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THE GLOBAL GOVERNANCE OF CLIMATE CHANGE AND HEALTH: WHAT DOES THE LITERATURE SAY ABOUT ITS EVOLUTION, WEAKNESSES AND PRIORITIES FOR CHANGE?

Laura Isabel Gomez Mejia, Ava Greenup, Daniela Morich, Suerie Moon

GENEVA GRADUATE INSTITUTE
GLOBAL HEALTH CENTRE

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CONTACT

Global Health Centre

Maison de la paix
Chemin Eugène-Rigot 2A
Case Postale 1672
CH-1211 Genève 1

graduateinstitute.ch/globalhealth

globalhealth@graduateinstitute.ch
@GVAGrad_GHC
@gvagrad-ghc.bsky.social
Global Health Centre
@globalhealthcentre

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
AR1, AR6	Assessment Reports 1 and 6, respectively (IPCC)
ATACH	Alliance for Transformative Action on Climate and Health
CBDR	Common but Differentiated Responsibilities
CC&H	Climate Change and Health
COP	Conference of the Parties
CSO	Civil Society Organization
EEA	European Environment Agency
ETF	Enhanced Transparency Framework
EU	European Union
FAO	Food and Agriculture Organization
FCTC	Framework Convention on Tobacco Control
GAIN	Global Alliance for Improved Nutrition
GCF	Global Climate Fund
GCHA	Global Climate and Health Alliance
GEF	Global Environmental Facility
GHHIN	Global Heat Health Information Network
GPoA	Global Plan of Action
GPW	General Programme of Work
GST	Global Stocktake
HCWH	Health Care Without Harm
HIIP	Health Impact Investment Platform
HIA	Health Impact Assessment
HNAP	Health National Adaptation Plan
I-CAN	Initiative on Climate Action and Nutrition
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least-developed countries
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NCQG	New Collective Quantified Goal
NGO	Non-governmental organization

ABBREVIATION	FULL FORM
NOAA	National Oceanic and Atmospheric Administration
SIDS	Small Island Developing States
SUN Movement	The Scaling Up Nutrition Movement
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WHA	World Health Assembly
WHO	World Health Organization

EXECUTIVE SUMMARY

This literature review examines the evolving global governance of climate change and health (CC&H), focusing primarily on how health is being integrated into climate policy frameworks, the actors and institutions shaping this process, as well as the tools available to support this integration. The paper draws on a structured review of peer-reviewed and institutional publications.

A comprehensive literature review using Science Direct and PubMed initially identified 3,244 records, resulting in 462 relevant articles after screening. An additional 162 articles were identified through a LitMaps tool, of which 105 were included. These 567 articles were categorized by theme, with a focus on global governance. An additional LitMaps search identified 102 articles which were individually assessed and collated into an annotated bibliography. Fifty-five articles were found to be of most relevance, from which, key themes were identified. Actionable recommendations are grounded in a robust synthesis of existing evidence and literature.

We begin by outlining the core institutions, actors, and policy spaces that influence global CC&H governance. We found a notable increase in high-level political recognition of health within climate negotiations towards the late 2010s, particularly in the UNFCCC and WHA processes. This growing visibility, however, is not matched by structural integration or reciprocal representation as health actors remain underrepresented in key climate negotiations, while environmental institutions are rarely present in global health spaces.

We then synthesize key insights from the literature to highlight four recurring themes that inform current challenges and opportunities for strengthening global governance in this space.

First, the literature points to a need for stronger evidence-policy linkages. Methodological inconsistencies, limited data from limited-resource settings, and fragmented knowledge across sectors hinder the effective translation of evidence into policy. Efforts such as the WHO's repository of systematic reviews and the expansion of Lancet Countdown indicators aim to address these gaps and support more inclusive decision-making.

Second, climate change is not framed often enough as a threat to health. By framing climate change through a health lens, increased awareness and action can occur. A 'Health in All Policies' approach is widely recommended in the reviewed literature to support accelerated action in global governance. The inclusion of health equity is also consistently emphasized as a necessary component for addressing structural inequalities and building trust in policy processes.

Third, financial and economic considerations remain underrepresented in CC&H discussions. Increased financial support is essential for effective global governance. Health co-benefits—such as reduced healthcare costs and increased productivity—are increasingly used to justify climate action. Yet health adaptation continues to receive a disproportionately small share of climate finance. While recent frameworks such as the COP28 Guiding Principles for Financing Climate and Health Solutions and WHO's 14th General Programme of Work (GPW14) signal progress, key barriers persist, including misaligned funding priorities.

Finally, the ability of collaborative platforms to effectively strengthen global CC&H governance by fostering cross-sector coordination and long-term planning is hindered by lack of coherence across mechanisms, inadequate funding and informal mandates. The reviewed literature advocates for integrating health into national climate strategies, increasing participation across sectors, and establishing clearer feedback and monitoring systems to assess implementation and progress over time.

We synthesize four interconnected recommendations extracted from the literature to improve global CC&H governance:

1. **Mainstream Health into Climate Policy Instruments and Financing Structures**

   Embed health into NDCs, NAPs, and climate finance frameworks through a 'Health in All Policies' approach. Support this integration with context-sensitive implementation, technical assistance, and improved alignment of funding priorities.

2. **Strengthen Institutional Coordination and Intergovernmental Platforms**

   Strengthen multi-sectoral coordination mechanisms and ensure better integration of informal initiatives into formal global governance structures.

3. **Invest in Long-Term Modelling Tools and Robust Data Systems**

   Develop standardized, accessible modelling tools and health-relevant metrics to support anticipatory, evidence-based planning, equity-sensitive projections, and cross-sectoral decision-making.

4. **Establish Clear Accountability Mechanisms**

   Establish clear accountability mechanisms by embedding measurable health objectives into climate and health initiatives and by institutionalizing regular review cycles to support adaptive learning, transparency, and performance tracking.

Future research should prioritize contributions particularly from underrepresented settings, to expand the evidence base and ensure research is generalizable to the global population. Monitoring frameworks, institutional accountability, and financing mechanisms should be explored further.

Translating global commitments into measurable and equitable outcomes remains an ongoing challenge of global CC&H governance. As climate impacts increase, the legitimacy and effectiveness of global governance structures will require continued political will to deliver effective implementation, foster monitoring and accountability, and ensure sustained coordination.

INTRODUCTION

The global governance of climate change and health (CC&H) refers to the collective processes, frameworks, and institutions that shape decisions on climate action while considering health outcomes.[1] It encompasses the integration of health considerations into climate change policies, strategies, and planning at the global, regional, and national levels.

The growing focus on global CC&H governance arises from the recognition that climate change not only poses environmental threats but also carries profound implications for human health and well-being. While the literature shows progress in addressing this intersection, challenges remain in both directions: integrating health into global climate governance frameworks and incorporating climate change considerations into public health agendas. This review examines both, while placing particular emphasis on the former, where the bulk of recent global governance developments and scholarly contributions are concentrated.

This paper synthesizes and summarizes existing literature on global CC&H governance, outlining how these governance structures, policies, and key actors interact at the interface of climate and health. It maps how health priorities have been integrated into global climate governance frameworks and briefly explores the incorporation of climate considerations into health strategies, highlighting major developments, persistent challenges, and critical gaps.

The paper concludes by extracting from the literature actionable recommendations aimed at addressing the structural and institutional barriers that continue to limit the meaningful inclusion of health in global climate governance, and at identifying opportunities to improve coordination and accountability among global climate and health stakeholders.

1 Kristie L. Ebi, 'Mechanisms, Policies, and Tools to Promote Health Equity and Effective Governance of the Health Risks of Climate Change.', *Journal of Public Health Policy* (England) 41, no. 1 (2020): 11–13, https://doi.org/10.1057/s41271-019-00212-2.

METHODOLOGY

To answer the proposed research question: "*The Global Governance of Climate Change and Health: What does the literature say about its evolution, weaknesses and priorities for change?*", reviews of Intergovernmental Panel on Climate Change (IPCC) reports, WHO documents, reports, resolutions, and decisions adopted under the United Nations Framework Convention on Climate Change (UNFCCC) including at its yearly Conferences of the Parties (COPs), were mapped and evaluated. This was done prior to the literature review to examine patterns and coverage of these topics over the past 15-20 years, providing a historically informed, evidence-based analysis of global CC&H governance.

Secondly, a comprehensive review of the available literature was undertaken and actionable recommendations were developed. To conduct this literature review, two primary databases were utilized: PubMed and ScienceDirect. Synonyms of 'climate change,' 'health' and 'governance' were applied. Table 1 contains the full search strategy deployed for each database. Slight variations were required due to ScienceDirect's limitation of eight Boolean operators. Available studies were examined up until December 2024.

Table 1: Database and Search Strategy

Database	Search Strategy
PubMed	(((((("climate change"[Title/Abstract]) OR ("climatic crisis"[Title/Abstract])) OR ("climate crisis"[Title/Abstract])) OR ("climatic change"[Title/Abstract])) OR (climate change[MeSH Terms])) AND (((((("Public Health"[Title/Abstract]) OR ("Global Health"[Title/Abstract])) OR (Health[Title/Abstract])) OR (Health[MeSH Terms])) OR ("Health system"[Title/Abstract]))) AND ((((((((("Global Governance"[Title/Abstract]) OR ("Global Policy"[Title/Abstract])) OR ("Global Framework"[Title/Abstract])) OR ("International Governance"[Title/Abstract])) OR ("Regional Governance"[Title/Abstract])) OR (government[MeSH Terms])) OR (health policy[MeSH Terms])) OR ("International agreement"[Title/Abstract])) OR ("international discussion"[Title/Abstract]))))) NOT ("local"[Title/Abstract])
ScienceDirect	"climate" AND ("Health" OR "Global Health" OR "Public Health") AND ("negotiation" OR "decision-making" OR "framework" OR "policy") NOT ("local")

Inclusion criteria focused on broad, interconnected topics that aligned with the scope of the research question and captured the intersection of climate change, health, and global governance mechanisms. Inclusion criteria included topics such as Climate Change, Climate Crisis, Global Warming, Climate Variability, Health, Health Systems, Global Governance, Regional Governance, Global Policy, Global Frameworks, International Agreements/Discussions, Air Pollution, One Health, Negotiations, and Decision-Making.

Exclusion criteria were applied to ensure the review remained manageable for the researchers and focused on the research question. Topics were excluded if they were overly specific, unrelated to global governance, or too vast to be comprehensively covered within

the review. These included Disease-specific studies, Planetary Health, Environmental Risks, Ocean and Marine Health, Local, Country, Sub-national, and National levels, as well as Food and Nutrition.

Initially, 3244 records were identified (2736 from ScienceDirect and 508 from PubMed). Two individuals conducted the review to minimize bias. After screening titles and abstracts, 2782 records were excluded based on predefined inclusion and exclusion criteria, resulting in 462 unique articles which were subsequently moved to Zotero after duplicates were removed.

To ensure a thorough review that captured relevant publications not identified through the initial search strategy, the Litmaps tool was deployed. Drawing on a Zotero bibliography containing 462 articles, the tool mapped citation networks and explored connections between key papers, resulting in the identification of an additional 162 articles. Of these, 105 publications were deemed relevant based on predefined inclusion and exclusion criteria.

