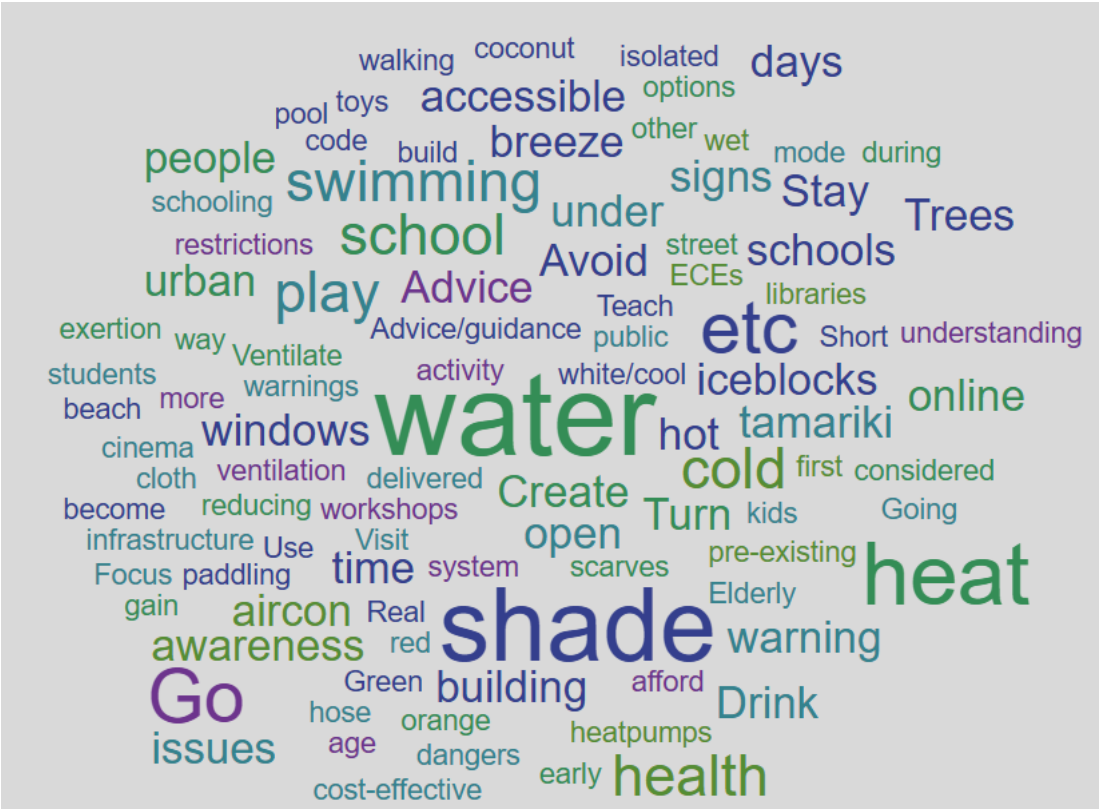
Workshop Summary: Temperature and Child Health Research



Word cloud generated from participants when asked how they cope with high temperature events

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Wānanga Workshop Summary: Climate Change, Heat Stress and Child Health

Summary

- Our research shows that children (aged 0-5 years) in Aotearoa New Zealand, are more vulnerable to heat, leading to increased hospital admissions.

Method and results

- Data from integrated systems (IDR) highlights various causes for these admissions, with significant differences based on ethnic groups (e.g., Asian, Pacific, Māori, European), and migrant children being more affected, the latter especially by colder weather.
- Analysis using daily maximum temperature data (NIWA) and meshblocks show that hospital admissions sharply increase when temperatures rise above (or drop below) the reference at 24°C.
- The risks are **most pronounced** for temperatures that are **above the local 95th percentile of summertime temperatures**, with cumulative risks evident **over three-week periods.**
- The impacts of temperature are often delayed, affecting conditions like infectious diseases, immune disorders, cardiovascular issues, respiratory problems, and skin conditions.
- The research also notes that both hotter and colder temperature extremes significantly raise hospitalisation rates of children.
- We presented these results to participants of the workshop and allowed them to respond to the data. We also discussed in breakout rooms a series of questions around this topic.

