



HOUSE CONDITION SURVEY 2015

February 2018

BRANZ house condition surveys provide an independent study of the physical characteristics and condition of New Zealand's housing stock. This bulletin describes findings of the 2015 survey.

The results show that, on average, the rental housing stock is in poorer condition than owner-occupied houses.

1.0 INTRODUCTION

1.0.1 BRANZ has conducted a house condition survey approximately every 5 years since 1994. This bulletin describes the findings of the 2015 survey.

1.0.2 From September 2015 to June 2016, 560 houses were surveyed throughout New Zealand. The survey sampling frame was designed to be broadly representative of the national housing stock. It included owner-occupied and rental housing but did not include apartments.

1.0.3 The survey comprised an on-site assessment by a trained surveyor, a telephone interview with the occupant and a questionnaire on appliance use filled out by the occupant.

1.0.4 The on-site assessment examined all areas of the house and some features external to the property (Figure 1), looking at the condition of up to 49 components in those areas. It was not a comprehensive examination of weathertightness or structural issues, but it did record the presence of defects and general state of repair and maintenance.

1.0.5 The condition ratings given were:

- serious health and safety implications; needs immediate attention
- poor needs attention within 3 months
- moderate will need attention within the next 2 years
- good very few defects; near-new condition
- excellent no defects; as-new condition.

1.0.6 Rental housing stock was typically in a worse condition than owner-occupied houses (Figure 2). This was evident in the assessment of both interior and exterior property features.

1.0.7 With regards to maintenance, rental properties were more than twice as likely overall to be rated by the assessor

as poorly maintained compared to owner-occupied houses (32% compared to 14%). Rented houses were only half as likely to be assessed as well maintained (Figure 3).

1.0.8 Rental properties were twice as likely as owneroccupied houses to smell damp (12% compared to 6%) and nearly three times as likely to feel damp (31% compared to 11%). Mould was visible somewhere in the home in nearly half (49%) of all properties surveyed.

1.0.9 More information about BRANZ house condition surveys and findings can be found in the BRANZ study reports and *Build* articles listed at the end of this bulletin.

2.0 INSULATION

2.0.1 New Zealand studies have shown that thermal insulation delivers improved comfort and health for house occupants and/or reduced energy bills.

2.0.2 Just under two-fifths of the houses (39%) had at least 120 mm insulation covering at least 80% of the accessible roof space area. 120 mm is the minimum recommended by the government's home insulation retrofit programme and the Energy Efficiency and Conservation Authority (EECA) (Figure 4).

2.0.3 Damaged or poorly fitted insulation can have a substantial impact on its efficacy in reducing heat loss. Around half of houses had at least one defect with insulation in the roof space that could reduce its effectiveness. Defects included gaps in insulation (31%) and insulation settling (22%), not fitted properly (16%) or displaced (11%).

2.0.4 Two-thirds of houses had a subfloor space. Of these, around one-fifth (19%) had less than 80% insulation coverage of the floor space.

2.0.5 Overall, the survey suggests that around 47% of houses (740,000 dwellings) could benefit from



Figure 1. Areas of houses examined in the on-site assessment.



Figure 2. Proportion of owner-occupied and rental properties with interior components in poor or serious condition.

additional insulation in the roof space and 19% (290,000 dwellings) could benefit from additional insulation of the subfloor.

2.0.6 Combined, this suggests that over half the housing stock (53% or 830,000 houses) could benefit from retrofitted insulation in the roof space and/or subfloor.

2.1 INSULATION IN RENTAL PROPERTIES

2.1.1 There was little difference overall in ceiling insulation levels between owned and rented houses,



Figure 3. Assessed level of maintenance of owner-occupied versus rented houses.

although a higher proportion of rentals had no insulation in the roof space (6% versus 2%).

2.1.2 New requirements for ceiling and underfloor insulation in rental properties must be met by 1 July 2019. The requirements are specified in R-values by climate zone. As a rule of thumb for existing insulation in the roof space, guidance suggests a thickness of greater than 70 mm is required to comply. Areas of ceiling insulation less than 70 mm thick will require upgrading.

2.1.3 The survey indicates that 63% of rental houses have at least 70 mm insulation covering at least 80% of the roof space. However, 23% had less than 70 mm and/ or insufficient coverage (less than 80% of the accessible area). The remainder (14%) are unknown as the roof space was not accessible.

2.1.4 Some of the rental properties with at least 70 mm insulation in the roof space may still require upgrading if the insulation is not in adequate condition.

2.1.5 For subfloors, insulation must cover all accessible areas below habitable spaces and must be in reasonable condition. Where existing insulation is damaged, degraded, missing or incomplete, new underfloor insulation must be installed to an R-value of at least R1.3.

2.1.6 Overall, 22% of rental properties surveyed had foil insulation in the subfloor. This is accepted under the Residential Tenancies Act requirements only if it is in good condition, free from rips and tears. In many cases, the foil will be damaged and ineffective and must be replaced.