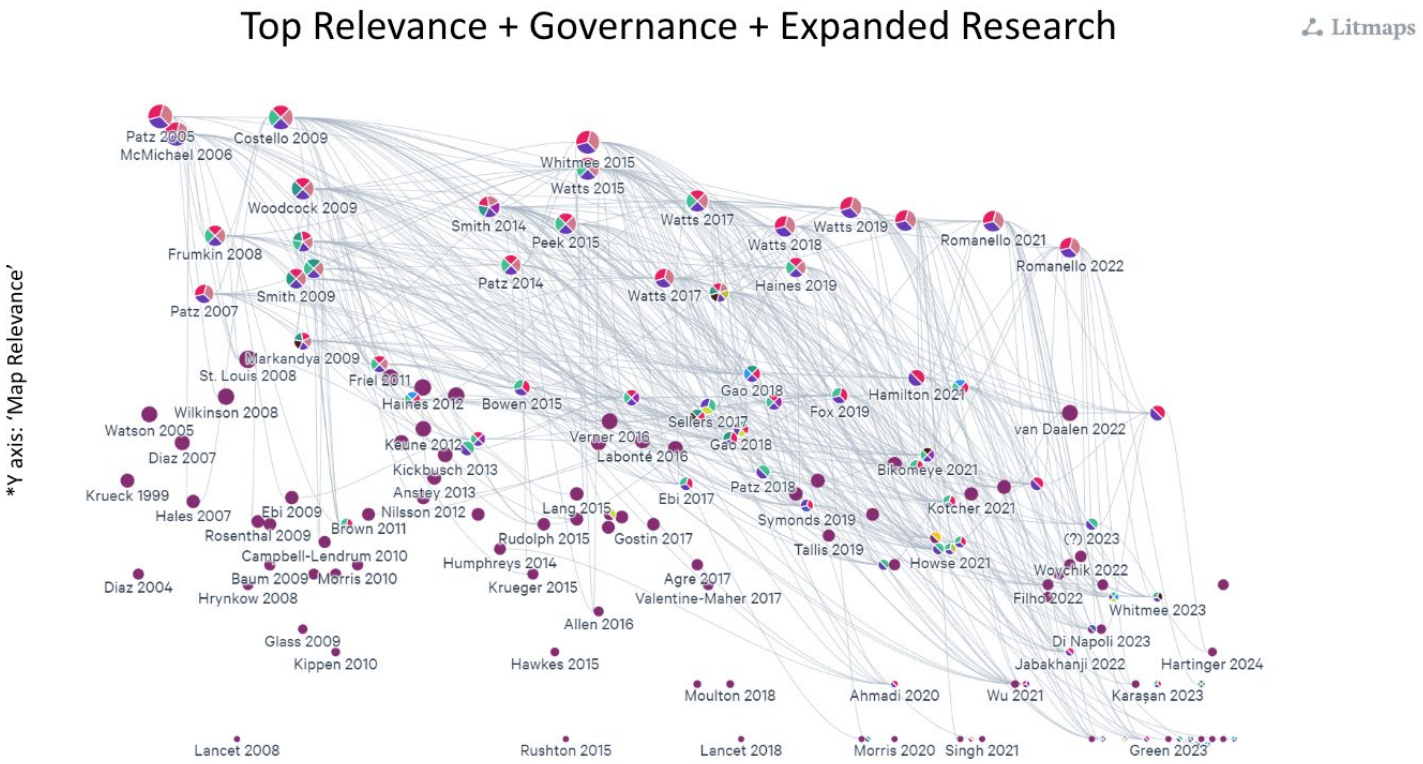
A total of 567 articles were then categorised based on their abstracts into several thematic areas: Top Relevance (visualisation map of the research articles created through Litmaps), Core References (references cited more than 100 times by other researchers), Governance, Co-benefits, Resilience/Adaptation, Reviews, Health Workers, Decarbonization/Mitigation, Air Pollution, One Health, Heat/Temperature, Mental Health, COVID-19, and Finance.

Through combining articles under the themes Top Relevance and Governance, 68 articles were identified with a further 73 articles from an expanded Litmaps search based on this bibliography (see figure 1). Of these 141 articles, 7 were not accessible and 32 were not relevant to the research question due to being too specific, country focused or not climate and health related.

The 102 articles identified were individually assessed and collated into an annotated bibliography where 55 were found to be of most relevance. Key themes were inductively identified from the 55 articles.

The paper commences by identifying key actors and global governance frameworks, providing a historical perspective on their evolution and how they have shaped current global CC&H governance. The remainder of the paper synthesizes the literature into the four key themes that emerged and then actionable recommendations were extracted. The paper concludes by highlighting the need to address fragmentation between climate change and health fora to form cohesive, collaborative global governance frameworks to effectively address this urgent interconnected issue.

Figure 1: Litmaps mapping of articles under the themes Top Relevance and Governance with the expanded search



68 + 73 new articles: A total of **141 articles** were annotated during the first phase

STRUCTURES FOR THE GLOBAL GOVERNANCE OF CC&H

The UNFCCC and WHO were most frequently referenced in the literature on global CC&H governance. The UNFCCC has led climate negotiations since the early 1990s, while the WHO has worked to integrate health into climate discussions since the 2000s. This section examines their roles in shaping global climate-health governance.

The scientific community and civil society have also shaped these discussions through policy contributions and advocacy, which are explored below in the *Other Actors in Global Climate-Health Governance* subsection.

Others, such as development banks, philanthropic organizations, and the private sector, also play a role in global CC&H governance but were less prominent in the literature and therefore are not included in this section.

THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The UNFCCC, adopted at the 1992 Earth Summit in Rio de Janeiro and in force since 1994, is widely recognized as the foundation of international climate governance. With 198 ratifications, it laid the foundation for global climate action, aiming to stabilize greenhouse gas concentrations and prevent dangerous anthropogenic emissions.[2,3] While health was not a primary focus of the treaty, it was referenced in Article 1.1, which included human health in the definition of "adverse effects" of climate change, and Article 4.1(f), which identified public health as a factor in climate action.[4,5]

The Kyoto Protocol, adopted at COP3 in 1997 and effective from 2005, was the first UNFCCC treaty to set legally binding emission reduction targets, obligating 37 industrialized countries and the European Union to reduce emissions by 5% below 1990 levels between 2008 and 2012. It upheld the principle of "common but differentiated responsibilities (CBDR)," thereby placing greater obligations on developed nations.[6]

Health considerations remained in the periphery until the 2010 Cancun Adaptation Framework (COP16), which introduced National Adaptation Plans (NAPs) to support

2 United Nations, 'United Nations Conference on Environment and Development, Rio de Janeiro, Brazil, 3-14 June 1992', June 1992, https://www.un.org/en/conferences/environment/rio1992.

3 UNFCCC, 'What Is the United Nations Framework Convention on Climate Change?', n.d., https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change.

4 UNFCCC, 'Article 1.1 "Adverse Effects of Climate Change" Means Changes in the Physical Environment or Biota Resulting from Climate Change Which Have Significant Deleterious Effects on the Composition, Resilience or Productivity of Natural and Managed Ecosystems or on the Operation of Socio-Economic Systems or on Human Health and Welfare.', in *United Nations Framework Convention on Climate Change*, 1992, https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

5 UNFCCC, 'Article 4.1.f "Take Climate Change Considerations into Account, to the Extent Feasible, in Their Relevant Social, Economic and Environmental Policies and Actions, and Employ Appropriate Methods, for Example Impact Assessments, Formulated and Determined Nationally, with a View to Minimizing Adverse Effects on the Economy, on Public Health and on the Quality of the Environment, of Projects or Measures Undertaken by Them to Mitigate or Adapt to Climate Change"', in *United Nations Framework Convention on Climate Change (UNFCCC)*, 1992, https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

6 UNFCCC, 'What Is the Kyoto Protocol?', n.d., https://unfccc.int/kyoto_protocol.

Least Developed Countries (LDCs) and Small Island Developing States (SIDS) to assess vulnerabilities and develop adaptation strategies.[7] Although not specifically designed for health, the NAP framework provided a mechanism for countries to incorporate health concerns into national climate planning. Indeed, it marked one of the earliest formal entry points for addressing health within the UNFCCC process. According to the UNFCCC's publication on NAP progress, by November 2023, 49 countries had submitted NAPs, including 22 LDCs and 11 SIDS.[8] Among the priority adaptation areas in the mentioned reports, 42% (21 countries) explicitly included health-related adaptation measures, such as addressing vector-borne diseases, heat stress, waterborne illnesses, and climate-induced malnutrition, placing it on par with water resources (41%) and just behind agriculture and food security (48%).

The Paris Agreement

Adopted at COP21 in 2015, the Paris Agreement marked a major shift in international climate governance. It marked a shift from the Kyoto Protocol's top-down approach with a more flexible, bottom-up structure, allowing countries to define their climate targets while committing to increased ambition over time. This design aimed to foster broader participation and greater political ownership among both developed and developing countries.[9]

One of the Paris Agreement's notable features was the explicit reference to the right to health in its preamble—a first in climate treaty language.[10] This recognition opened new entry points for health considerations within climate negotiations and policymaking. According to Beauchamp, Da Silva Bernardo, and Bueno (2021), this inclusion strengthened the case for integrating health into climate discourse and enabled health-focused actors to advocate more effectively for attention to health outcomes in climate commitments.[11]

To support implementation, the Paris Agreement introduced key planning and accountability mechanisms. Among these, Nationally Determined Contributions (NDCs) became central instruments through which countries communicate their mitigation and adaptation goals. Unlike the binding targets under the Kyoto Protocol, NDCs are self-determined, periodically updated every five years and aim to increase ambition over time, also known as a ratchet mechanism.[12] Complementing this, the Global Goal on Adaptation (GGA) was established to elevate the role of adaptation and strengthen resilience-building globally.[13]

The inclusion of health in NDCs has evolved over successive rounds. The 2023 synthesis report by the UNFCCC Secretariat noted that references to health rose from 70% of submissions in 2016 to 94% in 2020. However, this upward trend has not been sustained. The 2024 Lancet Countdown report observed that as of February 2024, fewer than half of the most recent NDCs included health-related keywords, though it is worth noting that only one-third of parties had submitted their updates by that date.[14]

7 UNFCCC, 'National Adaptation Plans', 2010, https://unfccc.int/national-adaptation-plans.

8 UNFCCC, 'National Adaptation Plans 2023', 2023, https://unfccc.int/sites/default/files/resource/NAP-progress-publication-2023.pdf.

9 UNFCCC, 'The Paris Agreement (UNFCCC)', n.d., https://unfccc.int/process-and-meetings/the-paris-agreement.

10 UNFCCC, 'The Paris Agreement (UNFCCC)'.

11 E Beauchamp et al., 'Progressing the Global Goal on Adaptation — Key Issues', *IIED London*, 2021, https://www.iied.org/17773iied.

12 UNFCCC, 'Nationally Determined Contributions (NDCs)', 2015, https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs.

13 UNFCCC, 'Global Goal on Adaptation', https://unfccc.int/topics/adaptation-and-resilience/workstreams/gga.

14 Marina Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change: Facing Record-Breaking Threats from Delayed Action', *The Lancet*, October 2024, S0140673624018221, https://doi.org/10.1016/S0140-6736(24)01822-1.

To track progress, the Paris Agreement established the Enhanced Transparency Framework (ETF), under which countries submit biennial reports detailing emissions, policy actions, adaptation efforts, and financial support. At the collective level, the Global Stocktake (GST)—conducted every five years—assesses global progress toward the agreement's long-term goals. The first GST, finalized at COP28 in 2023, concluded that current efforts remain insufficient: emissions are not aligned with the 1.5°C target, adaptation and finance gaps persist, and significantly more transformative action is needed across sectors.[15]

Health in UNFCCC COP Negotiations After Paris

COP26, held in Glasgow in 2021, marked a turning point with the launch of the COP26 Health Programme, led by the UK government in partnership with the WHO. This initiative invited commitments from countries to develop climate-resilient health systems and transition toward sustainable, low-carbon healthcare. To support implementation, the WHO launched and later expanded the Alliance for Transformative Action on Climate and Health (ATACH), which now includes over 90 countries and 80 partners engaged in technical cooperation to strengthen climate-health responses.[16] Additionally, COP26 introduced the first Health Pavilion, an event space featuring over 60 sessions that showcased country-level experiences, research, and initiatives linking climate and health.[17]

COP28, held in Dubai in 2023, featured the first Health Day and the launch of the Climate and Health Declaration, which was endorsed by 148 countries as of February 2024.[18] Furthermore, the event included the first Ministerial Session on Climate and Health, attended by over 110 health ministries.[19] Grant (2024) describes these developments, particularly the Health Day and associated declaration, as a milestone for mainstreaming health in global climate discourse.[20] At the same time, Kerry and Sayeed (2024) emphasize that despite broad endorsement, the declaration's implementation will largely depend on countries' existing health system capacities and access to financial support.[21] Both sources acknowledge the symbolic and political value of the declaration, while underscoring that meaningful progress will require sustained institutional commitment and concrete resource mobilization at the national level.

