Study Report SR456 [2020]

Assessing the condition of New Zealand housing: Survey methods and findings

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Preface

This is the first report presenting findings from a national housing assessment survey undertaken in 2018/19. It presents a high-level overview of results, with national estimates and by tenure.

Where relevant and applicable, findings have been considered alongside standards or regulations. Such comparisons are for context only. The data and results are not intended to report on compliance, and any comparison should be considered a proxy, indicative outcome.

Acknowledgements

The housing assessment survey presented in this report represents a collaborative project, the successful delivery of which is thanks to:

- Stats NZ, in particular, Rosemary Goodyear, Alexandra Ferguson and Claire Bretherton for supporting the project from conception to this report – special thanks to Alexandra for undertaking the analysis of consent rates reported in section 3
- the Ministry of Business, Innovation and Employment for co-funding, which enabled the pilot to scale up significantly, and contributing to the initial survey co-design
- Land Information New Zealand and Datacom for supporting the development of the survey app
- Vicki Cowan for her role as National Survey Coordinator, overseeing the safe delivery of the survey day to day, quality assurance and supporting the co-design process and development of training material
- housing survey trainers for contributing to the development of the survey training materials and delivery of training events
- all regional coordinators and assessors for delivering the survey on the ground, safely, efficiently and effectively
- all householders who participated in the survey, without whose willingness to engage the project would not have succeeded.

We also thank the Ministry of Housing and Urban Development for providing comment during the drafting of the report.

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Abstract

In 2018/19, BRANZ undertook a national housing assessment survey (the Pilot Housing Survey (PHS)) of 832 houses throughout New Zealand. The survey involved a physical assessment of the dwelling, undertaken by a team of independent, BRANZ-trained assessors and ran from August 2018 to May 2019. Participants were recruited to the PHS through the Stats NZ 2018 General Social Survey (GSS).

BRANZ has over two decades' experience of delivering national housing assessment surveys through its House Condition Survey (HCS). There is a need to regularly review the HCS to ensure it remains relevant and useful.

The importance of robust data on housing condition was also highlighted in the Stats NZ 2009 review of housing statistics, which identified housing quality as a key information gap in New Zealand's data system.

The PHS therefore represented an opportunity for BRANZ and Stats NZ to work together to address this gap and trial a new approach to collecting data on the condition of New Zealand housing. Initially intended to be a small pilot of 50–100 houses, co-funding from MBIE resulted in the trial survey expanding to over 800 houses, enabling national estimates to be generated.

This report presents an overview of methods and findings from the PHS. Results are intended to be high level, with estimates reported at the national level and by tenure.

The PHS content was largely based on the HCS, albeit significantly reduced and refined. There is also a relatively short time lag between the last HCS (2015/16) and the PHS (2018/19). It is therefore not surprising that the results remain largely consistent between the two surveys, both in terms of percent estimates and trends. This is encouraging from a survey methodological perspective as consistency in results upholds confidence in the robustness of methods and data. For example, consistent with the 2015/16 HCS, the PHS data shows around half of dwellings could still benefit from additional roof space insulation, mechanical extract ventilation in bathrooms and

kitchens and heating in bedrooms. Results from the PHS also show the gap between owned homes and rentals in terms of overall condition, and presence of visible mould remains.

However, some findings show indications of change, despite the short time between surveys. For example, there was no significant difference in insulation levels between the owned and rented stock and heat pumps had increased in prevalence in the latter. Both these findings could be indicative of the positive impact of new regulations and standards for tenanted dwellings.

In addition to providing a new, accessible data source (the PHS is available in the Stats NZ Data Lab, linked to the GSS), the pilot aspect of this project has also provided significant learning. The use of digital survey tools (apps) offered efficiencies and robustness in data collection and survey management. The partnership with Stats NZ and MBIE in co-designing and delivering the project also added significant value. This learning is already being applied in other BRANZ research and will help inform future housing survey work.

Keywords

Housing condition, housing assessment survey, pilot.

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1. Introduction

1.1 About the survey

The Pilot Housing Survey (PHS) involved a physical assessment of 832 houses throughout New Zealand. The survey was undertaken by a team of independent, BRANZ-trained assessors and ran from August 2018 to May 2019. Participants were recruited to the PHS through the Stats NZ 2018 General Social Survey (GSS).

1.2 Background

The PHS represented a partnership between BRANZ and Stats NZ to trial a new approach to collecting robust data on the condition of our housing stock.

BRANZ has over two decades' experience of delivering national housing assessment surveys through its House Condition Survey (HCS).[1] The HCS has been undertaken roughly every 5 years since 1994, with the most recent completed in 2015/16. The HCS has evolved over the years to reflect changes in both the housing stock and data needs. Changes have included an expansion of content (information recorded in the survey) and scope/scale (to include nationwide coverage and rental houses).

There is a need to regularly review the HCS to consider what data is being collected, how and why to ensure gaps and inefficiencies are addressed and it remains relevant and useful.

1.2.1 Need for robust data on housing condition

The importance of robust data on housing condition was also highlighted in a review of housing statistics, which identified housing quality as a key gap in New Zealand's data system (Stats NZ, 2009). Following this review and the subsequent 2012 review of Tier 1 statistics (Stats NZ, 2012), Cabinet mandated the Ministry of Business, Innovation and Employment (MBIE), in conjunction with Stats NZ, to develop a Tier 1 statistic on housing quality in New Zealand.[2]

A scoping paper by Stats NZ in 2015 presented options for addressing the need for more robust data on housing quality and contributing to the development of a Tier 1 statistic (Stats NZ, 2015). An outcome of this was the development of new content for the 2018 GSS and 2018 Census. The latter included new questions on housing (basic amenities, damp, mould and heating), while the former deployed a new supplement of questions on housing and the physical environment.

In recognition of and to support the identified data need, in 2018 BRANZ undertook to review its HCS and trial a new approach to collecting objective data on the condition of New Zealand housing. This trial included developing new data collection and survey management tools (a mobile and web-based application) and partnering with Stats NZ to utilise its 2018 GSS as a means to recruit participants.

[1] www.branz.co.nz/hcs

[2] Tier 1 statistics are the highest classification of statistic in New Zealand, described as "the most important statistics, essential to understand how well New Zealand is performing … essential to critical decision-making … of high public interest … meet expectations of impartiality and statistical quality … require long-term data continuity…" (Stats NZ, 2012).

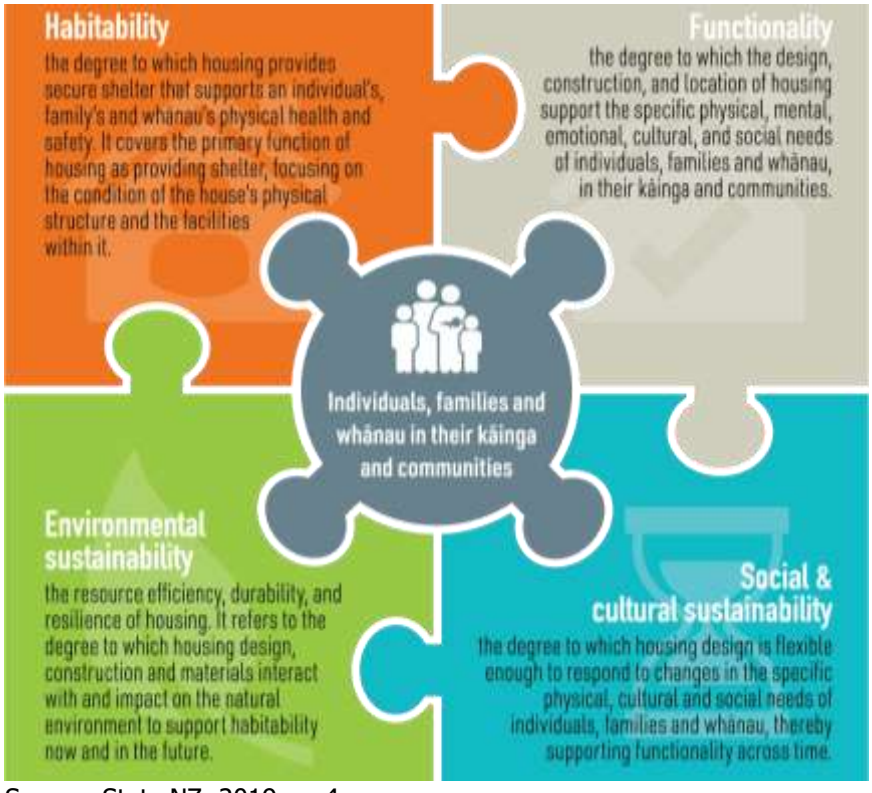
Initially intended as a small pilot survey of 50–100 houses, the team at MBIE leading the housing quality project at the time saw this as an opportunity to source data to support its work. Co-funding from MBIE therefore enabled the pilot to extend in scale to a target of 800 houses. This was achieved, with 832 surveys completed, enabling national estimates to be generated from the data.

1.3 Developing survey content

The BRANZ 2015 HCS was the starting point for developing content for the PHS. The HCS is very detailed, collecting information on materials, defects and condition for all components of a dwelling, inside and out. It typically takes around 2–3 hours on site to record the data. To reduce participant burden and test the extent of information that could be robustly recorded within a limited timeframe, the PHS was designed to take around 1 hour on average. This meant significantly reducing the HCS content and reviewing some data collection processes to develop a survey that could be completed within this timeframe. Priorities for survey content were driven by data and policy needs at the time and identified in collaboration with MBIE (with input from Housing, Building and Urban Systems; Building, Resources and Markets; Tenancy Services; Building Systems Performance), Stats NZ, EECA, BRANZ staff and previous HCS assessors/trainers.

1.3.1 Housing quality

As noted above, housing quality had been identified as a gap in New Zealand's data system. As an initial step to help address this, a co-design project led by Stats NZ working with MBIE and BRANZ was launched in 2018. The aim was to develop a conceptual framework, outlining the components, related definitions and scope of the concept of housing quality (Figure 1).



Source: Stats NZ, 2019, p. 4.

Figure 1. Conceptual framework for housing quality.

While the development of the framework was still under way at the time of designing the PHS, survey content was informed and directed by the emerging framework component of housing habitability.

Originally identified as a dimension of housing adequacy in the 2009 review of housing statistics, housing habitability was later adopted as one of the four dimensions of the conceptual framework for housing quality. It is this dimension that the PHS content sought to provide some data on: "the primary function of housing as providing shelter, focusing on the condition of the house's physical structure and the facilities within it" (Stats NZ, 2019, p. 5).

1.3.2 Healthy homes

The Healthy Homes Guarantee Act 2017 enabled standards to be introduced to help make rental homes warmer and drier.

At the time of designing content for the PHS, the new healthy housing standards (HHS) were also in development. BRANZ worked closely with the HHS team at MBIE[3] to inform and shape survey questions, recognising the potential opportunity the PHS presented to collect baseline data.

Appendix A provides an overview of the PHS content.

1.4 Data sharing

One of the original objectives of BRANZ's review of its housing survey methods was to improve data access. The HCS has not typically been shared (at the microdata level) with external organisations. As part of the PHS project, BRANZ worked with Stats NZ to make the dataset available to researchers in a secure environment through its Data Lab and the Integrated Data Infrastructure (IDI). The linked GSS-PHS dataset is available as a stand-alone dataset in the Data Lab. At the time of writing (November 2020), an application is in progress to lodge it in the IDI.

1.5 Report content and next steps

This report presents an overview of methods and findings from the PHS. Results are intended to be high level, with estimates reported at the national level and by tenure. Where dwellings are referred to as rental or rented, this means all housing that is not owner-occupied. All analysis uses the complete, weighted PHS dataset, unless otherwise stated. Sample errors are shown at 95% confidence intervals. Where appropriate and for context, comparisons have been made with relevant standards and regulations (such as the HHS or New Zealand Building Code (NZBC)) and/or results from the 2015/16 HCS.[4]

The results presented in this report provide a snapshot of results from the PHS dataset only. As noted above, a linked GSS-PHS dataset is available in the Stats NZ Data Lab. Further analysis will be undertaken to explore housing condition results by socio-demographic variables and self-reported indicators of wellbeing from the GSS.

[3] With the creation of the new Ministry of Housing and Urban Development (HUD) in 2018, responsibility for the HHS and housing quality project was later transferred from MBIE to HUD.
[4] For further information and results from the HCS, see www.branz.co.nz/hcs.

2. Method: survey delivery

2.1 Sampling approach

Households were recruited to the PHS through the 2018 GSS. The GSS is a national survey conducted every 2 years by Stats NZ. Interviewing around 8,000 people nationwide, it provides key information on the wellbeing of New Zealanders on a range of social and economic outcomes.

In addition, the 2018 GSS included a supplement on housing and the physical environment. This supplement included new content on housing suitability, healthy housing behaviours, home maintenance, housing tenure security and mobility, access to public facilities, sustainable living behaviours and understanding of environmental sustainability issues.

Households were recruited to the PHS through the 2018 General Social Survey. This was the first time BRANZ and Stats NZ had partnered to deliver a national housing survey.

Results from the GSS and housing supplement are available on the Stats NZ website.[5]

The PHS had a target of achieving 800 housing assessments.

All 2018 GSS participants were asked if they would be willing to take part in the BRANZ housing survey. The PHS was voluntary (opt in) and incentivised with the offer of a supermarket voucher to encourage and recognise participation.

In total, approximately 46% (±1.7 percentage points) of households (weighted) agreed to their contact details being passed to BRANZ. This was consistent throughout the surveying period.

As uptake exceeded the number required to achieve the overall survey target of 800, Stats NZ drew a sample each month for transferring to BRANZ.

Monthly sample quotas were set to allow for attrition and non-contact.

The monthly sample size was guided by a monthly quota, set by BRANZ, designed to ensure the overall target of 800 housing assessments would be achieved, whilst also allowing for attrition.

A stratified random sampling approach was used, with selection weights based on NZ-Dep 2013 (tertiles) and tenure (owner-occupied/not owner-occupied), aiming to achieve a balance of each.

No regional weights were applied in the sampling, so the distribution was mainly proportional to the number of consents in each region (assuming no strong region-NZ-Dep or region-tenure correlation).

However, due to the unpredictable nature of consents, some regions experienced higher than expected uptake rates (Table 1).

[5] https://www.stats.govt.nz/information-releases/wellbeing-statistics-2018

The monthly sample size was also not consistent throughout the collection period. This was largely by design:

- June and July represented trial months to enable final testing and verification of processes.
- August was the first month of full national roll-out, with a slightly lower sample (and target) compared to latter months to enable providers to get used to the survey process and tools.
- The sample was intentionally restricted in December and January to allow for expected (and observed) lower consent rates in the holiday period.

Also as expected, particularly with a survey of this nature, there was some attrition in the sample provided to BRANZ. Appendix B providers further discussion of rates of, and reasons for, opt-outs.

Table 1 shows the final achieved (unweighted) sample count by month, region and tenure. Sample weights, derived by Stats NZ, have been applied to the final dataset to adjust for different household participation levels by tenure, NZ-Dep and region.

Table 1. Unweighted sample counts by region, month and tenure.

Region	Survey count
Auckland	122
Bay of Plenty	65
Canterbury	145
Gisborne	32
Hawke's Bay	25
Manawatu-Wanganui	92
Marlborough	9
Nelson	9
Northland	31
Otago	53
Southland	27
Taranaki	22
Tasman	14
Waikato	85
Wellington	98
West Coast	3
Total	**832**

Month (2018/19)	Survey count	Cumulative
June (2018)	6	6
July	3	9
August	65	74
September	114	188
October	136	324
November	139	463
December	56	519
January (2019)	22	541
February	84	625
March	106	731
April	81	812*
May	20	832
Total	**832**	
*target achieved		
Owner-occupied	505 (60.7%)	
Not owner-occupied	327 (39.3%)	
Total	**832**	

2.2 Survey delivery

2.2.1 Working in partnership with Stats NZ

The consenting sample selected for the PHS was transferred from Stats NZ to BRANZ each month using a secure file transfer protocol.

BRANZ was then responsible for allocating properties to contracted providers throughout the country (largely on a regional basis).

These providers contacted participants, scheduled appointments and undertook the survey. An overview of the Pilot Housing Survey delivery process is shown in Figure 2.

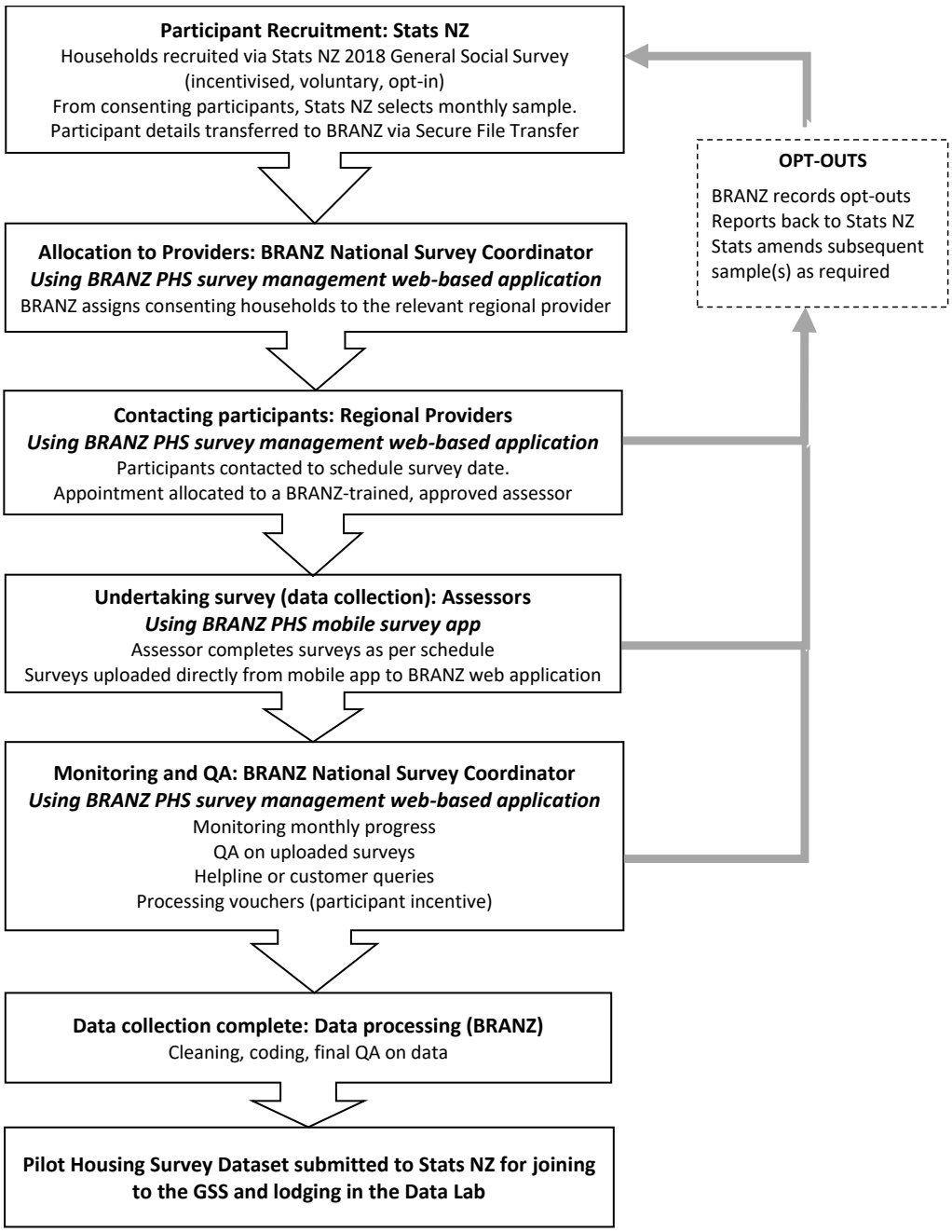


Figure 2. Overview of Pilot Housing Survey delivery process.

