

ISSUE 642 **BULLETIN**



## CHANGES IN THE CONDITION OF NEW ZEALAND HOUSES OVER 25 YEARS

December 2019

- BRANZ has surveyed the condition of New Zealand houses approximately every 5 years since 1994.
- There have been notable improvements in specific areas such as heating, ventilation and insulation.
- The last two surveys have included rental housing and found it to be in generally poorer condition than owner-occupied housing.

## 1 INTRODUCTION

**1.0.1** Before the first BRANZ House Condition Survey (HCS), there was no regularly collected, in-depth data on the state of our houses. As far back as 1935, the government had recognised the importance of house condition on New Zealanders' lives and acknowledged the need to collect information on it.

**1.0.2** BRANZ set out to uncover the physical condition of a sample of randomly selected New Zealand houses, with trained assessors using objective criteria. The survey also allowed calculation of the level of maintenance and repairs required and estimated the cost of those repairs. The HCS provided an important new source of information for policy making. It has also helped BRANZ researchers to understand the performance of different building materials and to target further research.

**1.0.3** BRANZ has surveyed a sample of houses approximately every 5 years since 1994, visiting 400–600 different houses each time.

**1.0.4** In each survey, different components of the houses as well as the overall condition have been inspected and assessed.

**1.0.5** New features have been added to the HCS over the years. A telephone interview with the occupants has allowed BRANZ to ask about how much they have spent on repairs and maintenance and how they perceive the condition of their homes. In 2015, occupants were given a questionnaire about appliance and energy use to complete.

**1.0.6** The data has been widely used, including by successive governments as background support for their legislative programmes to promote warmer, drier, healthier homes.

**1.0.7** The 2010 and 2015 surveys included rental housing, allowing comparison to be made between the condition of owner-occupied houses and rentals. Owner-occupied houses tend to be in better condition. In 2015, for example, around half the owner-occupied houses were assessed as well maintained compared to around one-quarter of rental houses.

**1.0.8** The surveys have consistently found that houses owned by people with higher incomes tend to be better maintained. For owner-occupied households, households earning over \$50,000 are more likely to have carried out maintenance or repairs in the previous 12 months [34% in 2015] than those who earn less than this [25%].

**1.0.9** Specific areas have seen considerable improvements. This includes thicker thermal insulation in ceilings, a shift to more efficient forms of heating and more use of mechanical extract ventilation in bathrooms.

## 2 THE SURVEY

**2.0.1** The survey has evolved over the years in both content and coverage to meet changing data needs (Figure 1).

**2.0.2** The first survey assessed over 400 houses in 1993/94. It covered a mix of city, suburban and rural houses in the Auckland, Wellington and Christchurch regions [but not beyond those]. Its focus was owner-occupied homes – mostly stand-alone houses with a few duplexes.

**2.0.3** The 1999 survey was expanded to include additional elements and information, but again, it did not include rental housing or extend beyond the three major regions. A telephone survey of owners gathered socio-economic data about the owners/occupants and more information about the house.

**2.0.4** The 2005 survey added subfloor plumbing pipes and decks to the list of components being assessed. As with earlier surveys, the sample was drawn from a mix of city, suburban and rural houses in the Auckland, Wellington and Christchurch regions.

**2.0.5** The 2010 survey was expanded to include a more geographically representative sample from across New Zealand and also included rental properties, which today make up approximately one-third of the housing stock. This represented a significant change and improvement to the survey and was a direct response to national housing data needs.

**2.0.6** The 2015 survey of 560 houses again covered New Zealand and included rental properties. The condition of over 40 individual house components was assessed [up from just 26 in 1994]. Household members were interviewed on the maintenance they had undertaken in the past 12 months or had decided to delay. They were also surveyed around their appliance ownership and use through a self-completion questionnaire. This was a new addition to the House Condition Survey, commissioned by the Energy Efficiency and Conservation Authority (EECA) to help better understand how householders use different appliances, including lighting, consumer products and heating.

**2.0.7** The surveys have included stand-alone houses and a few duplexes but not apartments or flats.

## 3 RATING THE CONDITION OF HOUSES AND HOUSE COMPONENTS

**3.0.1** In a physical assessment carried out in each house, the condition of house components is assessed against a 5-point scale (Table 1).

