

Research Article



Strengthening COP Meetings through Cross-Sectoral Thematic Convergence and Highlighting Health in COPs

Abbas Ostadtaghizadeh ^{1,2}, Edmond Fernandes ^{3,4}, Fatemeh Rezaei ^{5*}

¹ Department of Health in Emergencies and Disasters, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

² Climate Change and Health Research Center (CCHRC), Institute for Environmental Research (IER), Tehran University of Medical Sciences, Tehran, Iran

³ Cynthia Center for Research and Policy at the Edward & Cynthia Institute of Public Health, Mangalore, India

⁴ Department of Public Health, Yenepoya Deemed to be University, Mangalore, India

⁵ Department of Health in Emergencies and Disasters, Isfahan University of Medical Sciences, Isfahan, Iran

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ABSTRACT

Background: The spread of extreme climate events driven by the trajectory toward a 2.8°C increase has worsened health outcomes, a subject that has gained the attention of the Intergovernmental Panel on Climate Change (IPCC) in the past decade. In this commentary, the authors highlight significant aspects of Conferences of the Parties (COPs) and what should be pursued by the health community.

Methods: Based on a critical review of published reports, policy documents, gray literature, and an examination of pivotal events and outcomes from recent COPs, emerging trends in COP negotiations and potential areas for prioritized action in future iterations have been identified.

Results: The initiatives, platforms, health sector measurements, and climate-related academic education and research presented at COP meetings need to place greater emphasis on investment in climate-health projects to encourage further contributions from the health community.

Conclusion: Countries' contributions and commitments to mitigating the health impacts of climate change can be assessed by evaluating their investments in evidence-based climate actions within health systems and by demonstrating the resulting outcomes at upcoming COP meetings. Furthermore, COP meetings should prioritize fostering intersectoral collaboration to mobilize funding for scientific research and the scaling of applicable and accessible platforms.

Keywords: Climate change; Environment and Public Health; Health Policy

* Corresponding Author:

Fatemeh Rezaei;
Department of Health in Emergencies
and Disasters, Isfahan University of
Medical Sciences, Isfahan, Iran
Email: f.rezaei.pro@gmail.com

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Introduction

The Intergovernmental Panel on Climate Change (IPCC) has warned that climate change is already contributing to dramatic and rising humanitarian impacts [1]. In the last five years, 83% of all disasters triggered by natural hazards were caused by extreme weather and climate-related events such as floods, storms, cyclones, droughts, landslides, wildfires, cold, and heatwaves [2–4]. These events caused more than 12,000 deaths [5] in 2023 and an average of 21.5 million new displacements each year over the past decade [6]. Based on the study by Vicedo-Cabrera et al. [7], warm-season heat-related deaths attributed to climate change accounted for 37% of total mortality among 43 countries from 1991 to 2018, exceeding 50% in countries in southern and western Asia (Iran and Kuwait), Southeast Asia (Philippines and Thailand), and several countries in Central and South America. People who are most vulnerable and marginalized, such as the elderly, women, children, and those with disabilities, suffer the most from the impacts of climate change-induced extreme weather events [8]. In the past decade, people living in regions with high exposure to climate-related hazards were 15 times more likely to die from floods, droughts, and storms than those in regions with minimal exposure [9]. Climate change increases the risk of vector-borne, infectious, respiratory, and chronic diseases [10]. The IPCC has made it clear that reducing greenhouse gas emissions is critical to reducing the impacts on people and the planet. Yet, under current policies, the world is on track for 2.8°C global warming. This presents a renewed opportunity for the UNFCCC, as the custodian of COP meetings, to involve the health community more deeply in exploring effective ways to build climate-health policies through transboundary cooperation in climate research and education. In this review, the main health currents and issues discussed at recent COPs are examined, and insights for future perspectives are provided.

Method

This review is grounded in a comprehensive qualitative analysis of multiple sources, including peer-reviewed journal articles, policy briefs, institutional reports, and gray literature from international organizations involved in climate and health advocacy. To ensure depth and relevance, the authors systematically examined documents and websites, including official outputs from the UNFCCC, World Health Organization (WHO), Intergovernmental Panel on Climate Change (IPCC), and other global entities actively engaged in COP28 and COP29. The selection criteria prioritized materials published between 2023 and early 2025, focusing on

documents that reported on COP proceedings, health-related negotiations, capacity-building initiatives, and climate-health educational and research reforms. Data were identified through targeted keyword searches (e.g., “COP28 health outcomes,” “climate and public health platforms,” “climate-health education,” and “climate research initiatives”) in databases and institutional repositories.

