

UN Reports New Insights on Link Between Climate Change and Human Health

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The effects of climate change are no longer only future fears. They already threaten the environment as well as the physical—and mental—health of humans, according to new insights from the Intergovernmental Panel on Climate Change (IPCC), a body of the United Nations. The findings were published in the IPCC's [second installment](#) of its sixth assessment report (AR6).

Compared with those from prior years, this report more closely tied the well-being of the planet to the well-being of the people who inhabit it. "Since AR5, new evidence and awareness of current impacts and projected risk of climate change on health, wellbeing, migration, and conflict emerged, including greater evidence of the detrimental impacts of climate change on mental health," the authors wrote in [chapter 7](#).

Working Together

AR6 has been years in the making. The IPCC last released a comprehensive assessment report on climate change 8 years ago. Like its [2014 predecessor](#), AR6 includes 3 essential sections—each produced by a separate working group. A final version of AR6 synthesizing all sections is expected to roll out [later this year](#). [Working Group II](#), which specifically examines how climate change affects both ecosystems and human societies and the ability to adapt, released its portion in [February](#).

Finishing even a section of AR6 is no small feat: Working Group II's [270 authors from 67 countries](#) cited [more than 34 000 references](#) for their [3676-page contribution](#).

"There's a lot of new literature," said Kristie Ebi, PhD, MPH, MS, 1 of the lead authors who also helped direct Working Group II's contribution to AR5. "You have to cover all the literature published since the fifth assessment report, so there's a lot more detail about the exposure pathways."



The Hot Felt Round the World

Among AR6's many key findings is that the negative effects of climate change are felt worldwide and are more pervasive than initially thought. Per the report's [summary for policy makers](#), approximately 3.3 billion to 3.6 billion people live in areas that are highly vulnerable to climate change. "The rise in weather and climate extremes has led to some irreversible impacts as natural and human systems are pushed beyond their ability to adapt," the authors wrote.

Part of the problem is that the degradation and destruction of ecosystems is directly tied to the vulnerability of human communities. For example, heightened frequency and intensity of extreme temperature changes reduce food and water security. Rising temperatures and elongated periods of drought contribute to the death of crops and trees, which increase malnutrition and hunger.

Feeling Under the Weather

Notably, AR6 highlighted how climate change negatively affects human health—extreme heat being a key factor.

"Some health harms that were not originally anticipated until later this century are already here," Renee Salas, MD, MPH, MS—an emergency medicine physician at Massachusetts General Hospital and Harvard Medical School and a fellow at the Harvard T.H. Chan School of Public Health's Center for Climate, Health, and the Global Environment—said in an email.

A May 2022 study from the [United Kingdom's Met Office](#) found that climate change made the current heatwave in India and Pakistan over 100 times more likely. And the US isn't left unscathed: Last year's scorching [heat dome](#) in the Pacific Northwest of the US and Canada led to hundreds of heat-related deaths—and was almost certainly related to global warming, climate researchers say. Furthermore, a study published this year in [JAMA Network Open](#) that examined mortality rates in the US between 2008 and 2017 found that each additional day of extreme heat per month was associated with 0.07 additional deaths per 100 000 adults. In subgroup analyses, a greater increase was seen among older adults, men, and non-Hispanic Black indi-

viduals. The study concluded that without mitigation, the projected increase in extreme heat due to climate change may widen health disparities among groups.

"We've known for quite some time that climate change is increasing the frequency, intensity, and duration of many extreme weather and climate events, and we're seeing weekly in the newspaper how unprepared we are," said Ebi, also a professor in the Center for Health and the Global Environment at the University of Washington.

AR6 further noted that increased climate-sensitive aquatic pathogens have led to higher incidence of food- and water-borne diseases. As global warming continues, incidence of vector-borne diseases—such as those spread via ticks, fleas, and mosquitoes—are expected to continue climbing because of arthropods' widening geographic ranges, extended seasonal activity, and increased abundance. Heightened incidence of Lyme disease in the US has already been attributed to rising temperatures, and the risk of chikungunya, dengue, and West Nile virus will likely increase as well.

