Pan-European Commission on Climate and Health
Information Series

Understanding climate-related threats to health in the WHO European Region

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About this document

This document summarizes key evidence relevant to the climate change threats to human health in the WHO European Region. It provides key messages about the converging and interconnected climate-induced health risks, the implications of reaching climate tipping points and the health implications of inaction.

It is the first of a series of three short thematic briefs developed for the Pan-European Commission on Climate and Health (PECCH), which has been convened by the WHO Regional Office for Europe to accelerate decisive climate action that protects and promotes health.

PECCH will convene for three hybrid hearings in 2025, engaging leading experts, people with lived experience and other key informants and stakeholders in specific areas of climate change and health, as well as social development and policy-making, to present current evidence and case examples, and identify gaps and opportunities for accelerated action. Drawing upon these hearings, PECCH will make recommendations for accelerated health and climate action.

Ahead of each hearing, the PECCH research team, in close collaboration with its Chief Scientific Advisor will prepare a short thematic brief for PECCH members to help inform – and contextualize the evidence from the WHO European Region related to the scope of – the hearing. Each thematic brief contains a set of key messages for consideration by the Chair and the Commissioners to guide their discussions at the hearings on areas that might be deliberated as input to the final "Call to action" of the Commission.

The three hearings of the Commission are intended to build on each other, addressing the broad themes of:

- **threats** to human health, well-being and ecosystems;
- **opportunities and co-benefits** of addressing these threats through both adaptation and mitigation measures; and
- possible entry points for **actions** to enhance mitigation, adaptation and resilience to climate change in terms of legislation, governance, capacity strengthening, technologies and economic frameworks, among others, applied at different levels of governance, for equitable health and well-being outcomes.

The climate crisis is a global health crisis. The adverse effects of climate change on health are continuing to worsen throughout the Region

Beyond the sum of impacts: the threat logic

Climate-related threats are non-linear and emerge from compound system stress. They challenge the capacity of both public health systems and societal resilience, with significant and rising human, environmental and economic costs if left unaddressed.

The health consequences of climate change are well established, ranging from direct effects such as heat-related illnesses, respiratory illnesses and injuries due to flooding, to indirect consequences including food insecurity, forced migration, ecosystem collapse and emerging infectious diseases *(1)*. Mental health impacts, including depression, post-traumatic stress disorder and eco-anxiety (the latter particularly among young people), are also increasingly documented *(2,3)*.

However, framing these as discrete impacts underrepresents the nature of present and future threats. The climate-related risks arise through intersecting hazards (e.g. simultaneous heatwaves and droughts), heightened vulnerabilities (e.g. systemic inequalities, fragile health systems) and persistent exposures to climate hazards. Exposures and vulnerability to climate change vary substantially across the Region and within populations, for example, depending on age and pre-existing illness as well as location. These threats act as risk multipliers and, moreover, must be addressed against an increasingly turbulent background of geopolitical tensions and uncertainties, and the potential intersection with other global health crises, such as the coronavirus disease pandemic. The threats do not occur in isolation but amplify and cascade through systems, from infrastructure and supply chains to public trust and political stability *(1)*.

As an example of this, a single flood event may damage water, sanitation and transport infrastructure, trigger infectious disease outbreaks and acute mental distress, overwhelm local health-care capacity and deepen socioeconomic divides *(2,4,5)*. This, in turn, can lead to public distrust, deteriorating resilience and long-term declines in productivity and prosperity. Similar cascading impacts are also evident in prolonged drought conditions, which can reduce river navigability, disrupt agricultural production, and affect energy and water supplies, amplifying risks to ecosystems, public health and economic activity across sectors *(6)*.

In the WHO European Region, where climate hazards are intensifying, the economic and societal implications are increasingly severe. Heat-related deaths increased by an average of 17.2 per 100 000 people between 2003–2012 and 2013–2022. Activity by outdoor workers has declined due to heat exposure, undermining economic productivity and well-being *(7)*. The time window for greatest risk relating to high temperatures or physical activity (whether occupational or leisure) is expanding beyond midday, contributing to reduced activity and associated noncommunicable disease risks *(7)*. Southern and eastern Europe are disproportionately affected by drought, food insecurity, heat-related conditions and vector-borne diseases such as leishmaniasis and West Nile virus, while northern Europe faces rising threats from ticks and *Vibrio* bacteria *(7)*. Vulnerable populations, such as low-income groups, women, children, migrants and

older adults, often face higher exposure to climate-related hazards and have reduced capacity to cope with and adapt to these challenges *(7)*. Poorly designed or inequitable adaptation strategies risk exacerbating these disparities *(7)*.

