Condition of New Zealand Housing
<table>
<thead>
<tr>
<th>5th House Condition Survey (HCS)</th>
<th>Occupant ventilation behaviour</th>
<th>Occupant behaviour and fungal exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=560</td>
<td>N=64 (subset of HCS)</td>
<td>N=24</td>
</tr>
<tr>
<td>National coverage</td>
<td>4 areas of the country</td>
<td>Wellington region</td>
</tr>
<tr>
<td>Owned &amp; rented houses</td>
<td>Owner-occupied houses</td>
<td>Owned and rented houses</td>
</tr>
<tr>
<td>• Telephone interview</td>
<td>• Temperature and RH in bedrooms &amp; bathrooms</td>
<td>• Temperature and RH in all rooms</td>
</tr>
<tr>
<td>• Appliance-use questionnaire</td>
<td>• Windows and door motion sensors</td>
<td>• Windows and doors motion sensors</td>
</tr>
<tr>
<td>• Physical house assessment</td>
<td></td>
<td>• Air and floor fungal spore sampling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• In-home semi-structured interview</td>
</tr>
</tbody>
</table>
Condition and maintenance

49 features assessed on condition and defects

<table>
<thead>
<tr>
<th>CONDITION RATING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious</td>
<td>Health and safety implications; needs immediate attention</td>
</tr>
<tr>
<td>Poor</td>
<td>Needs attention within 3 months</td>
</tr>
<tr>
<td>Moderate</td>
<td>Will need attention within the next 2 years</td>
</tr>
<tr>
<td>Good</td>
<td>Very few defects; near-new condition</td>
</tr>
<tr>
<td>Excellent</td>
<td>No defects; as-new condition</td>
</tr>
</tbody>
</table>

House Condition Survey physical house assessment

1. Foundations and subfloor
2. Exterior (walls, windows, doors)
3. Interior (all room linings and fittings)
4. Roof
5. Roof space
6. Insulation
7. Hot water cylinder
8. Decks
9. Carports, garages, sleepouts
10. Paths, steps, ramps

Defects
- Decay
- Rot
- Chipped paint
- Surface cracks
- Borer
Defects - examples
What is needed for warm, dry, healthy homes?

- Indoor air quality
- Heating
- Minimising heat loss
- Moisture control & ventilation
- Mixing heat loss
- Heating
- Moisture control & Ventilation
Heat loss in an uninsulated house

- Air leakage: 6-9%
- Roof: 30-35%
- Walls: 18-25%
- Floor: 12-14%
- Windows: 21-31%
Sources of moisture in the home

- Cooking per day
- Clothes washing per load
- Unvented clothes drying per load
- Unflued gas heating to per hour
- Showers/baths per person
- Washing dishes per day
560 NZ HOUSES assessed from September 2015 to June 2016

35% rented
65% owned

HEATING HABITS

46% of households did not heat bedrooms in winter
51% of children's bedrooms were not heated in winter

VENTILATION

Only around HALF had an extractor fan in the bathroom venting to outside
Only around HALF had an extractor fan in the kitchen extracting to outside

INSULATION

53% could benefit from retrofitted insulation in the roof space and/or subfloor
47% had less than 120mm or insufficient coverage of insulation in the roof space
19% had insufficient coverage of insulation in the subfloor

HEATING APPLIANCES

Heat pumps
40% of owner-occupied houses
25% of rentals

Wood burners
39% of owner-occupied houses
23% of rentals

Electric heaters
25% of owner-occupied houses
33% of rentals

Portable unflued gas heaters
4% of owner-occupied houses
15% of rentals
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  - 33% of rentals

- Portable unflued gas heaters
  - 4% of owner-occupied houses
  - 15% of rentals
Overall Temperature Distribution in Bedrooms (2016)
## Temperature readings for all bedroom from the 2016 study

<table>
<thead>
<tr>
<th>Readings</th>
<th>Proportion of time</th>
<th>Percentage of bedrooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10°C</td>
<td>3%</td>
<td>54%</td>
</tr>
<tr>
<td>Less than 12°C</td>
<td>8%</td>
<td>84%</td>
</tr>
<tr>
<td>Less than 14°C</td>
<td>21%</td>
<td>96%</td>
</tr>
<tr>
<td>Less than 16°C</td>
<td>43%</td>
<td>98%</td>
</tr>
<tr>
<td>Less than 18 °C</td>
<td>71%</td>
<td>100%</td>
</tr>
<tr>
<td>Less than 21 °C</td>
<td>95%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Occupant heating habits and coping strategies (2017 study)

- Heat the living area and rely on heat flow to bedrooms
Occupant heating habits and coping strategies

- Heat the living area and rely on heat flow to bedrooms
- Sleep in one room, electric blankets, hot water bottles, extra blankets

“Nah, I’ve got an electric blanket, that’s my heater! It’s nice with my electric blanket on...but it does get really... what do you call it, when it gets cold...real damp, musty.”

“It's cold as. We actually had a column heater in there quite a bit, cos at the back of the section there are retaining walls, when the cold comes down and rain and wet, it just sits in that area. It doesn't get dry.”

“It heats up in here, we get it hot enough for us, so we can't bear it, then open all the doors so then the heat goes out.”
VENTILATION

Only around HALF had an extractor fan in the bathroom venting to outside

Only around HALF had an extractor fan in the kitchen extracting to outside
Occupant ventilation behaviour (reported)

Whilst taking a bath/shower

<table>
<thead>
<tr>
<th></th>
<th>Open windows</th>
<th>Use extractor fan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>30%</td>
<td>54%</td>
</tr>
<tr>
<td>Often</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>Never</td>
<td>6%</td>
<td>25%</td>
</tr>
<tr>
<td>N/A</td>
<td>27%</td>
<td>2%</td>
</tr>
</tbody>
</table>

After taking a bath/shower

<table>
<thead>
<tr>
<th></th>
<th>Open windows</th>
<th>Use extractor fan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>48%</td>
<td>42%</td>
</tr>
<tr>
<td>Often</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>9%</td>
<td>22%</td>
</tr>
<tr>
<td>Never</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>N/A</td>
<td>14%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Options:
- Always
- Often
- Sometimes
- Never
- N/A
• Windows not open for long enough/wide enough
• Extractor fans used too little
• Poor installation, fitting, ductwork
• Lack of heating
**HEATING HABITS**

46% of households did not heat bedrooms in winter.

51% of children’s bedrooms were not heated in winter.

**INSULATION**

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19% had insufficient coverage of insulation in the subfloor.

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8% “musty” smell
18% felt damp
Rentals twice as likely to smell damp
Rentals three times as likely to feel damp

Mould was most commonly found in bathrooms.

Mould in bedrooms

Almost 30% > 18% of rentals > owner-occupied

Managing mould
Mould was more commonly observed in houses lacking effective heating, ventilation and insulation

Moody was visible in 49% of all houses

44% owned
56% rented

David Rutherford,
Chief Commissioner,
Human Rights Commission

‘people shouldn’t have to live in houses contaminated by methamphetamine – but they shouldn’t have to live in houses that are damp and mouldy either’