Building on these developments, COP29 in Baku in 2024 hosted a second Health Day and a Health Pavilion organized by the WHO and partners.[22] Key discussions focused on advancing healthcare decarbonization, strengthening climate-resilient health systems, and embedding health into national climate planning processes. A significant institutional development was the operationalization of the Health Impact Investment Platform (HIIP), designed to mobilize resources for scalable, health-centred climate interventions.[23]

15 UNFCCC, 'Outcome of the First Global Stocktake', https://unfccc.int/topics/global-stocktake/about-the-global-stocktake/outcome-of-the-first-global-stocktake#:~:text=UNFCCC%20Nav&text=The%20first%20global%20stocktake%20outcome,goals%20of%20the%20Paris%20Agreement.

16 ATACH Community, 'About ATACH', n.d., https://www.atachcommunity.com/about-atach/.

17 World Health Organization, 'Climate Change and Health', 2021, https://www.who.int/teams/environment-climate-change-and-health/climate-change-and-health/advocacy-partnerships/talks/cop26.

18 COP28 UAE, 'COP28 Declaration on Climate and Health', 2024, https://cdn.who.int/media/docs/default-source/climate-change/cop28/cop28-uae-climate-and-health-declaration.pdf?sfvrsn=2c6eed5a_3&download=true.

19 WMO, and WHO, 'Health at COP28', ClimaHealth, https://climahealth.info/cop28-hub/.

20 Liz Grant, 'COP28: The Health Day Was a Call to Action from the Health Community Worldwide', *BMJ* 384 (2024), https://doi.org/10.1136/bmj.q97.

21 Vanessa Kerry and Sadath Sayeed, 'Advancing the Climate Change and Health Nexus: The 2024 Agenda', *PLOS Global Public Health* 4, no. 3 (2024): 1–5, https://doi.org/10.1371/journal.pgph.0003008.

22 World Health Organization, 'COP29 Health Pavillion Programme', 11 November 2024, https://cdn.who.int/media/docs/default-source/climate-change/cop29-health-pavilion-programme_11-16-nov24-5.pdf?sfvrsn=8b62bf30_10.

23 World Health Organization, 'IsDB Joins Efforts with WHO and Development Partners to Promote Health Impact Investment', 2024, https://www.who.int/news/item/12-11-2024-isdb-joins-efforts-with-who-and-development-partners-to-promote-health-impact-investment#:~:text=The%20HIIP%20represents%20a%20groundbreaking,health%20care%20services%20and%20systems.

Additionally, the WHO COP29 Special Report on Climate Change and Health emphasized the governance challenges surrounding health integration and called for coordinated action across sectors to meet adaptation and resilience goals.[24] These discussions were further informed by the COP29 Declaration on Multisectoral Action Pathways (MAP) for Resilient and Healthy Cities, issued jointly by 45 governments and 43 multilateral partners.[25]

The COP29 Health Day roundtable, held on November 18, 2024, reinforced previous efforts by launching the Baku COP Presidencies Continuity Coalition for Climate and Health. This initiative, supported by WHO and the presidencies of COP26 through COP30 (UK, Egypt, UAE, Azerbaijan, and Brazil), seeks to institutionalize health as a permanent item on UNFCCC agendas.[26] Resource mobilization was a central focus, with renewed calls to align national climate-health priorities with available funding.[27] The roundtable also introduced the Baku Initiative on Human Development for Climate Resilience, framing health within a broader discussion of equity and social determinants.[28] This initiative culminated in the adoption of the Baku Guiding Principles for Human Development, aimed at supporting integrated governance approaches across health, environment, and development sectors.[29]

THE WORLD HEALTH ORGANIZATION (WHO)

As the leading international health authority, the WHO has played a central role in the inclusion of health in global climate negotiations—particularly through its active engagement in multilateral meetings under the UNFCCC umbrella—while also working to systematically integrate climate change considerations into its normative frameworks, technical guidelines, and strategic planning to inform and shape public health agendas worldwide.

WHO's Evolving Role in Climate and Health Governance (2008 – 2014)

The first World Health Assembly (WHA) resolution referencing climate change was WHA 51.29 (1998) in the context of ozone depletion.[30] In 2008, WHA resolution 61.19 formally recognized climate change as a global health risk, calling for action on climate-related health threats, emphasizing the importance of adaptation, monitoring, and international cooperation. The resolution mandated the WHO Director-General to raise awareness, engage in international programmes, and develop tools to help countries reduce climate-related health vulnerabilities.[31]

24 Geneva: World Health Organization, 'COP29 Special Report on Climate Change and Health: Health Is the Argument for Climate Action.', 2024, https://cdn.who.int/media/docs/default-source/environment-climate-change-and-health/58595-who-cop29-special-report_layout_9web.pdf?sfvrsn=dd2b816_8.

25 UNFCCC COP 29, 'COP29 Declaration on Multisectoral Actions Pathways (MAP) to Resilient and Healthy Cities', November 2024, https://cop29.az/en/pages/cop29-declaration-on-multisectoral-actions-pathways-map-to-resilient-and-healthy-cities.

26 World Health Organization, 'Baku COP29 Advances Health-Climate Commitments with New Coalition', 2024, https://www.who.int/news/item/18-11-2024-baku-cop29-advances-health-climate-commitments-with-new-coalition.

27 World Health Organization, 'WHO Celebrates US$10 Million Grant for Health Impact Investment Platform', 2024, https://www.who.int/news/item/14-11-2024-who-celebrates-usd10-million-grant-for-health-impact-investment-platform.

28 COP29 Baku, 'Baku Initiative on Human Development for Climate Resilience', 2024, https://cop29.az/storage/2105/JOINT-STATEMENT.pdf.

29 COP29 Baku, 'Baku Guiding Principles on Human Development for Climate Resilience', 2024, https://cop29.az/storage/2106/Baku-guiding-principles.pdf.

30 World Health Organization, 'Fifty-First World Health Assembly', May 1998, https://iris.who.int/bitstream/handle/10665/258896/WHA51-1998-REC-1-eng.pdf.

31 World Health Organization, 'Climate Change and Health WHA61.19', 2008, https://www.who.int/docs/default-source/climate-change/climate-change-and-health-resolution-wha-61-19.pdf?sfvrsn=63295783_2.

During this period, WHO worked to strengthen the integration of health into adaptation mechanisms, particularly following the adoption of the Cancun Adaptation Framework under the UNFCCC in 2010. As part of this effort, WHO released the 2013 report *Protecting Health from Climate Change: Vulnerability and Adaptation Assessment* to assist countries in identifying and addressing climate-sensitive health risks.[32] Building on this work, WHO issued the 2014 guidance on Health National Adaptation Plans (HNAPs) to align national health adaptation planning with the UNFCCC-led NAP process and support governments in systematically embedding health considerations into broader climate strategies.[33]

WHO's Climate-Health Governance Frameworks (2015-2024)

In 2015, WHO expanded its climate-health engagement with a WHA resolution on air pollution and health, which aligned with global climate policies by emphasizing the health benefits of mitigation strategies.[34] That same year, WHO introduced the *Operational Framework for Building Climate-Resilient Health Systems*, providing governments with a roadmap to integrate climate resilience into health systems. The framework emphasized global governance structures, inter-ministerial collaboration, and long-term institutionalization to sustain health adaptation efforts beyond short-term projects.[35]

Then, at the Second Global Conference on Health and Climate Change, held in 2016, WHO called for stronger financing commitments to support health adaptation. The conference's conclusions highlighted the lack of dedicated financial channels for health in existing climate finance mechanisms, such as the Green Climate Fund (GCF) and the Global Environment Facility (GEF), which continued to prioritize sectors such as energy and infrastructure.[36]

To advance integration at the country level, in 2020, WHO launched the Global Strategy on Health, Environment and Climate Change. This strategy aimed to embed health systematically in national climate planning, strengthen intersectoral governance, and promote the establishment of sustainable funding pathways.[37] This was followed by the 2021 Review of HNAPs, which pointed out the global governance fragmentation, financing gaps, and limited integration of health into national climate policies.[38] That same year, WHO developed the Quality Criteria for Health National Adaptation Plans, setting technical benchmarks to support the integration of health into climate policy and encouraging the creation of dedicated climate-health coordination units within ministries.[39]

In 2023, the WHO updated its Operational Framework to reflect emerging needs, notably by expanding its focus to include low-carbon transitions within health systems. The revised framework emphasized stronger institutional coordination between health and climate sectors and called for greater access to global finance mechanisms, particularly the GCF

32 World Health Organization, *Protecting Health from Climate Change: Vulnerability and Adaptation Assessment* (World Health Organization, 2013), https://iris.who.int/handle/10665/104200.

33 World Health Organization, *WHO Guidance to Protect Health from Climate Change through Health Adaptation Planning* (World Health Organization, 2014), https://iris.who.int/handle/10665/137383.

34 World Health Organization, 'Health and the Environment: Addressing the Health Impact of Air Pollution WHA68.8', 2015, https://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_R8-en.pdf.

35 World Health Organization, *Operational Framework for Building Climate Resilient Health Systems* (World Health Organization, 2015), https://iris.who.int/handle/10665/189951.

36 World Health Organization, 'Second Global Conference Health & Climate: Conference Conclusions and Action Agenda', July 2016, https://cdn.who.int/media/docs/default-source/climate-change/action-agenda---2nd-global-conference-on-health-and-climate-change.pdf?sfvrsn=a2cad76f_0.

37 World Health Organization, *WHO Global Strategy on Health, Environment and Climate Change: The Transformation Needed to Improve Lives and Well Being Sustainably Through Healthy Environments*, 1st ed (World Health Organization, 2020).

38 World Health Organization, 'Health in National Adaptation Plans: Review', 2021, https://iris.who.int/bitstream/handle/10665/340915/9789240023604-eng.pdf?sequence=1.

39 World Health Organization, 'Quality Criteria for Health National Adaptation Plans', 2021, https://unfccc.int/sites/default/files/resource/WHO_Quality_criteria_for_HNAPs.pdf.

and GEF.[40] While the WHO participates in dialogues related to health adaptation, it does not have a formal decision-making role within major climate finance institutions. Furthermore, health-related adaptation receives only a limited share of climate finance. According to data cited by the GCF, just 2% of adaptation finance and 0.5% of total multilateral climate finance are currently allocated to projects targeting health outcomes.[41]

A significant institutional milestone was reached in 2024, when 194 Member States unanimously adopted resolution WHA77.14 on Climate Change and Health.[42] This landmark resolution formally launched the development of a Global Plan of Action on Climate Change and Health (GPoA), establishing a results-based, needs-oriented framework to guide WHO and its Member States. WHA77.14 resolution also marked the first time climate change and health became a standing item on the agenda of a WHA, signifying an elevation of the issue within WHO's governance structure. The resolution called for strengthened implementation of WHO's climate-health strategies, integration of climate considerations into health systems, and mobilization of financing, with special focus on vulnerable countries. It also mandated the Director-General to present the GPoA for Member State consideration at the 78th WHA.

The GPoA was successfully adopted in May 2025[43] and consists of three action areas: leadership, coordination and advocacy; evidence and monitoring; and country-level action and capacity-building. These action areas are associated with at least one global target and shared objectives and actions for Member States, the WHO secretariat and stakeholders to undertake.[44] A Climate Change and Health Steering Group was also established to oversee and track the implementation of the GPoA. The group will ensure that climate change is fully integrated across all areas of WHO's work and that resources are allocated efficiently. In collaboration with relevant stakeholders, indicators will be developed to measure progress, ensuring alignment with other key processes such as the UNFCCC. The WHA decision adopting the GPoA further mandates the WHO Director-General to submit progress reports to WHA80 in 2027 and WHA82 in 2029, enabling continuous monitoring and accountability.[45]

Finally, WHO's General Programme of Work 2025–2028 (GPW14) identifies climate change as one of the organization's strategic objectives and top priorities.[46] It introduces high-level indicators on health system resilience and emissions reduction, aiming to enhance national accountability and global progress tracking.

Environmental Representation in the WHA

The WHA, as the highest decision-making body of the WHO, has traditionally been largely composed of delegates from health ministries and oriented around public health priorities, disease control, and emergency preparedness. In contrast, representation from

40 Geneva: World Health Organization, 'Operational Framework for Building Climate Resilient and Low Carbon Health Systems', 2023, https://iris.who.int/bitstream/handle/10665/373837/9789240081888-eng.pdf?sequence=1.