**3.0.2** An overall house condition rating is created as an average of all the ratings given to different components of a property. Each component is regarded of equal importance.

**3.0.3** Owner-occupied houses were generally found to be in better condition than rental properties.

**3.0.4** Newer houses tend to be in better condition. In the last three surveys, average condition ratings have been broadly similar for houses constructed in each different period up to the 1960s, then the average condition improves for houses built from the 1970s on.

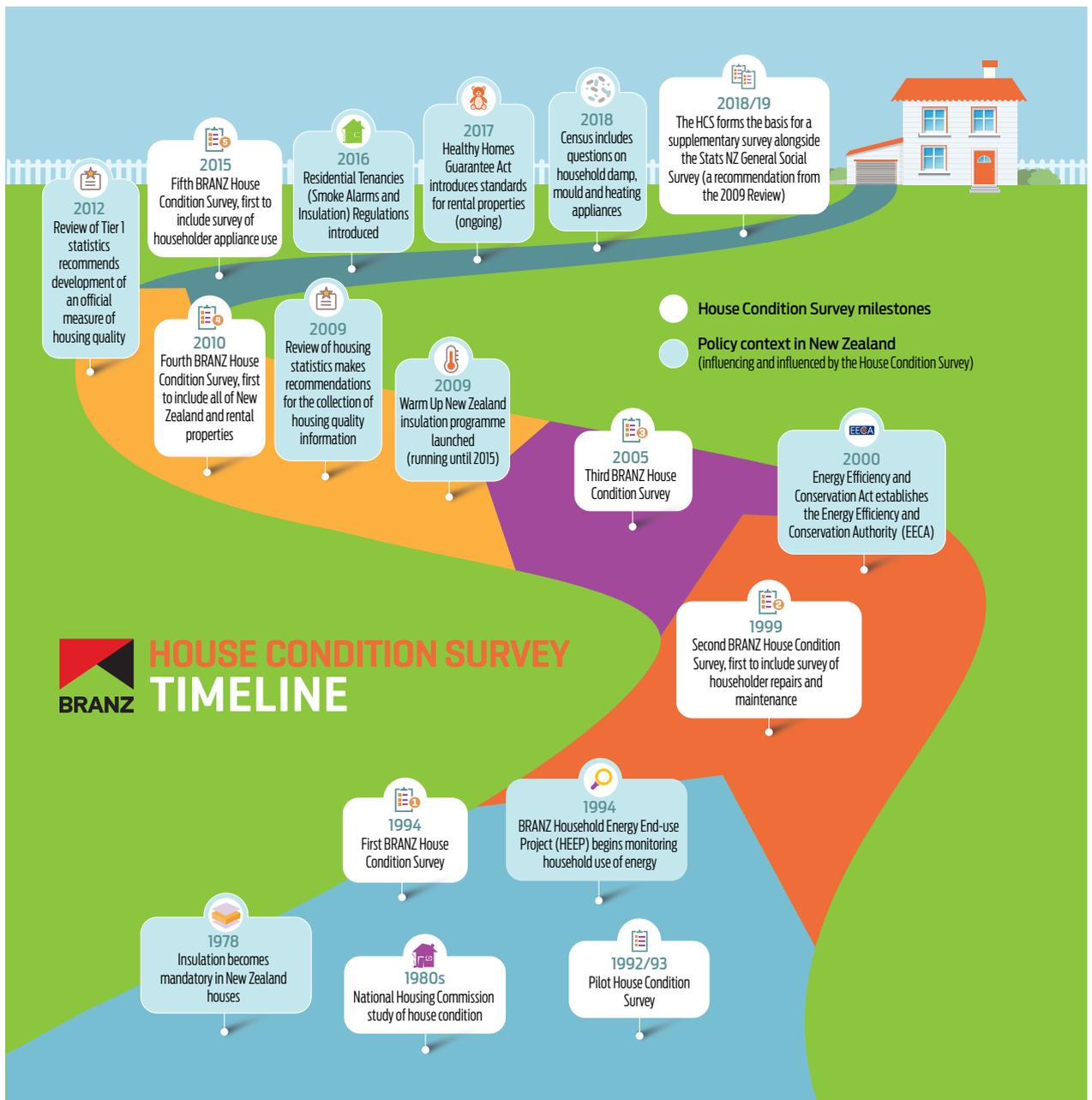


Figure 1. The House Condition Survey timeline.

