

OPINION

Turning up the heat on public health: Adapting to extreme temperatures in Latin America and the Caribbean

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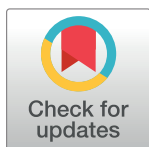
LAC heats up and health consequences follow

Rising global temperatures are an urgent challenge for Latin America and the Caribbean (LAC), a region highly vulnerable to climate change and natural variability such as El Niño [1]. Over recent decades, the frequency and intensity of heat waves have increased, accompanied with a notable rise in heat-related illnesses and deaths in the region. Compared to 2000–2009, Latin America has recorded a 140% increase in heat-related mortality between 2013–2022 [2]. This stark rise underscores that the consequences of extreme heat are devastating.

Last year, migrants in Mexico's Sonora Desert faced lethal dehydration, highlighting the dire human toll [3]. In Brazil, disenfranchised communities suffer disproportionately from heatwaves, with racial, gender, and socioeconomic inequalities exacerbating mortality rates [4]. The recent heat dome in Mexico and Central America exposed the heightened dangers of extreme heat when coupled with co-exposures such as wildfires and air pollution.

Furthermore, LAC's unique geographic and societal conditions amplify its vulnerability [5]. Urban areas like Bridgetown, Barbados or Lima, Peru face intensified urban heat island effects due to high population density and limited green spaces [6, 7]. Rural areas in the region face their own set of challenges, including inadequate healthcare infrastructure, limited access to resources and in many cases, a workforce exposed to high heat stress conditions experiencing emerging health problems, such as the Chronic Kidney Disease of Unknown etiology [8, 9]. Socioeconomic disparities further exacerbate these vulnerabilities, with marginalized communities often lacking the means to adapt effectively, particularly those excluded from the social system [10].

Despite the clear link between extreme heat and health risks, research and adaptation policy in LAC remain insufficient. Existing studies often lack comprehensive data and fail to address adaptation [2]. Policies are fragmented and underfunded, and the financial commitments to undertake adaptation projects with potential health benefits are declining [1, 2]. Dedicated funding mechanisms, including international aid and public-private partnerships, are essential for supporting these initiatives and ensuring their sustainability [11]. Bridging these gaps is crucial for implementing effective interventions that protect public health.



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From extreme heat to health wins: Adaptation in action

Adapting to extreme heat is essential for safeguarding public health and enhancing resilience. Tackling this challenge necessitates not only research and funding but also implementing early warning systems, robust healthcare systems, community-based strategies, resilient infrastructure, and supportive policies.

Heat-health warning systems

Heat-health warning systems (HHWS) are essential, providing timely and customized alerts to vulnerable populations, enabling them to take necessary precautions [12]. However, early warnings must be coupled with public education campaigns that equip people with actionable knowledge, such as recognizing symptoms of heat-related illnesses and understanding the steps to mitigate health risks.

In Costa Rica, the independent communications initiative Verano Vigilante has effectively utilized media to educate the public on heat-related health risks, offering recommendations and resources to protect against the extreme heat exacerbated by the El Niño phenomenon between 2023 and 2024 [13].

Strengthening public health systems

Enhancing healthcare infrastructure to manage heat-related illnesses is critical. Policies must focus on expanding healthcare facilities, improving emergency response systems, and ensuring the availability of essential medical supplies. Training healthcare professionals on managing heat-related conditions and issuing public health advisories during heat waves can significantly reduce morbidity and mortality, provided the health system is prepared to respond, and the public can act on these alerts.

In many communities across LAC (i.e., Ecuador, Guatemala, Haiti, among others) there are challenges with consistent water and electricity supplies [14]. These basic necessities are vital for healthcare facilities to function effectively during heat events. Addressing these fundamental needs is essential for building resilient health systems and ensuring health equity across the region.

Community-based approaches

Localized action plans and community engagement are vital for effective heat adaptation. Establishing community cooling centers offers safe, air-conditioned spaces for those without access to cool environments. Support networks should ensure vulnerable individuals, such as the elderly and those with preexisting health conditions, receive necessary assistance during extreme heat events.

Plans tailored to community needs and resources can enhance resilience and ensure interventions are culturally appropriate and widely accepted. For instance, Walking Palms Global Health in Bahia de Caraquez, Ecuador, implemented a four-week program in 2023 focused on building actionable knowledge of the oncoming El Niño event. The program included sessions on heat waves, heat-related illness, and preventive measures, bringing together community leaders, educators, healthcare workers, and climate scientists. This transdisciplinary approach fostered cross-cutting discussions and new perspectives, ultimately improving health outcomes.

Infrastructure enhancements

Developing heat-resilient infrastructure is essential. Urban planning should focus on reducing heat islands by implementing cool roofs, enhancing building insulation and increasing green

spaces. Constructing heat-resilient buildings designed to maintain cooler indoor temperatures will help protect residents from the worst effects of extreme heat. Incorporating these measures into new developments and retrofitting existing structures can significantly mitigate the health impacts of heatwaves. To achieve this, it is vital to adopt a comprehensive approach that takes into account the complex interactions between building characteristics, occupant behavior, and environmental factors [12]. Another key element of this approach is the integration of green spaces, which not only reduce heat-related health issues but also offer co-benefits such as improved mental health, better air quality, and safe spaces for physical activity. For example, planting trees on sidewalks and around schools can reduce temperatures significantly, creating cooler urban environments while also enhancing overall health and well-being [15].

Policy and governance

Integrating heat-health into national and regional climate adaptation plans is essential for a comprehensive approach. Developing national Heat Health Action Plans (HHAPs) and embedding them within broader climate change policies ensures a coordinated response to extreme heat. Recent agreements at COP28 underscore the importance of financing these initiatives, providing a framework for mobilizing resources and fostering international cooperation. Governments should leverage these agreements to secure funding for heat adaptation measures and prioritize heat-health in climate action agendas. Finally, addressing existing health system challenges and equity issues is critical. Mandates for increasing heat resilience should be first addressed in high priority areas such as hospitals, schools, senior centers, and public spaces.

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