Conclusions

- Children heat up quickly and struggle to express discomfort. Young children who are not mobile **rely on care givers** to understand the risk.
- Understanding how different **ethnic groups** are affected can guide targeted interventions to address specific vulnerabilities and ensure no one is left behind.
- **Sectors outside of health** are essential in reducing heat related health risks to children:
  Housing, both new builds and existing housing stock needs to include overheating risks, as managing indoor temperatures will become increasingly important. Increasing cross-ventilation, creating shade and using solar energy for cooling are some solutions.
- These implications extend to **educational settings**, particularly in early childhood education.
- **Infrastructure** must consider access to shade, whilst maximising benefits in terms of activity – which promotes life course protection against heat. Increasing green spaces provides a solution that supports both objectives.
- In terms of **legislation and policy**, it's vital to provide support to our kaiako (educators) working in these environments, as well as to those involved in designing and licensing educational services, such as the Ministry of Education and the Ministry

of Business, Innovation and Economy, **to ensure that buildings, homes and spaces are safe, comfortable, and conducive to learning and play, despite rising temperatures**. This could be achieved through the creation of maximum indoor temperature limits and deliberate building design.

- Through targeted **education and communication**, children, parents, guardians, caregivers, educators and health staff, can be included in efforts to reduce heat related health risks e.g. looking for signs of discomfort in children, closing curtains, seeking shade.
- **Roles and responsibilities:** It is also important to confirm roles and responsibilities across agencies as heat is a cross sectoral issue. Who's responsible for what could be outlined in plans such as the National Adaptation Plan and Health National Adaptation Plan.
- **Early warning:** There is currently no fully funded heat warning system. This would be useful for health sector planning and for other agencies that need to plan for high temperature events.

There is a stark contrast in climate impacts between the Global North and South, emphasising shared responsibilities. While our nation may not experience extreme temperatures in comparison, socioeconomically disadvantaged regions face severe challenges, including crowding, water scarcity, and limited cooling options. These regions have resilience limits that highlight the need for global solidarity in climate mitigation and adaptation.

Our research reveals an important finding: New Zealand, as a Global North country, also experiences heat-related health impacts similar to those observed in the Global South. This underscores a shared vulnerability to climate risks, though lower-income countries remain more exposed to rapid and severe changes under current and future warming rates. Together, these insights emphasise the interconnected nature of climate challenges and the urgent need for collaborative global action.

Introduction to the workshop and objectives

Government, agencies, businesses, NGO's, communities and individuals are increasingly focusing on the health impacts of climate change and enhancing cross-sector collaboration to tackle this wicked challenge. The vision for this research project is to contribute to cross-sectoral knowledge transfer and public health decision making in Aotearoa that reduces the adverse health effects of temperature on children, now and in the future.

The workshop objectives were to:

1. To share the key findings of our study on climate change, heat stress, and child health with stakeholders and interest groups, ensuring a clear understanding of the research outcomes.
2. Provide opportunities for participants to respond to the research, contribute additional insights, and share their perspectives on the implications of the findings.
3. Examine the policy context and collaboratively explore culturally relevant policy recommendations for addressing the impacts of climate change and heat stress on child health.

Workshop Approach:

The workshop was split over 2 cohorts. The first cohort took place on the 25th July 2024. This was a shorter workshop (1 hour), with the presentation and time for reflection/discussion. The public health climate change network (PHCCN) of Te Whatu Ora we're invited to this workshop. In addition, some local councils attended since they could not attend the main workshop. Participant reflections were captured on-line using the tool Padlet.

The main workshop took place on the 9th of October 2024. This 2-hour workshop was split into 2 components. In the first half, participants were given a presentation summarising the research on climate change heat stress and child health with time for reflections. In the second half, they were placed into breakout rooms to deep dive further into the subject.

A version of the presentation shared with participants can be found here:
https://youtu.be/kBJB7PCsHdg
The peer-reviewed paper from this research can be accessed here:
https://doi.org/10.3390/ijerph21091236

Workshop Outputs Cohort 1:

Workshop insights are summarised into the themes below.

Question
What is your reaction to the results in the presentation?

Is this surprising, expected, anything missing, what you have already observed?

There was a mix of surprise regarding the research results. The risks and impacts of cold temperatures on migrant families from warmer regions are aspects that others had not considered.