41 Green Climate Fund, *Bridging the Climate-Health Gap*, Insights Article (2024), https://www.greenclimate.fund/insights/bridging-climate-health-gap.

42 World Health Organization, 'Climate Change and Health WHA77.14', June 2024, https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_R14-en.pdf.

43 World Health Organization, 'Global Action Plan on Climate Change and Health WHA78(27)', 27 May 2025, https://apps.who.int/gb/ebwha/pdf_files/WHA78/A78_4Add2-en.pdf.

44 World Health Organization, 'Draft Global Action Plan on Climate Change and Health A78/4 Add.2', 15 May 2025, https://apps.who.int/gb/ebwha/pdf_files/WHA78/A78_4Add2-en.pdf.

45 World Health Organization, 'Global Action Plan on Climate Change and Health WHA78(27)'.

46 Geneva: World Health Organization, 'A Global Health Strategy for 2025-2028 - Advancing Equity and Resilience in a Turbulent World: Fourteenth General Programme of Work', 2025, https://cdn.who.int/media/docs/default-source/documents/about-us/general-programme-of-work/global-health-strategy-2025-2028.pdf?sfvrsn=237faeeb_3.

environmental and climate-focused institutions has remained limited. A 2022 policy guide published by the International Institute for Sustainable Development (IISD) highlights that multilateral environmental governance bodies, such as UNEP, the UNFCCC Secretariat, the WMO, and the IPCC, have no formal role in WHA proceedings. Their participation is generally confined to side events or technical contributions, often under the umbrella of UNEP.[47]

Although WHO's presence within UNFCCC platforms has grown in recent years, the WHA has yet to establish a formal mechanism for systematic engagement with global environmental governance institutions. Notably, the 2024 WHA meeting featured minimal participation from environmental institutions and actors.[48]

OTHER ACTORS IN GLOBAL CLIMATE-HEALTH GOVERNANCE

Beyond the UNFCCC and the WHO, a diverse array of actors has shaped the integration of health into global climate governance. Scientific institutions, academic journals, and civil society organizations (CSOs) have each contributed unique perspectives, resources, and strategies.

The Intergovernmental Panel on Climate Change (IPCC)

As the United Nations body responsible for assessing climate change science, the IPCC operates through three working groups: the physical science of climate change, its impacts and adaptation (including health), and mitigation.[49] The evolution of the IPCC's assessment reports highlights the growing recognition of health as a critical dimension of climate change impacts and a key consideration for policy. While the first assessment report (AR1) in 1990 focused exclusively on climate science without addressing health impacts,[50] each subsequent report incorporated health considerations more prominently. The Sixth Assessment Report (AR6), published in 2023, presented an extensive analysis of the health outcomes associated with climate change. It also recognized the socio-economic factors exacerbating health inequalities and offered actionable recommendations to strengthen global health systems and enhance climate-resilient healthcare infrastructure.[51] The IPCC's evolution from AR1 to AR6 reflects an expanding awareness of health as an integral piece in climate science and policy.

The Lancet

The Lancet has emerged as a significant resource for climate change and health discourse.[52] In 2009, the Lancet Commission on Health and Climate Change identified key challenges hindering global responses to climate-health issues, which are still relevant today, including

47 E Willetts et al., 'Health in the Global Environmental Agenda: A Policy Guide', International Institute for Sustainable Development, 2022, https://www.iisd.org/system/files/2022-01/health-environment-nexus.pdf.

48 World Health Organization, 'Seventy-Seventh World Health Assembly. List of Delegates and Other Participants', 2024, https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_DIV1Rev1-en.pdf.

49 The Intergovernmental Panel on Climate Change, 'IPCC Working Group I The Physical Science Basis', 2024, https://www.ipcc.ch/working-group/wg1/.

50 IPCC and WMO, eds, *Climate Change: The 1990 and 1992 IPCC Assessments, IPCC First Assessment Report Overview and Policymaker Summaries and 1992 IPPC Supplement* (IPCC, 1992).

51 Katherine Calvin et al., *IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (Eds.)]. IPCC, Geneva, Switzerland*., First, with Hoesung Lee (Intergovernmental Panel on Climate Change (IPCC), 2023), https://doi.org/10.59327/IPCC/AR6-9789291691647.

52 Joy Muhia et al., 'Health Journal Coverage of Climate Change and Health: A Bibliometric Study', *BMJ Global Health* 9, no. 2 (2024): e014498, https://doi.org/10.1136/bmjgh-2023-014498.

inadequate research capacity in low-income countries, socio-political constraints, and insufficient financial resources.[53]

The Lancet Countdown on Health and Climate Change, established in 2016 in response to a key recommendation from the 2015 Lancet Commission on Health and Climate Change, publishes annual multidisciplinary reports that monitor health-climate trends, evaluate the extent to which governments are advancing climate and health goals, and offer policy recommendations.[54] The 2024 report[55] includes 56 indicators across five domains (health hazards, adaptation, mitigation co-benefits, economics, and public engagement), aligning with the WHO's GPW14 priorities,[56] helping to elevate health in global climate discourse.

Civil Society Organizations (CSOs)

CSOs, such as the Global Climate and Health Alliance (GCHA), Health Care Without Harm (HCWH) and many more, have been pivotal in advocating for equity and inclusion within global CC&H governance. Yet their influence is often limited by systemic barriers, including restricted access to high-level negotiations and inconsistent funding streams.[57]

The GCHA has driven campaigns emphasizing air quality improvements, the inclusion of health considerations in national adaptation strategies[58] and contributed through numerous reports such as "A COP29 for People and Planet: Recommendations from the International Health and Climate Community."[59] Similarly, HCWH has focused on reducing the healthcare sector's environmental footprint while advocating for low-carbon, sustainable health infrastructure.[60]

53 Anthony Costello et al., 'Managing the Health Effects of Climate Change: Lancet and University College London Institute for Global Health Commission.', *Lancet (London, England)* (England) 373, no. 9676 (2009): 1693–733, https://doi.org/10.1016/S0140-6736(09)60935-1.

54 The Lancet, 'The Lancet Countdown on Health and Climate Change: Tracking Progress on Health and Climate Change', n.d., https://www.thelancet.com/countdown-health-climate/about.

55 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

56 World Health Organization, 'Draft Fourteenth General Programme of Work, 2025–2028', May 2024, https://apps.who.int/gb/ebwha/pdf_files/WHA77/A77_16-en.pdf.

57 Joshua Bickel and Melina Walling, 'Activists at COP29 Spend Weeks Planning Demos. But They Can Feel Stifled by Rules and Restrictions', 15 November 2024, https://apnews.com/article/climate-change-activism-protestors-cop29-united-nations-baku-9ace9defadc4b5b2555704db1b0140e9.

58 Global Climate & Health Alliance, 'Home - The Global Climate & Health Alliance', 2025, https://climateandhealthalliance.org/.

59 Global Climate and Health Alliance, 'A COP29 for People and Planet: Recommendations from the International Health and Climate Community. November 11–22, 2024', November 2024, https://climateandhealthalliance.org/wp-content/uploads/2024/11/COP29-Digital-Report.pdf.

60 Health Care Without Harm, 'Leading the Global Movement for Sustainable Health Care', 2025, https://noharm.org/.

CRITIQUES OF THE GLOBAL GOVERNANCE OF CC&H

This section presents four key critiques that appeared most frequently in the reviewed sources: 1) the need for stronger evidence-policy linkages to improve global CC&H governance; 2) the insufficient framing of climate as a threat to health, limiting policy uptake and action; 3) persistent funding deficits and economic barriers; and 4) gaps in collaboration and strategic policy instruments which require more integrated approaches to strengthen global CC&H governance.

EVIDENCE GENERATION TO POLICY CREATION

This section draws on the reviewed literature to highlight key pathways to strengthen the connection between evidence generation and policy development within global governance. This includes aligning priorities with global frameworks, exploring research methods, discussing data gaps from underrepresented regions, addressing fragmentation across sectors, and finally, public perception.

Evidence-policy linkages remain somewhat limited, affecting the impact of research on decision making. Without sustained engagement between researchers and policymakers data may lack practical application and fail to inform effective policies. Williamson and colleagues (2019)[61] and F de'Donato and colleagues (2021)[62] found that collaborating and engaging with policymakers throughout the research process has been shown to foster the development of impactful data that can directly inform and improve policy decisions, facilitating its use in real-world scenarios. These approaches can lead to more effective resource allocation and higher rates of policy uptake and implementation, especially when research aligns with global priorities and frameworks, as demonstrated by Hosking and Campbell-Lendrum (2012).[63]

To collate the literature on CC&H, the WHO has introduced a repository of systematic reviews on environment, climate change, and health interventions, designed to streamline the evaluation of evidence for policymakers, implementers, and researchers.[64] By organizing systematic reviews into an accessible and actionable format, the repository seeks to support cross-sectoral decision-making, bridge the gap between research and implementation, and identify areas requiring further study.[65]

61 Anna Williamson et al., 'How Are Evidence Generation Partnerships between Researchers and Policy-Makers Enacted in Practice? A Qualitative Interview Study', *Health Research Policy and Systems* 17, no. 1 (2019): 41, https://doi.org/10.1186/s12961-019-0441-2.

62 F de'Donato et al., 'Climate and Health Adaptation: Evidence Needs for Policy (Stakeholder Mapping in Europe)', *European Journal of Public Health* 31, no. Supplement_3 (2021): ckab164.115, https://doi.org/10.1093/eurpub/ckab164.115.

63 J. Hosking and D. Campbell-Lendrum, 'How Well Does Climate Change and Human Health Research Match the Demands of Policymakers? A Scoping Review', *Environmental Health Perspectives*, 2012, https://doi.org/10.1289/EHP.1104093.

64 Shreya Shrikhande et al., 'World Health Organization Repository of Systematic Reviews on Interventions in Environment, Climate Change and Health: A New Resource for Decision Makers, Intervention Implementers, and Researchers', *Environmental Health* 23, no. 1 (2024): 88, https://doi.org/10.1186/s12940-024-01105-y.

65 Shrikhande et al., 'World Health Organization Repository of Systematic Reviews on Interventions in Environment, Climate Change and Health'.

Methodologies to quantify co-benefits and long-term effects of climate change remain difficult to accurately demonstrate. This calls for the enhancement of current methodologies and the creation of new ones to improve the current CC&H evidence base, enabling reliable long-term modelling to occur, as underscored by Chang and colleagues (2017).[66] Additionally, these researchers highlighted that when co-benefits can be clearly demonstrated, policy uptake and resource mobilization are significantly enhanced.[67] This has been consistently illustrated in air pollution reduction policies, where clear, direct health benefits can be explained, as seen in the 2018 Lancet report.[68]

Numerous studies have limited global generalizability for their findings, primarily due to insufficient data from resource-limited settings as highlighted by Di Napoli and colleagues (2022).[69] Chang and colleagues (2017) complemented this by highlighting the need for standardized methodologies for comparison.[70] This underscores the urgent need for increased research capacity in resource-limited settings and global collaboration to ensure context-specific indicators that extrapolate from global ones, as found by Romanello and colleagues (2023)[71] and Watts and colleagues (2017).[72] The Lancet Countdown has made significant efforts to address this, recognizing the disparity and underrepresentation from resource-limited settings in the literature, by increasing the number of indicators they report on (40 in 2016 to 56 in 2024) and by collaborating with more institutions and researchers worldwide (24 in 2016 to 122 in 2024).[73,74]

Additionally, fragmentation of evidence across health and climate/environmental research areas results in uncoordinated efforts and missed opportunities for knowledge sharing across sectors, as found by Tallis and colleagues (2019).[75] To address this issue, Qamar and colleagues (2024) concluded that promoting transparency and fostering multisectoral and multidisciplinary collaboration are essential, with a focus on prioritizing long-term practical outcomes over purely academic findings.[76] Increasing cross-sectoral collaboration can bridge knowledge gaps between CC&H, subsequently resulting in greater policy coherence—understood as the alignment and logical consistency of objectives, implementation instruments, and institutional responsibilities across sectors and levels of global governance—which can enhance coordination, reduce duplication, and strengthen the effective implementation of health adaptation strategies, as described by Watts and colleagues (2018)[77] and further illustrated in the analysis by Quintana and colleagues (2024).[78]

66 Kelly Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies', *Environmental Research Letters*, 2017, https://doi.org/10.1088/1748-9326/AA8F7B.