2.1.7 Around 26% of rental properties with a subfloor cavity had no insulation. A further 9% of rentals with a



Figure 4. Ceiling insulation depth relative to different requirements and proportion of houses insulated to depth based on 2015 survey data.

subfloor had some insulation but covering less than 80% of the area.

2.1.8 The survey findings suggest that around 35% of rentals (approximately 190,000 dwellings) may need to upgrade insulation in the roof space and/or subfloor to align with the new requirements. This includes:

- 11% (60,000) rentals needing subfloor insulation only
- 13% (70,000) needing roof insulation only
- 11% (60,000) needing to upgrade both roof and subfloor insulation.

3.0 WINDOWS

3.0.1 Windows typically have the lowest thermal performance of any part of the building envelope.

3.0.2 In only 10% of houses surveyed were all windows double glazed, with a further 8% having a mix of double and single glazing. Double glazing was more often present in owner-occupied houses [23%], while in 90% of rentals, all windows were single glazed.

3.0.3 Not only did rental houses have a higher proportion of single glazing, but windows in rented houses were also in a poorer condition and showed more defects. While well over half (58%) of the windows in owner-occupied houses were assessed as good or excellent, this applied to just over a third (37%) of rented houses.

3.0.4 Defects were more common with timber-framed windows, which were present in around two-fifths (42%) of properties. However, nearly three-quarters (73%) of houses had aluminium-framed windows, which typically offer the lowest thermal performance of all window frame types unless thermally broken. (The figures add to more than 100% because some houses have more than one type of window frame present.)

4.0 HEATING

4.0.1 Warmer houses are better able to deal with moisture, and a warmer, drier indoor environment reduces the likelihood of damp and mould. Living in a cold, damp, mouldy home can lead to poor health in the occupants.

4.0.2 The most common types of heating appliance in the homes were measured:

- Portable electric heaters were present in around half of all houses. Convection heaters (such as oil column heaters) were the most common type, followed by fan heaters.
- Solid fuel heaters (typically enclosed wood burners) were the second most common heating appliance in owner-occupied homes, present in nearly half (49%). They were found in 36% of rentals.
- Heat pumps were prevalent in owner-occupied houses [46%] but less common in rental properties [27%].
- Fixed electric heaters were present in 23% of homes overall – 25% in owner-occupied dwellings compared to 18% of rentals. Panel heaters were the most common type of fixed electric heating appliance (13%).
- Fixed gas heating was found in 20% of houses. This was slightly more common among owner-occupied houses (22%) than rentals (16%). The most common types of fixed gas heaters were enclosed flame effect (8%) and panel heaters (no visible flame, 7%). Around 70% of fixed gas heaters were flued.

4.0.3 Heating appliances vary greatly in efficiency and cost to run. Heat pumps, enclosed wood burners and flued gas heaters are among the more cost-effective heating appliances. These were more commonly present in owner-occupied homes [88%] than rental homes [62%].

4.0.4 One-fifth of rental properties had no fixed heating system and were reliant on portable heating only – almost three times the proportion of owner-occupied homes [7%]. Portable heaters are typically more

expensive to operate. The cost per unit (kWh) of heat released can be two to five times more expensive than that of a heat pump, for example (based on data from the Energywise website). They are also less effective for heating larger living spaces than correctly sized fixed heaters.

4.0.5 Portable unflued LPG gas heaters (often referred to as cabinet heaters) are known for their risks to occupant health. Use of unflued gas heaters in bedrooms goes against Ministry of Health advice – unflued gas heaters release dangerous gases and water vapour directly into the home.

4.0.6 The largest differences in heating appliances present in houses were around wood and LPG. Wood burners were present in 43% of owner-occupied houses compared to 28% of rentals. The pattern is reversed for portable unflued LPG heaters, which were found in 17% of rental homes but only 6% of owner-occupied dwellings.

4.1 WINTER HEATING HABITS

4.1.1 The presence of a heating appliance in the home does not necessarily mean it is used by the occupants. The householder appliance use survey asked when householders usually heated the living area[s] and occupied bedroom[s] in winter and the type of heater used most in each room.

4.1.2 Overall, 5% of households did not usually heat living areas at all in winter.

4.1.3 In 32% of households, all occupied bedrooms were usually heated at some time in winter. In 22%, some occupied bedrooms were heated in winter. In 46% of households, no occupied bedrooms were heated in winter, even where those bedrooms were occupied by children or older adults. Without any heat input in winter, it is unlikely

the indoor temperature would always achieve the World Health Organisation minimum recommended level of 18°C.

5.0 VENTILATION AND MOISTURE CONTROL

5.0.1 Ventilation is important to remove excess moisture and pollutants such as carbon dioxide from the air inside a house and to replace it with dry, fresh air.