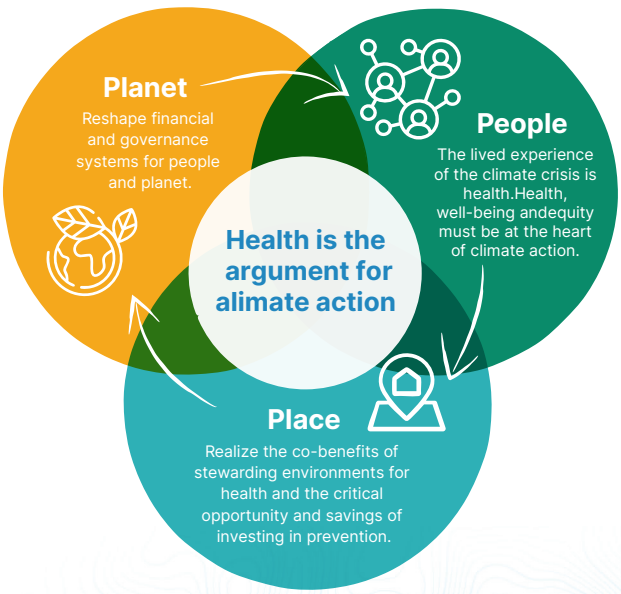
Reframing climate change from primarily a collection of discrete health impacts to a cascade of intersecting and multiplicative ones – including impacts on the health-care system's ability to deliver – helps to inform decision-making in several ways.

- First, it emphasizes the need for anticipatory governance and systems thinking, recognizing that interventions in one area (e.g. decarbonization) have multiple co-benefits on others (e.g. energy poverty, health equity).
- Second, it requires that public health arguments be integrated into economic assessments; not just as cost burdens but as drivers of innovation, resilience and prosperity.
- Finally, it brings into focus the political economy of inaction. Vested interests, particularly in fossil fuel industries, continue to impede bold climate-health responses *(2–4)*.

Strategically, the threat perspective can catalyse more urgent action and illuminate points of intervention. Acknowledging their complexity should galvanize – not delay – efforts to protect health and build resilience *(8)*. Importantly, this framing also helps identify areas where progress is possible and already underway, offering pathways toward shared prosperity and equity as will be discussed in the later second and third hearings.

The following sections discuss the intersection of threats in terms of the framework for people, place and planet (Fig. 1) developed by WHO for the 29th United Nations Climate Change Conference *(2)*.

Fig. 1. The "people-place-planet" framework: key pillars of taking action for climate change and health[3]



Source: (2).

Planetary pressures: tipping the scales of stability

Threats to human health originate in planetary destabilization and escalate without cross-sectoral planetary stewardship. These destabilizations at the planetary scale cascade through ecosystems, communities and health systems, threatening the ecological foundation of prosperity.

At the planetary level, human health and prosperity are embedded in Earth's life-support systems, but those systems are under accelerating strain. Six of the nine planetary boundaries have now been transgressed, including those governing climate, biosphere integrity, land use and freshwater flows *(9)*. As Earth system stability is eroded, the risk of triggering non-linear, potentially irreversible changes – the so-called Earth system tipping points – is growing *(10)*. These planetary thresholds are not abstract. Their transgression carries material, immediate and sustained consequences for health and societal stability. For example, the destabilization of the cryosphere and biosphere alters rainfall and temperature patterns, leading to crop failure, undernutrition and reduced labour productivity. Biodiversity loss and ecosystem fragmentation heighten the risk of zoonotic spillovers. Regions may become seasonally or permanently unliveable under climate change, as human physiological limits are breached *(9,10)*.