A narrative synthesis approach was applied to extract key themes, trends, and actionable insights. This included triangulating information from declarations, educational platform documentation, stakeholder engagement records, and funding frameworks. Special attention was paid to how health considerations were framed across COP events, the evolution of health sector engagement, and the integration of digital and research-based platforms in climate discourse.

Results

This review reveals three emerging domains that illustrate how health has increasingly become central to climate discourse in recent COPs: (1) the explicit recognition of health impacts and policies at high-level negotiations; (2) the advancement of education and research on climate-health interactions; and (3) the proliferation of practical, cross-sectoral initiatives and digital platforms that enhance climate resilience in health systems. These dimensions reflect a growing convergence of sectors and signal opportunities for action-oriented collaboration. The following sections examine key insights from recent COP meetings:

Health and Climate: Insights from COP28 and COP29

The first-ever dedicated Health Day was held on 2 December 2023, during the COP28 climate negotiations in the UAE [11]. Also, COP29, held in Baku, Azerbaijan, from 22 November 2024, built upon the momentum of COP28 by continuing to highlight health in climate discussions [12]. The events brought together health ministers and other stakeholders to call for prioritizing health in climate policies and actions [13–15]. The Health Day resulted in several key outcomes, including the endorsement of the Declaration on Climate and Health by 120 countries [16], and the announcement of new initiatives and partnerships to support health and climate action. The Health Day was a historic moment for mobilizing action on the links between health and climate change, besides launching the health scorecard and shifting the spotlight on human health as a critical lever for climate action. Similar to COP28, COP29 featured a dedicated Health Day. This day was marked by a high-level event, “Investing in Human Development for Climate Resilience” [17, 18].

It has been estimated that 1,908 out of 81,039 delegates (2.4%) who attended the high-level COP28

meetings were health professionals from around the world. While the search results do not explicitly state the number of health ministers or stakeholders in attendance, COP29 did bring together key global actors for climate change and health. The COP29 Health Pavilion hosted events showcasing evidence, initiatives, and solutions to maximize the health benefits of tackling climate change. The Alliance for Transformative Action on Climate and Health (ATACH) also had a dedicated day at the Health Pavilion, convening global leaders, policymakers, and experts to advance climate-resilient, sustainable, and equitable health systems. Furthermore, the Baku COP Presidencies Continuity Coalition for Climate and Health was launched, uniting Azerbaijan, Brazil, Egypt, the UAE, and the UK under a framework co-led with the WHO [15]. This coalition aims to bridge efforts across COP presidencies to drive global climate-health initiatives and ensure that health remains central in climate discussions [19].

Instead of the “COP28 Declaration on Climate and Health”, the “Baku Principles of Human Development for Climate Resilience” were adopted, with one principle emphasizing the importance of climate-resilient, low-carbon health systems [18]. COP28 saw around 80,000 participants overall [20], while COP29 had over 56,000 participants. The “Baku COP Presidencies Continuity Coalition for Climate and Health” also aimed to mobilize efforts and finance to scale up climate and health action [18].

· *Research and Education Progress*

This highlights the need to increase the involvement of health professionals in future COP meetings, ensuring they understand their role in enriching research and education on the health effects of climate change. For example, Columbia University is strengthening the curriculum in public health schools regarding climate and health education in cooperation with the WHO and the ASPPH within the Global Consortium on Climate and Health Education [21]. At COP29, several key actors emphasized the role of research and education in addressing climate change. The InterAcademy Partnership (IAP) contributed expertise on climate, education, and health, advocating for the integration of education systems and health policy into climate action frameworks [22]. Furthermore, a more rapid and growing scientific recognition of the links between health and climate change is required to demonstrate the need for urgent action by medical faculties and health ministries to protect and promote health in the face of the climate crisis. Health care providers and physicians practicing within health systems are insufficiently prepared to address the nexus of climate change, disasters, and public health consequences. Therefore, it is necessary to fundraise and direct the dissertations and theses of medical and paramedical students toward more cohort studies and epidemiological perspectives, especially in

underdeveloped and developing countries.