Table 1. Condition rating scale.

| Condition rating | Description   |
|------------------|---|
| Serious – 1      | Health and safety implications; needs immediate attention |
| Poor – 2         | Needs attention within the next 3 months                  |
| Moderate – 3     | Will need attention within the next 2 years               |
| Good – 4         | Very few defects; near-new condition                      |
| Excellent – 5    | No defects; as-new condition                              |

**3.0.5** In every survey, interior features have rated slightly higher than exterior features. This may be because exterior features are exposed to more possible defects, and these defects may be more serious, more expensive or more difficult to address. Householders in the 2015 survey who carried out maintenance worked more often on the interior of their homes than the exterior.

**3.0.6** The more recent surveys have asked the house owners/occupants to assess the condition of the houses they live in. Each time this question has been asked, for both the rental and owner-occupied properties, the owners/occupants perceive their home to be in significantly better condition than the BRANZ assessor ratings [Figure 2].

## 4 COMMON DEFECTS

**4.0.1** Many of the same common defects have remained over time [Table 2]. Some, such as defects in interior paintwork or linings, are relatively minor in importance in terms of the performance of the building or the wellbeing of its occupants. In every survey, around 40% of houses were recorded as having blemishes, discolouration or other minor damage to interior linings.

**4.0.2** Exterior paintwork, in contrast, contributes to the weathertightness of the house, so its condition is of greater importance. In each of the surveys, more than a third of all houses surveyed had some level of exterior wall, window and/or door paint deterioration.

**4.0.3** The most common defect over 25 years was the lack of effective seismic restraints on hot water cylinders, although its prevalence has fallen significantly. In 1999, for example, the defect was found in 61% of houses, but this had fallen to 26% by 2015.

**4.0.4** The building element in worst condition in the first surveys was subfloor ventilation, with vents typically inadequate or blocked and 75% assessed as in serious or poor condition.

**4.0.5** The inclusion of rental houses in the 2010 and 2015 surveys allowed comparisons to be made. Some components in owner-occupied houses are in better condition than those in rentals, while with other components, the opposite is true:

- Windows and roof claddings were far more likely to be in poor or serious condition in rentals than owner-occupied houses.
- Rental houses were almost twice as likely to have foundations in poor or serious condition than owner-occupied houses.
- Owner-occupied houses were more than twice as likely to have blocked subfloor vents than rentals and nearly twice as likely to have decks in poor or serious condition.

## 5 HEATING, WATER HEATING, VENTILATION AND INSULATION

**5.0.1** The surveys from 1999 onwards provide data on changes around heating and ventilation in New Zealand owner-occupied houses.

**5.0.2** There are varying differences between owner-occupied and rental houses in recent years. More details can be found in Bulletin 619 *House Condition Survey 2015* and study reports SR370 *BRANZ 2015 House Condition Survey: Comparison of house condition by tenure* [2017] and SR372 *Warm, dry, healthy?: Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses* [2017].

