Case study of summer overheating in Wellington public housing

Chen, Z; O'Sullivan, K C; Pierse, N; Ericson, E; Stephenson, K. (2025). Exploring Health and Wellbeing Impacts of Summer Indoor Overheating on Public Housing Tenants: A Mixed-Methods Study in Wellington, New Zealand. Under review.

THE RESEARCH

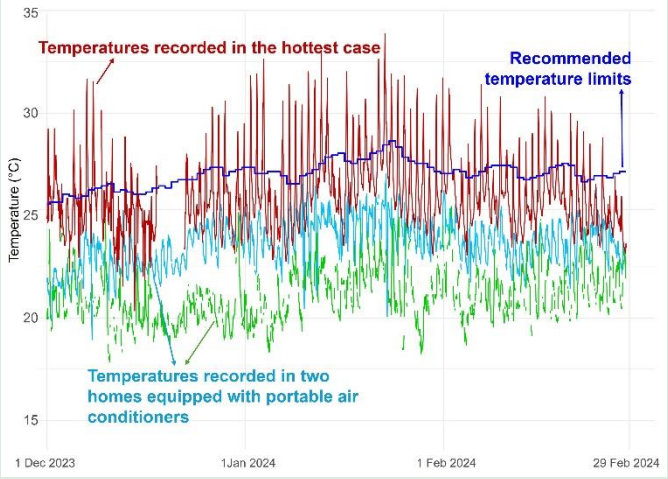
- Summers in New Zealand are becoming warmer due to climate change, and indoor overheating is now a significant concern.
- Public housing tenants often face challenges in adjusting their home temperatures. It is essential to recognise and address their specific cooling needs to support their health and wellbeing during the warmer months.

We conducted a mixed-methods study to assess the overheating risk in public housing units and to explore how it affects tenants' health and wellbeing.

- We tracked indoor temperatures in seven public housing units in Wellington from December 2023 to February 2024.
- We spoke with tenants before and after the summer to learn about their experiences.

NGĀ HUA MATUA // KEY FINDINGS

Our study found substantial overheating in homes without portable air conditioning, especially during sleeping hours. Compared to an international guidance (CIBSE TM59), the hottest case exceeded recommended temperature limits for over 11% of the time and 39% of sleeping hours. Homes with portable air conditioners exceeded the threshold for only less than 0.5% of the time.



- Overheating has direct effects on tenants' physical, emotional, and social wellbeing, leading to substantial discomfort, excessive sweating, sleep difficulties, fatigue, and mental health issues such as anxiety and stress. Overheating also contributes to a reduced ability to perform daily activities and places strain on the relationship between tenants and their home environment.
- Passive cooling methods, such as opening windows and using curtains, were reported as insufficient for cooling. Opening windows was sometimes not feasible due to weather conditions, particularly strong winds.
- Most participants used electric fans; however, some reported that fans were insufficient on hot days.
- Financial constraints significantly limit tenants' cooling options. While portable air conditioners can effectively lower temperatures to a comfortable level, their high purchase and running costs make them an impractical choice for many.

RECOMMENDATIONS

- **Long-Term Solutions:** Cost-effective, energy-efficient strategies at the building scale should be explored to prevent overheating during summer and ensure year-round thermal comfort. This may include implementing strategic shading and energy-efficient heating and cooling systems.
- **Immediate Needs:** It is equally essential to address the immediate cooling needs of tenants, particularly those with specific health-related cooling requirements. Advice should be considered for extreme heat events and hot days to assist the most vulnerable populations.
- **Policy recommendations:** Housing standards, building design guidelines and regulations must incorporate measures for preventing summer overheating. Policies and funding should facilitate upgrades, interventions, and renovations that ensure year-round thermal comfort and enhance building resilience to future climate change.

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