At recent COPs, climate education emerged as a critical component of the global response to the climate crisis. Following COP28 and COP29, a surge in climate education platforms has aimed to broaden access to sustainability knowledge, although their efficacy and effectiveness vary. Examples include the climate and health curriculum in graduate public health education [23], the Care Climate and Resilience Academy [24], ClimateFresk [25], The Climate Centre [26], and edX [27]. Besides, UNESCO, through the Greening Education Partnership (GEP), promoted the integration of environmental education across school subjects, providing guidance on greening schools and curricula and emphasizing the empowerment of young people [28, 29]. Moreover, ClimateScience, localized in Uzbekistan, offers free, science-based resources and interactive courses, potentially fostering critical thinking skills and climate literacy among young people [30]. In contrast, hub101.earth targets stakeholders in the Global South, providing capacity-building modules and curated resources focused on climate, nature, and people-centered solutions [31]. Platforms such as Coursera, Skillshare, and Udemy offer a range of courses on sustainability and climate change, but their variable pricing and focus on diverse subjects may dilute their impact on specialized climate education. The establishment of a Climate Residence at the Central Asian University of Environmental and Climate Change Studies (Green University) in Tashkent signifies a commitment to research and academic potential, with collaborations from institutions like the Leibniz Institute for Regional Geography [32]. While these platforms provide valuable resources, their effectiveness hinges on factors such as accessibility, target audience, and the integration of research-based content to drive meaningful engagement and action. These training platforms have various objectives, such as providing education, training, knowledge and experience sharing, and networking to encourage collective action, capacity building, and collaboration for climate change. These educational platforms and initiatives aim to achieve their mission by offering climate guidance, tools, training kits, games, events, partner publications, annual reports, case studies, country climate fact sheets, and more. They provide valuable and accessible resources for global community awareness and partnership.

At COP29, several avenues emerged to potentially bolster climate and health research funding for universities, although concrete guarantees remain elusive. The WHO's COP29 Special Report advocated for amplified funding towards interdisciplinary research focused on climate change health monitoring, evaluation, and solutions. This aligns with the broader push to integrate health considerations across climate initiatives, exemplified by the “Baku Initiative on Human Development for Climate Resilience.” Although global funding commitments, such as the pledged \$300 billion annually by 2035, include

support for developing countries [18], the extent of allocations to university-led research remains unspecified. The presence of university delegations, such as those from the University of Leicester and Northwestern University, ensures research expertise is present at the negotiations [33, 34]; however, the extent to which this translates into direct funding is uncertain. Capacity-building academics, like those led by the UNU-EHS and UNU-VIE [35], offer training opportunities for researchers, but dedicated financial support for university-based research programs requires further development. Although initiatives at COP29 signal a move toward recognizing the importance of research in climate and health, securing guaranteed funding streams for universities necessitates more explicit and targeted mechanisms.

To facilitate this, Azerbaijan announced the Climate Finance Action Fund (CFAF), capitalized through voluntary contributions from fossil fuel-producing nations and companies, aimed at catalyzing public-private partnerships and de-risking investments in mitigation, adaptation, and research and development [36]. These initiatives underscore a concerted effort to channel increased funding towards climate action, with specific attention to supporting vulnerable populations and promoting the adoption of clean energy technologies. However, there is a gap in securing funding for scientific research at higher education levels, even in developed countries, to conduct longitudinal studies. Fortunately, recent COPs highlighted recognition of research-based platforms like ENBEL [37], which supports connecting health and climate change research, brings together leaders in these fields, and coordinates a network of international health and climate research projects.

Since COP28, the “Climate x Health” initiative has emerged as a significant force in mobilizing action and resources at the intersection of climate change and public health. The initiative is convened by organizations such as the Wellcome Trust and the Rockefeller Foundation [38]. One concrete manifestation of this effort is the Climate x Health Challenge, led by PATH (a global nonprofit organization), which seeks product and process innovations and solutions on adaptation, mitigation, environmental governance, or local community participation for climate-resilient health systems and related health risks in low- and middle-income countries [39]. Furthermore, the Climate x Health initiative offered small grants between USD \$5,000 and \$10,000 to strengthen joint advocacy, action, and accountability for climate and health in early 2024, with a focus on civil society, non-governmental, and not-for-profit organizations in low- and middle-income countries⁵⁶. Besides, Grand Challenges Canada (GCC-funder of innovative solutions), with support from the Government of Canada and in partnership with the South African Medical Research Council, has also invested in 42 innovations addressing the impact of climate change on a variety of areas from infectious disease and mental health to nutrition, heat stress, food security and beyond,

awarding a collective \$6.3M CAD in seed funding [40].

