowded rose from 6.3 percent to 20.0 percent.

Crowding was much higher for ethnic minorities, with Pacific peoples experiencing the highest level of crowding. Levels of crowding for Pacific people fell slightly between 2006 and 2013. However, they rose for people in the Asian ethnic grouping.

The increase in crowding was more marked for households in the lowest JEAH income quintile, increasing from 3.5 to 4.5 percent of households.

The increase in crowding, although small, must be compared with an overall small decline in crowding nationwide. The odds of being crowded have increased 10.5 percent in greater Christchurch compared with the rest of New Zealand, after accounting for ethnicity.

**Conclusion**

Data from the 2013 Census shows some evidence of an increase in housing problems since the Canterbury earthquakes. It is likely that housing problems increased considerably in the months following the February 2011 earthquake as households moved in temporarily with others. By the time of the 2013 Census, the initial crisis response was over.

Housing stresses were evident for vulnerable populations. In particular, crowding has risen markedly in some area units and for households in the lowest JEAH income quintiles.

Some circumstances may have mitigated the effects of housing loss; notably the decline in population, particularly children, and a decrease in the numbers of low-income households. Also, much of the decline in housing stock did not occur straight away, but over two or three years. This extended period may have given many households an opportunity to make other housing arrangements.

The fact that rental affordability has only decreased slightly is largely due to a rise in household incomes. However, lower-income households and individuals may be using strategies (such as sharing accommodation even at the risk of being crowded, and living in temporary dwelling types) that reduce the adequacy of their housing to improve rental affordability and to gain access to housing.
References and further reading

References


Websites
Canterbury quake live http://quake.crowe.co.nz/
Christchurch quake map www.christchurchquakemap.co.nz/
Geonet www.geonet.org.nz/

Further reading


Appendix 1:

Census collection strategy for the greater Christchurch area

Statistics NZ recognised there would be challenges in carrying out a census post-quake in the greater Christchurch area because of ongoing population movement and damage to dwellings and infrastructure. Census staff developed a separate strategy for greater Christchurch – ‘Counting everyone in Canterbury’. The department developed an information sheet for people in Canterbury in recognition of the challenges that people might have in filling in census questions.

The guide notes were based on cognitive testing (that is, testing a person’s understanding of the question) of five census questions that had been identified as difficult to answer. Testing showed that people who had temporarily moved out of their dwelling for earthquake repairs initially found the usual residence question difficult to answer but could answer correctly once they had read the special advice for people in Canterbury. The guide notes were kept as succinct as possible to ensure they were easy to read and follow.

The Collections and Operations Regional Manager for the South Island had overall responsibility for Canterbury. The following information comes from her post-census report and from the manager for the area most affected by the earthquakes (Area 23).

The South Island region had six areas in 2013, an increase of one area from the five areas planned for 2011 Census. The additional area was added to contain the red-zoned properties in Canterbury so that management and potential process changes could be focused on any differences caused by the earthquakes. Area 23 for census collection included the central business district of Christchurch city and red-zone areas.

At the time the strategy was approved there were the levels of zoning used by CERA: red (zoned as unsuitable for dwellings), white (zoning decisions not yet finalised), and green (suitable for dwellings). As CERA made public announcements to change dwelling zones, the field scheme information was updated so that any changes could be applied correctly.

All census subdistricts that included a red or white zone were included in Area 23. There were 14 districts in Area 23. Special rules were established for Area 23 in recognition of the complex situation and the potential dangers that collectors might face, for example, for dwellings that were still in danger of rockfall. Collectors were instructed not to enter cordoned-off properties, or any dwellings that had notices advising against entry, as these could be dangerous.

**Earthquake damaged dwellings were defined as unoccupied and empty**

Normally, if a dwelling looks dilapidated, it is not counted. Census staff decided that if they applied the standard approach to counting dilapidated dwellings, some occupied dwellings would be missed because they could be badly damaged but still occupied. In area 23, therefore, if the dwelling was still standing, it was counted and classified as unoccupied, empty even if it was dilapidated (unlike in the rest of New Zealand).

As a result, some of the empty dwellings recorded in the 2013 Census in Area 23 will include dilapidated dwellings. Some of these unoccupied, damaged dwellings may have been damaged to the point of being uninhabitable.
Special process introduced for Crown-owned dwellings

Crown-owned dwellings were dwellings in the residential red zone that the government had purchased. Census staff gave a list of Crown-owned properties to collection staff. Census staff established a process where collectors visited Crown-owned dwellings once on delivery and once again on collection. In the rest of the country, collectors would normally make up to three visits to a dwelling if necessary in order to deliver census forms. Collectors found that almost all Crown-owned properties were unoccupied.