The implications go beyond health. System-level disruptions to food, water and climate systems can strain governance, create social unrest, displace populations and escalate cross-border tensions. The European Commission's Joint Research Centre has warned that the crossing of the Earth system tipping points is an emerging security blind spot for Europe, requiring urgent anticipatory governance to manage cascading polycrises *(10)*. Prosperity is also at stake. While estimates suggest that unchecked warming could reduce European Union (EU) gross domestic product by up to 7% by 2090 – or even 10% by 2050 if tipping points are triggered – these projections may understate the full range of systemic economic risks associated with cascading climate impacts *(10)*. These risks are not linear: they accelerate once thresholds are passed, with cascading losses to ecosystems, infrastructure and human capital. Analyses show that the costs of inaction exceed the costs of action *(1)*, to be discussed in the second hearing.

Addressing these interlinked risks requires planetary stewardship: a cross-sectoral commitment to safeguarding Earth's life-support systems as a foundation for health, security and economic stability. Planetary stewardship – the collective responsibility to manage Earth's life-support systems within safe and just boundaries – is not just ethical but essential. We propose it as a core discussion theme across all three PECCH hearings.

Broken contracts: eroding trust and institutional capacity

The governance and communications environment is itself a determinant of health. Rebuilding trust, across generations, sectors and communities, is essential to equip societies for long-term climate-health resilience.

The threat of climate change is not only biophysical or economic; it is also political, social and psychological. A defining risk in the Region lies in the erosion of trust in institutions meant to protect public health in the face of climate change and the transgression of planetary boundaries more broadly. Institutional capacity remains uneven across the Region *(11)*. When considered in terms of the "people" pillar of the "people-place-planet" framework (see Fig. 1) *(2)*, there are major implications for public engagement, for education and workforce training and for developing the next generation of climate-health leaders. Addressing these implications requires action across sectors, including for better communication, investment in people and joined-up policy. The health sector itself (that is, its people) has a moral imperative to act on and advocate for climate action. Despite limited progress in some countries *(12)*, the health sector generally has made inadequate progress in integrating climate into its own governance. Coordination across sectors is weak, mandates are fragmented and the health sector often lacks ownership of climate-related responsibilities *(4,7)*. These deficiencies hinder timely and effective responses and contribute to public scepticism, loss of trust and an erosion of social cohesion when institutions are seen as slow or misaligned with reality *(4,8)*.

Compounding these structural issues are deliberate efforts by vested interests to delay action. Fossil fuel industries continue to exert influence through lobbying and the spread of disinformation, shaping narratives that sow doubt and stall reform *(2,7,13,14)*. Governments' perceived complacency toward these commercial interests further damages public trust. Disinformation also finds fertile ground in today's digital environment. The growing use of artificial intelligence-generated content has amplified false or misleading claims *(15)*. When expert guidance is drowned out by algorithmic distortion, public consensus weakens *(2)*.

The mental health impacts of climate change are intensifying, particularly among youth. Rising eco-anxiety, despair and feelings of democratic exclusion are linked to a mismatch between the scale of the crisis and the pace of institutional response *(16–18)*. The lack of intergenerational justice, where youth see their futures compromised by present-day delay, has become a driver of civic disengagement in some contexts *(2)*. This erosion of trust is mirrored in polling on climate engagement. While concern about climate impacts is increasing, belief in personal and institutional efficacy is declining *(19)*. For example, a 2025 global survey by Ipsos showed that across 26 countries, the proportion of people agreeing that "if individuals like me don't act on climate change, we are failing future generations" has dropped since 2021 *(20)*. This is a worrying decline but needs further assessment across the Region to ascertain the extent to

which it can be attributed to people's scepticism about the scientific evidence, lack of trust in governments and other institutions to act, or concerns about personal financial implications arising from the transition away from fossil fuels. Importantly, there are gaps in delivery, effective communication and update of scientific evidence as well as in governance mechanisms to advance evidence-based actions. Disjointed policies, delayed responses and top-down strategies that overlook local realities continue to erode public confidence *(2,4,8)*.

Fragile frontlines: where threats hit hardest

Climate threats map onto pre-existing inequities, amplifying vulnerabilities in places least equipped to respond. Building resilience must start where health and social systems are weakest, and be guided by equity, solidarity, and accountability.