Frankly, there are still fewer research-based platforms available for all countries and academics. Further integration of UNFCCC responses with educational institutions and medical establishments could help develop thematic knowledge products informed by the latest research, strengthening scientific approaches to climate-related health challenges.

Revising new algorithms to achieve an integrated future that addresses health risks remains essential in global conversations and policies. At COP28, the commitment to the Alliance for Transformative Action on Climate and Health (ATACH) program reached 82 countries, and ATACH had grown to include 85 countries by COP29 [41]. The ATACH coalition of over 150 health and development organizations has developed a tool called the Healthy Scorecard to assess how well countries include health in their Nationally Determined Contributions (NDCs) to the Paris Agreement. The scorecard analyzes six categories of health-related criteria, with a maximum of three points for each category. It aims to encourage countries to recognize the links between health and climate change and to take action to protect and promote health in their climate policies. The Healthy Scorecard is renewed every five years, with the next deadline in 2025 [42]. However, current commitments from 2020 are insufficient to reach the Paris Agreement’s goal of limiting global temperature rise to well below 2°C, and preferably to 1.5°C [43]. The highest Healthy Scorecard at COP28 was 17 out of 18 points, achieved by Burundi [44]. This score indicates that Burundi has integrated health goals into its climate commitment (NDC) very well, addressing the health impacts of climate change, actions in the health sector, the health co-benefits of climate action in other sectors, economic and financial considerations, and the monitoring and implementation of its NDC. However, it is important to note that Burundi is not an industrialized country, according to the United Nations Industrial Development Organization (UNIDO). Burundi is classified as a least developed country (LDC) by the United Nations and as a low-income economy by the World Bank [45]. Burundi’s economy is heavily dependent on agriculture, which accounts for 27.57% of its gross domestic product (GDP), and it has a low level of industrialization, with industry contributing only 10.64% of its GDP in 2022 [46]. Therefore, a question arises: how can the scorecard differentiate between industrialized and unindustrialized countries? According to the Healthy Scorecard, low- and middle-income countries tend to score higher than developed countries in terms of integrating health goals into their climate commitments (NDCs). For instance, Côte d’Ivoire scored 15 points, while the EU scored only 8 points [42].

This indicates that the Healthy Scorecard needs to take other confounding variables into account. For example, the scorecard needs to be leveraged based on population, main GDP sources, continent, fossil fuel

reserves, etc. On the other hand, the “economic and finance” index is more closely aligned with the “health sector action” index than with the “monitoring and implementation” index, which pertains to evaluating the health impacts of climate actions and the progress of health-related initiatives. Therefore, it is evident that directing financial budgets towards assessments through academic research is necessary, as it has a long-term impact (albeit with higher costs) compared to increasing the overall score by focusing on short-term actions for annual reports, such as public health campaigns.

Applicable initiatives and platforms

Initiatives and platforms presented at the COPs are designed to promote climate action and provide technical assistance. For example, the Santiago Network [10] facilitates collaboration and knowledge sharing for vulnerable developing countries, enabling the exchange of best practices and innovative solutions. The Climate Action Accelerator equips companies with the knowledge and skills needed for emission reduction and provides funding for innovative technologies and practices to reduce health risks. The International Federation of Red Cross and Red Crescent Societies (IFRC) focuses on the Global Climate Resilience Platform [47], fostering knowledge sharing among stakeholders. All the platforms above provide a stepping stone for the health community’s contribution to decreasing the adverse effects of climate change.