The report also found that heavier rainfall and higher temperatures boost the risk of diarrheal diseases like cholera, especially in Africa and Asia. Overflowing sewers in the US from heavy rainfall results in contaminated wastewater making its way into the drinking water supply, leading to increased gastrointestinal illness. Climate-sensitive cardiovascular and respiratory distress are associated with increased exposure to wildfire smoke—like across the *Western US*, which has experienced larger, more frequent wildfires and longer droughts in recent years. The *North American Electric Reliability Corporation* also warned of blackout risks this summer across the US due to extreme weather events.

"When you have massive heatwaves, power goes out, and if you're relying on air conditioning to keep cool, you've got to figure out a backup plan," Ebi added.

Rain and the Brain

Heightened temperatures affect mental health, too. "AR5 mentions the impacts on mental health—but the disease burden and our understanding have accelerated since then," said Salas, who, since 2018, has served as the lead author of *The Lancet Countdown on Health and Climate Change: Policy Brief for the United States of America*.

AR6 pointed out that in North America, climate change has been associated with several mental health issues, including anxiety, depression, and increased use of alcohol and other drugs. Moreover, the report cited several studies—including research from *Nature Climate Change*—that linked climate change to increased suicide, which is projected to further increase as temperatures continue climbing.

And trauma often results from extreme weather events when people are forced to flee their homes. Hurricanes, floods, droughts, and severe heat can wreak havoc on communities, resulting in lost culture and livelihoods. According to AR6, approximately 20% to 30% of people who experience a hurricane or flood develop depression or posttraumatic stress disorder within the first few months after the incident. The authors referenced in *chapter 8* how the aftermath of Hurricane Katrina included mental health challenges of displaced evacuees, and a resulting "'climate gentrification' in parts of New Orleans."

Fewest Resources, Hit the Hardest

Vulnerability to climate change is often high in poverty-stricken areas. Despite being among the lowest contributors of greenhouse gas emissions, *Africa* has experienced some of the greatest impacts of climate change, ranging from reduced economic growth and food production to loss of biodiversity and human lives. In *North America*, the impact severity of climate change on issues like morbidity and mortality is influenced by multiple demographic factors, including socioeconomic status, which is often linked to where people live.

"Climate change is a stress multiplier," Ebi said. "When you think about heat, for example, we know that *redlined districts are hotter*, and we know that people who live in those districts—because of institutional racism—have higher rates of chronic disease, so they're at greater risk during a heatwave."

Among those most affected by climate change in the long-term are Indigenous peoples who depend on surrounding ecosystems to meet basic needs. AR6 reported that between 2010 and 2020, death from droughts, floods, and storms was 15 times higher in highly vulnerable regions than in other areas; inequity and marginalization exacerbate vulnerability issues, particularly among Indigenous peoples.

"The health response is not only about what we do, but how we do it," Salas said. "Thus, our efforts to tackle climate change must also promote health and social equity."

Be Prepared

If by 2040 global warming reaches 1.5 °C above preindustrial levels, AR6 forecasted that risks to humans will inevitably increase. But there's good news—and bad news: "Near-term actions that limit global warming to close to 1.5°C would substantially reduce projected losses and damages related to climate change in human systems and ecosystems, compared to higher warming levels, but cannot eliminate them all," the authors warned in their *summary for policy makers*.

"I'm worried most about the next couple of decades because of our lack of preparedness," added Ebi. "We're just not ready for a changing climate."

To mitigate looming threats, AR6 proposed various actions, including vaccine development and better sanitation policies. To improve mental health outcomes, the authors noted the importance of monitoring psychosocial impacts, such as anxiety and depression, from extreme weather events and increasing access to mental health care. They also suggested collaborating with Indigenous peoples, many of whom are familiar with nature, such as the *Indigenous Dene Peoples of Canada* who have traditional knowledge about permafrost.

"Supporting Indigenous self-determination, recognizing Indigenous Peoples' rights, and supporting Indigenous knowledge based-adaptation are critical to reducing climate change risks to achieve adaptation success," the report emphasized in *chapter 14*.

But such action must be taken immediately, Salas cautioned. "The IPCC lays out a very clear diagnosis," she said. "The climate crisis is the greatest threat to health and well-being and our opportunity to act is rapidly closing." ■

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