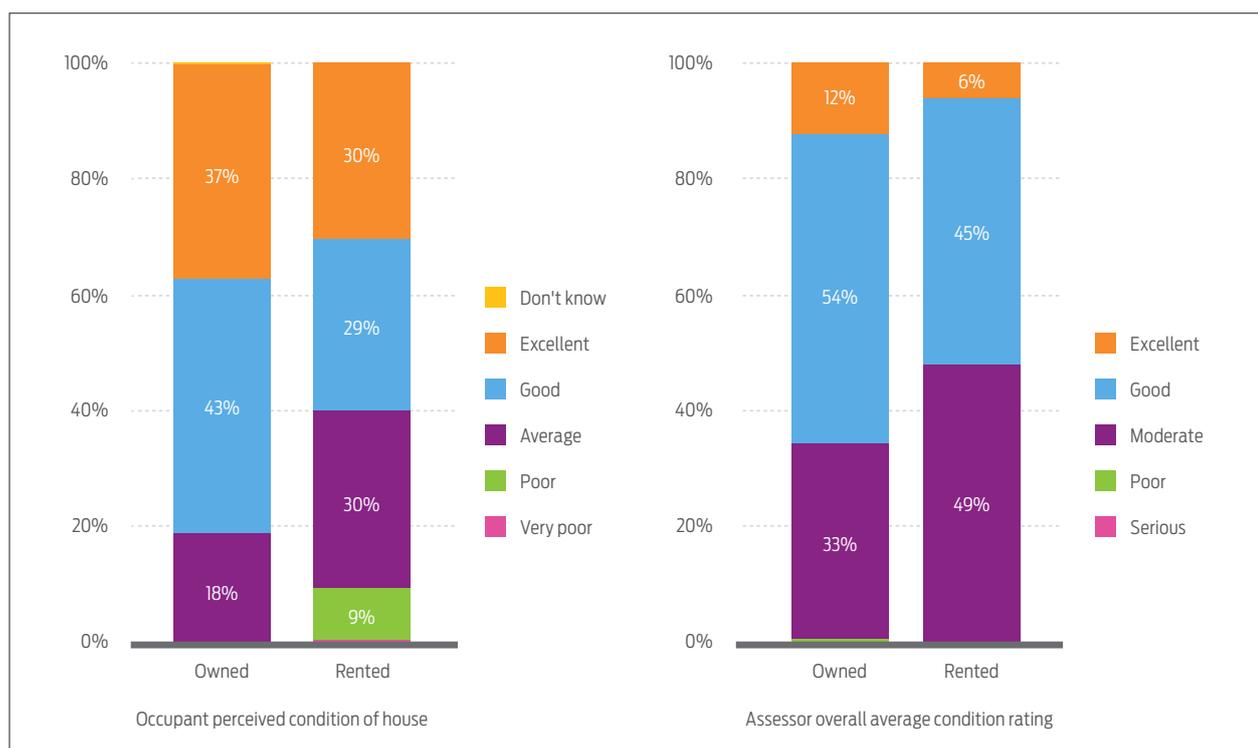


Figure 2. Occupant and assessor ratings of overall house condition.

Table 2. Common defects [or components in serious/poor condition] in each survey.

| Survey year | Common interior defects   | Common exterior defects   |
|-------------|---|---|
| 1994        | <ul style="list-style-type: none"> <li>No restraint on hot water cylinder</li> <li>No restraint on roof space header tank</li> <li>Inadequate/missing roof underlay</li> <li>Steam venting into roof space</li> <li>Inadequate thermal insulation</li> <li>Bathroom lining decay due to moisture penetration</li> </ul> | <ul style="list-style-type: none"> <li>Inadequate/blocked subfloor vents</li> <li>Inadequate subfloor fasteners</li> <li>Inadequate ground clearance to cladding</li> <li>Rust in roof steel tile/sheets/interior gutters</li> <li>Loss of chip on roof tiles</li> <li>Missing timber weatherboards, timber decay/checking</li> <li>Paint deterioration</li> <li>Decay in timber window frames</li> </ul> |
| 2000        | <ul style="list-style-type: none"> <li>No restraint on hot water cylinder</li> <li>No restraint on roof space header tank</li> <li>Inadequate/missing roof underlay</li> <li>Steam venting into roof space</li> <li>Laundry linings in poor condition</li> </ul>  | <ul style="list-style-type: none"> <li>Inadequate/blocked subfloor vents</li> <li>Inadequate subfloor fasteners</li> <li>Inadequate ground clearance to cladding</li> <li>Rust in roof steel tile/sheets/interior gutters</li> <li>Loss of chip on roof tiles</li> <li>Missing timber weatherboards, timber decay/checking</li> <li>Paint deterioration</li> <li>Decay in timber window frames</li> </ul> |
| 2005        | <ul style="list-style-type: none"> <li>No restraint on hot water cylinder</li> <li>No restraint on roof space header tank</li> <li>Poor ventilation of bathrooms and kitchens</li> <li>Laundry linings in poor condition</li> </ul>   | <ul style="list-style-type: none"> <li>Poor subfloor ventilation</li> <li>Inadequate clearance of wall claddings from the ground</li> <li>Poor or missing subfloor fasteners</li> </ul>   |
| 2010        | <ul style="list-style-type: none"> <li>Lack of earthquake restraints on hot water cylinder</li> <li>Linings in bathroom and laundry in poor condition</li> <li>Kitchen and bathroom fittings in poor condition</li> </ul>   | <ul style="list-style-type: none"> <li>Poor subfloor ventilation</li> <li>Windows and doors in poor condition</li> <li>Roof cladding in poor/serious condition in rental houses</li> <li>Poor or missing subfloor fasteners</li> <li>Inadequate clearance of wall claddings from the ground</li> <li>Inadequate deck barriers.</li> </ul>   |
| 2015        | <ul style="list-style-type: none"> <li>Bathroom fittings in poor condition</li> <li>Laundry linings in poor condition</li> <li>Kitchen joinery in poor condition in rental houses</li> <li>Kitchen linings in poor condition</li> </ul>   | <ul style="list-style-type: none"> <li>Windows fasteners in poor condition</li> <li>Subfloor fasteners in poor condition</li> <li>Subfloor vents blocked</li> <li>Decks in poor condition</li> <li>External doors in poor condition</li> </ul>  |