Additionally, the Carbon Map [48] visualizes the carbon footprint of different countries and regions. This tool’s utility could be enhanced by incorporating health indices such as heat-related deaths, neurological disorders, respiratory diseases, and more. The EW4ALL [49], endorsed by all Parties at COP27, highlights the growing recognition of the need for climate education and awareness, but incorporating healthcare indicators could enrich such dashboards. At COP29, the UN Climate Change Global Innovation Hub (UN GIH) Digital Platform was launched, highlighting the potential of digital technologies to contribute to climate solutions, including those relevant to the health sector. Developed in partnership with the UNFCCC and Uni-partner, this platform connects cities, scientists, financial institutions, and digital solution providers through AI-driven capabilities, fostering collaboration across various domains. Designed as a dynamic marketplace, the UN GIH Digital Platform seeks to facilitate resource and knowledge sharing, thereby enabling more effective responses to climate-related challenges [50]. While its applications are broad, the platform’s capacity to connect stakeholders and facilitate access to expertise can be leveraged to strengthen health systems’ resilience to climate change impacts, promote the use of digital tools for monitoring climate-sensitive diseases, and foster innovation in

reducing the carbon footprint of healthcare facilities [51].

Furthermore, its AI-powered matchmaking capabilities could link public health challenges with private-sector innovations, accelerating the development and deployment of digital health solutions tailored to address climate-related health risks. Ultimately, the UN GIH Digital Platform presents opportunities to strengthen the health sector’s response to climate change through enhanced collaboration, knowledge sharing, and access to digital solutions. These initiatives demonstrate the increasing recognition of the need for collaboration, innovation, and action to address the health issues related to the climate crisis, and the role of networks, organizations, and businesses in achieving this goal should be highlighted at coming COPs.

Discussion

Climate-driven health impacts are multifaceted and often interlinked, manifesting in a range of conditions such as cardiovascular diseases, chronic respiratory illnesses (including asthma and chronic obstructive pulmonary disease), respiratory allergies, and protein-energy malnutrition. These health challenges are further compounded by systemic issues like the economic repercussions of the COVID-19 pandemic, ongoing conflicts, and escalating global debt. The convergence of these factors exacerbates vulnerabilities, particularly in low- and middle-income countries, where health systems are frequently under-resourced and overburdened. Addressing these complex challenges necessitates a holistic approach that includes substantial investments in scientific research and environmental epidemiology. Such investments are crucial for developing effective climate action strategies and for motivating health authorities and funding bodies by demonstrating potential health benefits and cost-effectiveness at upcoming COP meetings [52].

To build resilience against the adverse health impacts of climate change, health systems must secure adequate funding from both domestic budgets and international sources. This funding is vital for strengthening infrastructure, enhancing workforce capacity, and integrating climate considerations into health planning and service delivery. Strategies to bolster climate-resilient health systems include developing national health and climate change adaptation plans, assessing system vulnerabilities, and enhancing surveillance for climate-sensitive diseases [53]. Moreover, integrating climate change into health policies and ensuring robust governance and leadership are essential for effective adaptation. By prioritizing these actions, countries can enhance their health systems’ ability to withstand climate-related shocks and stresses, thereby safeguarding public health and promoting sustainable development.

Conclusion

In light of intensifying climate-health risks, it is crucial that COP meetings reinforce cross-sectoral collaboration and prioritize health in climate policies. Investments in evidence-based research, resilient health systems, and inclusive education platforms must be scaled up. The health community should be more actively engaged in global negotiations to ensure sustainable outcomes. Monitoring national commitments through transparent scorecards and metrics can foster accountability. Ultimately, placing health at the core of climate action is essential for achieving equitable and lasting global resilience.

List of Abbreviations

Intergovernmental Panel on Climate Change (IPCC)
COPs (Conferences of the Parties)
World Health Organization (WHO)
Climate Finance Action Fund (CFAF)
Alliance for Transformative Action on Climate and Health (ATACH)
Nationally Determined Contributions (NDCs)
United Nations Industrial Development Organization (UNIDO)
International Federation of Red Cross and Red Crescent Societies (IFRC)

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Authors' contributions

FR had substantial contribution to the conception, design of the work and the acquisition of data. AOT contributed in final approval of the version to be published, and EF revise the part of the work appropriately.

Competing Interests

The authors declare no conflict of interest.

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international collaboration and decision-making on climate action.

Ethical Considerations

The authors have fully adhered to all ethical standards in the conduct of this research, including those pertaining to plagiarism, informed consent, research misconduct, data fabrication and/or falsification, duplicate publication and/or submission, and redundancy.

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