2.2.2 Digital survey management and data collection tools

The PHS developed new digital data collection and survey management tools not previously used in the HCS, which had typically relied on paper forms.

A bespoke web-based survey management application and mobile app were developed, utilising an existing prototype application developed by Land Information New Zealand (LINZ). The LINZ application was modified and adapted to provide functionality and content required for the PHS.

A bespoke web-based survey management tool and mobile data collection app was used in the PHS.

2.2.3 Training

Training is a critical part of delivering a robust dataset on housing condition and ensuring the safety of assessors and participants.

All providers contracted to deliver the PHS were trained by BRANZ. Training covered topics such as:

- health and safety
- ethics and code of conduct
- cultural awareness and sensitivity
- how to use the survey management and data collection tools
- how to complete the survey (condition assessment criteria, identifying different materials etc.).

Detailed manuals were developed for each role. All assessors were required to complete a 2-day training course to BRANZ's satisfaction prior to being contracted to undertake surveys (Figure 3). Training included classroom-based learning (presentations, tasks and discussion) and fieldwork, through which all assessors had to complete at least two mock housing surveys.

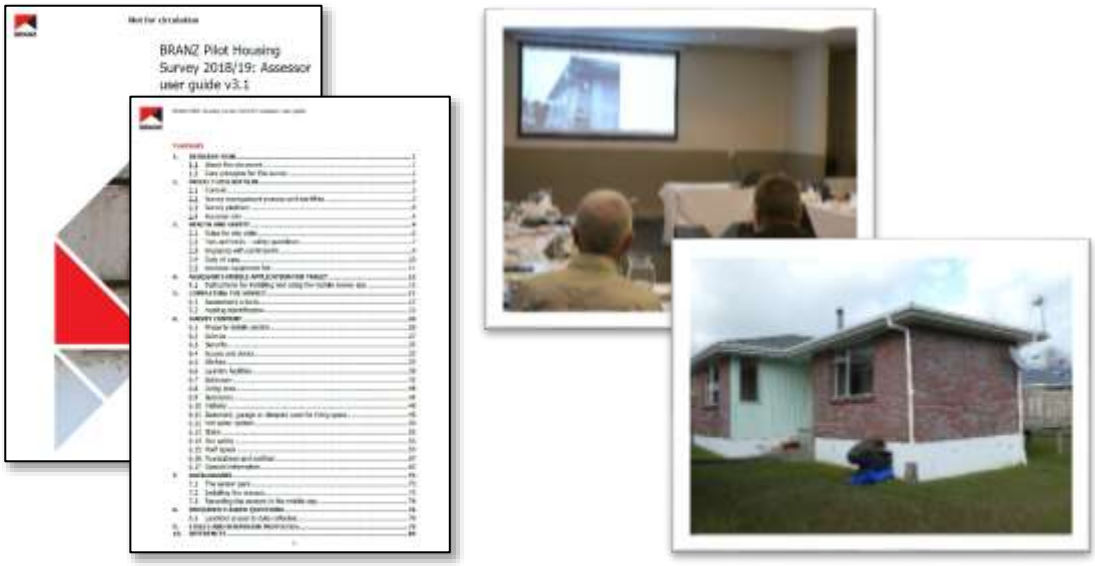


Figure 3. Training manuals were developed for the PHS, and all assessors attended a 2-day course of classroom-based learning and fieldwork.

2.2.4 Data quality assurance and sharing

A national survey coordinator was also appointed by BRANZ to oversee the day-to-day delivery of the survey. This included monitoring progress (such as ensuring participants were being contacted within the required timeframe from allocation), supporting assessors in the field (such as with data collection queries), managing the survey participant customer helpline (responding to participant queries by phone and email) and quality assurance of completed surveys. The latter was facilitated by the web-based survey application through which uploaded surveys (including dwelling photos) could be reviewed in real time.

The combined PHS-GSS linked dataset provides a rich and unique source of information on housing in New Zealand, combining independent objective assessment data with occupancy information and self-reported measures of wellbeing.

On completion of data collection, further data cleaning, coding and final quality assurance was completed by BRANZ.

The resulting PHS dataset was provided to Stats NZ and has been linked to the GSS data subset. This linked (GSS-PHS) dataset is available in the Stats NZ Data Lab. The Data Lab provides a secure and controlled environment through which researchers can access microdata.[6]

[6] See www.stats.govt.nz/integrated-data/ and www.stats.govt.nz/integrated-data/apply-to-use-microdata-for-research

3. Consent rates by subgroups

As outlined in section 2, all households in the 2018 GSS were asked if they were willing to be contacted by BRANZ about participating in the PHS. This information was recorded and is included as part of the final GSS dataset, enabling analysis of consent rates by population subgroups. Such analysis has not been possible before with the BRANZ HCS, which has typically relied on outbound calling to recruit participants (with no information recorded on those who declined). This therefore presents an opportunity to help develop understanding of the likelihood of different household types/individuals taking part in a survey of this nature. This can help inform future survey work, providing insight into household types that may be harder to reach and require different approaches to recruitment. It is also important for understanding any potential bias in the PHS that could impact the representativeness of the housing data.

The analysis presented in this section was kindly undertaken and provided by Stats NZ.

Overall rate of consent

Overall, 46% (±1.7 percentage points (pp)) of households in the GSS agreed to be contacted by BRANZ about participating in the PHS. As this represented far more households than required to achieve the survey target of 800, only a proportion were selected (as per the sampling method described in section 2.1) and passed to BRANZ. Appendix B provides more information on conversion and attrition rates.

46% of GSS households agreed to be contacted about participating in the PHS.

Consent rates amongst different household types

Analysis was undertaken by Stats NZ to explore consent rates by a range of GSS variables. This included tenure, NZ Dep, family type, household income, length of time at address, occupant perception of house condition, crowding and self-reported damp, mould and cold.

The results showed owner-occupied households were more likely to agree compared to non-owner-occupier households and the general population: 51% (±2.0 pp) of households who owned their home agreed, compared to 37% (±2.3 pp) of those who did not own their home (Figure 4). This is consistent with the experience of previous HCSs, in which recruiting non-owner-occupiers proved a challenge.

Consent rates were lower amongst non-owner-occupied households.

Households not in a family nucleus were less likely to agree, both compared to those in a family nucleus and the general population.[7] This effect remained even when examined by tenure, showing it is not just an attribute of tenanted households being more likely to live in non-family groups.

Households who considered their home in no need of repair or maintenance were less likely to agree compared to the general population and all other repair/maintenance subgroups.

[7] 'In a family nucleus' includes anyone who is part of a couple and/or with children at home.

There were also differences by crowding (although this appears mostly explained by ethnicity). There was no significant difference in the consent rates by self-reported damp, mould and cold, household income and years at address.

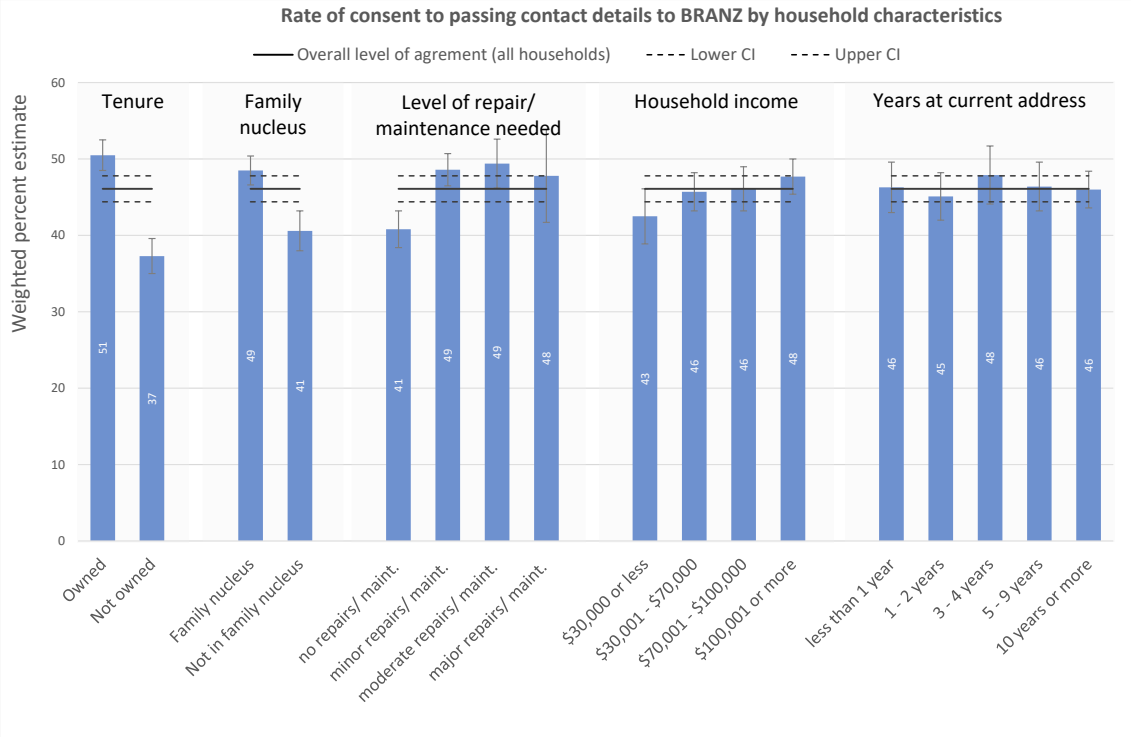


Figure 4. Rates of consent for different household subgroups.

Consent rates by respondent characteristics

Additional analysis was undertaken by Stats NZ to explore consent rates for subgroups of households where the respondent who consented to participate in the PHS was also the main GSS respondent.[8] This included analysis by: ethnicity, migrant status, generalised trust, sex, material hardship, highest qualification, labour force status, income sufficiency, and age band.

Table 2 summarises the results for variables where there was a significant difference between subgroups. This shows females, European and Māori, non-migrants, those with high general trust and those with severe material hardship were more likely to agree to be contacted by BRANZ about taking part in the PHS compared to other subcategories within their group.

Pacific, Asian and Middle Eastern, Latin American and African and migrants were less likely to agree to take part.

While these all showed within-group differences, not all were significant compared to the general population, as illustrated by Figure 5.

[8] The GSS includes a household questionnaire and personal questionnaire. One randomly selected individual in the household completes the household questionnaire.

Table 2. Characteristics of main respondent and likelihood to agree to take part.

Subgroup (main respondent)	More likely to agree to participate in the PHS	Less likely to agree to participate
Sex	Female	Male
Ethnicity	European or Māori	Pacific, Asian or Middle Eastern, Latin American and African (MELAA)
Migrant status	Born in New Zealand	Migrant
Generalised trust[9]	High (8–10) general trust	Moderate or low general trust
Material hardship[10]	Severe material hardship	Not experiencing material hardship

Table shows results where there was a significant difference at the subgroup level.

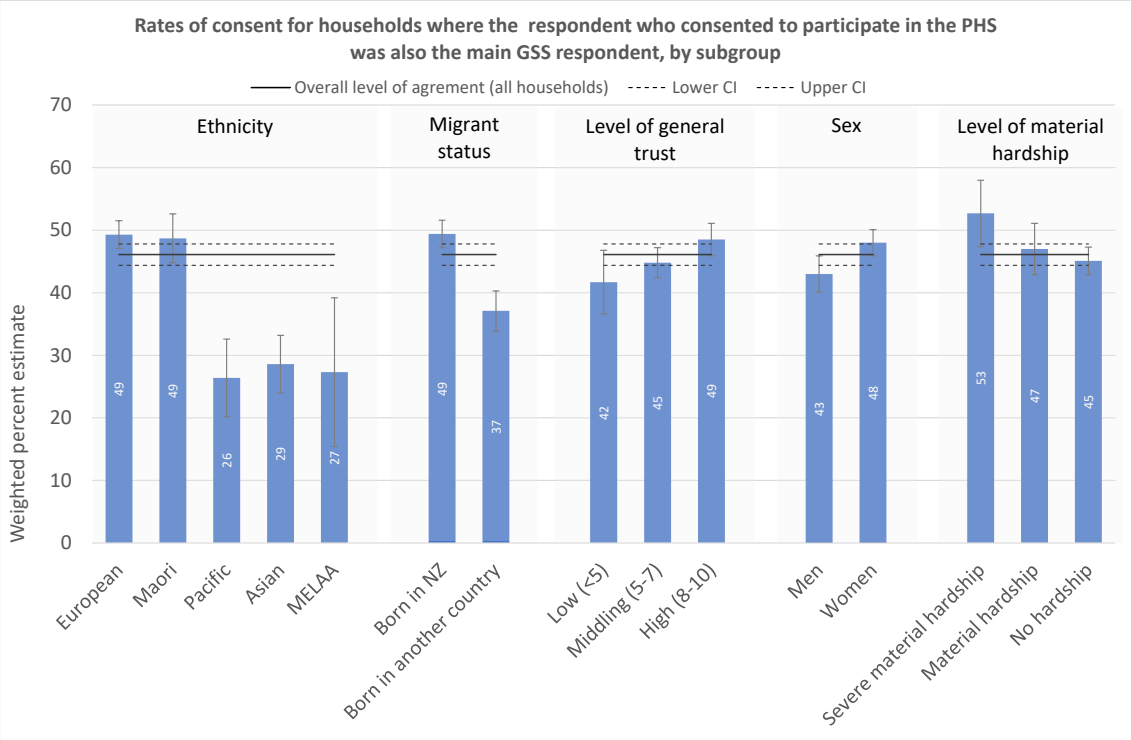


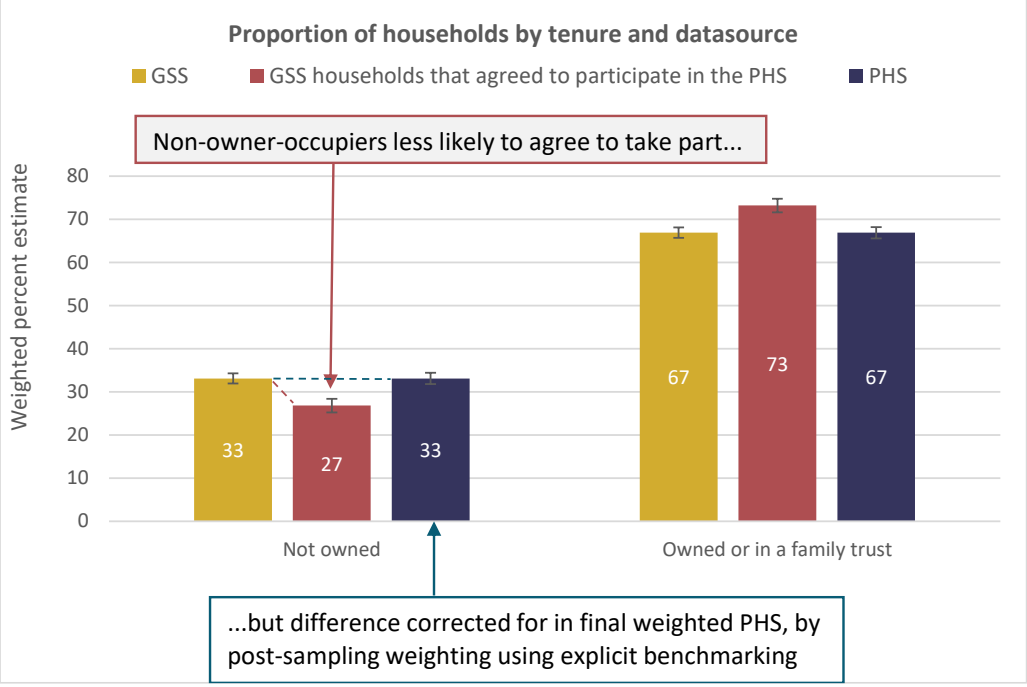
Figure 5. Rates of consent for households where the respondent who consented to participate in the PHS was also the main GSS respondent, by subgroup.

Understanding potential bias

Further analysis was undertaken to compare some key socio-demographic characteristics of the GSS compared to the final (weighted) PHS dataset (Figure 6, Figure 7 and Figure 8).

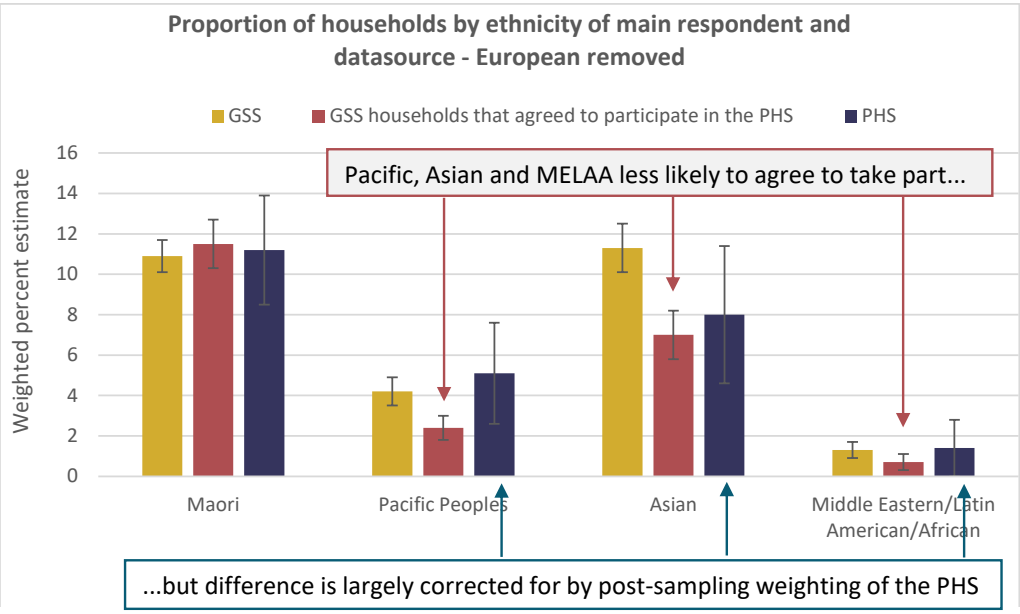
[9] The GSS asks respondents to rate their general level of trust of most people in New Zealand on a score from 1 to 10 (10 being highest).