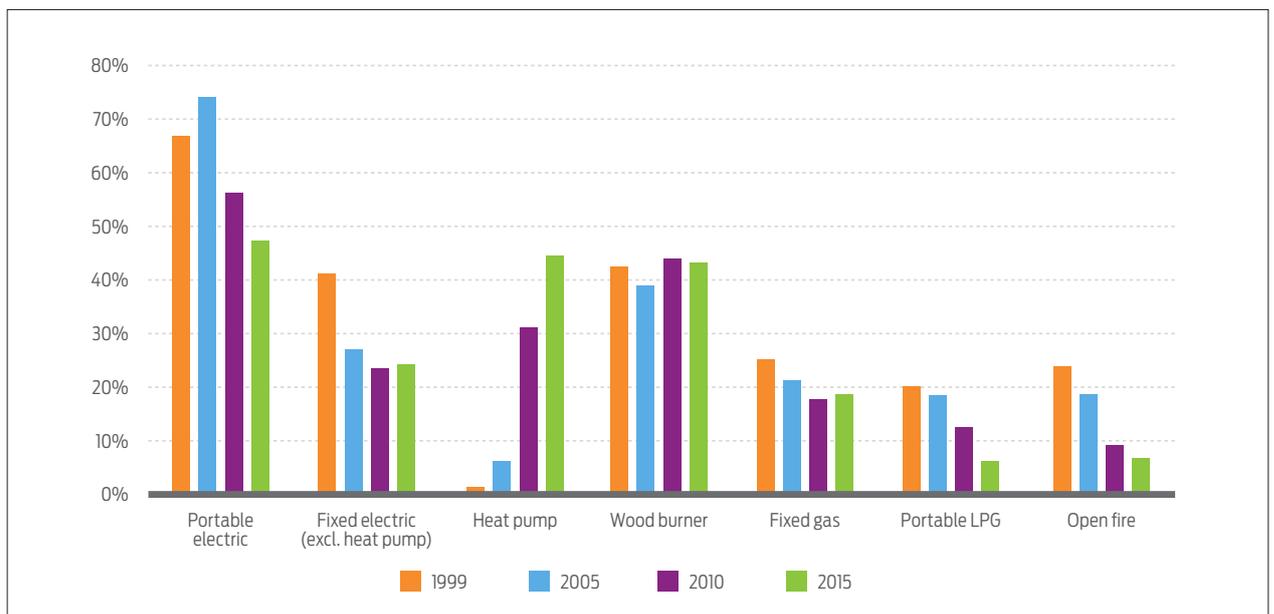


Figure 3. Types of heater in owner-occupied houses, 1999-2015.

## 5.1 HEATING

**5.1.1** Looking at space heating, the number of wood burners was relatively unchanged over 15 years, being found in around 43% of houses [Figure 3]. Beyond that, there were significant changes:

- The number of houses with open fires has fallen from 24% to 6%.
- The number of houses with portable LPG heaters has fallen from 20% to 6%.
- The number of houses with portable electric heaters has fallen from 67% to 47%.
- Heat pumps have gone from being in virtually no houses in 1999 to being in 46% of owner-occupied homes in 2015.