67 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

68 Nick Watts et al., 'The 2018 Report of the Lancet Countdown on Health and Climate Change: Shaping the Health of Nations for Centuries to Come.', *Lancet (London, England)* 392, no. 10163 (2018): 2479–514, https://doi.org/10.1016/S0140-6736(18)32594-7.

69 Claudia Di Napoli et al., 'Tracking the Impacts of Climate Change on Human Health via Indicators: Lessons from the Lancet Countdown', *BMC Public Health*, 2022, https://doi.org/10.1186/S12889-022-13055-6.

70 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

71 Marina Romanello et al., 'The 2023 Report of the Lancet Countdown on Health and Climate Change: The Imperative for a Health-Centred Response in a World Facing Irreversible Harms', *The Lancet*, 2023, https://doi.org/10.1016/S0140-6736(23)01859-7.

72 N. Watts et al., 'The Lancet Countdown on Health and Climate Change: From 25 Years of Inaction to a Global Transformation for Public Health', *The Lancet*, 2017, https://doi.org/10.1016/S0140-6736(17)32464-9.

73 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

74 Watts et al., 'The Lancet Countdown on Health and Climate Change: From 25 Years of Inaction to a Global Transformation for Public Health'.

75 Heather Tallis et al., 'Aligning Evidence Generation and Use across Health, Development, and Environment', *Current Opinion in Environmental Sustainability* 39 (2019): 81–93, https://doi.org/10.1016/j.cosust.2019.09.004.

76 Wajiha Qamar et al., 'Promoting Transdisciplinary Collaboration in Academia: Uniting for Climate-Resilient Health', *Frontiers in Climate* 6 (2024), https://doi.org/10.3389/fclim.2024.1304643.

77 Watts et al., 'The Lancet Countdown on Health and Climate Change: From 25 Years of Inaction to a Global Transformation for Public Health'.

78 Amanda V. Quintana et al., 'A Story of (in)Coherence: Climate Adaptation for Health in South African Policies.', *Health Policy and Planning* 39, no. 4 (2024): 400–411, https://doi.org/10.1093/heapol/czae011.

Data can sometimes be inaccessible to the general public, resulting in decreased understanding and contributing to misinformation and/or disinformation. This is supported by Louis and Hess (2008) who concluded that evidence should be presented in a clear and accessible manner to the general public to ensure increased understanding and to foster advocacy.[79] Additionally, greater public awareness can help to address scepticism and conspiracy theories, as noted by Campbell-Lendrum and Bertollini (2010).[80] Verner and colleagues (2016) highlight that increasing research interest, coupled with open access education for public audiences, can further aid in expanding awareness, leading to informed action.[81] Addressing public perception and misinformation is a critical step towards driving advocacy efforts that can lead to meaningful political action, as described by Cook and colleagues (2017).[82]

FRAMING CLIMATE ISSUES THROUGH A HEALTH LENS

The reviewed literature highlights that climate change is still insufficiently framed as a threat to health – representing a missed opportunity to achieve positive outcomes and enhance policy uptake. This section synthesizes findings on the 'Health in All Policies' approach and highlights how focusing on the health impacts and benefits of climate action can increase engagement from policymakers. Finally, it addresses the importance of incorporating health equity into climate policies.

Climate change is not adequately framed as a threat to health. Without this framing, opportunities to elevate health are missed and the full extent of the effects of climate change cannot be addressed. A 'Health in All Policies' approach promotes collaboration across the governance of CC&H sectors globally, seeking to improve health outcomes as highlighted by Haines and colleagues in 2012[83] and Bowen and Ebi in 2015.[84] Additionally, this approach is strongly advocated for by Patz and Thomson (2018) as an effective global governance strategy to address the limited consideration of health within climate policies.[85]

The idea of framing climate change as a health issue to increase widespread awareness and action was showcased in the landmark study published by the Lancet in 2009.[86] The report outlined three key areas for action: reducing carbon emissions, addressing the links between CC&H, and improving public health systems' resilience, underscoring the clear link between climate and health and prompting urgent action.

An example of this is air pollution, where health-centred climate policies were created and implemented, resulting in direct effects and tangible results, as Chang and colleagues concluded (2017).[87] This is further supported by the findings of Kotcher and colleagues

79 Michael E. St. Louis and Jeremy J. Hess, 'Climate Change: Impacts on and Implications for Global Health', A*merican Journal of Preventive Medicine*, 2008, https://doi.org/10.1016/J.AMEPRE.2008.08.023.

80 Diarmid Campbell-Lendrum and Roberto Bertollini, 'Science, Media and Public Perception: Implications for Climate and Health Policies.', *Bulletin of the World Health Organization* 88, no. 4 (2010): 242–43, https://doi.org/10.2471/BLT.10.077362.

81 G. Verner et al., 'Health in Climate Change Research from 1990 to 2014: Positive Trend, but Still Underperforming', *Global Health Action*, 2016, https://doi.org/10.3402/GHA.V9.30723.

82 John Cook et al., 'Neutralizing Misinformation through Inoculation: Exposing Misleading Argumentation Techniques Reduces Their Influence', *PLOS ONE* 12, no. 5 (2017): 1–21, https://doi.org/10.1371/journal.pone.0175799.

83 Andy Haines et al., 'From the Earth Summit to Rio+20: Integration of Health and Sustainable Development.', *Lancet (London, England)* 379, no. 9832 (2012): 2189–97, https://doi.org/10.1016/S0140-6736(12)60779-X.

84 Kathryn J. Bowen and Kristie L. Ebi, 'Governing the Health Risks of Climate Change: Towards Multi-Sector Responses', *Current Opinion in Environmental Sustainability* 12 (2015): 80–85, https://doi.org/10.1016/j.cosust.2014.12.001.

85 Jonathan A. Patz and Madeleine C. Thomson, 'Climate Change and Health: Moving from Theory to Practice.', *PLOS Medicine*, 2018, https://doi.org/10.1371/JOURNAL.PMED.1002628.

86 Anthony Costello et al., 'Managing the Health Effects of Climate Change: Lancet and University College London Institute for Global Health Commission.', *Lancet (London, England)* (England) 373, no. 9676 (2009): 1693–733, https://doi.org/10.1016/S0140-6736(09)60935-1.

87 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

(2021), which highlight the benefits of focusing on health co-benefits that can be achieved through climate-based policies, leading to increased engagement from public officials.[88] Furthermore, when health considerations are embedded into global and national climate frameworks, including NDCs, as highlighted by Hamilton and colleagues (2021),[89] it can be easier to prioritize health across climate policies.[90]

Research on communication approaches that result in increased engagement from government officials is limited. A report published by the Centre for Climate Change Communication (2023)[91] and a study by Ahmadi and colleagues (2020)[92] indicated that more research is needed on specific communication strategies, as few studies have demonstrated the full effectiveness of one communication approach over another. The report highlighted that framing climate issues through a health lens, as explored above, is an effective approach for increased engagement. Additionally, capacity building of health care professionals through education on climate and health interlinkages and increased engagement of public officials with reliable, actionable information can elicit widespread awareness and supportive policy implementation.[93]

Baum (2009) argues that health equity cannot be fully realized without cohesive health-climate policies and environmental sustainability.[94] Focusing on health equity puts vulnerable populations, who usually suffer disproportionately from the effects of climate change, at the centre of these policies and allows for health to become a key component to them, as noted by Galvão and colleagues (2009)[95] and further emphasized by Haines and colleagues in 2012.[96] Additionally, Fears and colleagues (2023) have highlighted that despite a growing evidence base supporting the incorporation of health equity into climate considerations, its inclusion has been slow to materialize.[97] Incorporating health equity into climate policies not only allows for a full assessment of where the unequal effects of climate change stem from but also allows for the allocation of resources to address these structural inequalities and the opportunity to build trust in global governance processes, as Haines and colleagues advocated in their 2012 paper.[98] An integrated approach to climate change, one that explicitly addresses health equity, public health outcomes, and the social determinants of health, can enable a more holistic and comprehensive response to climate-related health effects, as demonstrated by Rudolph and Gould (2015)[99] and further elaborated by Bowen and colleagues (2013).[100]

88 John Kotcher et al., 'Advocacy Messages about Climate and Health Are More Effective When They Include Information about Risks, Solutions, and a Normative Appeal: Evidence from a Conjoint Experiment', *The Journal of Climate Change and Health* 3 (2021): 100030, https://doi.org/10.1016/j.joclim.2021.100030.

89 Ian Hamilton et al., 'The Public Health Implications of the Paris Agreement: A Modelling Study', *The Lancet Planetary Health* 5, no. 2 (2021): e74–83, https://doi.org/10.1016/S2542-5196(20)30249-7.

90 Watts et al., 'The 2018 Report of the Lancet Countdown on Health and Climate Change: Shaping the Health of Nations for Centuries to Come.'

91 S. Uppalapati et al., 'A Global Review of Research on Effective Advocacy and Communication Strategies at the Intersection of Climate Change and Health', 2023, https://www.climatechangecommunication.org/all/effective-advocacy-communication-intersection-climate-change-and-health/.

92 Shukrullah Ahmadi et al., *Health as a Key Driver of Climate Change Communication. A Scoping Review,* 2020, https://doi.org/10.20944/PREPRINTS202010.0095.V1.

93 S. Uppalapati et al., 'A Global Review of Research on Effective Advocacy and Communication Strategies at the Intersection of Climate Change and Health'.

94 Fran Baum, 'Envisioning a Healthy and Sustainable Future: Essential to Closing the Gap in a Generation.', *Global Health Promotion* Suppl 1 (2009): 72–80, https://doi.org/10.1177/1757975909103760.

95 Luiz Augusto C. Galvão et al., 'Climate Change and Social Determinants of Health: Two Interlinked Agendas.', *Global Health Promotion* Suppl 1 (2009): 81–84, https://doi.org/10.1177/1757975909103761.

96 Haines et al., 'From the Earth Summit to Rio+20: Integration of Health and Sustainable Development.'

97 R. Fears et al., 'Climate Action for Health: Inter-Regional Engagement to Share Knowledge to Guide Mitigation and Adaptation Actions', *Global Policy*, 2023, https://doi.org/10.1111/1758-5899.13210.

98 Haines et al., 'From the Earth Summit to Rio+20: Integration of Health and Sustainable Development.'

99 Linda Rudolph and Solange Gould, 'Climate Change and Health Inequities: A Framework for Action', *Annals of Global Health* 81, no. 3 (2015): 432–44, https://doi.org/10.1016/j.aogh.2015.06.003.

100 K. Bowen et al., 'A Multi-Layered Governance Framework for Incorporating Social Science Insights into Adapting to the Health Impacts of Climate Change.', *Global Health Action*, 2013, https://doi.org/10.3402/GHA.V6I0.21820.

FINANCIAL & ECONOMIC CONSIDERATIONS

The literature revealed that financial and economic factors require in-depth consideration as they are central to advancing the integration of climate ambitions with health outcomes. This section synthesizes key insights across studies to explore the untapped potential of health co-benefits in framing climate investments and the persistent challenges in mobilizing and sustaining funding.

Health co-benefits

Health co-benefits or 'positive externalities' as described by Bikomeye, Rublee and Beyer (2021) refer to positive outcomes that benefit both the climate and human health.[101] However, the short- and long-term data that can substantiate these dual benefits are often lacking. When these benefits can be economically quantified, policy uptake and implementation are more likely, as described in the *Framing Climate Issues through a Health Lens* section above.[102]

The interlinkages between climate and health are difficult to demonstrate without critical, accurate data. The 2024 Lancet report has started to address this by including new metrics specifically designed to measure health gains from climate action. Examples include reductions in respiratory illnesses due to air pollution mitigation and economic savings linked to improving public health. The report highlights the importance of data-driven approaches to illustrate the link between climate and health outcomes.[103]

Furthermore, health co-benefits can also be achieved through diverse pathways, including increased physical activity and improved dietary choices, as highlighted by Bikomeye, Rublee, and Beyer (2021).[104] They concluded that benefits not only deliver immediate public health outcomes but also provide significant economic advantages, such as lowering healthcare costs and enhancing productivity.[105] For instance, valuing avoided mortality through air quality improvements has consistently demonstrated that the marginal health co-benefits of climate action often exceed marginal abatement costs, providing a compelling economic rationale for proactive measures.[106] Additionally, the reduction of fossil fuel use, frequently discussed in global climate governance forums, offers a dual opportunity to decrease emissions and improve health outcomes.[107]

Despite these advances, only a small fraction of climate finance has been directed toward health-related adaptation projects, as Alcayna, O'Donnell, and Chandaria (2023) indicated in a systematic analysis of adaptation finance from 2009 to 2019.[108] They concluded that only USD 1,431 million, or 4.9% of total multilateral and bilateral adaptation funding, was committed to health activities, and that even this figure is likely to be an overestimate. Most

101 Jean C. Bikomeye et al., 'Positive Externalities of Climate Change Mitigation and Adaptation for Human Health: A Review and Conceptual Framework for Public Health Research.', *International Journal of Environmental Research and Public Health*, 2021, https://doi.org/10.3390/IJERPH18052481.