[10] The GSS uses the material wellbeing index, as developed by the Ministry of Social Development, to ask respondents about their economising measures and financial limitations. This allows for reporting on the extent of material hardship felt by households.



Source: Stats NZ, 2020.

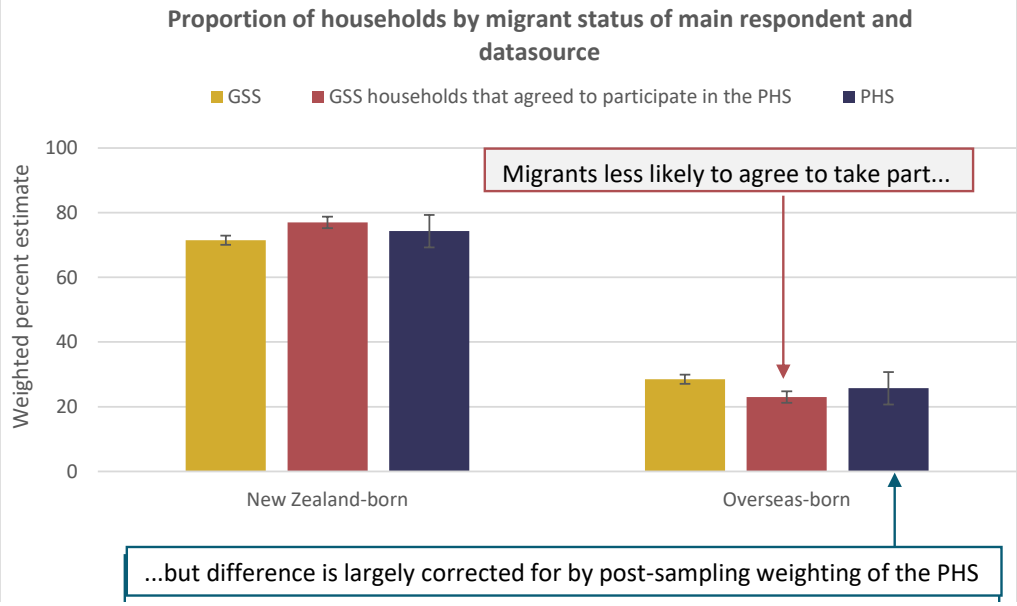
Figure 6. Tenure of GSS households that agreed to be contacted to take part in the PHS and the final PHS sample.



Note: GSS and PHS sources only include respondents who answered both the HQ and PQ questionaires. Source: Stats NZ, 2020.

Figure 7. Ethnicity of GSS households that agreed to be contacted to take part in the PHS and the final PHS sample.[11]

[11] European subgroup not shown due to scale (around 80% of respondents). As noted in the text, part of the correction in differences between the GSS sample and weighted PHS sample is down to the larger sample errors of the latter. For example, the estimate for Asian changes little between the 'agreed' and final PHS datasets, but due to the large sample errors (due to smaller sample of the PHS), the difference is no longer significant compared to the GSS.



Note: GSS and PHS sources only include respondents who answered both the HQ and PQ questionaires. Source: Stats NZ, 2020.

Figure 8. Migrant status of GSS households that agreed to be contacted to take part in the PHS and the final PHS sample.

The results show that, where differences in consent rates did exist (i.e. those described above), many have largely been corrected for by the post-sampling weights applied. Whilst part of the 'correction' is down to the larger sample errors in the PHS compared to the GSS (due to the reduced sample size in the former), the effects observed also highlight the importance of applying appropriate weights and explicit benchmarking.

4. Dwelling characteristics

Dwelling size (floor area and number of storeys) and type (stand-alone versus joined units, single-storey versus multi-storey) have implications for thermal performance (heat loss and heating requirements) and retrofit opportunities (such as accessibility of a roof space or subfloor for insulation). Before looking at some of the indicators of housing condition from the PHS, it is therefore useful to explore some of the basic differences in dwelling characteristics by tenure.

The PHS recorded information on built form (whether the dwelling was joined or stand-alone and number of storeys), typology,[12] size (approximate total floor area) and number of bedrooms.[13]

Owner-occupied dwellings were more likely to be larger, stand-alone houses.

The results show owner-occupied dwellings were more likely to be larger, stand-alone houses while rented houses were more likely to be smaller, multi-unit/joined dwellings:

Rented houses were more likely to be smaller, joined dwellings.

- Over one-third (35%) of the rented stock surveyed were joined dwellings, compared to 6% of the owner-occupier stock (Figure 9).
- Two-fifths (42%) of non-owner-occupied dwellings were small (less than 100 m^2 approximately) while one-fifth (19%) of owner-occupied dwellings were 150 m^2 or larger (Figure 10).
- A smaller footprint (floor area) was also reflected in the number of bedrooms: two-fifths (40%) of non-owner-occupied dwellings surveyed had one or two bedrooms, while a similar proportion (37%) of owner-occupied dwellings had four or more (Figure 10)).

The prevalence of smaller housing amongst the non-owner-occupied stock is consistent with findings from the latest Census, which showed a higher percentage of one-bedroom and two-bedroom houses amongst rentals.[14]

Owner-occupied dwellings were also more likely to be newer, with 26% of the sample being built post-1996, compared to 9% of non-owner-occupied dwellings. Conversely, a higher proportion of rentals occupied housing from the 1960s–1980s era (17% compared to 3% for the owner-occupied sample).

Housing typology, built form and size have implications for energy performance and energy requirements (such as space heating) and maintenance and repair.[15]

[12] Categories of typology were based on the research and analysis by Beacon Pathway, which classified the housing stock based on construction era (Ryan, Burgess & Easton, 2008).
[13] The count of bedrooms is based on the number assessed in the survey. This could differ from the total number of bedrooms – for example, if a bedroom was not accessible (occupied) at the time of the survey.
[14] Stats NZ, 2018 Census – weekly rent by household by number of bedrooms, for households in rented occupied private dwellings.
[15] For examples of maintenance requirements, see www.maintainingmyhome.org.nz, and for retrofit opportunities, see https://beaconpathway.co.nz/further-research/article/how_house_type_affects_energy_retrofits.

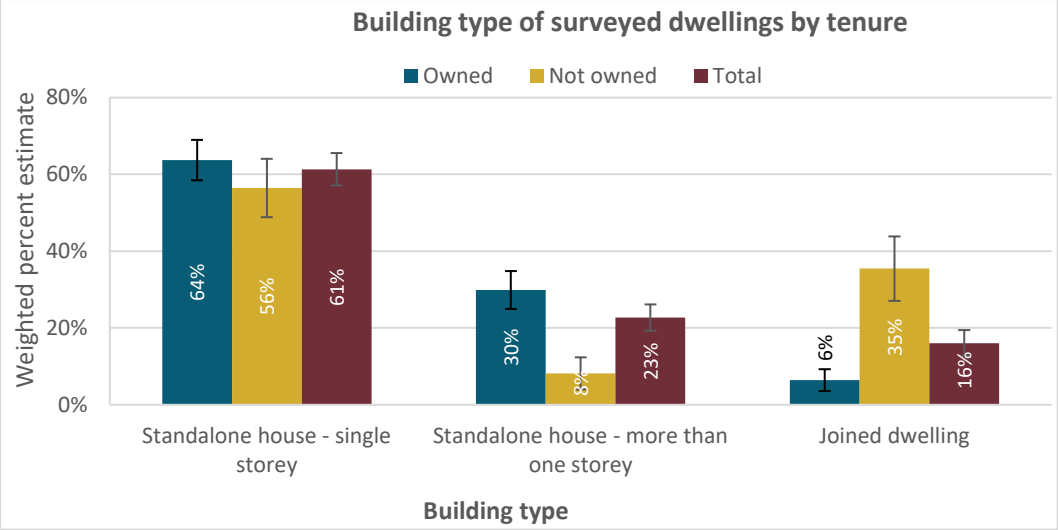
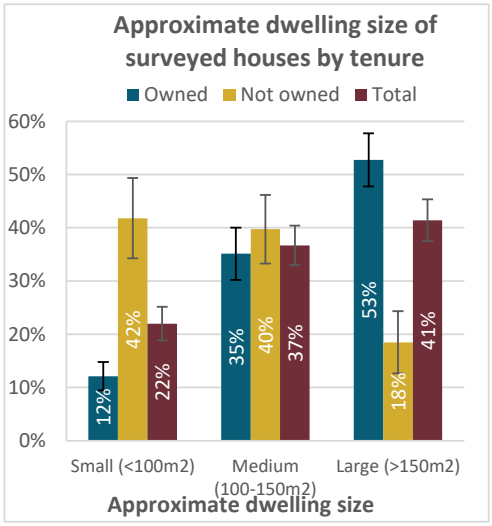


Figure 9. Dwelling type by tenure and overall.



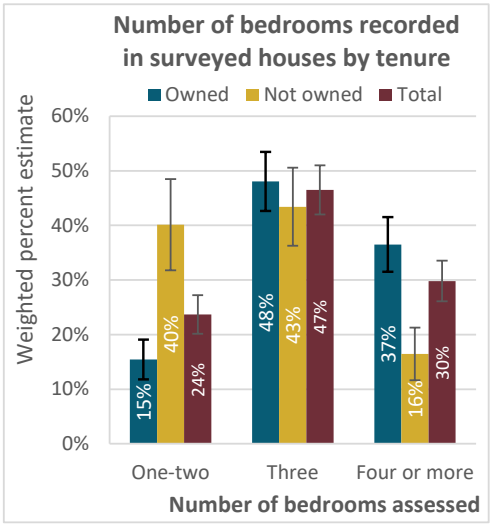


Figure 10. Approximate dwelling size (total floor area) and number of bedrooms by tenure and overall.

5. Exterior condition

5.1 Assessing condition and defects

The PHS includes an assessment of the condition and presence of defects of different dwelling features. Defects were identified from a finite list specified in the survey. The condition assessment is made based on the extent and severity of defects, using the criteria shown in Table 3.

Table 3. PHS 2018/19 condition rating assessment guide.[16]

Condition	Description and assessment criteria
Excellent ★★★★★	"As new condition" **Visually:** no signs of any damage/wear and tear **Function:** item is performing its main function **Maintenance demand/timeline:** none/none
Good ★★★★	"Good, clean condition" **Visually:** minor signs of wear and tear **Function:** item is performing its main function **Maintenance demand/timeline:** none/none
Average ★★★	"Sound and clean" **Visually:** minor marks, chips and slight deterioration/signs of wear and tear **Function:** item is currently performing its main function **Maintenance demand/timeline:** normal work/minor repairs, e.g. repaint, clean/within a year
Poor ★★	"Needs work" **Visually:** badly marked, damaged or chipped **Function:** evident this is not working as required or it is nearing the end of its expected life **Maintenance demand/timeline:** significant repair or maintenance work within 3 months
Serious (★)	"Urgent attention" **Visually:** item is either broken and needs to be repaired/replaced or item is missing and needs to be installed; check for major and obvious faults, cracks, holes, serious damage, hazards **Function:** evident this item is not working, doesn't meet legislation/regulation requirements, is not installed, is a health and safety, security or fire risk, directly impacts on weathertightness, has major damage where replacing may be less expensive than repair, has reached end of expected life, is obsolete and cannot be repaired. **Maintenance demand/timeline:** major repair/urgently needed

There are some important methodological points to note with the defects and condition assessments:

- As a list of the most common defects was specified in the survey, if none of these were selected, that does not mean the component was (necessarily) free from all defects. Rather, none of the listed issues were visible.

[16] Assessors have a duty of care when undertaking the housing assessment survey. Issues identified that could present serious or imminent risk to the occupant were communicated verbally to the occupant, with recommendation to seek expert advice.

- The condition rating is a comprehensive assessment of the overall state of repair and need for maintenance of specific dwelling features, taking account of all defects and issues affecting that component (not necessarily limited to those specified in the survey defects list).
- For multi-unit dwellings, where there was another dwelling above or below, this was recorded as such, and the subfloor/roof was not assessed.
- Condition and defects were recorded based on what the assessor could see at the time of the survey from a non-invasive inspection. For roofs, this was based on what they could see from ground level (without using a ladder or climbing onto the roof). For the subfloor and roof space, this was based on what was visible from the access hatch (without fully entering the crawl space or roof space). These approaches differ from previous HCSs, in which the assessments did include fully accessing roofs, roof spaces and subfloors. These changes were introduced to:
    - help keep survey time to within 1 hour on average
    - reduce health and safety risks
    - test the extent to which a full and robust assessment could be done within these limitations to help inform future survey work.

A different approach (from previous HCSs) to assessing roofs, roof spaces and subfloors was trialled in the PHS.

5.2 Roof materials, defects and condition

Materials used in construction have implications for maintenance and repair requirements, as different materials will be subjected to different rates of wear and tear, deterioration and defects.[17]

Painted steel was the most common roofing type of surveyed dwellings (for owned and rented), followed by coil-coated steel (more common on owner-occupied dwellings), while concrete tiles were the second most common roof type on rental stock (Figure 11).

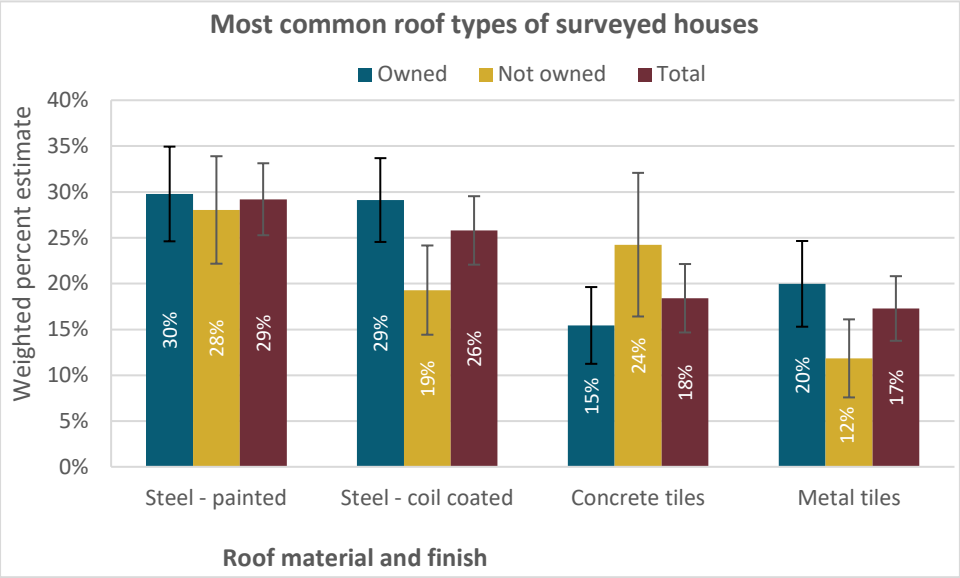


Figure 11. Roof material and finish by tenure.

[17] See BRANZ Maintaining My Home online resource: www.maintainingmyhome.org.nz

Three-fifths (60%, ±3.8 pp) of houses surveyed showed no signs of the defects listed in the survey, which included:

- cracked tiles/holes/rust
- membrane lifting or damaged
- missing tiles
- loose fixings/ridging/flashing issues.

One-fifth of dwellings surveyed showed signs of loose fixings/ridging/flashing issues (21%, ±2.5 pp) and cracked tiles/holes/rust (19%, ±3.8 pp).

Overall, in nearly half (47%) of dwellings surveyed, the roof was considered in excellent or good condition, while in 11%, it was serious or poor (Figure 12). The roof was more likely to be in better condition for owner-occupied dwellings compared to non-owner-occupied houses (Figure 13), a finding consistent with the previous HCS (White, Jones, Cowan & Chun, 2017).

Figure 12. Almost half of roofs were in excellent or good condition, and one in 10 roofs were considered to be in poor or serious condition.

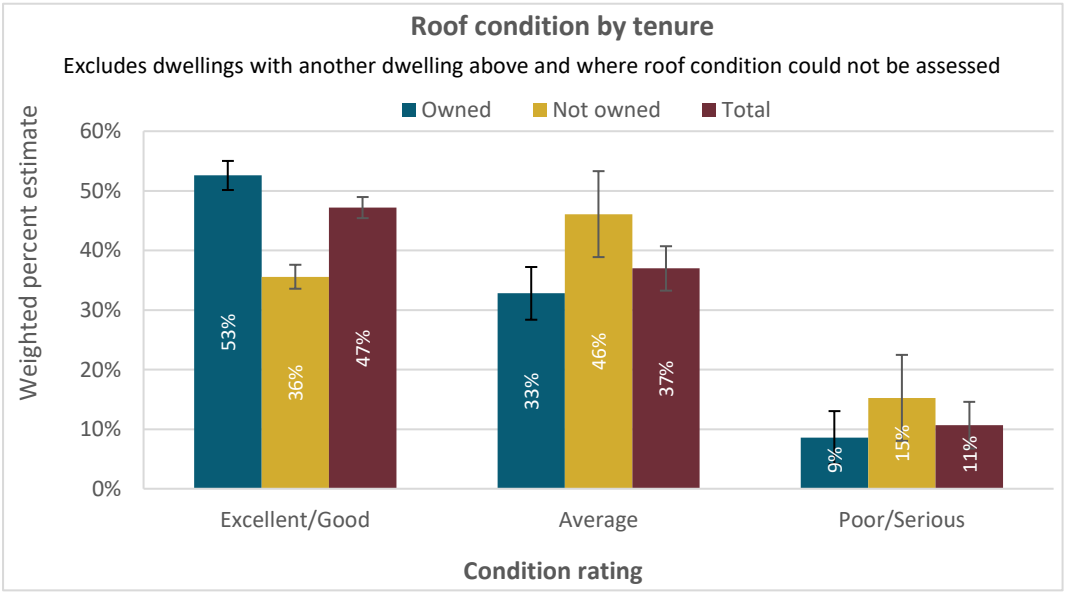


Figure 13. Condition of roofs by tenure and overall.

5.3 Wall cladding materials, defects and condition

Timber weatherboard was the most common wall cladding type for both owned and rented dwellings, present on nearly two-fifths (39%) of all houses surveyed, followed by brick (33%) and fibre-cement weatherboard (21%).