**5.1.2** More houses today have a heater in the main bathroom. In 1999, 48% had bathroom heating, but by 2015, 60% had.

## 5.2 WATER HEATING

**5.2.1** The proportion of houses with electric hot water systems – around 80% – has changed little from 1999 to 2015. Most of the remaining 20% use gas for hot water, and here there has been a noticeable change. In 1999, 24% of gas water heating systems were instantaneous, but this had grown to 65% by 2015.

**5.2.2** There is a small but growing proportion of houses that use solar energy alone or in combination with back-up [gas or electricity] for water heating.

## 5.3 VENTILATION

**5.3.1** Mechanical ventilation in bathrooms is increasingly common. In 1999, one-third of owner-

occupied houses had mechanical ventilation in the main bathroom [with just 14% venting to the outside]. By 2015, this had increased to 56% of houses surveyed, with 49% venting to the outside.

**5.3.2** Surprisingly, there was not a similar jump in the use of mechanical ventilation [rangehoods] in kitchens. Around 50% of houses had mechanical ventilation in the kitchen venting to the outside, changing very little from year to year.

## 5.4 INSULATION

**5.4.1** For ceiling insulation, EECA recommends a minimum depth of 120 mm across at least 80% of the accessible roof space. Just 2% of houses in 1999 had insulation thicker than 100 mm, but this had risen to 53% by 2015.

**5.4.2** A particularly large increase in insulation was recorded between 2010 and 2015 [Figure 4]. Part of the explanation for this may be the government-funded Warm Up New Zealand programme. This scheme, which ran from 2009 to 2016, provided \$465 million to install insulation in almost 300,000 homes of lower-income households.

**5.4.3** There was also a significant jump in the presence of bulk underfloor insulation between 2010 and 2015 and a corresponding fall in the proportion of accessible subfloors where no insulation was observed.

## 6 MAINTENANCE SPENDING

**6.0.1** BRANZ has estimated that the annual cost of maintenance required to keep a house in good condition is typically around 0.5–2.0% of the value of the house,