Focusing on the "place" pillar of the WHO "people-place-planet" framework (see Fig. 1) *(2)*, the demonstrable impacts of climate change on health are distributed unevenly across the WHO European Region, reflecting and reinforcing existing social, economic and geographic inequities. In addition, areas such as eastern Europe, central Asia and the Arctic experience significant transdisciplinary, cross-sectoral data gaps, limiting both the attribution of climate-health burdens and the design of targeted adaptation measures *(7)*. While this must not be used as an excuse for inaction now, addressing these gaps is essential for longer-term equitable and effective policy. There are opportunities to leverage comparable evidence and transfer knowledge from well-documented cases to inform anticipatory policy in data-sparse settings *(8)*. For example, the WHO Regional Office for Europe, which is already a partner in the EU Climate and Health Observatory, could further strengthen its collaboration and facilitate the expansion of its geographic reach, building on the existing involvement of non-EU Member States, such as Iceland, Norway and Türkiye. This would align with emerging regional and global recommendations, for example from the Budapest Declaration of the Seventh Ministerial Conference on Environment and Health *(21)*, the Second European Programme of Work *(22)*, and WHO's Global Action Plan on Climate Change and Health *(23)*, to create a robust and relevant evidence base directly connected to policy, implementation and monitoring.

Addressing these fragile frontlines requires a values-based approach rooted in solidarity, equity and the principle of common but differentiated responsibilities: a principle enshrined in international climate governance frameworks *(2)*. Yet, values alone are insufficient for transformative action. Communities most affected often lack agency and representation in political and decision-making processes. Vested interests and uneven power dynamics can obstruct just transitions, and climate-health governance must proactively confront these barriers *(3)*.

Geographic vulnerability hotspots illustrate the diverse place-related and people-related risk profiles across the Region. Southern Europe faces compounding threats

from heat, wildfire, drought and water scarcity *(7,16)*. In eastern Europe and central Asia, flood-related mortality, cold stress and water stress remain underexamined yet are likely to be severe *(5,7)*. Alpine and arctic zones face rapid warming, biodiversity loss and infrastructure destabilization from permafrost melt *(3,7)*. These environmental pressures disproportionately affect certain populations: older adults, children, migrants, ethnic minorities, indigenous peoples and rural and economically marginalized groups *(7)*. However, many of these groups remain invisible in research, policy and surveillance systems, risking further exclusion from adaptive planning.

Health systems themselves are vulnerable: overstretched workforces, aging infrastructure and climate-sensitive supply chains strain capacity in already underserved areas. As climate shocks intensify, these systems risk surpassing adaptation thresholds, compounding health and economic burdens *(1,7)*.

To effectively promote prosperity and well-being across the Region, climate-health strategies must explicitly prioritize these fragile frontlines. This includes resourcing surveillance systems, investing in inclusive health infrastructure, strengthening the adaptive capacity of health workers and ensuring meaningful community participation in decision-making. Solidarity in action requires that those with greater capacity support those with greatest need, not as charity, but as a shared imperative for regional resilience.

Inaction is its own threat: from risk to reality

Delay is not neutral. It creates its own threats. Failing to act today accelerates tomorrow's crises. Delay deepens vulnerability across people, place and planet, undermining prosperity, equity and resilience.

The WHO European Region's current emissions trajectory is incompatible with the 1.5°C target above pre-industrial levels, as established in the Paris Agreement to avoid the most dangerous impacts of climate change *(24)*. Despite some progress, Europe is on track to reach net-zero carbon emissions only by 2100, far from the 2040 benchmark required under fair-share principles *(7)*. This delay exacerbates health risks, including heat-related illness, vector-borne diseases and food insecurity *(7)*.

Meanwhile, the opportunity costs – both health and economic – of delay are substantial. Health-responsive climate mitigation could yield annual co-benefits from cleaner air, healthier diets, increased physical activity and more liveable cities. Yet these benefits are forfeited with each year of inaction *(7)*.

The financial costs of inaction are not abstract. Between 1980 and 2021, economic losses from climate and weather-related extremes in the EU exceeded €560 billion *(25)*. In 2022 alone, climate-related disasters caused €18.7 billion in losses across the EU, with over 75% of losses uninsured in southern and eastern regions *(7)*. Projections suggest that without scaled adaptation, these losses will rise sharply under warming trajectories above 2°C *(25)*. At the same time some adaptation measures are highly cost effective. For instance, early warning systems for heatwaves show benefit-cost

ratios between 11 and 3700 depending on valuation methods *(25)*.