Suggestions from Participants for Public Education and Communication

- Creation of simple summaries/infographic of the research for non-experts e.g. community groups.
- Some targeted stakeholders to be informed of the research e.g. Ministry of Education, Ministry of Housing and Urban Development, social housing providers/BRANZ/building code developers for policy development.
- The data should be broken down by year and analysed regularly in the future for ongoing monitoring and community education, with a follow up on increasing health literacy e.g. comparing new migrant populations vs established ones: do the risk factors decrease?
- It was felt that effects on children were a good way of motivating policy makers.

Further research interests:

- Heat related health risks to older people, people with disabilities, people with mental health conditions, etc.
- Pollen effects on children. An example was given of challenges in Tairāwhiti with allergies including respiratory conditions.
- The net effect of heat and cold in children.

Equity

- In southern cities the maximum heat impacts are in poorer communities.

Workshop Outputs Cohort 2:

What is your reaction to the results in the presentation?

Is this surprising, expected, anything missing, what you have already observed?

- Crowded homes – home ownership and ethnicity could account for this. However, data on crowding in small areas from the census is available at the area level. Cohort data could be used to look at crowding and require a different study design.
- Evidence shows that medium-density terraced housing and apartments are already overheating, reaching temperatures exceeding 28°C, due to a lack of cross-ventilation and the urban heat island effect. Existing homes can also overheat. Checking whether a new build would overheat (through modelling) presents an opportunity to make an investment that can reduce a lifetime of discomfort.
- NIWA data suggested an increased prevalence of hot days (above 25°C) that are likely to rise to over 12 additional days per year.

Breakout Rooms

This part of the workshop aimed to collaboratively gain a deeper understanding of current experiences and practice of stakeholders working with parents and children, as well as those involved in the policy and adaptation context of climate and health.

The following is a summary from combined breakout rooms. We have generated themes based on the conversations and the Zoom chat.

Workshop Process

Participants in each breakout room were asked to answer questions via a virtual whiteboard (Miro). Participants could verbally answer the questions or add them to the whiteboards themselves. They were encouraged to explain their responses.

Question 1.
What do you already do in the space of heat related impacts?
Does the research change what you are doing?

Key insights:

It was generally felt that now more work could be done to raise awareness of heat related health impacts. There were clear opportunities to present the research as evidence in support of heat related policy change and education to specific groups, in particular housing, midwifery and education, to inform and enhance ongoing initiatives.

There was some expectation that a temperature threshold value would be available for comparing with other studies and to develop early warning systems.

There was recognition that this research is likely underreporting child health impacts, along with some equity issues related to socioeconomic status. Intervention has typically focussed on cold, damp, and sun protection. Higher temperature interventions are relatively new, but their necessity will increase.

The discussion highlighted several key areas of focus related to the impacts of heat on child health:

Legislative or Regulatory

- Supporting local councils to think about the way they plan and organise future generations (e.g. heat policies)
- Evidence to increase/improve building standards, particularly public housing.
- Interest in upper thresholds to recommend for infants at home.

Public Education and Communication

- Information needs to reach educators in preschools, midwives, public health nurses and the general public.
- Hot cars were identified as a risk with the need to ensure that a hot car can be cooled down quickly before and while driving. This raised an equity issue around older cars and adequate air conditioning systems.
- Some interventions included education on closing curtains to reduce solar gain. This was seen as is key for the general public, but particularly for immigrants that do not typically use curtains.

Technological or Engineering, Infrastructure, Development and Ecosystem Intervention

- Some challenges understanding infrastructure upgrades and climate change; e.g. HVAC systems (heating, AC, etc.); not only with new builds but also older homes, buildings, etc.
- **Data and Scalability:** Utilising international and localised data to create scalable solutions that are aligned with broader efforts.
- **School Design:** Considering the design of school buildings to mitigate heat effects on children, including the educating children.

Health Intervention and Health Systems

- The need to understand the relationship between climate change and health impacts to improve the delivery of health services and align heat response strategies with global and national benchmarks.
- Issues with scalability; localised context can get lost in global context and measures.
- For heat warnings, temperature thresholds are needed that affect various groups of people.

