

Climate, Housing and Health Profiling: Promoting housing quality to improve health and wellbeing

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Introduction

New Zealand's existing housing stock is subject to rapid aging and deteriorated conditions, due to the low replacement rate and lack of maintenance. Dampness conditions such as mould are visible in nearly half of all houses, with a slightly higher prevalence in rental properties. The overall indoor air quality of houses is potentially harmful to the health of household occupants.

Lack of ventilation and overcrowding are significantly associated with streptococci infections and rheumatic fever, with high rates compared to other developed countries.

The links between poor housing quality and New Zealand's high incidence of health-related fatality are

well recognised. Each year more than 20 children are killed by respiratory diseases linked to unhealthy housing. Mortality is especially high among low-income Māori and Pacific families who live in sub-standard rental properties.

Several interventions in recent years, including a warrant of fitness (WoF) tool from Housing NZ (in 2014), and the Homestar rating tool launched in 2010, help landlords and tenants share housing quality information. The Government passed the Healthy Homes Guarantee Act 2017 with the introduction of healthy homes standards for rental homes. However, in addition to indoor temperature, heating, insulation, ventilation, moisture ingress, drainage and draught stopping to improve the quality of rental homes, human behavioural factors and environmental disturbances should be also considered when defining housing quality.

Why is this important for New Zealand?

As of June 2018, nearly a third of households (588,700) in New Zealand were in rental homes, and a significant proportion of these rental properties are reported as being cold and damp. Climate changes have the potential to cause even more respiratory health hazards, such as increasing dampness and mould in the house, that may compromise housing quality and increase the occupants' susceptibility to illness and health issues. These changes will have profound consequences for the health and wellbeing of our nation.

In considering the [United Nations' Sustainable Development Goal 11](#) - to 'make cities inclusive, safe, resilient and sustainable,' climate change adaptation or response requires an urban health perspective to unite all actions behind a common cause - the health and wellbeing of communities.

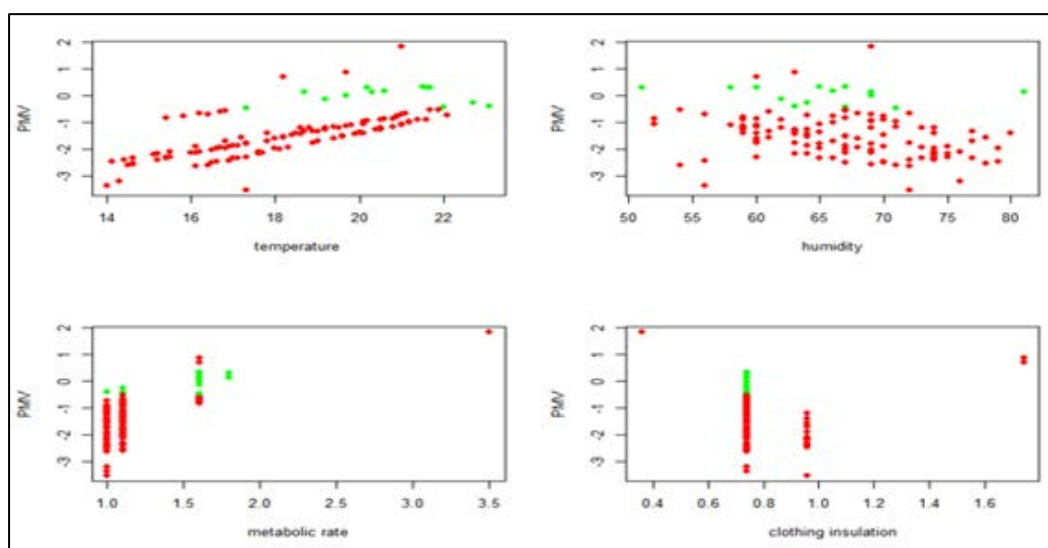
Key Concerns:

- **Lack of access to quality housing**, especially for at-risk groups in rental properties.
- **Poor housing conditions** and changes in **climate** create challenges for **public health and housing equity**
- The Healthy Homes Guarantee Act (2017) aims to improve the quality of rental homes, but what are the **standards for a healthy home?**
- **Human behavioural factors** and/or environmental disturbances also contribute to housing quality
- Working with stakeholders to effectively developing a **people-centered thermal comfort approach**.

Research findings

Smart sensors were installed in a typical rental property in Auckland without any heating devices. Data from a questionnaire survey captured occupants' behaviours and occupants recorded their daily activities. House inspections were conducted on structure and housing conditions. Together with real-time environmental data (humidity, temperature, light levels, etc.) recorded from sensors, these were used to calculate the Predicted Mean Vote (thermal comfort) and Percentage of People Dissatisfied according to the American Society of Heating, Refrigerating and Air-Conditioning Engineers and International Standards (ISO-7730). Thermal comfort simulation was also undertaken.

The correlation between the Predicted Mean Vote and four variables, namely **temperature, relative humidity, metabolic rate, and clothing insulation** showed that thermal comfort was not achieved most of the time, and occupants felt cold even during the spring season. Relative humidity was not significant, so lack of a heating system and the structural insulation method in the house seem to be the main reasons for the thermal discomfort.



What should policy makers do?

- Carry out planned **consultation on Healthy Homes Standards** (led by Ministry of Business, Innovation and Employment) and a framework for housing quality (led by Statistics New Zealand) and align the indicators and actions between these two policy frameworks.
- Work together with Whānau, community groups, local authorities and other stakeholders to ensure that construction of new dwellings and upgrading of existing rental or owner-occupied housing will take place by **providing financial incentives** to meet the Healthy Homes Standards.
- **Promote a thermal comfort approach** at the building scale, considering human behavioural factors and/or environmental disturbances.
- Further encourage the development of **solar heating and ventilation solutions**.
- Initiate new programmes to promote **energy efficiency**, such as subsidies for insulation on the roof, double glazing, and solar panels.
- **Re-visit the New Zealand building code** to stipulate the optimal indoor thermal comfort of the occupants.

To find out more about this research, please visit:

<https://smarthousinglab.files.wordpress.com/2018/11/smart-housing-and-health-project-report.pdf>

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