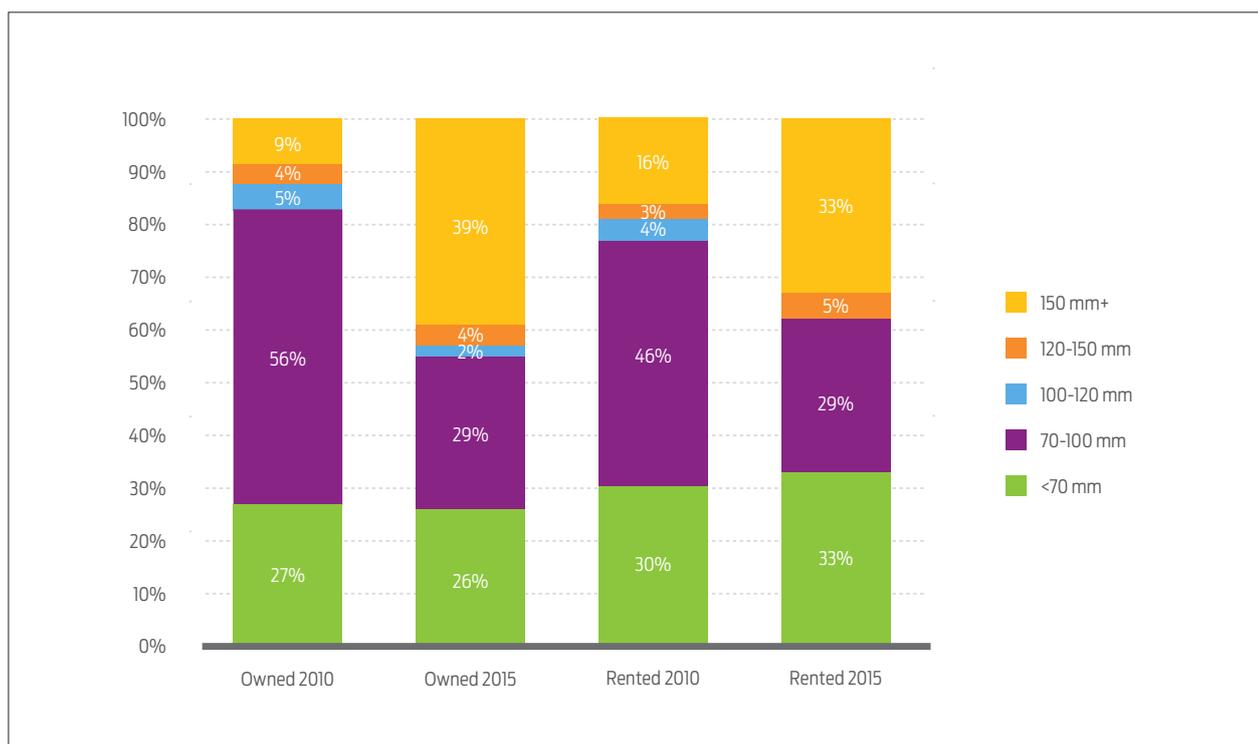


Figure 4. Depth of ceiling insulation [owned and rented houses, 2010 and 2015] where there was at least 80% coverage of the roof space.

excluding the land. In other words, for a house with a value of \$300,000, the owner should plan to spend around \$1,500–6,000 each year on maintenance and repairs.

**6.0.2** The House Condition Surveys have consistently found that owners are not spending this. In fact, the actual spend has often been around only a third of the amount required to repair the most serious defects.

**6.0.3** The 1994 study looked into the costs of delaying maintenance by estimating the cost effects of delays in remedying component defects for each condition rating. Delays of 5 years and 10 years were considered, with the probable worsening of condition that would be involved after those time periods. These costs averaged out at around \$2,500 for a 5-year delay and \$7,100 for a 10-year delay.

**6.0.4** The 2000 survey estimated \$4,160 for a 5-year delay and \$11,086 for a 10-year delay. The increase was due to higher costs for exterior items, especially wall cladding and windows.

## 7 OVERALL ASSESSMENT

**7.0.1** The surveys have measured improvements in certain specific areas – in a few instances, by considerable amounts.

**7.0.2** Many of the improvements have been in the areas of heating, insulation and ventilation – the focus of attention by many government agencies and non-government organisations in the past decade. Changes in heating and ventilation systems have been addressed above, but the two most recent surveys also allow some of the impacts of those changes to be assessed. For example, the number of houses with visible mould fell from 59% in 2010 to 49% in 2015.

**7.0.3** Looking at the 2010 and 2015 data, there are indications that house maintenance may be improving, with a clear drop in the number of both owner-occupied houses and rentals assessed as poorly maintained (Figure 5).

**7.0.4** There have been significant changes in housing policies and laws in recent years applying to both owner-occupied and rental housing. These have included changes to the New Zealand Building Code and New Zealand standards and the introduction of the healthy homes standards for rentals. It is likely that BRANZ House Condition Surveys over the next 25 years will measure some significant improvements in our housing stock.

## 8 MORE INFORMATION

### BRANZ STUDY REPORTS:

SR372 *Warm, dry, healthy? Insights from the 2015 House Condition Survey on insulation, ventilation, heating and mould in New Zealand houses* (2017)

SR370 *BRANZ 2015 House Condition Survey: Comparison of house condition by tenure* (2017)

These can be downloaded from [www.branz.co.nz/study\\_reports](http://www.branz.co.nz/study_reports).

### BRANZ BULLETINS

BU619 *House Condition Survey 2015*

### BRANZ WEBSITES

[www.branz.co.nz/hcs](http://www.branz.co.nz/hcs)