While two-fifths (41%) of houses surveyed showed no signs of the wall cladding defects listed in the survey (which included holes/cracks/gaps, rotting, paintwork), a similar proportion did show signs of holes/cracks/gaps (42%) and deteriorating/ defected paintwork (40%).

For nearly half (47%, ±2 pp) of surveyed dwellings, the wall cladding was considered in excellent or good condition, while nearly one in five houses had cladding in poor or serious condition (Figure 14). Owner-occupied dwellings were again more likely to have cladding in better condition (excellent or good) compared to non-owner-occupied houses (Figure 15). This trend is again consistent with the latest (2015/16) HCS (White, Jones, Cowan & Chun, 2017).

Figure 14. Wall cladding was in poor or serious condition for one in five dwellings.

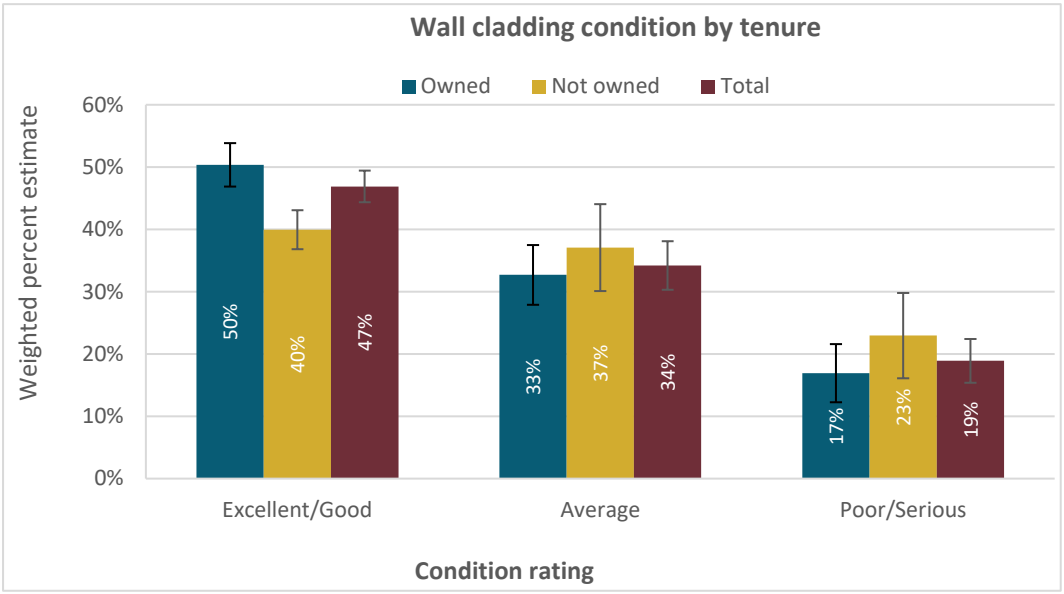


Figure 15. Condition of wall cladding by tenure and overall.

5.4 Windows

Window frame material and glazing has implications for both thermal performance (heat loss) and maintenance requirements. Up until the 1970s, the main material used for window frames in New Zealand was timber. Aluminium windows became very popular from the 1970s onwards and remain so today. While timber framing was present in over two-fifths (42%) of houses surveyed in the PHS, timber was the predominant frame type in less than one-third (32%). Aluminium framing was present in four out of five (80%) of dwellings surveyed and the predominant framing type for 68%. Aluminium has lower maintenance requirements compared to timber, but unless thermally broken,[18] it performs less well in terms of heat loss (Villard, 2018).

While single glazing still dominates in our housing stock, with over three-quarters (76%) of dwellings surveyed being entirely single glazed (Figure 16), the survey shows double glazing is on the increase. In the 2015 HCS, only 10% of houses surveyed were entirely double glazed (White & Jones, 2017), compared to 16% in the PHS. This likely reflects changes to the NZBC that made double glazing mandatory in all new builds from 2008. Whilst on the upward trend, this seems mainly driven by the owner-occupied sector. Disparity between the owned and rented stock remains, with almost twice the proportion of owner-occupied dwellings being fully double glazed compared to rentals.

Double-glazing is increasing, but more so amongst the owner-occupied stock.

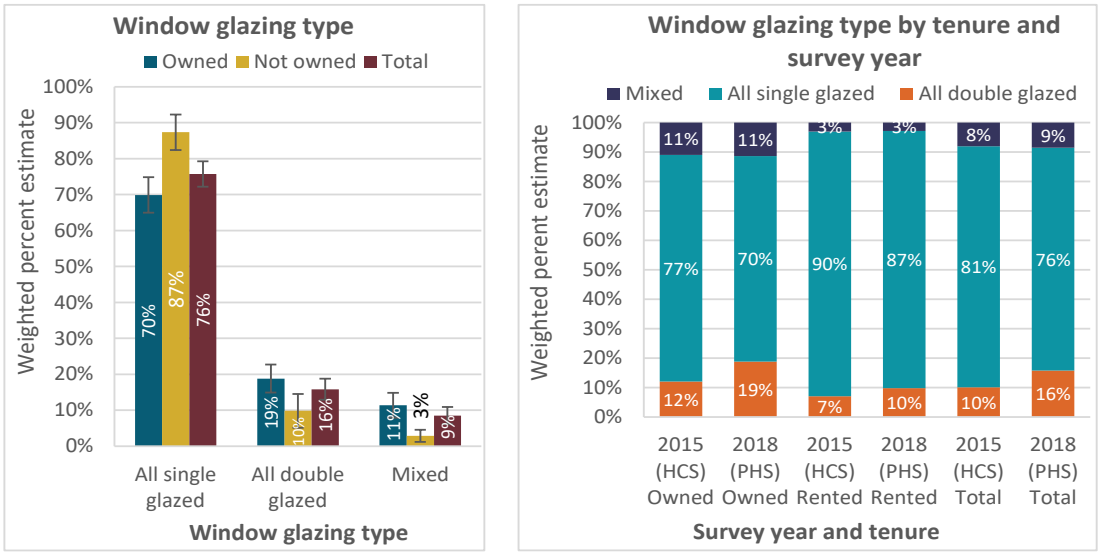


Figure 16. Window glazing types in owner-occupied and rental houses and overall.

As with the roof and wall cladding, the survey asked about defects affecting windows and exterior doors, including:

- missing panes
- broken/cracked panes
- leaking (sign of moisture ingress)
- decay or rot
- ill-fitting or warped
- seal decay/putty cracked/missing.

[18] Thermally broken window frames have a section inside the frame made of insulating material, such as plastic or wood to prevent the transfer of heat and cold via the window frame.

Window defects were more commonly observed on rental dwellings

Defects were more commonly observed on non-owner-occupied dwellings, with 58% of rentals having at least one of the listed defects present, compared to 42% of owner-occupied dwellings (Figure 17). The most common defect observed was seal decay/putty cracked/missing, evident in 45% of rentals (±7.9 pp) and 29% (±4.6 pp) of owner-occupied houses. One-quarter of non-owner occupied (25%, ±6.5 pp) had windows/exterior doors that were ill-fitting or warped, compared to 13% (±3.4 pp) of owner-occupied houses.

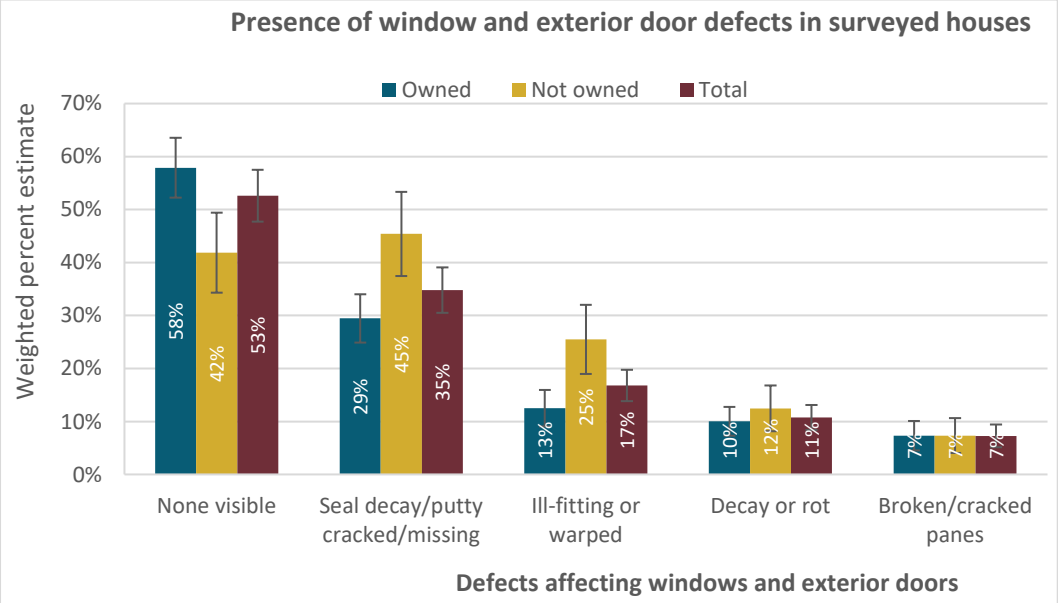


Figure 17. Defects observed on windows/exterior doors in owner-occupied and non-owner-occupied surveyed houses.

Around three in five owner-occupied dwellings had windows in good or excellent condition, compared to two in five rentals.

The higher prevalence of defects in rentals aligns with the lower overall condition rating of windows/doors (Figure 18). While 58% (±5.1 pp) of owner-occupied dwellings had windows and exterior doors in excellent or good condition, this applied to less than two-fifths (38%, ±7.8 pp) of non-owner-occupied dwellings (Figure 19).

Figure 18. One in five rental dwellings had windows in poor or serious condition.

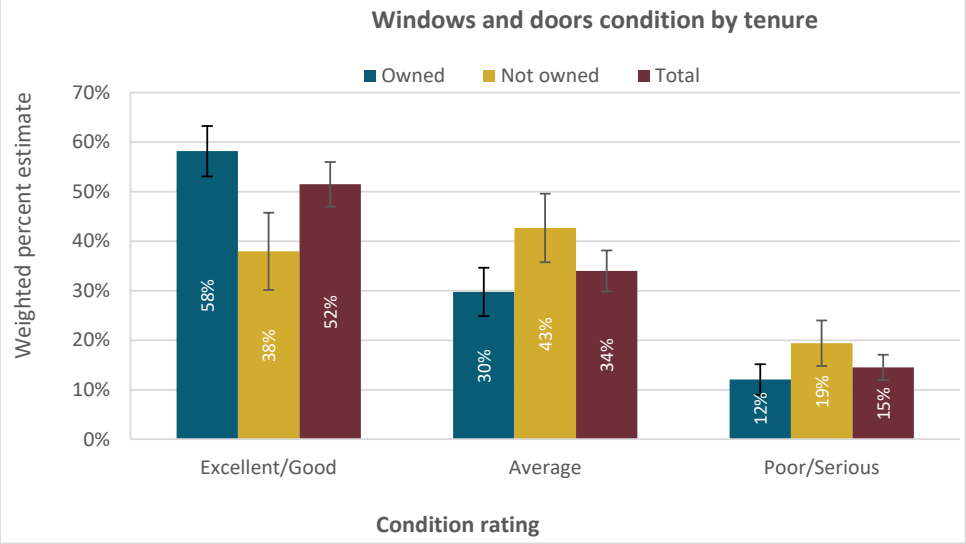


Figure 19. Condition of windows and exterior doors by tenure and overall.

Defects with exterior doors and windows could present potential weathertightness issues and/or result in draughts, impacting the thermal performance of the dwelling. The PHS included a new question on draughts, which uses both extent (prevalence) and size of gaps around windows and exterior doors to determine draughtiness (results are discussed in section 7.1.3).

Windows and exterior doors in poor condition were more likely to also have gaps presenting risk of draughts.

The results from the draught assessment need to be treated with some caution as this question had not been used in previous HCSs (and therefore is less thoroughly field-tested) and draughts can be hard to assess (may be more noticeable on windy or cold days but less obvious on calm, warm days). However, the results do show some correlation with the assessment of window and exterior door defects and condition, which is what we might expect. Over three-quarters (76%) of houses with windows and exterior doors in good or excellent condition had no visible gaps, while 71% of houses with windows and exterior doors in poor or serious condition had moderate-large/some-many visible gaps (Figure 20).

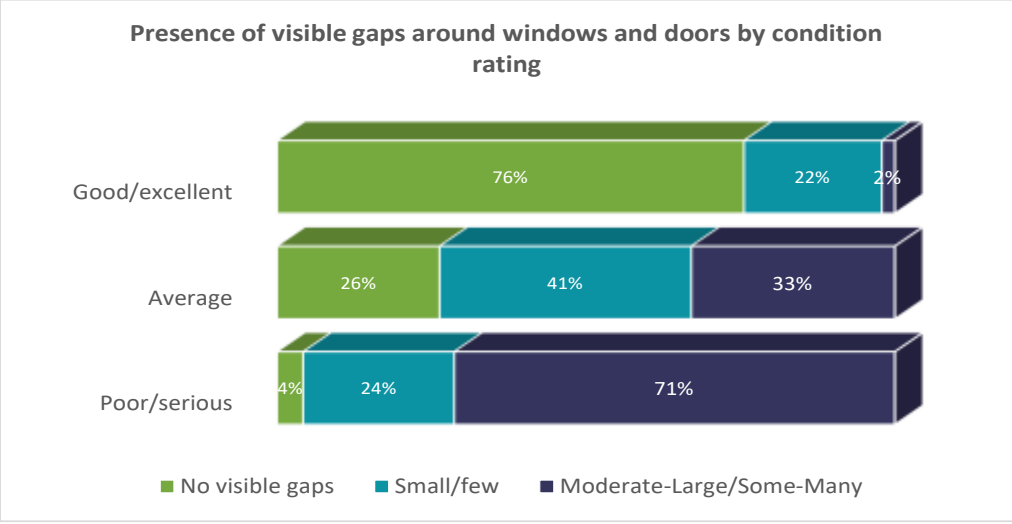


Figure 20. Presence of visible gaps and condition of windows and exterior doors.

5.5 Drainage

Effective drainage is important for removing sources of moisture away from the dwelling. The healthy homes standards outline requirements for ensuring adequate drainage of stormwater, surface water and groundwater for rented dwellings. Amongst the things to consider, HHS guidance recommends checking all gutters are connected to a downpipe, gutters and downpipes are intact (not broken, corroded or with pieces missing) and gutters and downpipes are not obstructed or blocked (MBIE, 2019c).

The PHS recorded information on the presence of different defects affecting guttering and downpipes. Defects assessed included whether they were missing in parts, broken in parts, had visible holes, were blocked with debris or draining to under-house. Whilst these defects could be indicative of poor or inadequate drainage, they do not provide a complete or comprehensive picture of HHS requirements.

5.5.1 Guttering and downpipes

The results from the PHS assessment of guttering and downpipes show two-thirds of houses surveyed (67%) had no visible defects with the guttering or downpipes, while one-fifth (21%) had signs of holes, broken or missing parts (Figure 21). Blocked guttering was more commonly observed in rented dwellings (17%) compared to owner-occupied dwellings (9%).

Figure 21. One-third of dwellings required some maintenance or repair to guttering or downpipes.

5.5.2 Subfloor ventilation and ground moisture barriers

The subfloor can be a major source of moisture into the home, with potential to release 40 litres per day on average for a 100 m^2 dwelling (McNeil, Li, Cox-Smith & Marston, 2016). Installing a ground cover has been shown to be an effective way to control ground-sourced moisture (Figure 22).

The healthy homes standards specify that rented dwellings with suspended floors must have a ground moisture barrier where the subfloor space is enclosed unless it is not reasonably practicable to install one (MBIE, 2019c).

Figure 22. A ground cover is important for preventing ground-sourced moisture entering the home.

Results from the PHS show that, of the houses surveyed that had a subfloor cavity (61% of the total sample), 17% had a ground moisture barrier (±3.2 pp). In 11% of cases, it was not possible to tell, due to access/visibility restrictions. This suggests around three-quarters (73%, ±4 pp) of houses with a subfloor could benefit from a ground moisture barrier (44% of the total sample). There was little difference observed between the owned and rented stock, with 16% and 18% respectively of those with a subfloor cavity having a ground moisture barrier.

Fewer than one in five houses with a subfloor cavity had a ground moisture barrier.

Of those without a ground moisture barrier, in the majority of cases, the subfloor could be considered enclosed (neither open, trellis nor baseboards with continuous gaps).

The PHS also recorded whether there was evidence of ponding under the house, which can be a sign of poor drainage. Around half (47%, ±5 pp) the houses with a subfloor were dry at the time of the survey, while around one-third (35%, ±5 pp) were damp or showed signs of ponding (the vast majority being in the former 'damp' category). While the weather preceding or during the assessment could affect the conditions observed, signs of ponding at any time are indicative of poor or insufficient drainage or leaks.

5.6 Foundations

Where accessible, the condition of the foundations (presence of different defects) was assessed from the subfloor access hatch. As nearly two-fifths of houses surveyed did not have a subfloor cavity (i.e. entirely concrete slab or another dwelling below), this data applies to a subset only (n=533).

Of those with a subfloor, around one-quarter (23%) had a least one defect listed in the survey, which included:

- poor fixing (including piles not attached to bearer, jack and pack defects, poor/damaged/missing bearer-pile connection, packer >100 mm)
- structural cracks
- missing/leaning/displaced piles
- rot/borer.

Poor fixing was the most common defect, identified in 16% of those with a subfloor cavity, followed by rot/borer (6%) (Figure 23). In 16% of houses, the assessor was unable to accurately assess the condition of the foundations due to poor visibility from the access hatch.

Figure 23. Signs of borer in subfloor timber.

6. Interior condition

The interior of each dwelling was surveyed to record information on the presence of visible mould and condition. As with the exterior, a rating scale was used to assess condition based on the presence and severity of defects and need for repair/maintenance (see Table 3). While the condition and presence of mould was assessed in all rooms individually, the results presented here have been combined for rooms of the same type. This means where more than one room of that type (living areas, bedrooms and bathrooms) was present in the dwelling, the worst rating for a room of that type has been used. For example, in a three-bedroom house where two bedrooms were in average condition, and one in poor condition, bedrooms for that dwelling would be reported here as poor. Similarly, if there were two bathrooms and one had small mould and the other moderate mould, this would be counted as moderate. It therefore presents the worst-case scenario.

6.1 Condition of room linings

The results show dwelling interiors were consistently in a poorer state of repair in non-owner-occupied dwellings compared to the owner-occupied survey sample (Figure 24).