Figure 53
Area 23 census collection zone

Instructions to collectors in Area 23

Collectors were recruited to enumerate the areas in which they lived. Collectors were told:

- that even if dwellings were inaccessible, they should be marked in the fieldbook – but they should record if the dwelling was cordoned off
- they must not enter properties that are cordoned off, or have signs saying they are not to be accessed
- if the dwelling looks vacant, code the vacant private dwelling status to empty
- treat all Crown-owned properties as vacant, unless contact is made during your first delivery and collection visits.
At the time of the census, not all people in red-zone areas had settled with the Crown, but the population of these areas had greatly reduced.

The Canterbury strategy of intensive training and recruitment generally worked well. The manager for Area 23 commented in his weekly reports that there was "a lot of hard work by a lot of dedicated people."

Data processing and evaluation

- For the 2013 Census, regions were processed one at a time. Canterbury was processed fifth to allow processing staff time to get very familiar with data and systems, as it was expected Canterbury could prove more complicated to process.
- Because empty dwellings in Canterbury were treated slightly differently by collectors, there were special processing instructions as well. If there was any doubt about whether a dwelling was empty or not (for example if there were forms for a household) then the processor would check with the field book to see what the collector had written and whether or not the forms were for another dwelling, such as a different flat at the same street number.
- A special evaluation report was prepared for the greater Christchurch area. All greater-Christchurch data was compared with expectations and other sources of data if possible, to see whether there were any inconsistencies.

In summary, census staff developed a series of quality-control measures to make sure census data collection in greater Christchurch was as accurate as possible.

Counting everyone in Canterbury

Counting everyone in Canterbury is the specific information given to people in Canterbury along with their census forms. Below are the questions about dwellings and usual residence.

2013 Census – information for people in Canterbury

Filling in the forms

Brown dwelling form

Question 11: Rent paid by household

How should I answer if my rent is being paid by my insurance company?
The household does not pay rent if it is paid by your insurance company. Mark ‘no’ for question 11.

Questions 14 and 15: Number of rooms

Should I count rooms that are unusable due to earthquake damage?
If the unusable rooms will be repaired, count them towards your total number of rooms. If any of these rooms are bedrooms, please also include them in your bedrooms count.
If the unusable rooms will not be repaired, or you don’t know whether they will be repaired, don’t count them.

Blue individual form

Question 5: Usual address

How should I answer if my address has been affected by the Canterbury earthquakes?

Give the address you are currently living at, unless you are temporarily living somewhere and will be moving back to your earthquake affected address (once your home has been
repaired or rebuilt, for example). In that case, give that address you will be moving back to.

Question 24:

Home ownership
What if I own a dwelling that I am not currently living in due to the Canterbury earthquakes? Please answer this question for the dwelling at the address you gave in question 5 (your usual address), even if you own another dwelling that you are not currently living in.
Appendix 2 Revised Jensen Scale and Jensen Equivalised Annual Household Income

Annual household income, derived by summing annual personal income for all household members, provides basic information about household wealth. However, as an indicator of relative standard of living, median annual household income is inadequate. For example, a one-adult household with an annual household income of $35,000 is likely to be able to access a higher standard of living than a household of 10 people with that income.

To allow household income to be compared across household types, a scale can be used to equilibrate annual household income for household composition. Equivalised income is a ranked measure of income. The equivalence scale used in this paper is the RJS,3 developed by John Jensen of the (then) Department of Social Welfare (1988).

The scale is constructed so that a two-adult household has a rating of 1. Households with fewer members score less than 1, those with more score more than 1. The scale also accounts for children being likely to require less income than adults to maintain a similar standard of living. JEAH income is calculated for individual households by reweighting household income to a two-adult household.

Jensen Equivalised Annual Household Income = \( \frac{\text{Annual Household Income}}{\text{Jensen Rating}} \)

where

\[
\text{Jensen Rating} = \left[ \frac{a + xc + yt}{z^2} \right]^{\frac{1}{z}}
\]

with

- \( a \) = number of adults in household
- \( c \) = number of children in household
- \( t \) = total age of children in household

\( x, y, z \) are constants 2. Jensen (1988).

For example, a two-adult household with an annual total income of $35,000 will also have a JEAH income of $35,000, since its Jensen Rating is 1.

If this household included a seven-year-old child, its Jensen Rating would increase to 1.19 and its JEAH would be:

\[
\frac{\$35,000}{1.19} = \$29,400 \text{ (rounded to nearest $100)}
\]

1.19
Appendix 3

Figure 54

Peak ground accelerations (larger of the two horizontal components)


Figure 55

Peak ground accelerations (Vertical component)