102 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

103 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

104 Bikomeye et al., 'Positive Externalities of Climate Change Mitigation and Adaptation for Human Health: A Review and Conceptual Framework for Public Health Research.'

105 Bikomeye et al., 'Positive Externalities of Climate Change Mitigation and Adaptation for Human Health: A Review and Conceptual Framework for Public Health Research.'

106 Anil Markandya et al., 'Health Co-Benefits from Air Pollution and Mitigation Costs of the Paris Agreement: A Modelling Study', *The Lancet Planetary Health* 2, no. 3 (2018): e126–33, https://doi.org/10.1016/S2542-5196(18)30029-9.

107 J. Remais et al., 'Estimating the Health Effects of Greenhouse Gas Mitigation Strategies: Addressing Parametric, Model, and Valuation Challenges', *Environmental Health Perspectives*, 2014, https://doi.org/10.1289/EHP.1306744.

108 T. Alcayna et al., 'How Much Bilateral and Multilateral Climate Adaptation Finance Is Targeting the Health Sector? A Scoping Review of Official Development Assistance Data between 2009–2019', *PLOS Global Public Health*, 2023, https://doi.org/10.1371/JOURNAL.PGPH.0001493.

projects framed health as a co-benefit rather than a primary objective, with significant gaps in monitoring health outcomes, highlighting the need for innovative indicators and methodologies to demonstrate tangible health and economic advantages.[109]

A recent example of integrating health into climate policies is the COP28 Guiding Principles for Financing Climate and Health Solutions, developed by the COP28 Presidency in partnership with WHO, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, the GCF, the Rockefeller Foundation, and WHO, and endorsed by over 30 organizations.[110] These principles outline pathways to integrate health solutions into long-term planning and promote inclusive and equitable approaches to sustainable financing including for climate adaptation and mitigation[111]—key areas where health gains arise.[112]

Additionally, these principles align with the WHO's strategic objectives under its GPW14 2025–2028, which prioritizes mitigation strategies that inherently produce positive health outcomes.[113] Clean energy transitions and air quality improvements are key examples of health gains that align with public health and climate resilience goals.[114]

Sustained funding

Implementing and maintaining CC&H related activities—including capacity building, improving infrastructure, implementing and monitoring mitigation and adaptation strategies, assessing subsequent health effects, and translating results into actionable recommendations—becomes extremely difficult without sustained funding, as described by Jabakhanji and colleagues (2022).[115]

The Adaptation Gap Report, published by UNEP in 2018 with a focus on financing and health, identified the growing financial burden of climate-related health impacts, estimating direct damage costs of US$2-4 billion per year globally by 2030, a figure that is likely to be an underestimate.[116] A more recent estimate from the 2023 Adaptation Gap Report describes the financial gap as being more than 50 percent higher than previous estimates, indicating that financial flows will need to increase 10-18 times more than current spending to meet adaptation needs.[117] Sustained funding is a major barrier to the effective execution of public health strategies for climate change adaptation and mitigation.[118] Insufficient and fragmented global governance structures, as described by Quintana and colleagues (2024)[119] and by a 2014 review of adaptation planning in OECD countries,[120] further hinders access to necessary funding.

109 Alcayna et al., 'How Much Bilateral and Multilateral Climate Adaptation Finance Is Targeting the Health Sector? A Scoping Review of Official Development Assistance Data between 2009–2019'.

110 COP28 UAE, 'Guiding Principles on Financing Climate and Health Solutions', 2023, https://www.cop28.com/en/guiding-principles.

111 COP28 UAE, 'Guiding Principles on Financing Climate and Health Solutions'.

112 Bikomeye et al., 'Positive Externalities of Climate Change Mitigation and Adaptation for Human Health: A Review and Conceptual Framework for Public Health Research.'

113 World Health Organization, 'Draft Fourteenth General Programme of Work, 2025–2028'.

114 Napoli et al., 'Tracking the Impacts of Climate Change on Human Health via Indicators: Lessons from the Lancet Countdown'.

115 Samira Barbara Jabakhanji et al., *Public Health Measures to Address the Impact of Climate Change on Population Health—Proceedings from a Stakeholder Workshop*, 2022, https://doi.org/10.3390/IJERPH192013665.

116 G. S. Martinez and P. Berry, *The Adaptation Health Gap: A Global Overview,* 2018.

117 United Nations Environment Programme, 'Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate Investment and Planning on Climate Adaptation Leaves World Exposed', 2023, https://www.unep.org/resources/adaptation-gap-report-2023.

118 Cunrui Huang et al., 'Constraints and Barriers to Public Health Adaptation to Climate Change: A Review of the Literature.', *American Journal of Preventive Medicine*, 2011, https://doi.org/10.1016/J.AMEPRE.2010.10.025.

119 Quintana et al., 'A Story of (in)Coherence: Climate Adaptation for Health in South African Policies.'

120 Mirna Panic and James D. Ford, 'A Review of National-Level Adaptation Planning with Regards to the Risks Posed by Climate Change on Infectious Diseases in 14 OECD Nations.', *International Journal of Environmental Research and Public Health*, 2013, https://doi.org/10.3390/IJERPH10127083.

Given the large array of funds available, often with different objectives, there is a need for greater coherence and simplicity across funding sources to enable successful implementation of national and international strategies, as noted by Berry and colleagues in their 2018 review.[121] A recent report released at the 2024 WHO ATACH meeting, in partnership with the Rockefeller Foundation, illustrate this landscape. The report found that the largest funders for climate and health solutions are the WHO, followed by the GCF and the GEF, which are dedicated to assisting developing countries in responding to climate change.[122] Fifty percent of countries reported receiving funding from WHO, 37% of countries used GCF as a resource, and 37% of countries received funding from the GEF.[123] Other significant financial sources include UNICEF, UNDP, UNEP, and World Bank.[124]

Funders, though essential, come with predetermined strategies that are oftentimes misaligned with local and community contexts, resulting in wasted funding and sometimes ineffective initiatives, as highlighted by Negev and colleagues (2021).[125] Involving local stakeholders[126] at all levels of decision-making, as described by the Global Climate and Health Alliance (2024),[127] and providing more adaptable funds, as Alcayna, O'Donnell and Chandaria (2020) concluded,[128] can help addressing these issues.

Additionally, the reviewed literature points out that short-term economic gains are often prioritized, particularly in high income countries, over long-term health improvements. Whitmee and colleagues (2015) note that such improvements can be difficult to quantify and may not yield immediate financial returns.[129] Workman and colleagues (2018) noted that it can be challenging to convince investors and funders to prioritize long-term health outcomes and returns when more immediate profits are available from activities that generate high levels of pollution or involve other health-harming sectors, ultimately undermining both long-term environmental sustainability and public health.[130] However, quantifying future health benefits remains complex, as researchers often arrive at varying estimates, as described by Robinson (2023).[131] This urgent need to improve and standardize research methodologies to accurately quantify and reflect this data has been emphasized across numerous studies in the reviewed literature (Chang et al.,2017;[132] Bowen and Lynch, 2017;[133] and Whitmee et al., 2023[134]).

121 P. Berry et al., 'Assessing Health Vulnerabilities and Adaptation to Climate Change: A Review of International Progress', *International Journal of Environmental Research and Public Health*, 2018, https://doi.org/10.3390/IJERPH15122626.

122 The Rockefeller Foundation and World Health Organization, 'Climate and Health Financing Needs', March 2024, https://www.rockefellerfoundation.org/report/climate-and-health-financing-needs/.

123 The Rockefeller Foundation and World Health Organization, 'Climate and Health Financing Needs'.

124 The Rockefeller Foundation and World Health Organization, 'Climate and Health Financing Needs'.

125 M. Negev et al., 'Barriers and Enablers for Integrating Public Health Cobenefits in Urban Climate Policy.', *Annual Review of Public Health*, 2021, https://doi.org/10.1146/ANNUREV-PUBLHEALTH-052020-010820.

126 Negev et al., 'Barriers and Enablers for Integrating Public Health Cobenefits in Urban Climate Policy.'

127 Global Climate and Health Alliance, 'A COP29 for People and Planet: Recommendations from the International Health and Climate Community. November 11–22, 2024'.

128 Alcayna et al., 'How Much Bilateral and Multilateral Climate Adaptation Finance Is Targeting the Health Sector? A Scoping Review of Official Development Assistance Data between 2009–2019'.

129 Sarah Whitmee et al., 'Safeguarding Human Health in the Anthropocene Epoch: Report of The Rockefeller Foundation–Lancet Commission on Planetary Health', *The Lancet*, 2015, https://doi.org/10.1016/S0140-6736(15)60901-1.

130 Annabelle Workman et al., 'The Political Economy of Health Co-Benefits: Embedding Health in the Climate Change Agenda.', *International Journal of Environmental Research and Public Health* 15, no. 4 (2018), https://doi.org/10.3390/ijerph15040674.

131 Elizabeth J Z Robinson, 'Climate Friendly Public Health Policies Make Economic Sense', *British Medical Journal*, 2023, https://doi.org/10.1136/BMJ.P2236.

132 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

133 Kathryn Bowen and Yvonne Lynch, 'The Public Health Benefits of Green Infrastructure: The Potential of Economic Framing for Enhanced Decision-Making', *Current Opinion in Environmental Sustainability*, 2017, https://doi.org/10.1016/J.COSUST.2017.08.003.

134 Sarah Whitmee et al., 'Pathways to a Healthy Net-Zero Future: Report of the Lancet Pathfinder Commission', *The Lancet,* 2023, https://doi.org/10.1016/S0140-6736(23)02466-2.

The literature also highlights the influence of vested interests as a barrier to sustained funding for public health. Historical experience in the tobacco sector illustrates how powerful industries delayed the implementation of meaningful health policies by redirecting financial and political attention.[135] The WHO Framework Convention on Tobacco Control (FCTC), however, demonstrates that coordinated global action can overcome such resistance (Chersich and colleagues 2024).[136] This relates to CC&H in the context of fossil fuel and coal industries which are significantly larger than tobacco in both economic scale and sectoral reach.[137] Addressing their influence will therefore require even stronger coordination and collaboration to redirect financial flows towards climate resilient health systems, as emphasized in the 2024 Lancet report.[138]

STRENGTHENING GLOBAL CC&H GOVERNANCE THROUGH COLLABORATION AND STRATEGIC POLICY INSTRUMENTS

The reviewed literature highlights a growing range of efforts to strengthen global CC&H governance through the development of structured collaborative platforms and policy initiatives. These efforts focus on systematically embedding health within climate policy and global governance frameworks to build resilient health systems, mainstream health in NDCs and NAPs, and applying long-term modelling to inform policy planning and implementation. However, these efforts remain constrained by the absence of coherence across mechanisms, insufficient financial resources, and the reliance on informal mandates.

Collaborative Initiatives and Coordination Mechanisms

Despite increasing acknowledgement of the interconnections between climate change and human health, efforts to integrate these domains within global governance structures remain fragmented and inadequately resourced. In response, a range of initiatives have emerged to advance the incorporation of health considerations into global climate policy frameworks and, conversely, to strengthen the integration of climate risks within health systems planning and governance. These initiatives have primarily concentrated on three domains: enabling cross-sectoral entry points, establishing platforms for policy alignment, and supporting the implementation of integrated approaches.