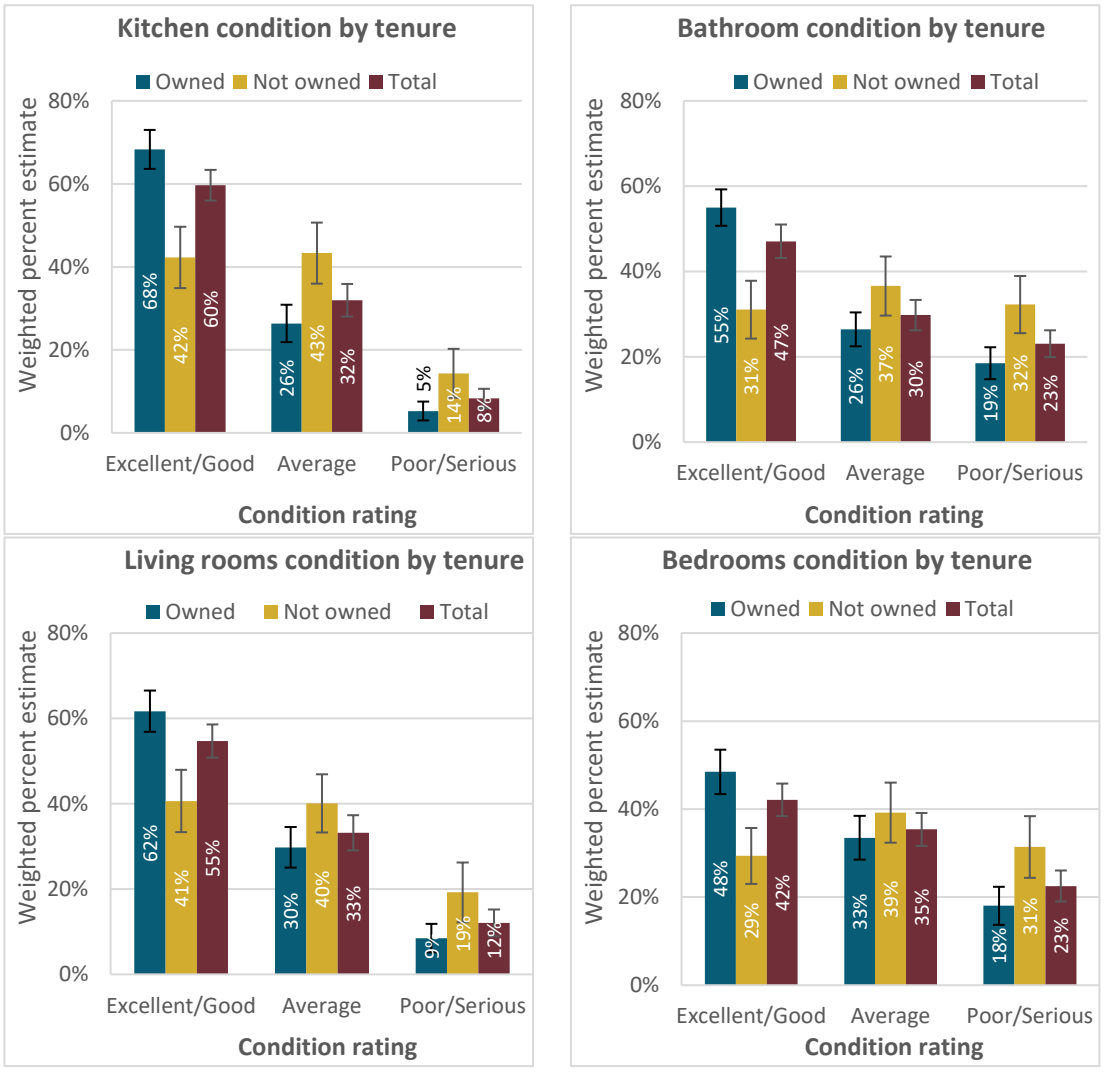


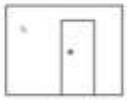
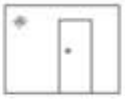
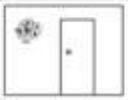
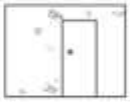
Figure 24. Condition of interior by room and tenure.

Kitchen linings were more likely to be in better condition than bedroom linings: three in five dwellings had kitchen linings in good/excellent condition compared to two in five for bedroom linings.

6.2 Presence of visible mould

Mould is a key indicator of poor indoor environmental quality and has implications for occupant health, including links to asthma, respiratory infections and rheumatic fever (Afshari et al., 2009). Mould and damp arise through a combination of inadequate warmth and excessive moisture/lack of ventilation. The PHS assessed the extent of visible mould in all rooms of the house. It used an assessment scale from none through to large or extensive (Table 4).

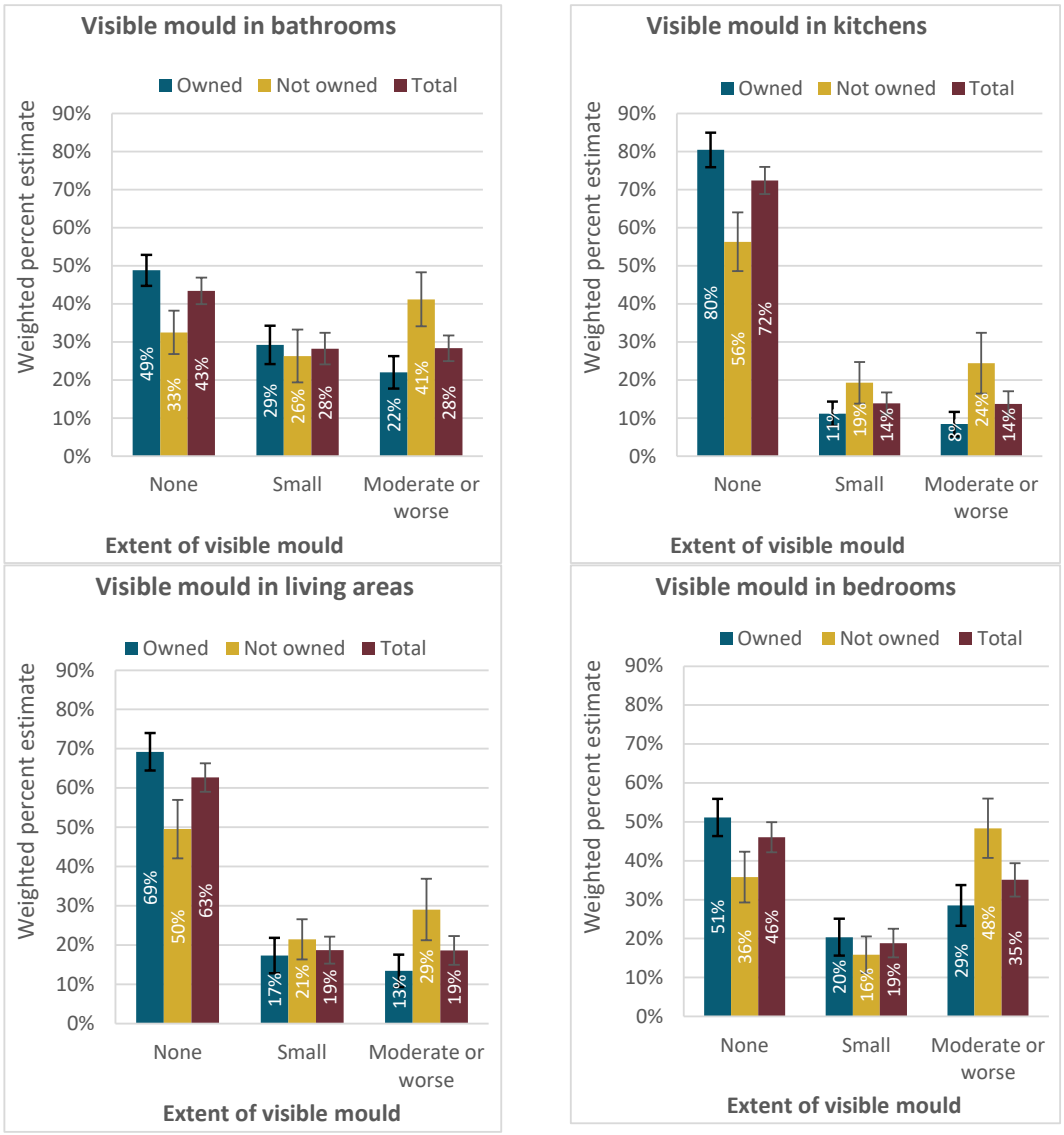
Table 4. PHS 2018/19 mould assessment scale.

Visible mould categories	Size	Commentary
NONE		You cannot see ANY mould on any surface, taking care to inspect walls, windows, ceilings, floor coverings and backs of curtains.
SMALL ***~door knob***		"manageable for most residents" Size: specks or see image for single patch Location: specks on one or two features or see image for single patch Maintenance demand/timing: surface cleanable (vinegar & water) or wash curtains/linings. Action needed: within a week
MODERATE ***~A4 paper***		"requires concerted resident effort" Size: see image for single patch Location: one patch in a room, i.e. only on one feature (including curtains). Maintenance demand/timing: surface cleanable (vinegar & water) or wash curtains Action needed: within a week
LARGE		"needs specialist attention" Size: see image for single patch Location: one patch in a room, i.e. only on one feature including curtains. Maintenance demand/timing: beyond householder DIY action, i.e. embedded in material e.g. lining material or whole curtains need replacement Action needed: urgent, consider not using room.
EXTENSIVE		"infestation, needs specialist attention" Size: varying sizes beyond specks Location: across multiple features in a room Maintenance demand/timing: extent puts this beyond householder DIY action, i.e. embedded in multiple materials, some needing replacement Action needed: urgent, consider not using room.

All surfaces were considered in the assessment, including windows and curtains (Figure 25). This is an important change to note from previous HCSs. It will likely result in a higher rate of observed mould. In addition, to align with new questions on mould in the 2018 Census and GSS, moderate was described as roughly equivalent to the size of an A4 piece of paper (which is the indicator used in the Census and GSS).

Figure 25. An assessment of visible mould was applied to all surfaces, including wall, floor and ceiling linings, windows and curtains.

The results below are derived from all mould assessments (Figure 26). As noted above, where there is more than one room of that type (i.e. bathrooms, living areas and bedrooms), the worst level of mould recorded has been used.



Where figures do not sum to 100%, this is due to rounding

Figure 26. Extent of visible mould in living areas and bedrooms.

- 57% of **bathrooms** showed some signs of mould, with 28% (±3.4 pp) having moderate or worse mould. Mould in bathrooms was more commonly observed in rentals, with 41% (±7.1 pp) having moderate or worse mould, compared to 22% (±4.3 pp) of owner-occupied dwellings.
- 28% of **kitchens** showed some signs of visible mould, with 14% (±3.3 pp) having moderate or worse mould. Mould was again more commonly observed in kitchens of rented dwellings, with 24% (±8 pp) having moderate or worse visible mould, compared to 8% (±3.2 pp) of owner-occupied dwellings.
- Mould was observed in the **living area(s)** in 37% of houses, with nearly one-fifth (19%, ±3.6 pp) being moderate or worse. Moderate or worse mould was observed in the living area(s) in 13% (±4.1 pp) of owner-occupied houses, compared to 29% (±7.8 pp) of rentals.
- Moderate or worse mould was observed in at least one **bedroom** in 48% (±7.6 pp) of rentals, compared to 29% (±5.3 pp) of owner-occupied dwellings. Overall, 54% of houses showed some signs of visible mould in bedroom(s), with 35% (±4.3 pp) being moderate or worse.

Visible mould was most commonly observed in bathrooms and bedrooms.

The trend in mould being more frequently observed in rentals is consistent with the poorer condition rating of rooms in this sector as observed above. Mould can be considered a defect requiring maintenance. The extent and severity of the mould dictates the level of maintenance required – for example, cleaning where it is surface level and relatively limited in extent through to full removal and replacement of linings where the mould is extensive or embedded in the material. The presence and severity of visible mould will therefore have impacted on and be linked to the condition rating given for the linings.

Excluding high moisture areas of the home (bathrooms, kitchens and laundry), and looking at the worst level of mould recorded in any living area, bedroom or hallway shows two-fifths (41%) of houses surveyed had no visible mould in these spaces (Figure 27). Around half (51%) of non-owner-occupied dwellings had moderate or worse mould in the living area/bedroom(s)/hallway compared to 30% of owner-occupied dwellings. As noted above, due to methodological changes in how mould was assessed in the PHS, these figures are not comparable to previous HCSs.

Rental dwellings were more likely to have moderate or worse mould in all rooms assessed.

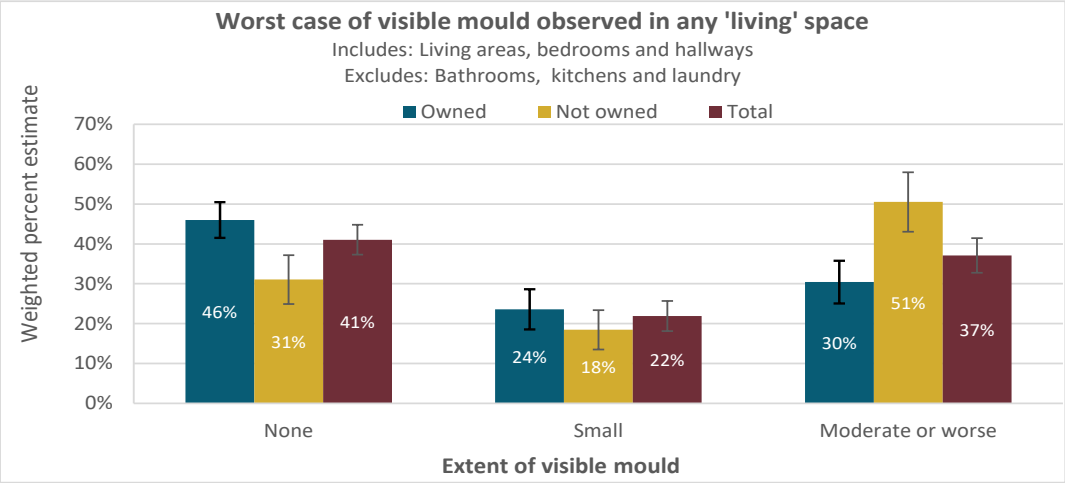


Figure 27. Worst case of visible mould recorded in any living space.

6.3 Roof space

Where accessible, the presence of defects in the roof space was recorded from a pre-defined list that included:

- signs of leaks, gaps, holes
- damaged wiring
- signs of rot/borer
- signs of damp/mould
- pest infestation
- exposed roofing (no underlay)
- missing or damaged underlay
- major structural/framing defect
- ventilation ducting needs repair
- ventilation ducting not connected
- header tank leaking
- header tank no lid
- header tank unrestrained.

This assessment applied to 82% of the (weighted) sample. In 12% of cases, there was no roof cavity, either due to the roof type or there being another dwelling above. In 7% of dwellings, the assessor was unable to accurately assess the presence of defects due to poor visibility from the access hatch or no access at the time of the survey.

Of those with a roof cavity, in half of houses (50%, ±4.3 pp), at least one defect from the survey was identified. The most common issues related to underlay (missing or damaged, 10% – Figure 28) and signs of gaps, holes or leaks (11%). Exposed roofing was more commonly observed in non-owner-occupied dwellings (27% compared to 15% of owner-occupied houses). However, this may relate, in part, to roof material types and buildings practices – for example, concrete tile roofs were not always typically installed with underlay, and this roofing was more common on the rental stock surveyed. Furthermore, whilst the survey gives an indication of the prevalence of different issues affecting the roof cavity, the severity and full extent of implications are not clear (issues could be minor or could be severe and present weathertightness or structural risks).

Figure 28. Damaged roof underlay.

7. Preventing heat loss

The dwelling fabric plays a critical role in mediating the impact of outdoor temperatures on occupants. The construction type and design, insulation levels, glazing, draughts, window coverings and state of repair will affect the efficacy with which a dwelling fulfils that role.

7.1.1 Roof space insulation

In an uninsulated house, 30–35% of heat can be lost through the roof (Figure 29). Insulation became mandatory in all new houses in New Zealand from 1978. Houses built before then are unlikely to have insulation unless it has been retrofitted. The healthy homes insulation standard requires all rental homes to have insulation consistent with the 2008 NZBC, or for existing insulation, it must be at least 120 mm thick (HUD, 2020). This is also the minimum recommended by the Energy Efficiency and Conservation Authority.

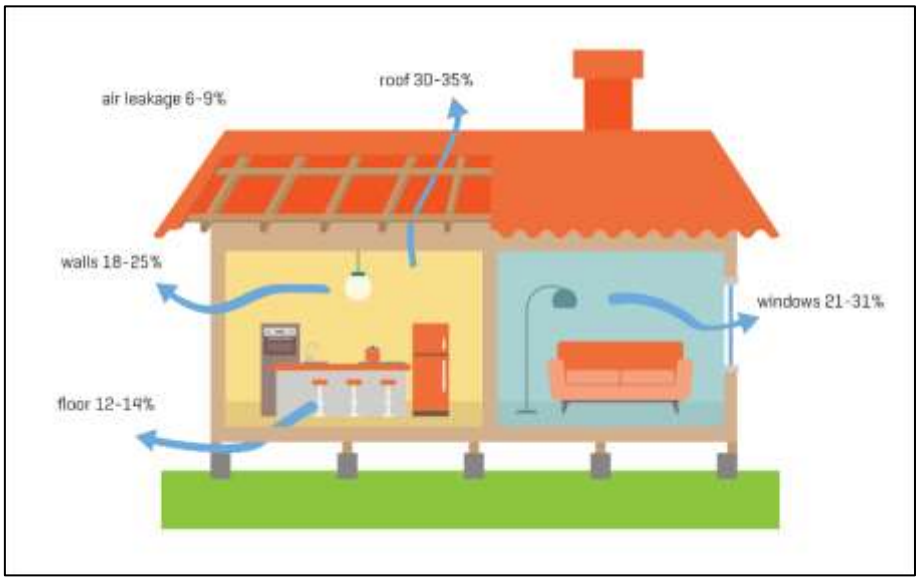


Figure 29. Typical heat losses from an uninsulated house.

The PHS recorded the type, depth and coverage of all insulation materials in the roof space where there was an accessible roof cavity – 3% of houses surveyed had another dwelling above, and 9% had no accessible roof cavity (skillion roof).[19] The insulation assessment was done from the access hatch rather than the assessor fully entering the roof space, hence in some cases (5% of those with a roof cavity), it was not possible to ascertain all the information.

[19] In skillion roofs, the roof cladding and ceiling run parallel, typically within 300 mm of each other and the roof space is generally inaccessible. Examples are chapel or cathedral style roofs, roofs with internally exposed rafters, roofs with the ceiling lining attached to the underside of the rafters.

There was little difference between the proportion of owned and rented dwellings lacking adequate insulation in the roof space.