Research/Information/Surveillance/Monitoring

- Research is needed to present ethnicities and other factors more easily.
- Data must align with the evidence already available for “hot days”. For example, maintain the modelling in a manner similar to existing studies, possibly utilising some form of numerical value.
- How does heat affect cognitive function? Signs of heat stress and behaviours may have health consequences, even though they are not direct health, e.g. effects of heat-effected behaviour, such as increased violence.
- Studies from around the world show that heat affects various factors, such as sports and alcohol, as well as having an impact on health.

- Identifying the key factors that contribute to heat-related impacts on different populations, with a particular focus on Māori and tamariki.
- Analysing socio-economic factors that contribute to higher risks and create differential impacts, with particular attention to priority (at risk) groups.

Equity and Fairness

- **Intergenerational Equity:** Emphasising the need to address intergenerational disparities in heat impact, while ensuring fairness for future generations. Older children in low-income households are also affected.
- **Digital Equity:** Addressing issues of digital equity to ensure fair access to resources and information. E.g. Lower socio-economic areas don't have access to technology outside of school.

Question 2.
How do people with children currently cope with high temperature events?
What is your general advice in this situation?

There was recognition that heat negatively affects cognitive function and overall well-being. Coping strategies and advice for dealing with high-temperature events, particularly for people with children, include taking cold showers, visiting the beach, using paddling pools, staying hydrated and maintaining electrolyte balance, using wet scarves, undressing babies, ensuring adequate clothing, seeking shade, opening windows to create a breeze, going to places with air conditioning, and avoiding outdoor activities and exertion during peak heat. A negative impact of high heat can include taking time off school. People emphasised the importance of teaching children about heat precautions through informational resources and noted that the impact of heat on sports and physical activities needs to be considered. There was also awareness that heat can increase stress and violence, affecting family dynamics and well-being. In terms of equity, in some communities, women and girls often bear the responsibility of caring for other children when they become unwell due to heat.

This final question introduced a set of policies on the virtual whiteboard. These were policies presented in the paper published in September 2024.

Question 3.
We would like to know if participants think these policies are currently useful and will be useful in the future given the projected changes in temperature. This can be thought of as:

- **How do these policies match with your knowledge of community experiences and actions?**
- **What other actions would you suggest, on the basis of this research?**

Key insights

Priority Alignment: Effective policy changes and interventions require heat health to be recognised as a priority across multiple sectors. Without this alignment, efforts may fall short.

Role of Fitness: Fitness is a critical, though not the only, determinant in managing heat stress. It is important to promote active lifestyles in the context of increases in sedentary behaviours.

Planning for Slow-Onset Climate Impacts: There is a general lack of preparedness for gradual climate impacts. A comprehensive, interconnected policy approach, such as "Health in All Policies," is necessary to address the interwoven links between climate and well-being, as demonstrated by an example from Wales. Some practical solutions include planting street trees, implementing natural solutions and developing other community-based responses, constructing public swimming pools and establishing green corridors.

Multiple Impacts on Communities: Some communities are more vulnerable as they face multiple stressors and impacts simultaneously.

The summary of policy alignment with community experiences and suggested actions includes the following:

Legislative or Regulatory

- **Temperature Guidelines:** Developing clear guidelines for temperature management, particularly for housing, educational facilities and home-schooling standards, to mitigate health impacts. Minimum and maximum temperature guidance would be useful as well as changes to building standards to consider overheating risks.

Public Education and Communication

- **Balanced messaging:** Awareness of unintended consequences of heat messaging – avoiding exacerbation of sedentary lifestyles and instead encouraging safe activities.

- **Education:** teaching children to build resilience
- **Policy development:** integrated adaptation and mitigation policy development for heat. For example there are opportunities to influence the maintenance and construction of school buildings, as well as policies regarding when and where we should engage in sport, especially outside (e.g., the collapse of a triathlon Olympian, polluted water etc). We should adopt a “children in all policies” approach e.g. CAP2030.
- **Communication:** Policy briefs intended for the public, the Commissioner for Children, and the Climate change Commission should be communicated in a way that is easily understandable for ordinary people. Principals and Boards of Trustees should also be included in these communications, as they have obligations regarding health and safety under Education and Training Act.
- **Building Trust:** Need to find better ways of communicating climate information with communities and to understand who accesses 'trusted' sources and where they do so.