Institutional inertia compounds risk. Fragmented mandates and reactive planning embed governance structures that reinforce vulnerability rather than reduce it *(1,7)*. However, proactive institutional reform offers a way forward. By creating positive path dependencies, such as integrated urban planning, food transitions and regional risk pooling, systems can be reoriented toward resilience as will be discussed in the second hearing.

Reducing environmentally harmful consumption is fundamentally constrained by growth-oriented political systems and the lack of affordable sustainable choices. This places climate-health policy within a broader conversation about systemic transformation *(26)*. In summary, delay is not passive. It generates escalating health, economic and social harms, while closing the door on transformative change that would include the innovative approaches that can drive future prosperity.

Final reflections ahead of the first Commission hearing

Currently, climate-related threats to health are escalating in scale, complexity and interconnectedness. Across the WHO European Region, these threats manifest not only through direct environmental hazards, but also through cascading social, economic and institutional stresses that undermine the foundations of well-being and resilience. Irreversible planetary tipping points are being approached, while social systems are strained by inequity, fragmentation and the erosion of public trust.

It is vital to raise the profile of health in climate policy-making, while also raising the profile of climate change in health policy-making. We must act together – and now. As Commissioners prepare for this first and the following hearings, the evidence underscores the need to examine how threats converge across people, places and planetary systems. Understanding and communicating these dynamics is essential for anticipating future risks, identifying the populations and systems most exposed, and considering the broader implications of inaction, not just for health outcomes, but for equity, stability and the ability of societies to adapt. Integrated assessment, knowledge-translation and communication plays core roles: to highlight the urgency of the threats and to guide action (including funding choices) to implement solutions, accompanied by the reform of governance systems.

References[1]

