

Two billion people will struggle to survive in a warming world, and these parts of Australia are most vulnerable

May 23 2023, by Annabelle Workman and Kathryn Bowen



Credit: AI-generated image ([disclaimer](#))

Two billion people, including many Australians, will find themselves living in dangerously hot places this century if global warming reaches 2.7°C, [research](#) released today reveals.

The authors calculated how many people would be left outside the "human [climate](#) niche" by 2100. The niche is defined as places with an average temperature of about 13°C, or about 27°C in the tropics. Human population has historically peaked in these areas.

The world is on track for [2.7°C of warming](#) by 2100. This would push a third of people on Earth outside the human climate niche. This includes people in parts of northwest Australia such as Darwin, Broome and Port Hedland. It also includes parts of Southeast Asia, India, Africa and South America.

Limiting [warming](#) to 1.5°C would substantially reduce the number of people exposed, including most of those affected in northwest Australia.

We were not involved in the research, which was conducted by researchers in the United Kingdom, China, Europe and United States. We are Australian experts in the [health](#) implications of global warming. Below, we discuss the broader implications of these globally significant findings.

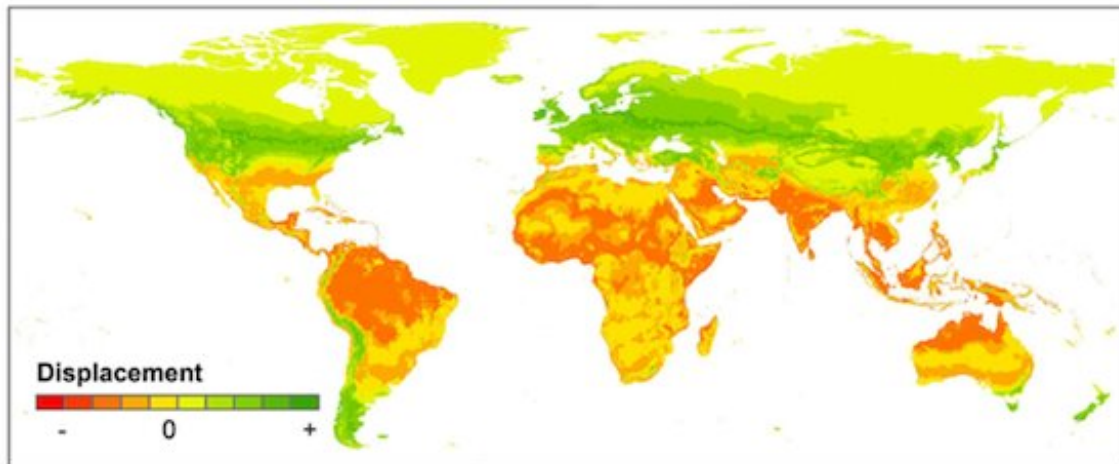
What is the human cost of global warming?

The research calculated the number of people outside the "human climate niche" under different demographic scenarios and levels of warming. Exposure to unprecedented [heat](#) was the main factor pushing people out of the niche.

This includes an average temperature greater than or equal to 29°C, as well as a high number of days with a maximum temperature above 40°C or in humid places, with a [wet-bulb temperature](#) greater than 28°C. The wet-bulb temperature (as opposed to the standard dry-bulb temperature) reflects humidity and is a method used to measure [heat stress](#). That's because it's the point at which sweating is no longer effective as a means

of cooling.

Niche displacement induced by climate and demography combined



Credit: Nature Sustainability

The study says a wet-bulb temperature of 35 °C can be fatal, especially for vulnerable people, because the body can no longer cool itself.

Above the present level of about 1.2 °C [global warming](#), the authors found exposure to unprecedented average temperatures increased markedly, along with increased exposure to [temperature extremes](#).

But 2.7 °C of warming threatens a third of the world's population. The below map shows where in the world people will suffer the worst heat. Almost the entire area of some countries, such as Burkina Faso and Mali in West Africa, would be exposed to unprecedented heat.

Why is warming a health hazard?

Just last week, the [World Meteorological Organization](#) predicted global surface temperatures would rise to record levels within the next five years. The [temperature](#) is also likely to temporarily climb 1.5°C above pre-industrial levels.

This spells trouble for [human health](#). [Even incremental warming](#) increases exposure to [health hazards](#) including potentially deadly heatwaves, infectious diseases and diet-related health issues.

Let's be clear. [A 1.5°C world](#) will result in injury and death, particularly for people in Asia and Africa. Importantly, the people most at risk will be the least capable of protecting themselves: children, the elderly and those with existing health conditions.

While populations closer to the equator are more likely to experience heat-related harm, Australians are by no means immune.

For example, a [2019 study](#) found heat-related health issues in Australia have been grossly [underestimated](#). It found more than 36,000 deaths between 2006 and 2017 were attributable to heat.

And [experts predict](#) Darwin could experience an average 265 days a year above 35°C in a 3°C warmer world.

As in other parts of world, primarily [high-risk populations](#) in Australia will experience some of the worst impacts from a changing climate. In essence, [climate change creates and maintains health inequities](#).