Based on the data available on roof insulation in the PHS, the results suggest 45% (±4.5 pp) of houses with a roof cavity had at least 120 mm insulation, while 49% (±4.3 pp) had less than 120 mm (Figure 30 and Figure 31).[20] There was little difference observed between the owned and rental stock.

Figure 30. Roof spaces should be insulated to help prevent heat loss from the home. Around half of houses surveyed lacked adequate insulation in the roof.

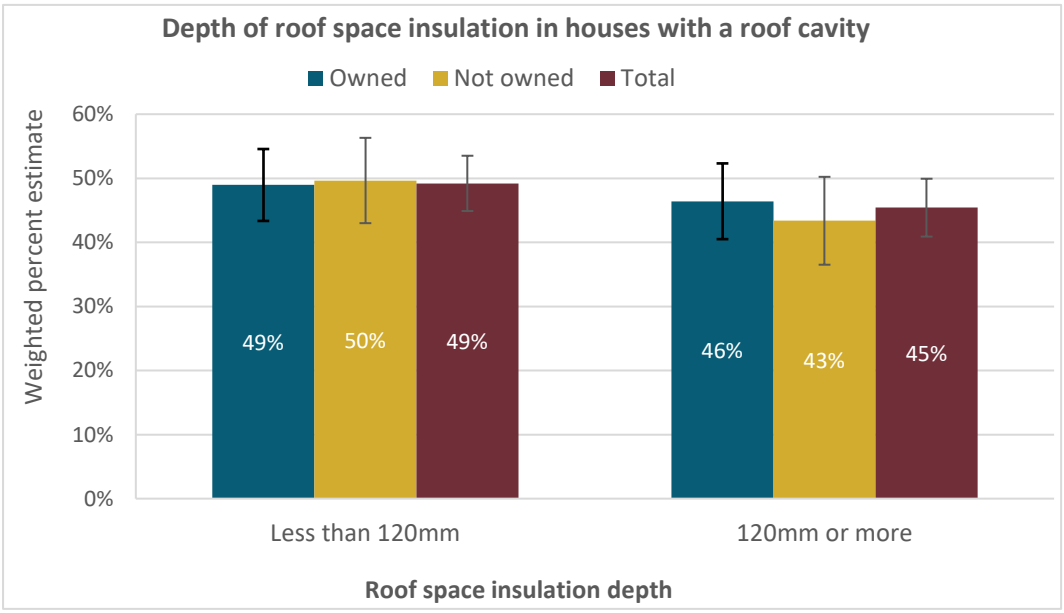


Figure 31. Depth of insulation in surveyed houses that had a roof cavity.

These estimates are consistent with those from the 2015/16 HCS (White, Jones, Cowan & Chun, 2017), although the data indicates some improvement with proportionally fewer houses with less than 70 mm insulation. Of those with less than 70 mm insulation, very few had no insulation at all (around 1% of houses with an accessible roof cavity).

[20] Proportion not shown is 5% of cases in which the depth of insulation could not be ascertained due to visibility. These figures do not take account of coverage. If coverage is taken into account, a further 5% could potentially benefit from additional insulation to ensure all roof space is adequately covered.

The condition of the insulation is also an important consideration, as it can impact its thermal performance. The PHS recorded the presence of a range of defects that can impact the effectiveness of insulation. These included rips/tears/gaps, signs of vermin in roof cavity, gaps due to downlights, signs of damp or mould, tucks/folds/compressed and inappropriate/improvised/unsuitable material. The results show that, of those with insulation, 52% (±4.2 pp) had defects that, depending on severity/extent (which is not detailed in the data), could compromise the effectiveness.

7.1.2 Subfloor insulation

An uninsulated subfloor can be another major source of heat loss from a home. The HHS require rental homes to have subfloor insulation consistent with the 2008 Building Code (at least R1.3 or around 60 mm thick, depending on the material) (MBIE, 2019b). Foil may be acceptable under the HHS, depending on when it was installed and its state of repair. However, BRANZ research has shown foil insulation is far less effective and subject to wind damage (Figure 32) and therefore not recommended (McNeil et al., 2016).

Figure 32. Subfloor foil insulation is prone to damage

For houses with an accessible subfloor, the PHS recorded the type and coverage (not thickness) of insulation. As with roof space insulation, the assessment was done from the access hatch rather than fully entering the crawl space.

Over one-third of houses surveyed had entirely concrete slab foundation (36% of the sample, ±3.9 pp). This was more common amongst owner-occupied houses (40%, ±5.1 pp) compared to non-owner-occupied dwellings (28%, ±7.5 pp).

In 6% of cases, the subfloor was not accessible and could therefore be considered unsuitable (not practicable) for retrofit (Figure 33).

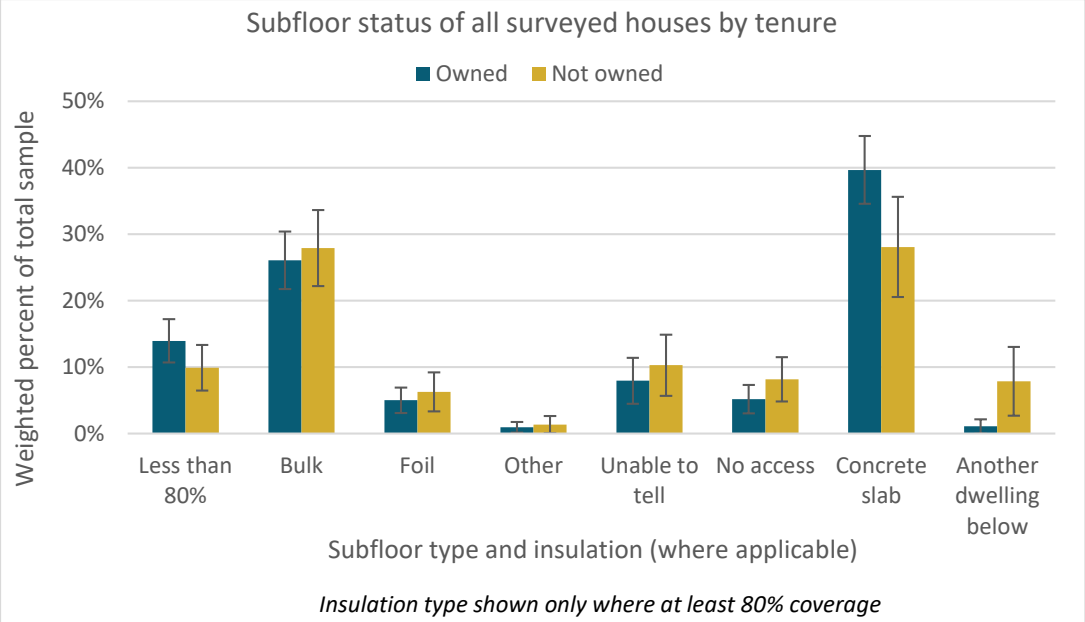


Figure 33. Subfloor status of all houses surveyed.

Of those with an accessible subfloor (55% of the total sample):

- in 16% (±4.9 pp) of houses, the extent of insulation could not be determined, hence these are classed as 'unable to tell'
- 61% (±4.8 pp) had at least 80% coverage of insulation in the subfloor – most of these had bulk insulation (80%), while 16% had foil insulation
- 23% (4.2 pp) had less than 80% coverage – most of these had no insulation at all, while a small proportion had some but less than 80% coverage (Figure 34).

Three in five houses with a subfloor cavity were insulated with at least 80% coverage.

Figure 34. Almost one-quarter of houses with a subfloor cavity lacked adequate insulation. This applied to owned and rented dwellings.

There was little difference observed between the proportion of owned and rented houses lacking insulation in the subfloor (Figure 35).

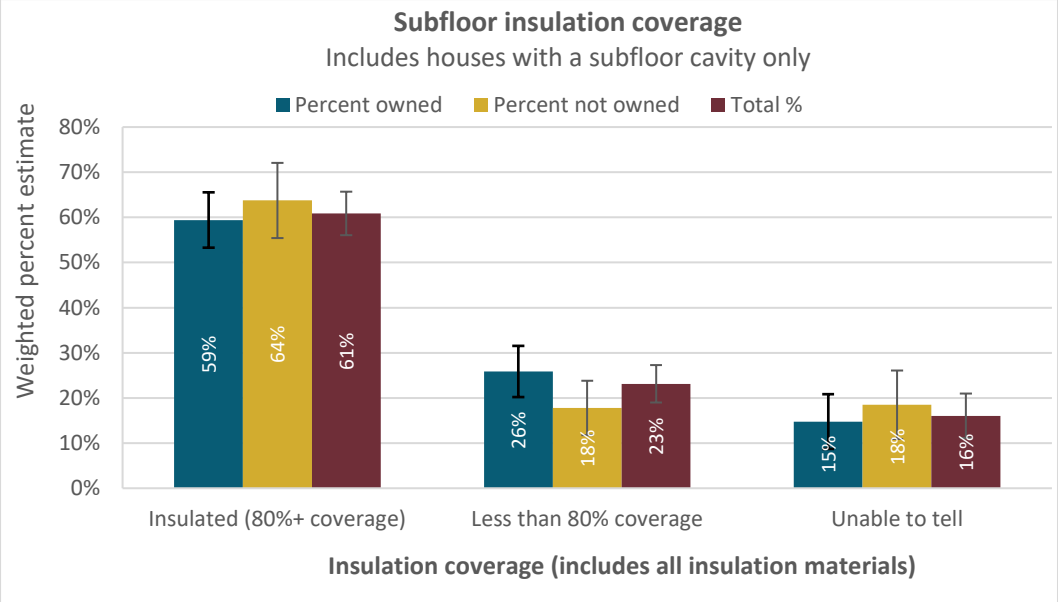


Figure 35. Subfloor insulation coverage in houses with a subfloor cavity.

The figures above include foil insulation. Findings are again reasonably consistent with results from the previous HCS (White & Jones, 2017) but indicate some evidence of improvement (suggesting a decrease in the proportion still needing subfloor insulation).

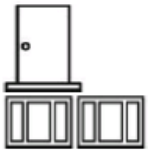
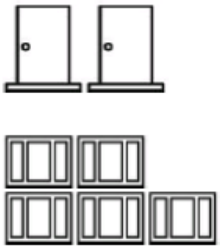
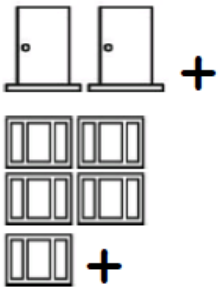
7.1.3 Draughts

Gaps around windows and doors and unblocked (unused) chimneys can be a major source of draughts that impact the thermal performance of a dwelling.

The HHS require landlords to "stop any unreasonable gaps or holes in walls, ceilings, windows, floors, and doors that cause noticeable draughts" (HUD, 2020).

The PHS introduced a new question on draughts, which assessed the extent and size of gaps around windows and doors (Table 5).

Table 5. PHS 2018/19 draught assessment guide.

Condition	Description and assessment criteria
No visible gaps	"Not draughty" All main doors intact and close tightly (don't rattle when shut, any gaps covered by effective draught-stopping devices, e.g. brush strips), and all windows intact and close tightly (don't rattle when shut)
Small/few visible gaps 	"A little draughty" **Extent:** one door + two windows **Gap size:** bottom of door gap of 3–15 mm, surrounds of door and windows gaps of 3–10mm and >50 mm in length with no effective draught-stopping solution in place **Maintenance demand/timeline:** off-the-shelf DIY solutions (v-seal, brush strips) will address with little effort – 3 months
Moderate/some visible gaps 	"Draughty" **Extent:** two doors + five windows **Gap size:** bottom of doors gap of 3–15 mm, surrounds of doors and windows gaps of 3–10mm and >50 mm in length with no effective draught-stopping solution in place. **Maintenance demand/timeline:** off-the-shelf DIY solutions (v-seal, brush strips) will address with a bit of effort – 1 month
Large/many visible gaps 	"Very draughty" **Extent:** ≥2 doors + ≥5 windows **Gap size:** bottom of doors gap of 3–15 mm, surrounds of doors and windows gaps of 3–10mm and >50 mm in length with no effective draught-stopping solution in place. **Maintenance demand/timeline:** while off-the-shelf DIY solutions (v-seal, brush strips) may address, the extent means this requires more investment and time to address all gaps and/or draughts beyond easy DIY and skilled input required/immediately

An assessment of draughts had not been included in recent HCSs (although it had been in earlier versions in the 1990s). There is therefore a lack of previous data to compare against, and being new to the PHS, the question does not have the years of experience of previous housing survey data capture methods. The results to this question therefore need to be treated with some caution and used as an indication only.

The PHS trialled a new question to assess the extent of draughts.

Furthermore, the PHS content was designed prior to the HHS being defined and does not align with the guidance in the HHS, which suggests any gaps larger than around 3 mm that would fit the edge of a $2 coin should be fixed (MBIE, 2019a).

Notwithstanding the above caveats, the results indicate gaps around windows and doors – and therefore the likely prevalence of draughts – were more commonly observed in non-owner-occupied dwellings:

- 19% of owner-occupied (±4.3 pp) and 31% of rental dwellings (±6.0 pp) had moderate or large gaps (or some or many) around windows and doors.
- 55% of owned and 36% of rentals had no visible gaps (Figure 36).

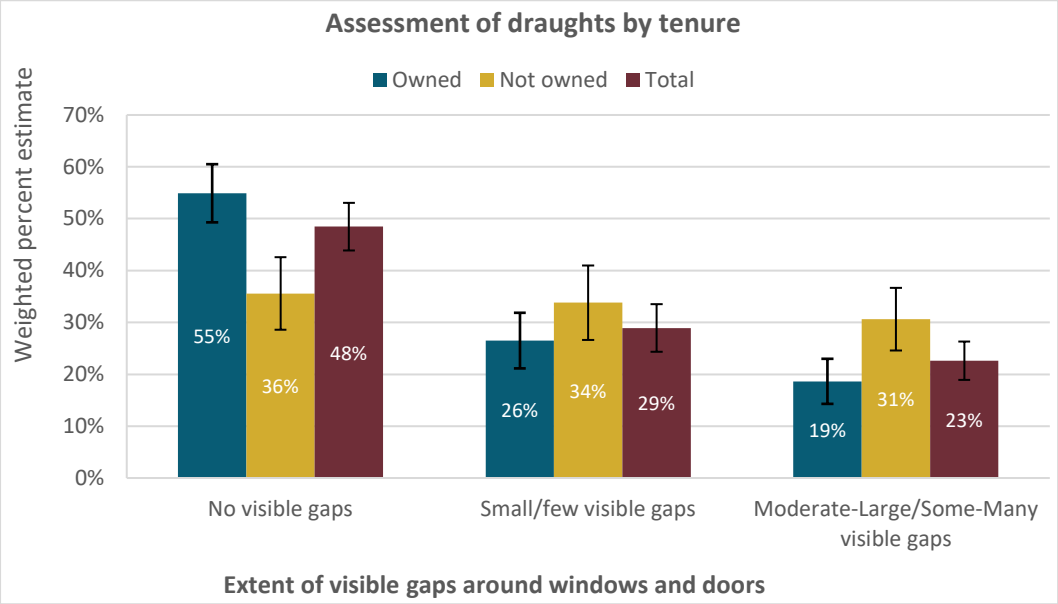


Figure 36. Assessment of draughts based on visible gaps around windows/doors.

8. Managing moisture

While installing a ground moisture barrier and ensuring effective drainage can help prevent moisture entering the home from outside, daily activities within the home also generate moisture. Occupant behaviour is therefore key to effectively managing moisture – for example, not drying clothes indoors, keeping lids on pots when cooking and limiting shower time can help reduce the amount of moisture released into the indoor environment (Figure 37). It is also important to ventilate, to effectively move moisture to outside, reducing the risk of damp and mould and helping maintain a healthy, comfortable indoor environment. This is particularly important in high moisture areas of the home, such as the kitchen and bathrooms.

Figure 37. Sources of moisture in the home.

8.1 Mechanical extract ventilation in kitchens and bathrooms

Mechanical extract ventilation is important for removing moisture generated in the home, particularly in areas such as bathrooms and kitchens where everyday activities can produce a lot of moisture (Figure 37). The HHS require kitchens and bathrooms in rental dwellings to have mechanical extract ventilation (rangehood or extractor fans) and specify that living, dining, kitchen and bedrooms must have openable windows or external doors (HUD, 2020). The PHS recorded the presence of mechanical extract ventilation in kitchens and bathrooms and openable windows in all rooms. When considering extract ventilation, the survey only counted appliances that were venting to the outside (Figure 38) and working at the time of the survey.

Figure 38. Mechanical extract ventilation must extract outside not to the roof space.

The results suggest half of houses (51%, +/4.1 pp) had working mechanical extract, extracting to the outside, in all bathrooms, with little difference between owned and rented (Figure 39). The proportion was slightly higher for kitchens, with 55% having working mechanical extract ventilation extracting to the outside. However, this was largely driven by owner-occupied dwellings, with 64% having functional extract in the kitchen, compared to 37% non-owner-occupied houses.

Half of houses lacked working mechanical extract in the bathroom.

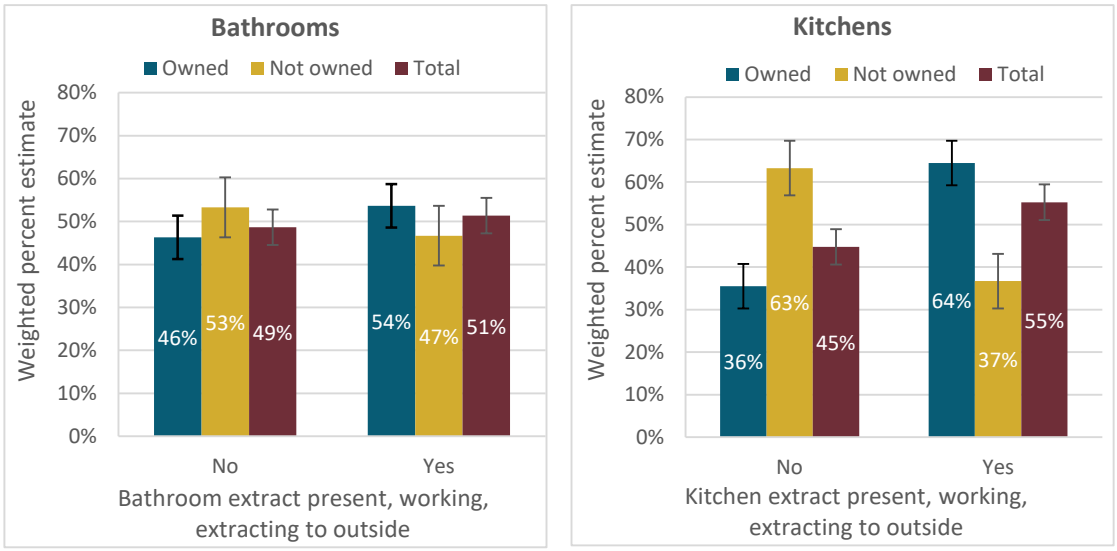


Figure 39. Presence of working mechanical extract ventilation in bathroom/kitchen.