5.0.2 Around half of bathrooms and kitchens (49%) did not have mechanical extract ventilation venting to the outside. It is important in kitchens and bathrooms to remove moist air and reduce problems of damp and mould.

5.0.3 Clothes dryers can release significant amounts of moisture into the indoor environment if not vented to the outdoors. Just under half (49%) of households had a dryer, but only a quarter of dryers (23%) were vented.

5.0.4 Temperature is also a factor in air quality and humidity because warm air can hold more moisture. Heating the bathroom can help with managing moisture and reduce the risk of condensation forming on cold surfaces. Around half of households (48%) did not have heating in the main bathroom. Where bathrooms did have heating, fan heaters and heat bulbs were the most common appliances present.

5.0.5 There was also a difference in the availability of heating in the bathroom between rented and owned houses (Figure 5). Owner-occupiers were much more likely to have heating in the main bathroom (60% versus 37%).

5.0.6 Combining the data on heating and ventilation shows that around two-fifths [42%] of main bathrooms in rental houses had neither heating nor mechanical ventilation. This compares to less than one-quarter of owner-occupied houses [24%] having neither.



Figure 5. Rental houses were less likely to have heating in the main bathroom.

5.0.7 The lack of heating and extractor fans suggests a high proportion of householders in rental houses have limited means for controlling moisture levels in the bathroom. Therefore, the bathroom may be more susceptible to damp and mould.

5.0.8 Looking to other types of air treatment systems such as those that draw air from the roof space into the house, a big difference between owner-occupied and rental houses is revealed. 21% of owner-occupied houses have these systems compared to just 2% of rentals.

6.0 MOULD AND DAMP

6.0.1 The survey included three different assessments of mould and damp made as part of the physical house inspection, which were:

- the degree to which the house felt damp or dry
- whether or not the house smelt musty
- whether mould was visible and to what extent.

6.0.2 The surveyors found 31% of rentals felt damp ('a little damp' to 'damp throughout'). This is nearly three times the proportion of owner-occupied houses (11%) (Figure 6).

6.0.3 Twice the proportion of rentals (12%) had a musty smell compared to owner-occupied houses (6%).

6.0.4 Overall, mould was visible in nearly half (49%) of all houses surveyed, breaking down to 43% of owneroccupied and 55% of rental properties (Figure 7). In most cases, this was just specks of mould. Mould was most commonly found in bathrooms.

6.0.5 The owned versus rented difference was greater when mould in bedrooms is considered – almost 30% of rentals had visible mould in bedrooms compared to 18% in owner-occupied houses.

6.0.6 Strong connections were found between the presence of mould and the presence (or absence) of insulation, heating and ventilation, and heating type:

- There was moderate to extensive mould in 33% of houses with less than 70 mm roof space insulation but in only 19% of houses with more insulation than this.
- There was moderate to extensive mould in 24% of the bathrooms with no heating or mechanical ventilation compared to only 8% of bathrooms with these features.
- Houses without any mechanical ventilation in the kitchen (32% overall) were three times as likely to have visible mould in the kitchen compared to those with mechanical ventilation.
- 30% of households using portable LPG heaters had moderate to extensive mould compared to 22% of the rest.

6.0.7 As might be expected, mould levels were higher in houses that had poorer condition ratings and were considered less well maintained overall:

- There was moderate to extensive mould in 39% of houses assessed in moderate/poor condition compared to 12% in houses rated good/excellent.
- There was moderate to extensive mould in 44% of houses assessed as poorly maintained compared to just 7% in houses assessed as well maintained.

7.0 COMPARING 2015 RESULTS WITH 2010

7.0.1 Using assessors' judgement of how well maintained properties were in 2010 and 2015 as a measure, there are indications that house maintenance may be improving across the whole housing stock (Figure 8).



Figure 6. Subjective assessment of dampness in houses.



Figure 7. Visible signs of mould anywhere in the house.



Figure 8. Changes in overall assessed level of maintenance between 2010 and 2015.

8.0 MORE INFORMATION

BRANZ STUDY REPORTS

These study reports can be downloaded from www.branz.co.nz/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)
- SR264 BRANZ 2010 House Condition Survey condition comparison by tenure (2011)
- SR240 Preliminary BRANZ 2010 House Condition Survey report (2011)
- SR142 New Zealand 2005 House Condition Survey [2005]
- SR91 New Zealand House Condition Survey (2000)
- SR62 New Zealand House Condition Survey 1994 (1995)

BUILD MAGAZINE ARTICLES

These *Build* articles can be downloaded from www.buildmagazine.org.nz:

- Are we warm, dry and healthy?, *Build* 161, 1 August 2017
- Maintenance insights, Build 160, 1 June 2017
- Bathroom habits falling short, Build 159, 1 April 2017
- Rental houses need TLC, Build 159, 1 April 2017

BRANZ WEBSITE

The following page on the BRANZ website provides more detail on the BRANZ House Condition Survey 2015:

• House Condition Survey www.branz.co.nz/hcs.



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

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