First, several joint initiatives serve to operationalize climate–health linkages across policy domains. The WHO–WMO Joint Office on Climate and Health plays a coordinating role in promoting the use of climate services within the health sector.[139] It hosts platforms such as ClimaHealth, which offers access to climate data, tools, and technical guidance for national planning,[140] and the Global Heat Health Information Network (GHHIN), a multistakeholder initiative that includes academic, governmental, and international actors.[141] These efforts aim to build national capacities for integrating climate information into health decision-making.

Other WHO-led efforts further reinforce this bidirectional integration, embedding health within global climate governance and, concurrently, climate resilience into health systems.

135 Workman et al., 'The Political Economy of Health Co-Benefits: Embedding Health in the Climate Change Agenda.'

136 Matthew Chersich et al., 'A WHO-Led Global Strategy to Control Greenhouse Gas Emissions: A Call for Action', *Globalization and Health*, 2024, https://doi.org/10.1186/S12992-023-01008-6.

137 Carol Olson and Frank Lenzmann, 'The Social and Economic Consequences of the Fossil Fuel Supply Chain', *MRS Energy & Sustainability* 3 (2016): E6, Cambridge Core, https://doi.org/10.1557/mre.2016.7.

138 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

139 WMO and WHO, 'WHO – WMO Joint Climate and Health Programme', https://wmo.int/activities/who-wmo-joint-climate-and-health-programme.

140 WMO and WHO, 'ClimaHealth', https://climahealth.info/.

141 WMO and WHO, 'WHO – WMO Joint Climate and Health Programme'.

Through ATACH, WHO supports countries in building low-carbon, climate-resilient health systems via policy dialogue, technical assistance, knowledge exchange, and access to finance. The Initiative on Climate Action and Nutrition (I-CAN)—developed by the government of Egypt, in partnership with WHO, Food and Agriculture Organization (FAO), the UN-Nutrition secretariat, The Global Alliance for Improved Nutrition (GAIN), the Scaling Up Nutrition (SUN) Movement and other partners, and formally hosted as a working group under ATACH—promotes the alignment of nutrition and climate objectives by supporting the inclusion of health in NDCs and NAPs while enhancing resilience in food and health systems.[142] This agenda echoes calls from some scholars, such as Lang and Rayner (2015) to reorient public health toward an "ecological public health" model that accounts for the systemic interlinkages between environmental sustainability and health equity.[143]

Second, both formal and informal coordination platforms are contributing to increased cross-sectoral engagement. The WHO–Civil Society Working Group to Advance Action on Climate and Health, co-convened with the GCHA, brings together over 30 organizations to facilitate policy development, advocacy, and knowledge sharing.[144] The group was actively involved in key moments at COP28, including Health Day and the UAE Declaration on Climate and Health. In parallel, the Friends of Climate and Health coalition—launched in 2024 with participation from 25 countries—offers an informal space for UNFCCC delegations to engage on health-related climate issues.[145]

Finally, operational platforms have been established to enhance the use of data and evidence in policy formulation. These platforms aim to improve access to technical resources and to foster institutional coordination between climate and health actors. ClimaHealth, for instance, equips governments and stakeholders with tools for planning national climate–health strategies.[146] The WHO–WMO Joint Office also facilitates cross-sectoral consultations and knowledge-sharing mechanisms, thereby strengthening institutional capacity for evidence-informed policymaking.

The Role of NDCs, NAPs, and Long-Term Modelling in Implementing Climate–Health Goals

The literature underscores the untapped potential of national climate planning instruments, particularly NDCs and NAPs, as vehicles for more systemically integrating health considerations into climate strategies. Accordingly, these mechanisms can play a central role in translating global commitments into national priorities, while long-term modelling tools are increasingly identified as essential to supporting implementation, cross-sectoral coordination, and priority setting. Although some contributions have examined the integration of climate considerations into health systems, this section focuses on the integration of health into climate policy.

A foundational contribution to this discussion is the work of Costello et al. (2009), whose Lancet publication described climate change as "the biggest global health threat of the 21st century" and called for strengthened health systems to manage rising climate-related health risks.[147] Building on this premise, scholars such as Sellers and Ebi (2017) have argued

142 ATACH Community, 'Initiative on Climate Action and Nutrition', 2023, https://www.atachcommunity.com/fileadmin/uploads/atach/Documents/I-CAN_narrative_FINAL.pdf?utm.

143 Tim Lang and Geof Rayner, 'Beyond the Golden Era of Public Health: Charting a Path from Sanitarianism to Ecological Public Health', *Public Health* 129, no. 10 (2015): 1369–82, https://doi.org/10.1016/j.puhe.2015.07.042.

144 Global Climate and Health Alliance, 'WHO-Civil Society Working Group to Advance Action on Climate and Health', https://climateandhealthalliance.org/working-group/.

145 International Institute for Sustainable Development, 'Friends of Climate and Health', n.d., https://www.iisd.org/projects/friends-climate-health.

146 WMO and WHO, 'ClimaHealth'.

147 Costello et al., 'Managing the Health Effects of Climate Change: Lancet and University College London Institute for Global Health Commission.', 2009.

that robust governance structures, equitable resource allocation, and public health–oriented policy frameworks are necessary to operationalize this vision.[148] As elaborated by Ebi (2020), NAPs hold particular promise as mechanisms to translate climate–health strategies into actionable national interventions.[149]

In practice, NAPs serve as planning platforms for country-specific adaptation strategies,[150] while NDCs represent the formal channel through which countries communicate climate priorities to the international community under the Paris Agreement.[151] The integration of health into NDCs has become increasingly visible. According to a WHO's 2023 analysis, 91% of submitted NDCs reference health-related priorities, including in mitigation, adaptation, means of implementation, and links to the SDGs.[152] The report also notes greater involvement of ministries of health and public health experts in the drafting process. Examples include contributions from health authorities in countries such as Antigua and Barbuda, Burkina Faso, Mozambique, Pakistan, Zimbabwe, and Paraguay. Several countries explicitly anchor their health commitments in legal or constitutional provisions—for instance, Indonesia refers to its constitutional guarantee of a healthy environment, Pakistan references a "Health in All Policies" approach, and Tunisia draws on human rights principles in NDC development.[153]

Despite these advances, several studies point to persistent limitations in the operationalization of health goals. The 2024 Lancet Countdown notes that while health features prominently in climate commitments, most countries still lack the mechanisms to track implementation over time.[154] Indicator 5.4.1 of their report highlights the absence of governance-related tracking tools in updated NDCs. Although many submissions present broad adaptation goals, few specify how progress will be monitored or evaluated.[155] As found by Lacobuţă, Brandi, and Dzebo (2023), while 92% of actions in NDCs are adaptation-focused, only 9% include quantifiable targets, and even fewer outline measurable health-related interventions.[156]

The literature also reflects unequal integration across countries. The WHO's 2023 review of NDCs indicates that low- and medium-Human Development Index (HDI) countries are more likely to include health in their NDCs than high-HDI countries.[157] Dasandi et al. (2021) interpret this as reflecting differing national priorities, with higher-income countries often emphasizing economic growth, while lower-income or climate-vulnerable countries prioritize health equity and resilience.[158]

Among countries showing consistent engagement, SIDS are frequently cited. The 2024 Lancet Countdown found that SIDS accounted for 57% of climate–health discussions

148 Samuel P Sellers and K. Ebi, 'Climate Change and Health under the Shared Socioeconomic Pathway Framework', *International Journal of Environmental Research and Public Health*, 2017, https://doi.org/10.3390/IJERPH15010003.

149 Ebi, 'Mechanisms, Policies, and Tools to Promote Health Equity and Effective Governance of the Health Risks of Climate Change.'

150 UNFCCC, 'National Adaptation Plans'.

151 UNFCCC, 'Nationally Determined Contributions (NDCs)'.

152 Geneva: World Health Organization, '2023 WHO Review of Health in Nationally Determined Contributions and Long-Term Strategies: Health at the Heart of the Paris Agreement', 2023, https://iris.who.int/bitstream/handle/10665/372276/9789240074729-eng.pdf?sequence=1.

153 Geneva: World Health Organization, '2023 WHO Review of Health in Nationally Determined Contributions and Long-Term Strategies: Health at the Heart of the Paris Agreement'.

154 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

155 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

156 Gabriela Lacobuţă et al., 'NDC-SDG Connections: Data on First NDC Submissions', version V1 1.0.0, German Institute of Development and Sustainability (IDOS); Stockholm Environment Institute (SEI), 2023, https://doi.org/10.5281/zenodo.8089826.

157 Geneva: World Health Organization, '2023 WHO Review of Health in Nationally Determined Contributions and Long-Term Strategies: Health at the Heart of the Paris Agreement'.

158 Niheer Dasandi et al., 'Engagement with Health in National Climate Change Commitments under the Paris Agreement: A Global Mixed-Methods Analysis of the Nationally Determined Contributions', *The Lancet Planetary Health* 5, no. 2 (2021): e93–101, https://doi.org/10.1016/S2542-5196(20)30302-8.

in global forums during 2023.[159] A focused analysis by Mohan (2024) reports that all 16 Caribbean SIDS included health adaptation goals in their NDCs, five of which specified measurable targets.[160]

While such regional leadership demonstrates what coordinated governance can achieve, these examples remain the exception rather than the rule. The broader landscape remains characterized by gaps in specificity, quantification, and monitoring. In response, an emerging body of literature highlights the value of long-term modelling as a strategic tool for embedding health systematically into national climate planning frameworks. Early contributions by Huntingford et al. (2007) emphasized that models integrating climate, demographic, and health data can generate empirically grounded projections of health risks and help prioritize adaptation measures.[161] Chang et al. (2017) characterized long-term modelling as the use of simulations to explore plausible future scenarios and policy options, underscoring its potential to enhance cross-sectoral coordination and to translate policy goals into actionable steps.[162] Ebi et al. (2018) elaborated on its role in planning and monitoring long-term impacts and adaptation needs.[163] More recently, Hamilton et al. (2021) emphasized the importance of such tools for public health preparedness, data-informed decision-making, and the efficient allocation of adaptation investments.[164] These approaches are increasingly reflected in institutional platforms such as ClimaHealth[165] and GHHIN,[166] which provide access to climate data and scenario-based planning tools for health.

159 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

160 Preeya Mohan, 'Health Engagement in National Climate Commitments of Small Island Developing States: A Content Analysis of Caribbean Nationally Determined Contributions', *The Journal of Climate Change and Health* 18 (2024): 100322, https://doi.org/10.1016/j.joclim.2024.100322.

161 C. Huntingford et al., 'Impact of Climate Change on Health: What Is Required of Climate Modellers?', *Transactions of the Royal Society of Tropical Medicine and Hygiene* 101, no. 2 (2007): 97–103, https://doi.org/10.1016/j.trstmh.2006.11.001.

162 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

163 Kristie L. Ebi et al., 'Monitoring and Evaluation Indicators for Climate Change-Related Health Impacts, Risks, Adaptation, and Resilience.', *International Journal of Environmental Research and Public Health*, 2018, https://doi.org/10.3390/IJERPH15091943.

164 Hamilton et al., 'The Public Health Implications of the Paris Agreement: A Modelling Study'.

165 WMO and WHO, 'ClimaHealth'.

166 WMO and WHO, 'Global Heat Health Information Network', https://ghhin.org/.

ACTIONABLE RECOMMENDATIONS

The literature reviewed underscores key global governance challenges in aligning climate and health agendas, particularly in translating commitments into effective implementation. The following recommendations are derived from the body of literature and aim to inform actionable pathways for strengthening coordination, institutional accountability, and policy coherence. Together, they address core global governance challenges and propose steps to enhance transparency, effectiveness, and equity in the climate-health nexus.

Mainstream Health into Climate Policy Instruments and Financing Structures

Although health is increasingly referenced in national climate strategies, its integration into key instruments such as NDCs and NAPs remains uneven and often lacks specificity (Watts et al., 2021[167]; WHO, 2023[168]). A commonly cited recommendation in the reviewed literature, also put forward by the international health and climate community ahead of COP29,[169] is to mainstream health into these planning instruments to ensure that climate-related health impacts are systematically addressed. This would contribute to improving policy coherence, understood here as the alignment between a country's health priorities and its climate strategies (Quintana et al., 2024[170]).