1. Romanello M, Walawender M, Hsu SC, Moskeland A, Palmeiro-Silva Y, Scamman D, et al. The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action. Lancet. 2024;404(10465):1847–96 (https://doi.org/10.1016/S0140-6736(24)01822-1).
2. Health is the argument for climate action: COP29 Special Report on Climate Change and Health. Geneva: World Health Organization; 2024 (https://cdn.who.int/media/docs/default-source/environment-climate-change-and-health/58595-who-cop29-special-report_layout_9web.pdf).
3. The imperative of climate action to protect human health in Europe. Vienna: European Academies Science Advisory Council; 2019 (https://easac.eu/publications/details/the-imperative-of-climate-action-to-protect-human-health-in-europe).
4. Climate Change Adaptation for Health: Systems-based Approaches to Formulating Solutions and Guiding Policy. Trieste: InterAcademy Partnership; 2023 (https://www.interacademies.org/sites/default/files/2023-12/IAP%20Science%20Policy%20Brief_spreads_web.pdf).
5. Yang Z, Huang W, McKenzie JE, Xu R, Yu P, Ye T, et al. Mortality risks associated with floods in 761 communities worldwide: time series study. BMJ. 2023;383:e075081 (https://doi.org/10.1136/bmj-2023-075081).
6. Drought in Europe April 2025. Brussels: European Commission; 2025 (https://publications.jrc.ec.europa.eu/repository/handle/JRC142141).
7. van Daalen KR, Tonne C, Semenza JC, Rocklöv J, Markandya A, Dasandi N, et al. The 2024 Europe report of the Lancet Countdown on health and climate change: unprecedented warming demands unprecedented action. Lancet Public Health. 2024;9(7):e495–522 (https://doi.org/10.1016/S2468-2667(24)00055-0).
8. Zero regrets: scaling up action on climate change mitigation and adaptation for health in the WHO European Region, second edition. Key messages from the Working Group on Health in Climate Change. Copenhagen: WHO Regional Office for Europe; 2023 (https://iris.who.int/handle/10665/368161). License: CC BY-NC-SA 3.0 IGO.
9. Richardson K, Steffen W, Lucht W, Bendtsen J, Cornell SE, Donges JF, et al. Earth beyond six of nine planetary boundaries. Sci Adv. 2023;9(37):eadh2458 (https://doi.org/10.1126/sciadv.adh2458).
10. Roman-Cuesta RM, Dentener F, Galmarini S, Milkoreit M, Armstrong McKay D, De Groeve T, et al. Earth System Tipping Points are a threat to Europe. Science for Policy Brief. Brussels: European Commission; 2025 (JRC140827; https://publications.jrc.ec.europa.eu/repository/handle/JRC140827).
11. Health at a Glance: Europe 2024. Paris: Organisation for Economic Co-operation and Development; 2024 (https://www.oecd.org/en/publications/health-at-a-glance-europe-2024_b3704e14-en.html).
12. Wilkinson E. NHS in England on track to hit first year carbon reduction target. BMJ. 2021;375:n2466 (https://doi:10.1136/bmj.n2466).
13. Heede R, Oreskes N. Scientists' warning on fossil fuels. Oxford Open Clim Chang. 2024;5(1):kgaf011 (https://doi.org/10.1093/oxfclm/kgaf011).
14. Climate Obstruction Across Europe. Providence: Climate Social Science Network; 2024 (https://cssn.org/wp-content/uploads/2024/05/2024-04-Climate-Obstruction-Across-Europe-Brief.pdf).
15. Galaz V, Metzler H, Daume S, Olsson A, Lindström B, Marklund A. AI could create a perfect storm of climate misinformation. arXiv Prepr. 2023 (https://doi.org/10.48550/arXiv.2306.12807).
16. European Academies' Science Advisory Council, InterAcademy Partnership. Tackling the effects of climate change on health in the Mediterranean and surrounding regions. Trieste: InterAcademy Partnership; 2021 (https://www.interacademies.org/sites/default/files/2021-10/Tackling%20the%20effects%20of%20climate%20change%20on%20health%20in%20the%20Mediterranean%20and%20surrounding%20regions.pdf).
17. Hickman C, Marks E, Pihkala P, Clayton S, Lewandowski RE, Mayall EE, et al. Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. Lancet Planet Health. 2021;5(12):e863–73 (https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00278-3/fulltext).
18. The role of the youth sector in addressing young people's climate emotions. Brussels: European Commission; 2024 (https://climate-pact.europa.eu/eu-climate-action-academy/resources/role-youth-sector-addressing-young-peoples-climate-emotions_en?prefLang=sv).
19. Bridging the trust gap: Public perception and government action on climate change. Luxembourg: European Institute of Public Administration; 2025 (https://www.eipa.eu/news/bridging-the-trust-gap-public-perception-and-government-action-on-climate-change).
20. People and Climate Change: Public attitudes to the climate crisis and the transition to net zero. Paris: Ipsos; 2025. (https://www.ipsos.com/en/people-and-climate-change-2025).
21. Declaration of the Seventh Ministerial Conference on Environment and Health: Budapest, Hungary 5–7 July 2023. Copenhagen: WHO Regional Office for Europe; 2023 (https://iris.who.int/handle/10665/371461).
22. Second European Programme of Work 2026-2030 (EPW2) [website]. WHO Regional Office for Europe; 2025 (https://www.who.int/europe/about-us/our-work/second-european-programme-of-work-2026-2030).
23. Climate change and health: draft Global Action Plan on Climate Change and Health. Report by the Director-General. Geneva: World Health Organization; 2025 (EB156/25; https://apps.who.int/gb/ebwha/pdf_files/EB156/B156_25-en.pdf).
24. Conference of the Parties, twenty-first session. Adoption of the Paris Agreement. Bonn: United Nations Framework Convention on Climate Change; 2015 (http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf).
25. Assessing the costs and benefits of climate change adaptation. Copenhagen: European Environment Agency; 2023 (https://www.eea.europa.eu/publications/assessing-the-costs-and-benefits).
26. Gupta J, Bai X, Liverman DM, Rockström J, Qin D, Stewart-Koster B, et al. A just world on a safe planet: a Lancet Planetary Health-Earth Commission report on Earth-system boundaries, translations, and transformations. Lancet Planet Health. 2024;8(10):e813–73 (https://doi.org/10.1016/S2542-5196(24)00042-1).

1 All references were accessed on the 3 June 2025.

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