PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA


# Fighting cold, damp housing – a big tick for Warmer Kiwi programme

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# Summary

New research shows heat pumps are effective in reducing electricity use, result in warmer, drier living areas in winter, and can help to lower respiratory illness.

Motu Research has evaluated the Government's Warmer Kiwi Homes programme and found using heat pumps reduces electricity use by 16 percent on average over winter months and is effective at creating warm, dry homes in Aotearoa.

The programme will also be lowering the risk of respiratory disease caused by our damp, cold houses. Respiratory disease disproportionally affects Māori and Pacific peoples. Hospitalisation rates from respiratory illness are much higher for Pacific peoples and Māori than for other ethnic groups.

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The NZ Government provides home insulation and heating subsidies through its Warmer Kiwi Homes programme. The Warmer Kiwis Study team at Motu Research recently evaluated the Government's Warmer Kiwi Homes programme to determine if the subsidised heat pumps installed in people's homes deliver the desired outcomes. The Energy Efficiency and Conservation Authority commissioned this evaluation.

Our Warmer Kiwis Study team worked to determine if the health and wellbeing of people in households improve when they their homes are insulated and a heat pump installed. The study's results relate to:

- people's health and wellbeing in their homes
- the homes' indoor environment (including temperature and relative humidity)
- electricity consumption.

## Testing the programme

There is a great need for affordable, energy efficient home heating, especially given the ongoing climate and cost of living crises. To address this need, in the recent Budget 2023, the Government decided to nearly double its Warmer Kiwi Homes programme, to deliver 26,500 home insulation and heating retrofits per year for the next four years. That decision was based on the results of Motu's Warmer Kiwis Study evaluation, published at the end of last year which clearly demonstrated the effectiveness of the Warmer Kiwi Homes programme.

Ours is the most comprehensive study of heat pump effectiveness in homes in Aotearoa New Zealand, which provided very strong results in favour of subsidising heat pumps for low-income families.

## How heat pumps improve people's health

The housing stock in Aotearoa is well known for being damp, cold and difficult to heat. This causes many health problems, including respiratory infections and exacerbation of chronic conditions such as asthma.[1,2,3]

Improved home heating can lead to reductions in these health issues. Living in a warmer

house can also have significant benefits for general wellbeing. These benefits have been demonstrated by previous studies.[4,5]

We show in our study that warmer and drier environments, provided by Warmer Kiwi Homes interventions, benefit individuals. A warmer and drier home environment also benefits society, through reduced healthcare costs and loss of productivity due to illness.

This study shows specific positive effects from replacing inefficient heaters with heat pumps on people's lives:

- After a heat pump was installed, living areas of study houses experienced higher temperatures, especially when outdoor temperatures were low. Higher temperatures were most pronounced around breakfast and evening times.
- Households used less electricity to heat their house, compared to houses without heat pumps.
- Houses experienced reductions in relative humidity and carbon dioxide concentration in living areas.
- Household members overwhelmingly reported increases in warmth, comfort and satisfaction with their home.
- Household members reported a decrease in condensation, damp and having to restrict heating due to costs.
- Household members, on balance, report an increase in life satisfaction.

## Impacts on Māori and Pacific peoples' health

Warmer Kiwis Homes programme is targeted at low income homeowners. Improved home heating can lead to reductions in respiratory illness. This is important because people living in the most deprived households are admitted to hospital for respiratory illness over two times more often than people from the wealthiest areas.[6]

Because Māori and Pacific people are overrepresented in lower socioeconomic groups, many Māori and Pacific homeowners can participate in the programme and receive the health benefits of a warmer, drier home — and lower home heating costs. It is important the Government helps Māori and Pacific because hospitalisation rates from respiratory illness are much higher for Pacific peoples (2.6 times higher) and Māori (2.2 times higher) than for other ethnic groups.[7]

## How we did the study

We measured temperature, humidity and CO2 in living rooms for several weeks before each participant's old heaters were switched out for heat pumps.