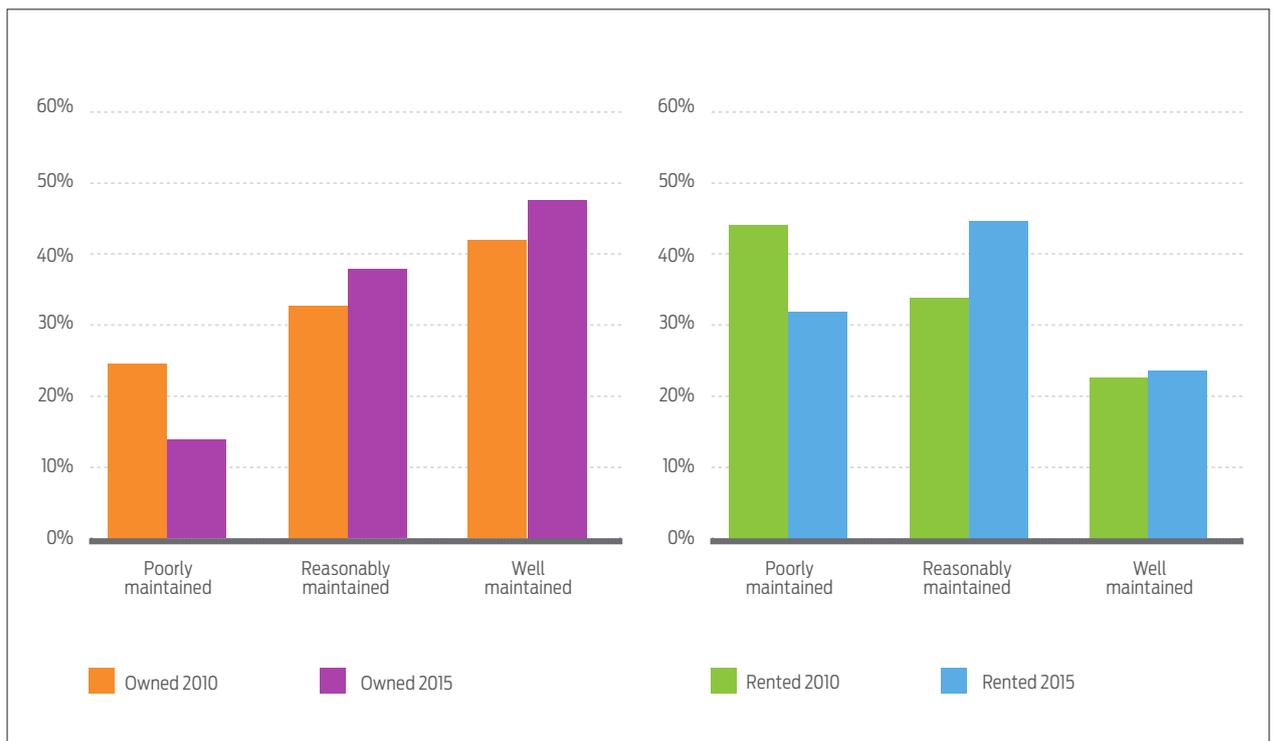


Figure 5. Changes in overall assessed level of maintenance between 2010 and 2015.



## INSPIRING THE INDUSTRY TO PROVIDE BETTER BUILDINGS FOR NEW ZEALANDERS

### BRANZ ADVISORY HELP LINES

FOR THE BUILDING INDUSTRY

**0800 80 80 85**

FOR THE HOME OWNER AND PUBLIC ENQUIRIES

**0900 5 90 90**

Calls cost \$1.99 per minute plus GST. Children please ask your parents first.

 **BRANZ Find** [www.branzfind.co.nz](http://www.branzfind.co.nz)

HEAD OFFICE AND RESEARCH STATION

1222 Moonshine Road, Judgeford, Porirua, New Zealand

Private Bag 50 908, Porirua 5240, New Zealand

Telephone 04 237 1170 - Fax 04 237 1171

[www.branz.nz](http://www.branz.nz)

Standards referred to in this publication can be purchased from Standards New Zealand by phone 0800 782 632 or by visiting the website: [www.standards.co.nz](http://www.standards.co.nz).

Please note, BRANZ books or bulletins mentioned in this publication may be withdrawn at any time. For more information and an up-to-date list, visit BRANZ Shop online: [www.branz.nz](http://www.branz.nz) or phone BRANZ 0800 80 80 85, press 2.

Disclaimer: The information contained within this publication is of a general nature only. BRANZ does not accept any responsibility or liability for any direct, indirect, incidental, consequential, special, exemplary or punitive damage, or for any loss of profit, income or any intangible losses, or any claims, costs, expenses, or damage, whether in contract, tort (including negligence), equality or otherwise, arising directly or indirectly from or connected with your use of this publication, or your reliance on information contained in this publication.

ISSN 1178-4725 (Print) 2537-7310 (Online)

Copyright © BRANZ 2019. No part of this publication may be photocopied or otherwise reproduced without the prior permission in writing from BRANZ.