8.2 Whole-house ventilation systems

Overall, 18% (±3.1 pp) of houses surveyed had a positive-pressure ventilation system and 5% a balanced-pressure system. Whole-house ventilation systems were more commonly observed in owner-occupied dwellings than non-owner-occupied houses (Figure 40).

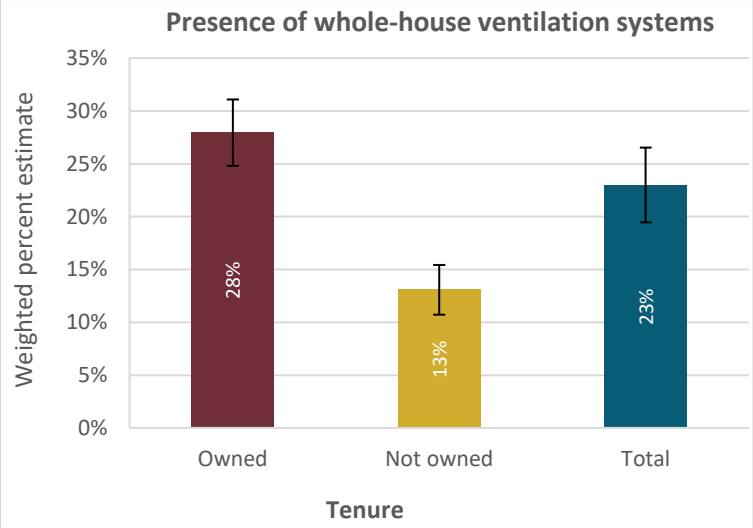


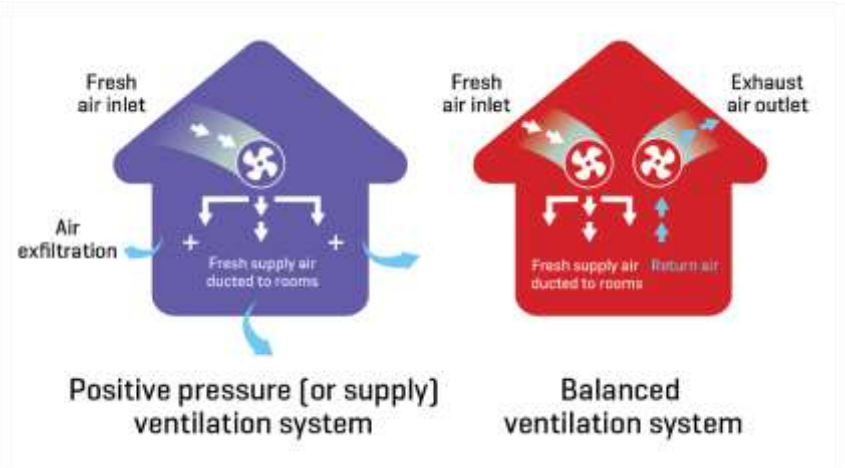
Figure 40. Presence of whole-house ventilation systems by tenure (includes positive-pressure and balanced systems).

Home mechanical ventilation systems

Mechanical ventilation systems control airflow between the air inside the building and the air surrounding it or from the roof space.

Supply or positive-pressure systems take air from outside or from the roof space and duct it into living spaces through ceiling vents in the home. Stale air is forced out through gaps, windows and doors (hence 'positive pressure').

Balanced systems will include both supply and extract – an intake fan supplies fresh air from the outside in a similar way to the positive-pressure system, but an additional exhaust fan helps remove stale air and discharges to the outside (hence 'balanced' system).



For more information, see BRANZ Bulletin 581 *Residential mechanical ventilation systems*.

9. Heating and hot water

9.1 Heating

The presence of good insulation in the roof space and subfloor will, in most cases, not in itself result in a consistently and sufficiently warm home. At some time of the year, most dwellings in New Zealand will require some heating to ensure indoor temperatures are maintained at a healthy level – the World Health Organization recommends at least 18°C in occupied rooms.

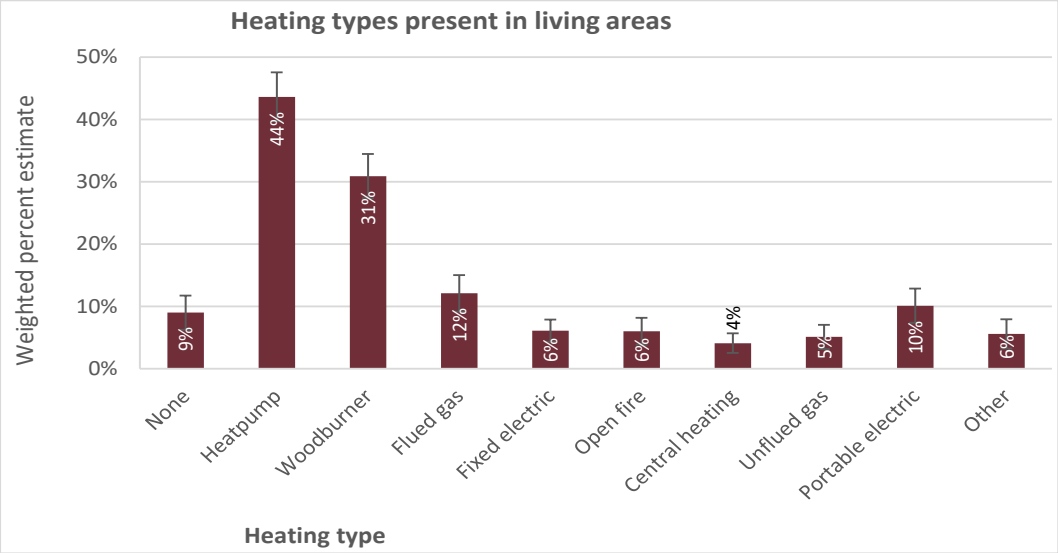
The HHS specify that rentals must now have a fixed heating source in the main living area.[21] Unflued gas heaters and open fires are not considered acceptable under these standards (HUD, 2020). The type of heating appliance and its fuel supply have implications for efficiency and effectiveness.

The PHS recorded information on the presence of heating appliances in all rooms of the house separately (including the kitchen, living areas, hallway and bedrooms). Heating appliances were recorded based on what the assessor could ascertain at the time of the survey. The timing of the survey – whether it was conducted during the colder months when heating would be more likely or in warmer months – could have implications for the results on portable devices. These may be less evident in warmer months if the occupants had tidied them away to cupboards or storage.

9.1.1 Heating in living areas

The results show heat pumps and enclosed wood burners were the most common heating type in living areas, with 44% and 31% of houses surveyed having these heating appliances (Figure 41). Non-owner-occupied houses were more likely to have no heating in living areas (15% (±6.4 pp) compared to 6% (±2.7 pp) in owner-occupied houses).

Heat pumps were the most common heating appliance in living areas, in owned and rental dwellings.



[21] The main living area is deemed to be the largest living space if more than one is present (HUD, 2020).

Figure 41. Presence of different heating types in living areas in surveyed houses.

Around three in five houses did have a fixed heating source in the main living area, but this was less common in rentals.

Looking at the largest living area only, the survey results suggest that, overall, nearly four out five of houses surveyed (78%) had a fixed heating source in the main living area (excluding unflued gas and open fires).[22] This proportion differed slightly between owned and non-owner-occupied dwellings (83% compared to 69% respectively).

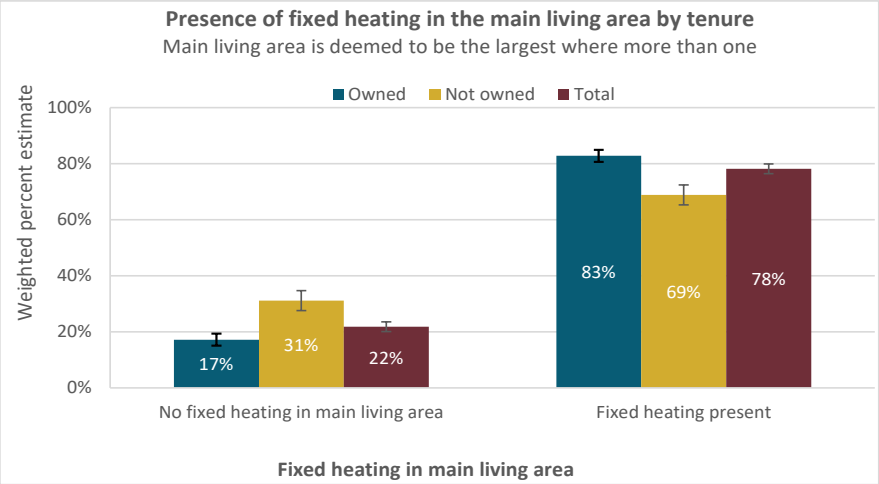


Figure 42. Presence of fixed heating source in the largest living area.

9.1.2 Heating in bedrooms

The proportion of houses without heating in bedrooms is higher: over half (54%, ±4.3 pp) of houses surveyed had no heating present in any bedrooms, while only 12% (±2.5 pp) had heating in all bedrooms (Figure 43). Where heating was present, portable electric was the most common type.

Over half of houses surveyed did not have heating in bedrooms.

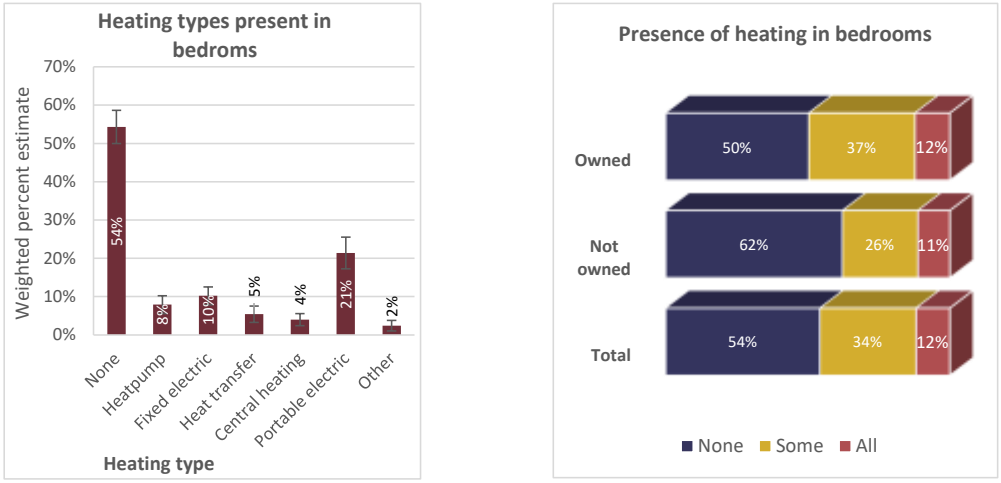


Figure 43. Presence of different heating types in bedrooms in surveyed houses.

[22] These were excluded to align with the HHS requirements (HUD, 2020). There are additional requirements in the HHS around kW capacity not covered in the PHS, so the results provide an indication only of whether there is an acceptable type of fixed heating source present in the largest living area.

9.1.3 All heating present

Counting heating present anywhere in the house (including living spaces, bedrooms, kitchens and hallways but excluding bathrooms and laundry), just under half of houses surveyed (49%, ±4.5 pp) had at least one heat pump and one-third (32%, ±3.5 pp) had a wood burner (Figure 44). While heat pumps were more common in owner-occupied dwellings (54%), the results suggest they are increasing in prevalence in rental homes. In the most recent HCS (2015/16), heat pumps were observed in 27% of rentals (White & Jones, 2017) compared to 39% in the PHS. Consistent with the previous HCS, rentals were still more likely to have portable heating only compared to owner-occupied dwellings (17% (±5.6 pp) compared to 4% of owner-occupied with no fixed heating).

Heat pumps were present in around half of all houses and increasing in rentals.

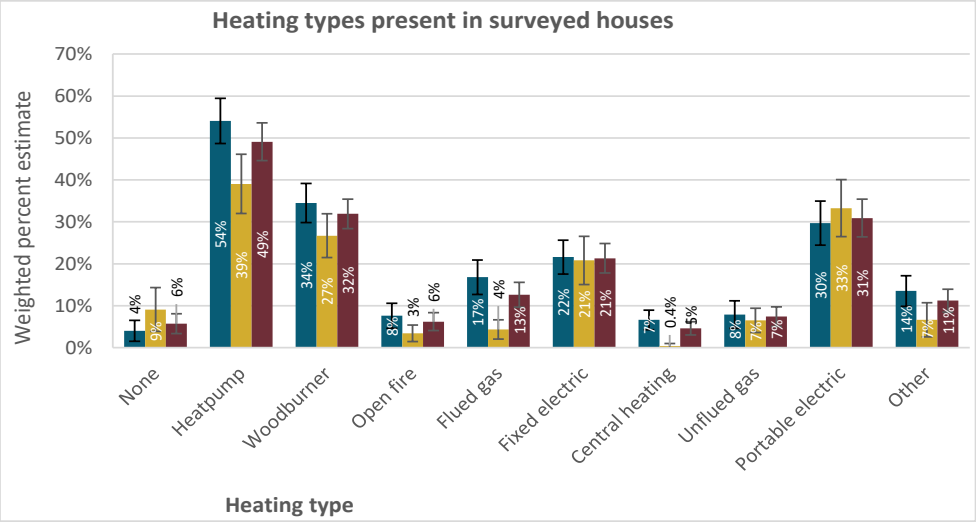


Figure 44. Presence of different heating types in surveyed houses.

The results hint at a decrease in the presence of unflued gas heaters – a positive finding (Figure 45). These release noxious gases and moisture into the home and are not recommended for health reasons. They are also amongst the most expensive heating appliances. In the 2015 HCS, unflued gas heating (fixed or portable) was recorded in 15% of houses surveyed (White & Jones, 2017). The PHS recorded these appliances in only 5%.

Figure 45. Portable LPG heaters are unhealthy, dangerous and expensive to run.

9.2 Hot water

As with heating, hot water system type has implications for efficiency and running costs. Most New Zealand homes have an electric hot water cylinder. Older cylinders tend to be low pressure, whereas modern electric hot water cylinders tend to be high pressure/mains pressure cylinders.[23]

The survey results also suggest a difference in hot water system types in owned and rented dwellings. In the latter, low pressure electric cylinders were the most common type of water heating, found in 58% of rentals surveyed (Figure 46). In owner-occupied dwellings, low pressure and mains pressure cylinders were observed in roughly equal proportions (34% and 32% respectively).

While instant gas hot water heating was still less common than electric cylinders, the survey results suggest an increase since the previous HCS, from 11% in 2015/16 (BRANZ, 2018) to 21%. This appears mainly driven by uptake in the owner-occupied stock.

Instantaneous gas hot water systems were observed in one in five houses.

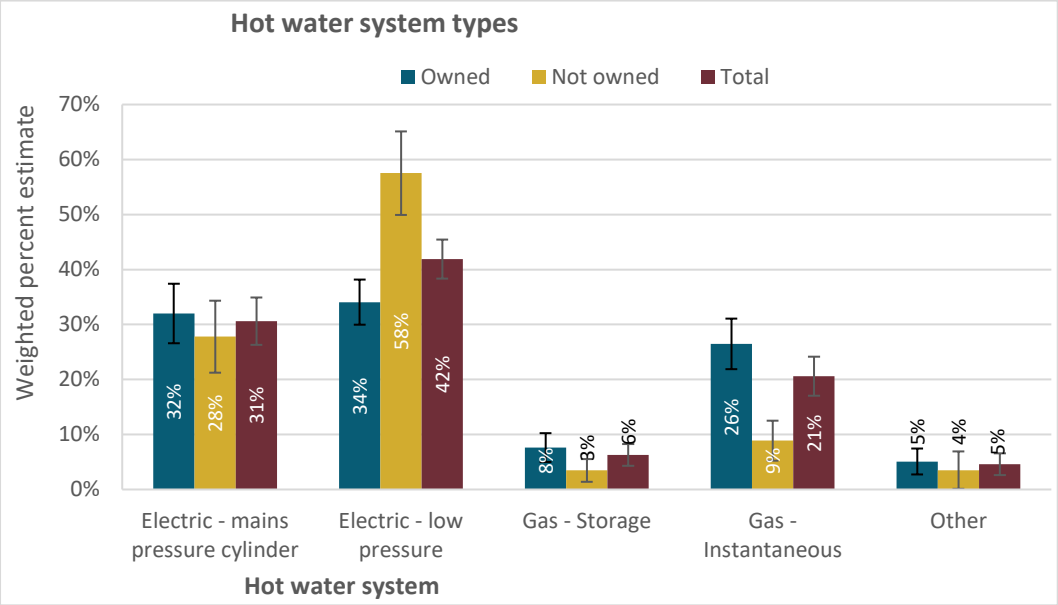


Figure 46. Presence of different hot water heating types in surveyed houses.

[23] For more information on hot water storage cylinder systems, see www.level.org.nz/water/water-supply/hot-water-supply/controlling-pressure-in-storage-cylinders.

10. Health and safety

10.1 Smoke alarms

Smoke alarms are a requirement under NZBC clause F7 *Warning systems*. This applies to new homes and all existing homes undergoing building work.

Consistent with the NZBC, the Residential Tenancies (Smoke Alarms and Insulation) Regulations 2016 also require all rental homes to have smoke alarms:

- On floors with bedrooms, the smoke alarms must be located either in every sleeping space or within 3.0 m of every sleeping space door.
- In multi-storey homes, there must be at least one smoke alarm on each level.

The PHS assessed the presence of smoke alarms against these criteria.

The results show that, in around three-quarters of houses (72%, ±3.5 pp) surveyed, all smoke alarms were working at the time of the survey, with no difference between owned and rental dwellings (Figure 47).

There was no difference in the presence (or lack) of working smoke alarms in owned and rental houses.

However, in around one-quarter of houses (25%, ±3.1 pp), they were not within 3 m of all bedrooms.

Almost one-fifth of dwellings had no functioning smoke alarms at the time of the survey.

One in 10 houses surveyed had no smoke alarms at all, and in a further 7%, none were working at the time of the survey.

Combined, these figures suggest 17% of dwellings had no working smoke alarms at the time of the survey.