Adopting a 'Health in All Policies' approach would position health equity at the centre of these strategies, guiding countries in addressing climate-driven disparities and fostering long-term health outcomes, environmental sustainability, and a more coherent, system-wide response (Haines et al., 2012[171]; Fears et al., 2023[172]). This integration should be tailored to countries' differing capacities to include, implement, and report on health objectives, supported by appropriate technical assistance and infrastructure. The WHO and other institutions have promoted this approach through technical guidance, indicators, and capacity-building efforts.[173] Recognizing national contexts while advancing shared goals can foster trust and increase transparency and accountability among member states,[174] enabling more effective monitoring and evaluation processes.

In parallel, funding decisions are influenced by multiple factors, including institutional priorities, political will, and global policy trends. While the WHO plays an important role in supporting countries to access resources (as a GCF Readiness Delivery Partner and Adaptation Fund Implementing Entity), its direct influence over funding allocations is limited.

167 Nick Watts et al., 'The 2020 Report of The Lancet Countdown on Health and Climate Change: Responding to Converging Crises.', *Lancet (London, England)* (England) 397, no. 10269 (2021): 129–70, https://doi.org/10.1016/S0140-6736(20)32290-X.

168 Geneva: World Health Organization, '2023 WHO Review of Health in Nationally Determined Contributions and Long-Term Strategies: Health at the Heart of the Paris Agreement'.

169 Global Climate and Health Alliance, 'A COP29 for People and Planet: Recommendations from the International Health and Climate Community. November 11–22, 2024'.

170 Quintana et al., 'A Story of (in)Coherence: Climate Adaptation for Health in South African Policies.'

171 Haines et al., 'From the Earth Summit to Rio+20: Integration of Health and Sustainable Development.'

172 Fears et al., 'Climate Action for Health: Inter-Regional Engagement to Share Knowledge to Guide Mitigation and Adaptation Actions'.

173 Geneva: World Health Organization, 'Quality Criteria for Integrating Health into Nationally Determined Contributions (NDCs)', 2024, https://cdn.who.int/media/docs/default-source/environment-climate-change-and-health/quality-criteria-for-integrating-health-into-ndcs-7nov2024.pdf?sfvrsn=ccd3e050_6.

174 Haines et al., 'From the Earth Summit to Rio+20: Integration of Health and Sustainable Development.'

Although health adaptation remains underfunded relative to needs (WHO, 2025[175]); there has been growing recognition of the importance of integrating health into climate finance. Embedding health priorities into funding criteria, improving transparency and accessibility to mechanisms, and supporting countries to prepare health-inclusive, fundable proposals could help ensure resources are better aligned with public health goals.

Reinforce Institutional Coordination and Intergovernmental Platforms

The second recommendation addresses persistent gaps in global climate–health governance stemming from institutional fragmentation (Lang and Rayner, 2015[176]), entrenched sectoral silos (Bowen et al., 2015[177]), and limited intersectoral dialogue (Quintana et al., 2024[178]). These challenges are evident across global governance and remain a core obstacle to coherent and sustained action.

Formally mandated platforms, such as the WHO–WMO Joint Office, illustrate the potential for cross-sectoral coordination but remain limited in mandate and reach. In parallel, a growing number of technical initiatives and informal mechanisms, such as ATACH, I-CAN, and the WHO–Civil Society Working Group (WHO-Civil Society Working Group Report 2023[179]), contribute to knowledge exchange and advocacy. While valuable, these efforts operate outside formal global governance structures and lack the authority to drive long-term institutional alignment.[180] Additionally, the limited engagement of environment and finance ministries in global health forums, such as the World Health Assembly, reflects a broader lack of reciprocity and inclusiveness in current global governance arrangements.[181]

Moving from fragmented dialogue to structured collaboration requires reinforcing formal coordination mechanisms, ensuring participation beyond the health sector, and creating stronger linkages between informal alliances and intergovernmental processes.

Invest in Long-Term Modelling Tools and Robust Data Systems for Climate–Health Action

The third recommendation highlights the need to strengthen long-term modelling tools and health-relevant data systems to support anticipatory, evidence-based decision-making and cross-sectoral coordination. The literature points to long-term modelling as an underutilized tool in climate–health governance, with inconsistent adoption across countries despite increasing recognition of its value (Ebi et al., 2018[182]; Hamilton et al., 2021[183]).

Robust modelling frameworks are critical not only for projecting health risks under various climate scenarios but also for informing resource allocation, policy design, and long-term

175 World Health Organization, 'Finance for Health and Climate Change', 2025, https://www.who.int/teams/environment-climate-change-and-health/climate-change-and-health/country-support/finance-for-health-and-climate-change.

176 Lang and Rayner, 'Beyond the Golden Era of Public Health: Charting a Path from Sanitarianism to Ecological Public Health'.

177 Bowen and Ebi, 'Governing the Health Risks of Climate Change: Towards Multi-Sector Responses'.

178 Quintana et al., 'A Story of (in)Coherence: Climate Adaptation for Health in South African Policies.'

179 Global Climate and Health Alliance, *2023 Report on the WHO-Civil Society Working Group to Advance Action on Climate and Health* (2024), https://climateandhealthalliance.org/wp-content/uploads/2024/03/2023-WHO-CS-WG-Report-to-DG.pdf.

180 Willetts et al., 'Health in the Global Environmental Agenda: A Policy Guide'.

181 Willetts et al., 'Health in the Global Environmental Agenda: A Policy Guide'.

182 Ebi et al., 'Monitoring and Evaluation Indicators for Climate Change-Related Health Impacts, Risks, Adaptation, and Resilience.'

183 Hamilton et al., 'The Public Health Implications of the Paris Agreement: A Modelling Study'.

planning (Watts et al., 2018[184]; Romanello et al., 2024[185]). Improved methodologies that incorporate health outcomes and economic losses, particularly those linked to inaction, can support policy uptake and sustained financing. Projections of cost savings and return on investment have been shown to enhance political and financial support for health-centred climate strategies (Chang et al., 2017[186]).

Standardized and accessible metrics would also strengthen progress in monitoring, enhance accountability, and enable regional and global comparability (Di Napoli et al., 2022[187]; Lacobuţă, Brandi, and Dzebo, 2023[188]). Equity-sensitive modelling frameworks, designed with inclusive data inputs and scenario planning, are particularly important to ensure that projections inform responses tailored to vulnerable populations. Strengthening the technical quality and governance relevance of modelling and data systems will ultimately improve the capacity of institutions and actors, at national, regional, and global levels, to deliver timely, coordinated, and data-driven climate–health responses.

Establish Clear Accountability Mechanisms to Bridge the Implementation Gap

The final recommendation addresses the persistent gap between climate–health commitments and measurable outcomes by emphasizing the role of accountability mechanisms. While political attention to health has increased, institutional capacity to monitor implementation remains limited. This disconnect is well documented in successive Lancet Countdown reports, including the 2024 edition, which underscores the absence of robust systems to evaluate progress.[189]

A limited number of authors in the reviewed literature propose concrete solutions. Tallis et al. (2019) call for structured planning tools, such as results chains and rubrics, to align cross-sectoral implementation.[190] Ebi et al. (2018) recommend embedding continuous monitoring within institutional frameworks to enable performance tracking, learning, and adaptation over time.[191] Yet, as Hoffman and Røttingen (2015) caution, even where such mechanisms exist, their effectiveness is often limited by broader systemic barriers—most notably the reliance on national political will, institutional capacity, and available resources.[192]

Ultimately, the extent to which instruments such as NDCs and NAPs, among others, incorporate measurable health objectives will shape the capacity of global governance systems to evaluate, refine, and adjust climate–health action over time. In this context, accountability should be understood not only as a reporting obligation but also as a global governance function that builds trust, transparency, and long-term institutional effectiveness.

Taken together, these recommendations reflect core priorities emerging for strengthening global governance at the intersection of climate and health. Integrating health more systematically into climate policy instruments and financing structures, reinforcing

184 Watts et al., 'The 2018 Report of the Lancet Countdown on Health and Climate Change: Shaping the Health of Nations for Centuries to Come.'

185 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

186 Chang et al., 'Ancillary Health Effects of Climate Mitigation Scenarios as Drivers of Policy Uptake: A Review of Air Quality, Transportation and Diet Co-Benefits Modeling Studies'.

187 Napoli et al., 'Tracking the Impacts of Climate Change on Human Health via Indicators: Lessons from the Lancet Countdown'.

188 Lacobuţă et al., 'NDC-SDG Connections: Data on First NDC Submissions'.

189 Romanello et al., 'The 2024 Report of the Lancet Countdown on Health and Climate Change'.

190 Tallis et al., 'Aligning Evidence Generation and Use across Health, Development, and Environment'.

191 Ebi et al., 'Monitoring and Evaluation Indicators for Climate Change-Related Health Impacts, Risks, Adaptation, and Resilience.'

192 Steven J. Hoffman and John-Arne Røttingen, *Assessing the Expected Impact of Global Health Treaties: Evidence From 90 Quantitative Evaluations*, January 2015, https://doi.org/10.2105/AJPH.2014.302085.

coordination across sectors and institutions, investing in long-term modelling and data systems, and establishing robust accountability mechanisms are all critical to bridging the persistent gap between commitment and implementation. While national contexts will shape specific approaches, progress in these areas requires sustained support from global institutions, actors and frameworks.

CONCLUSION

The global governance of CC&H stands at a critical juncture, where the accelerating impacts of climate change demand urgent, cohesive, and measurable action. António Guterres, UN Secretary-General, aptly warned, "*Record-high emissions are posing record-breaking threats to our health. We must cure the sickness of climate inaction – by slashing emissions, protecting people from climate extremes, and ending our fossil fuel addiction – to create a fairer, safer, and healthier future for all.*" The 2024 Emissions Gap Report reinforces this urgency, affirming that the 1.5° target from the Paris Agreement remains possible, but only if immediate and decisive action is taken.[193]

This literature review has examined how global CC&H governance has evolved over the past two decades and what factors have shaped its visibility, integration, and influence. It reviewed key institutions, actors and negotiating spaces, while mapping how health has been framed in climate discourse, what tools support its integration, and where gaps persist. Although recognition of CC&H interlinkages has grown, particularly in recent years, fragmentation and uneven implementation continue to constrain progress.

This review suggests that, to advance implementation, health professionals and experts should have secure and sustained representation within global climate governance processes, including formal negotiations. As emphasized throughout the paper, global commitments—whether articulated through new decisions or resolutions—must be matched by concrete actions at the national level. Ensuring inclusive global decision-making is therefore essential, both to establish shared ambitions and to reflect countries' differing capacities.

The actionable recommendations outlined in this review aim to support policymakers, funders, and institutional leaders in strengthening the architecture of global CC&H governance, including the intergovernmental platforms, national strategies, and cross-sectoral mechanisms that shape coordination and implementation. From embedding health in NDCs and climate finance, to improving coordination and monitoring systems, and investing in long-term modelling tools, each step addresses a core global governance function. Taken together, they can reinforce transparency, equity, and long-term resilience.

Future research should prioritize interdisciplinary and regionally diverse contributions, particularly from underrepresented settings, to expand the evidence base and reduce knowledge asymmetries. Areas such as monitoring frameworks, institutional accountability, and financing mechanisms warrant deeper investigation.

Despite growing technical capacity and availability of tools, translating global commitments into measurable and equitable outcomes remains a defining challenge of global CC&H governance. As climate impacts intensify, the legitimacy and effectiveness of global governance will rest not only on political will but also on the capacity of systems and structures to deliver implementation, foster accountability, and ensure sustained coordination. Whether current frameworks can meet this challenge will also hinge on the extent to which health and equity are fully embraced as foundational pillars of climate action.

193 United Nations Environment Programme, 'Emissions Gap Report 2024', October 2024, https://www.unep.org/resources/emissions-gap-report-2024.

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GENEVA GRADUATE INSTITUTE

GLOBAL HEALTH CENTRE

Global Health Centre
Maison de la paix
Chemin Eugène-Rigot 2A
Case Postale 1672
CH-1211 Genève 1
graduateinstitute.ch/globalhealth

globalhealth@graduateinstitute.ch
@GVAGrad_GHC
@gvagrad-ghc.bsky.social
Global Health Centre
@globalhealthcentre