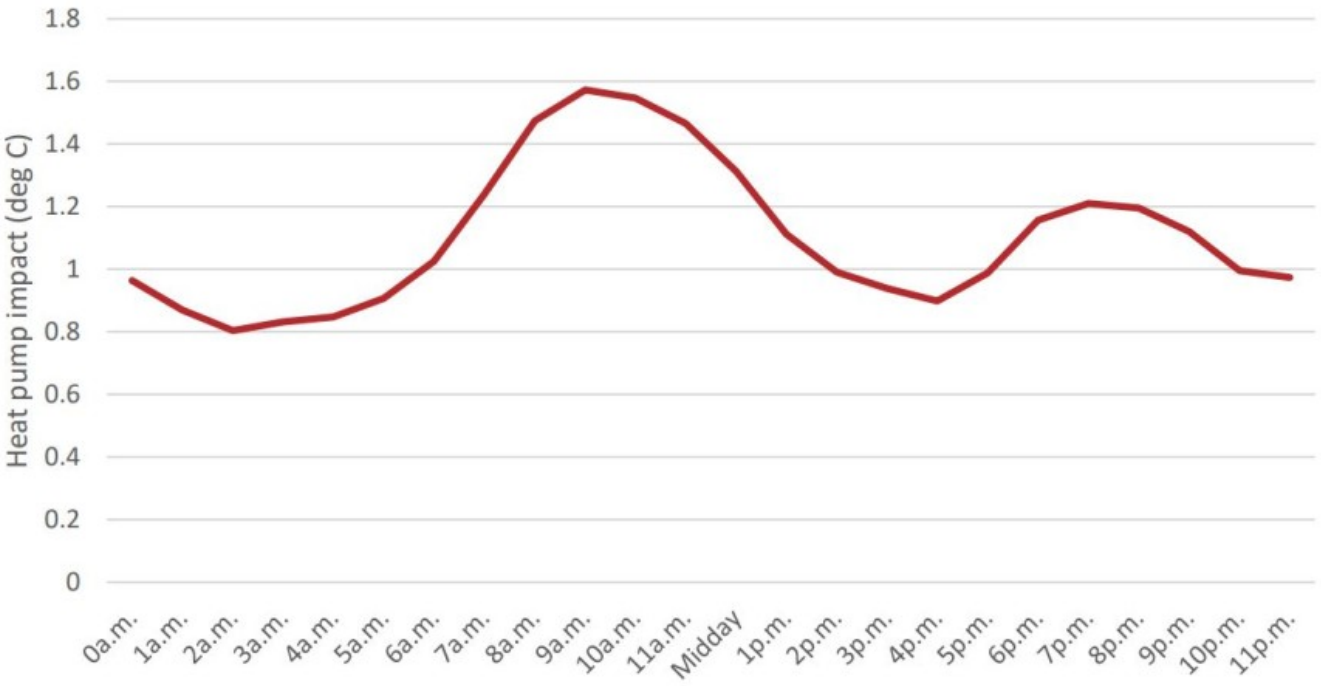
We adjusted internal measurements for external conditions, by looking at the difference between indoor and outdoor temperature, especially when it was very cold outside. This allowed us to understand the difference between the house using their old heating system compared to them using a heat pump. We also collected electricity records for participating households, to see how much electricity they were using at a particular hour of the day.

By looking at the difference between indoor and outdoor temperatures, we saw heat pumps made a big difference compared to the old inefficient heater, particularly when outdoor temperatures were very low. At these times, when the difference between outdoor and indoor temperatures was the greatest, households were actually using less electricity than

with the previous heater.

In fact, houses in our study used 16 percent less electricity on average over the winter period from using a heat pump instead of an inefficient heater. What's more, some houses had replaced gas heaters, meaning the real reductions in overall energy use were even greater.

The figure below (from the study's summary report) shows the average temperature increase in a living area from using a heat pump, by hour of day. It shows temperatures in the living area for a house with a heat pump installed through WKH averaged around 1.1°C warmer over the full day than the same house without a heat pump fitted.




## Study findings

Motu's study provides powerful evidence heat pumps are effective at keeping houses warm and reduce home heating costs. We concluded the Warmer Kiwi Homes programme is effective at creating warm, dry homes in Aotearoa.

– Full Report available as Motu Working Paper WP 22-14.

See video testimonials of low income homeowners who have benefited from Warmer Kiwi Homes (please credit this to EECA).

## What's new in this Briefing

- Motu's study provides powerful evidence heat pumps are effective at keeping houses warm and reduce home heating costs.
- Using heat pumps reduces electricity use by 16 percent on average over winter months.
- We concluded the Warmer Kiwi Homes programme is effective at creating warm, dry homes in Aotearoa.

## Implications for public health policy and practice

- Because Warmer Kiwi Homes is making homes warmer and drier, it will also be reducing the risk of respiratory disease in our population.
- This is important because the housing stock in Aotearoa is well known for being damp, cold and difficult to heat. This causes health problems like respiratory infections and exacerbates chronic conditions such as asthma.
- This problem disproportionally affects Māori and Pacific peoples. Hospitalisation rates from respiratory illness are much higher for Pacific peoples (2.6 times higher) and Māori (2.2 times higher) than for other ethnic groups.
- Warmer Kiwi Homes programme is helping Māori and Pacific peoples suffering from respiratory illness because of cold, damp housing.

### Author details

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