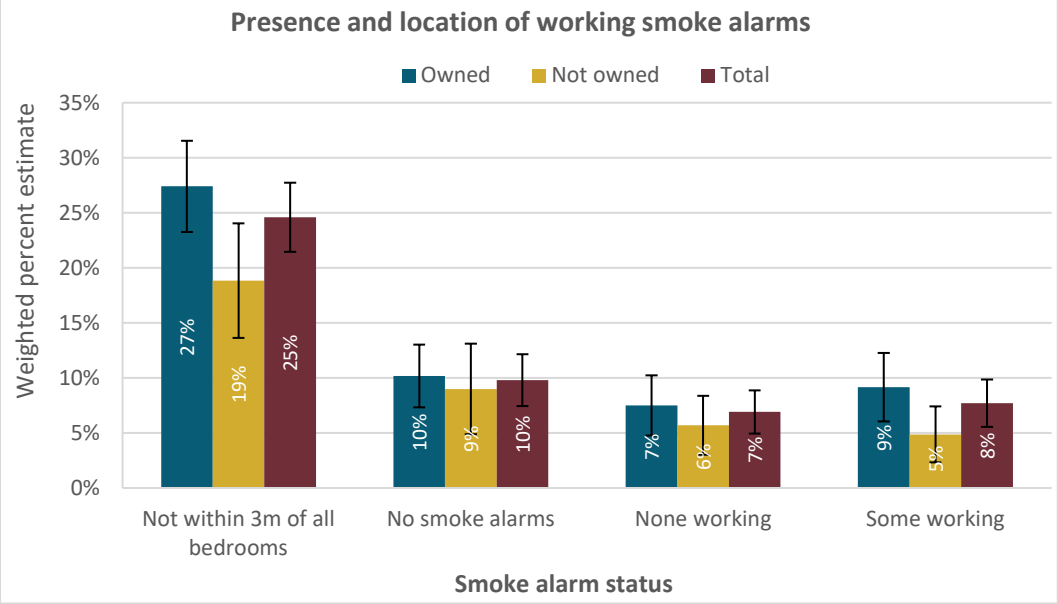


Figure 47. Presence of smoke alarms in surveyed houses.

10.2 Hot water tap temperatures

The temperature of hot water at the tap should be in a safe range to avoid scalding. Where a cylinder is present, water should also be stored at a sufficient temperature (recommended 60°C) to prevent *Legionella* bacteria growth. The NZBC states that, in the home, the maximum water temperature at the tap for showers, baths and hand basins is 55°C and recommends no higher than 45°C in some instances (such as if young children are present).

The PHS recorded the temperature at the hot water tap in all bathrooms (Figure 48). The results suggest around one-third of houses (33%, ±4.1 pp) had hot water exceeding 55°C in a bathroom (Figure 49). Hot water tap temperatures exceeding this threshold were more commonly observed in non-owner-occupied dwellings. These results are consistent with previous measurements in HCSs when sample error is taken into account (BRANZ, 2018).

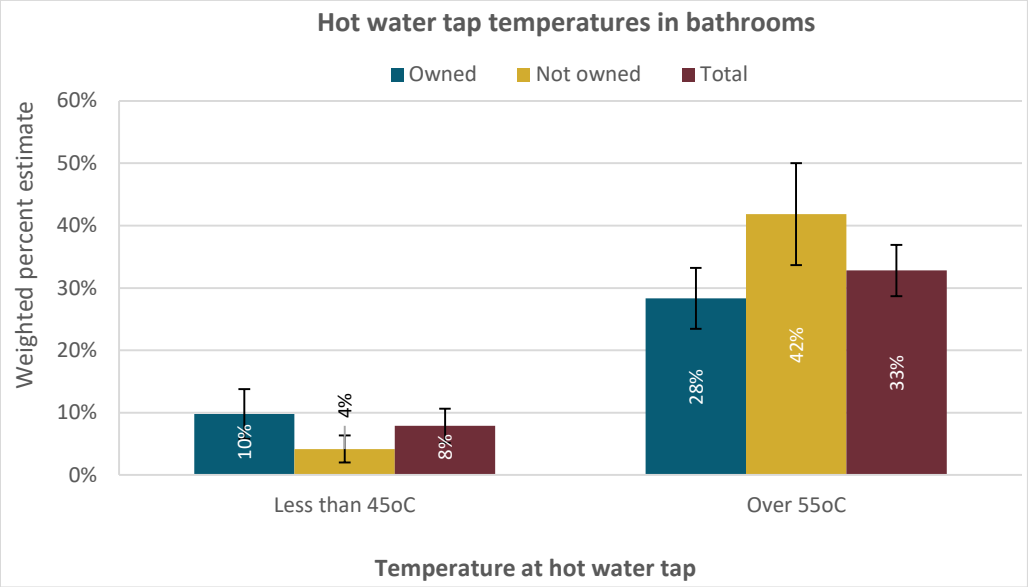


Figure 48. Temperatures at hot water taps in bathrooms of surveyed houses.

Figure 49. Around one-third of dwellings had hot water exceeding the recommended temperature at the tap.

10.3 Stairs

The NZBC specifies requirements for internal stairs to safeguard against the risk of injury (from trips and falls. These include specifications for handrails and balustrades and tread and riser depth and height.

Internal stairs were assessed against some of these requirements and other potential defects that could present a trip or fall hazard. As a large proportion of the housing stock is single storey only, this assessment only applied to a subset of the survey sample (just over one-quarter (26%, n=186 unweighted count).

The results suggest that, of the defects assessed in the survey – structurally unsound, shaky or loose balustrade or handrails, unsafe surface (such as holes/gaps – 9% of houses had at least one defect that could pose a trip or fall hazard. If non-Code compliant handrails and balustrades are included, this increases to 38% (10 pp of the total sample). However, given the smaller sample of houses that had stairs, results need to be treated with some caution.

10.4 Access and decks

The PHS recorded the presence of potential hazards with access paths and steps, including:

- slippery, uneven, cracked surfaces or obstructions (Figure 50)
- risers or treads not to Code requirements (too high or insufficient depth) or varying heights/depths (for steps)
- unsafe structure for steps (structural cracks, loose fixings)
- inadequate or missing handrails.

Figure 50. Overgrown vegetation can pose an access hazard.

The results show no difference between owner-occupied and rented dwellings in the presence of these defects. Over half of houses had none of the listed hazards (56%, ±4.1 pp). The most common hazard identified was a slippery or uneven surface, affecting around one-fifth of dwellings surveyed (Figure 51).

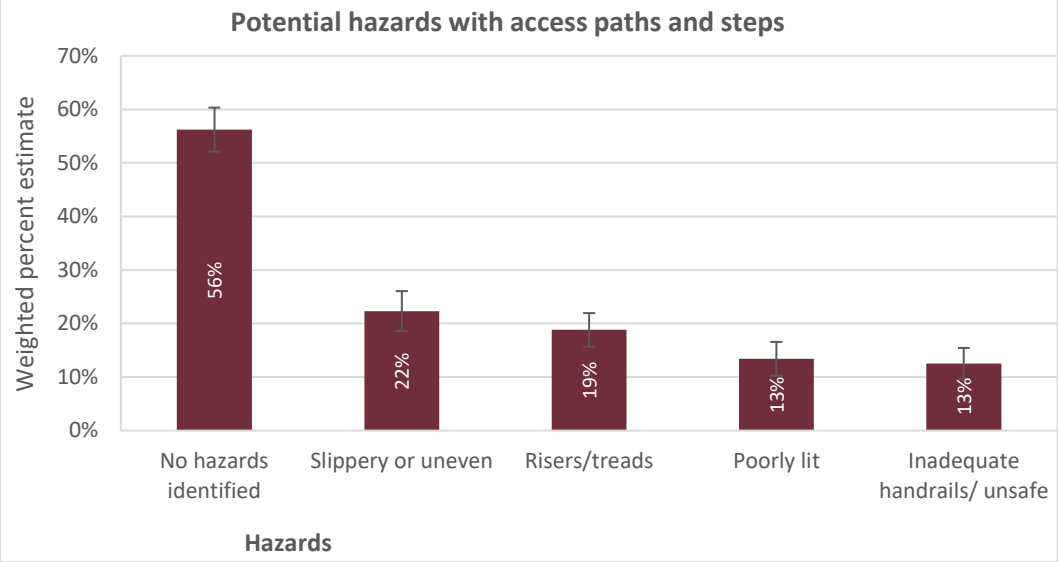


Figure 51. Presence of defects and potential hazards with access paths and steps.

Decks were also assessed for potential trips and falls hazards where these were sited 1 m or more above ground. This applied to around one-third (30%) of the total sample. Half of these houses with a deck showed signs of one or more potential hazard. However, as these results are based on a subset of the total sample (n=196 dwellings with a deck at 1 m or higher), they should be treated with some caution.

11. Conclusion

The Pilot Housing Survey had two distinct overall aims:

- To trial a new approach to collecting objective data on the condition of New Zealand housing, with the objectives of:
    - developing new app-based data collection tools to eliminate the need for paper surveys and manual data entry
    - partnering with Stats NZ to trial recruiting households through one of its national surveys
    - redesigning survey content and approaches to test the extent and robustness of data that could be recorded in a 1-hour on-site assessment.
- To provide a new data resource that could be used to help inform measures of housing quality for New Zealand.

A detailed review was conducted post-pilot with all agencies and providers involved in delivering the survey to capture and document learning from the pilot. This information will help inform BRANZ's future housing survey work.

Of note were the benefits of using a digital data collection and survey management tool, which was preferred to paper surveys by all assessors for the efficiencies and robustness it provided.

The value of collaboration – the partnership with Stats and MBIE in co-designing and delivering the project – is also noted as critical to the project's success.

Besides learning from the pilot aspect of the project, a key outcome lies in the dataset that this partnership has delivered. The analysis presented in this report provides an initial high-level overview of some of the results for owner-occupied and rental dwellings.

While many of these findings are not new as several of the results mirror those from the most recent HCS, this is a positive outcome in itself. Consistency in results upholds confidence in the robustness of methods and data. While new regulations have been introduced and new houses built to (or above) Code will deliver changes to the housing stock, these changes take time to take effect.

While many of the findings are consistent with previous HCSs, there are also some indications of shifts in a positive direction. For example, there was little difference observed in insulation levels of the owned and rented stock, and the latter showed higher prevalence of heat pumps compared to the last HCS. Such changes could be indicative of the new requirements introduced under the HHS.

This report has looked only at the PHS dataset in isolation and at a selection of housing parameters by tenure. There is significant scope to expand on this – for example, to explore condition by materials or dwelling typology/age (subject to sample size). Furthermore, the linked PHS-GSS data, which is available in the Stats NZ Data Lab, provides a new, accessible resource on housing and wellbeing. Analysis of this linked dataset is still in the early stages, hence the full value add of this project is perhaps yet to be realised. Working with Stats NZ, BRANZ will be undertaking distributional analysis (housing condition parameters by socio-demographic factors) and exploring the association between housing condition and self-reported wellbeing. This research is due for completion in 2021.

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Appendix A. Summary of PHS content

Table 6. PHS 2018/19 PHS summary.

Area	Subcomponent	Information recorded	Applicability/topic
Exterior	Roof	Materials, defects, condition	Housing condition Repair and maintenance
	Wall cladding	Materials, defects, condition	Housing condition Repair and maintenance
	Window frame and glazing	Materials, defects, condition	Housing condition Repair and maintenance Thermal performance
	Guttering and downpipes	Defects	Drainage Repair and maintenance Healthy homes standards
	Subfloor ventilation	Type, spacing	Drainage
	Gaps around windows and doors	Extent of gaps	Draughts Repair and maintenance Healthy homes standards
Entrance and exit	Security, safety	Lockable doors, lighting	Safety
	Access paths and steps	Defects	Housing condition Safety
	Decks	Defects	Housing condition Safety
Kitchen	Food preparation	Bench space, cooking facilities, potable water supply	Health and safety Basic amenities
	Openable window	Openable window, security stay	Ventilation
	Mechanical extract ventilation	Type, functioning, extraction outlet	Moisture control Healthy homes standards
	Heating	Type	Heating
	Lighting	Functioning	Health and safety
	Wastewater connection	Functioning	Health and safety
	Hot water tap	Temperature	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Laundry	Facilities	Location, dryer vented to outside	Basic amenities Health and safety Moisture control
	Openable window	Openable window, security stay	Ventilation
	Mechanical extract ventilation	Type, functioning, extraction outlet	Moisture control
	Lighting	Functioning	Health and safety

Area	Subcomponent	Information recorded	Applicability/topic
	Wastewater connection	Functioning	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Bathroom	Facilities	Toilet, hand wash basin, shower/bath	Basic amenities Health and safety
	Openable window	Openable window, security stay	Ventilation Healthy homes standards
	Mechanical extract ventilation	Type, functioning, extraction outlet	Moisture control Healthy homes standards
	Heating	Type	Heating
	Lighting	Functioning	Health and safety
	Wastewater connection	Functioning	Health and safety
	Hot water tap	Temperature	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Living area(s)	Design	Open plan, size	Heating requirements
	Glazing coverings	Curtains and blinds present, quality assessment	Thermal performance, managing heat loss
	Openable window	Openable window, security stay	Ventilation
	Heating	Type	Heating Healthy homes standards
	Lighting	Functioning	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Bedrooms	Glazing coverings	Curtains and blinds present, quality assessment	Thermal performance, managing heat loss
	Openable window	Openable window, security stay	Ventilation
	Heating	Type	Heating
	Lighting	Functioning	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Hallway	Heating	Type	Heating
	Lighting	Functioning	Health and safety
	Mould	Extent of visible mould	Health and safety

Area	Subcomponent	Information recorded	Applicability/topic
			Housing condition
	Linings	Condition	Housing condition Repair and maintenance
Internal stairs	Handrails and balustrades	To Code	Health and safety
	Stairwell/staircase	Lighting, defects	Health and safety Housing condition Repairs and maintenance
Other interior	Fire safety	Location and functionality of smoke alarms	Healthy and safety RTA requirements
Basements, garages, sleepouts	Openable window	Openable window, security stay	Ventilation
	Heating	Type	Heating
	Lighting	Functioning	Health and safety
	Mould	Extent of visible mould	Health and safety Housing condition
Hot water systems	Hot water systems	Type, leaks, TPR valve, earthquake restraint	Basic amenity Energy use Health and safety
Roof space	Roof space general	Type of ceiling cavity, accessibility, maintenance issues	Housing condition Repair and maintenance
	Insulation	Type, depth, coverage, defects	Housing condition Energy efficiency RTA requirements Healthy homes standards
Foundations and subfloor	Foundations	Type, defects	Housing condition Repair and maintenance
	Subfloor accessibility	Accessibility, restrictions, crawl space	Energy efficiency (insulation) and moisture management
	Insulation	Type, coverage, defects	Housing condition Energy efficiency RTA requirements
	Subfloor moisture	Ground vapour barrier coverage, condition Ponding extent and cause	Moisture control Healthy homes standards
General	Dwelling type	Building type, house typology, size	Classification Retrofit opportunity
	State of repair, damp	Overall assessment of state of repair, feel of damp, musty smell	Housing condition
	Ventilation, air treatment	Ventilation systems, air cooling, dehumidifiers	Ventilation Moisture control Indoor air quality
	Wiring	Unsafe wiring	Health and safety

Appendix B. Conversion and attrition rates

Conversion rates

The PHS ran from August 2018 to June 2019, following a short trial month in June 2018. The statistics below include this June 2018 trial (24 properties, of which 18 went on to complete the PHS).

Over the course of the survey, a total of 1,117 consenting households were passed to BRANZ from Stats NZ. From these, 832 (74%) went on to complete the PHS. The remainder were classed as declined (participant opted out), unreachable (participant could not be contacted) or surplus (survey timeframe passed and target achieved).

Figure 52 summarises conversion rates by tenure, which show slightly lower completion rates for rented dwellings (69%) compared to owner-occupied dwellings (78%). This was due to a higher proportion of rentals being unreachable – 14% compared to 8% of owner-occupied households.

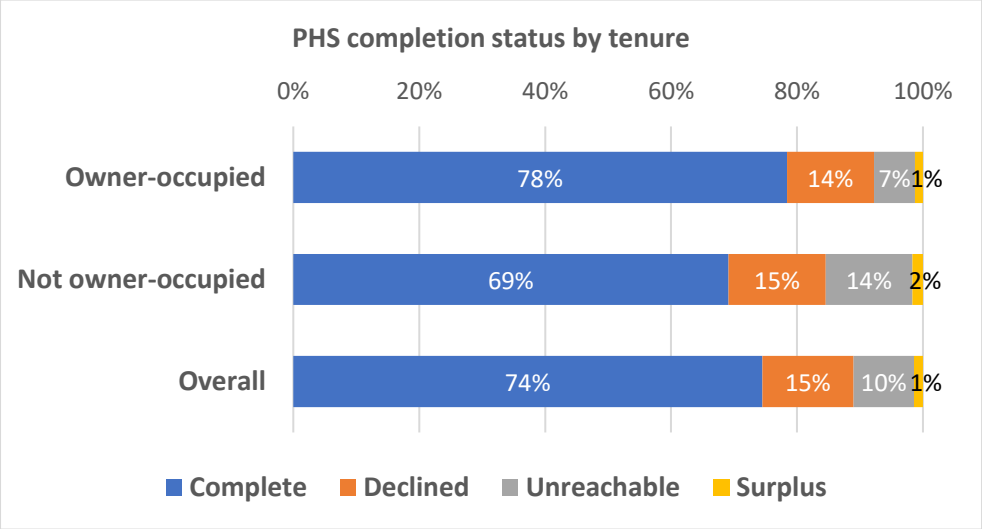

Figure 52. Survey conversion rates by tenure and overall.

Understanding conversion/attrition rates

The higher rates of attrition amongst rental houses are not surprising. This is consistent with previous HCSs, which have typically struggled to fulfil the rental quota. However, the fact that this was due to being unreachable rather than actively opting out is interesting. All participants were contacted in the same way – phone calls with follow-up by text if required. Providers were instructed to attempt contact by different means (call/text) and at different times of the day/days of the week. At least five attempts were made before the contact was deemed unreachable.

It is difficult to unpick and understand why rentals would be more likely to be unreachable. Further analysis of occupant characteristics (age, employment status) may provide some indication.

Reasons for opt-outs

Providers were asked to record all contact with participants in the notes section of the housing survey web application. This was important for helping them and the national

survey coordinator track contact and for BRANZ to gain insight into the number of call/text attempts and reasons for opting out.

Analysis of these notes (summarised in Table 7) shows, not surprisingly, the most common reasons given for opting out were simply that they had changed their mind or were too busy.

Table 7. Analysis of regional coordinator notes on reasons for opting out.

Reason for opting out	Count of participants
Changed mind/no longer interested	74
Too busy/inconvenient time	40
Can't recall (either taking part in the Stats NZ survey or consenting to be contacted)	17
Moving house soon	14
Health/wellbeing (of self or family member)/bereavement	11
Concerns over landlord	9