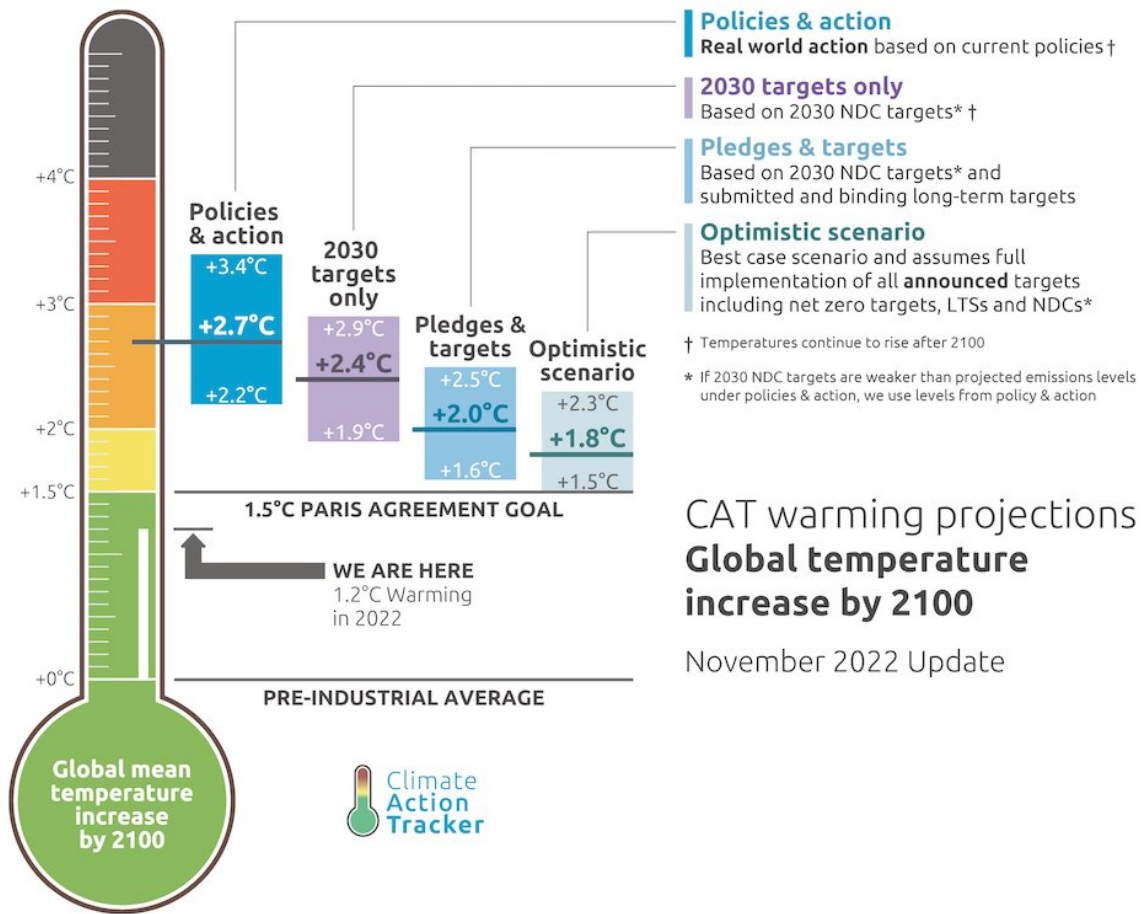
To date, the Earth's [average surface temperature has warmed 1.2°C](#) above pre-industrial levels. We must enact ambitious climate policies now if we are to change our dangerous trajectory.

For too long, we have focused disproportionately on the [economic costs of climate action](#) for current—often wealthy—groups at the expense of considering the [economic costs of inaction](#) for all, including future generations.

Historically health has rarely been included in these economic assessments, much less ethical considerations. Emissions reduction policies need to consider health and equity issues, and in doing so can provide governments with a strategic rationale to act.

How can extreme heat harm health?

There are multiple ways in which [climate change can harm human health](#). Extreme heat can have direct effects, such as [dehydration and heat stroke](#). Groups most at risk include [the elderly and those already unwell](#).



CAT warming projections
Global temperature increase by 2100

November 2022 Update

The Climate Action Tracker charts policies and action against global mean temperature increase by 2100. Credit: [Climate Action Tracker is an initiative of Climate Analytics and the NewClimate Institute](#)

Extreme heat can also harm mental health, [increasing rates of injury and death](#) by aggravating existing mental illness. Beyond direct effects, heat can affect health by influencing, for example, [agricultural productivity, water security and air quality](#).

There are physiological limits to adaptation, [particularly to heat](#). These

limits can have negative consequences for labour productivity, [especially for outdoor workers](#), and for [health service demand](#), leading to increased hospital admissions, emergency department visits, and ambulance calls.

Pursuing adaptation measures in an effort to reduce the harmful effects of existing [climate change](#) is vital, but to protect the health of all, it is critical that we pursue strong emissions reduction measures.

Developing healthier climate policies

Australian climate action targets have improved under the Albanese government, however they remain [incompatible](#) with keeping warming to 1.5°C.

Approving additional coal projects is not helpful for reducing emissions or demonstrating climate leadership.

A commitment to develop and implement a [National Health and Climate Strategy](#) and establish a National Sustainability and Climate Unit are promising initiatives. This will help to address our woeful performance in a [recent assessment](#) showing how national climate commitments don't link with health.

Last week, the Victorian Government [committed](#) to reducing emissions by 75-80% compared with 2005 levels by 2035. Their analysis indicates it will lead to A\$5.7 billion in health benefits from improved air quality between 2035 and 2045.

As today's new research states, the findings highlight the need for "more decisive policy action to limit the human costs and inequities of climate change." Australia, in particular, must protect children, the elderly and the broader population from the harms they face in a warmer world.

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