Technological or Engineering, Infrastructure, Development and Ecosystem Intervention, Infrastructure Resilience

- **Support kaupapa Māori solutions**: For example, papakāinga are built with resilience to extreme heat through communal structures and processes.
- **Improving our building standards/ legislation –** although it is viewed as a legislative change, this is also an infrastructure issue, as housing is integral to overall planning and development. This long-term change is necessary to build resilience for the future.

- **Lifelines/Critical Infrastructure:** This is considered critical in cyclone events. Peak energy usage currently occurs in cold temperatures, but it could also result in high draw events during the summer. Could our national grid handle this? This raises an argument for increased investment in more sustainable energy sources such as solar and wind as suggested by MBIE. Should there be support for council sports and recreational facilities during heat stress events? Is there a need for a summer subsidy for power, similar to what exists in the winter? Can our roads manage during extreme heat as well?

- **Urban Planning:** Green spaces are important in cities for reducing heat, are we building hotter cities as suggested by PCE. Can we increase tree canopy, green spaces, and blue spaces? Do children travelling to and from school have adequate shade? Existing initiatives, such as the Healthy Streets framework and approach, focus on improving the human experience, with street shade and shelter being one of the indicators.
- **Insurance:** Rethinking policies, 1 in 100-year events no longer relevant so need to avoid building on flood plains.

Health Intervention and Health Systems

- **Event Response**: Recognising the difference in attention and response to slow-onset extreme events as opposed to immediate crises.
- **Health Facilities**: Creating guidelines for backup systems for air conditioning and maximum temperature limits in healthcare facilities.

Research/Information/Surveillance/Monitoring

- **Research Gaps:** Emphasis on the need for specific research focused on Māori and Pasifika communities to address their unique challenges, including the impact of heat and other climate factors on school attendance. Additionally modelling the effects of activity (e.g. obesity vs activity) on health is important.
- **Life Course Impact:** Understanding how research findings on heat and climate affect children's health and development over their lifetimes, including engaging young people as part of the research to influence future preparedness.
- **Disease Pathways:** Encouraging more research into various disease pathways linked to heat and climate change to inform effective health interventions.
- **Green Spaces:** National monitoring of urban canopy cover.
- **Regional Temperature Profiles:** Need to understand regional temperature profiles so we can adapt accordingly
- **Cost Benefit Analysis:** Economic analysis should be conducted to outline the health and social costs associated with high indoor temperatures, as well as the benefits of strengthened building and housing standards. For example, Building Code Assessment (BCA) was performed for health-related bushfire impacts in Australia; economic data will likely be more persuasive to the Treasury and MBIE than health data.

Equity

- **Future Generations:** Highlighting the importance of policies that meet the needs of future generations and take long-term impacts into consideration.
- **Community Engagement:** Investing in preparedness by actively involving communities in research and ensuring they play a role in shaping outcomes.

- **Youth Participation:** Involving young people in the policy design process to ensure that their needs and perspectives are taken into account.
- **Prioritise those most in need:** We will expect more climate refugees. Focus all interventions in deprived, low SES and Māori/Pacific communities. The research provides strong evidence for this.

Question 4: If you could know more, what would you want to know?

- Further communication of this research.
- Region specific temperature thresholds.

Workshop Participants:

The workshop was attended by 17 people across central and local Government, research and other sectors including:

- Education or Educational Research
- University researchers across Māori Health, Physiology
- Health NZ
- Housing/Building
- Midwifery
- National Public Health Agency
- Emergency Management

Workshop agenda:

Time	Activities
10 mins	Welcome, karakia and agenda sharing. Introduction and opening of workshop.
30 min	Introduce Hakkan Lai and Simon Hales Presentation 20 minutes: Climate Change, Heat Stress and Child Health research presentation. Ice Breaker
10 mins	Quick Comfort Break After the break we will be going into breakout rooms. Please make a note of your room.
60 mins	This part of the workshop aims to collaboratively gain a deeper understanding of current experiences and practice of stakeholders working with parents and children, and/or within the policy and adaptation context of climate and health. 1. Stakeholder analysis – Breakout rooms in Miro (link at the top in green) 2. Whakawhanaungatanga – Introductions in the rooms 3. Back to the main room: Sharing some key points from each group.
10 mins	Wrap up and end of workshop – One thing you have learned (in the chat) – Way of reporting back from this workshop and further engagement
	Thanking everyone, closing karakia