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The human cost of climate change

Health is needed for accelerated and equitable climate action

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1.0 Key messages

- The climate crisis is an urgent health crisis that must be acted upon.
- Climate sensitive health threats cause millions of avoidable deaths annually, reversing decades of progress on global health. Climate change affects health directly, through heat waves and extreme weather events; indirectly, such as via global food supplies or vector-borne infectious diseases or mental health; and finally through socioeconomic systems, such as loss of livelihoods, migration, and reductions in habitable land.
- There is an urgent need for comprehensive and integrated climate mitigation, adaptation, and public health strategies at all levels of government in order to protect the health of the world's poorest and most vulnerable people.
- The 2015 Paris Agreement enshrines the right to health and recognises the significant implications of climate change for human health. To date, incorporating health considerations into climate policies and operational mechanisms of this Agreement has fallen short, putting lives at risk.
- By considering and assessing the health benefits of climate policy, countries can develop targeted interventions that address the specific health risks and vulnerabilities associated with climate change – leading to more effective approaches to climate governance.
- **Ahead of the 28th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change, this briefing focuses on the intersection between climate change and health, outlines the evidence of the impacts of climate change on human health to inform policy and practice, and identifies opportunities to deliver health centred climate action.**

2.0 The climate crisis is a health crisis

Climate change and health are intricately interconnected. The impact of a changing climate poses significant challenges to human health and wellbeing, globally. The World Health Organization (WHO) has defined climate change as the greatest global health threat in the 21st Century[1].It risks undermining decades of progress, by exacerbating existing health challenges and creating new ones.

The science is unequivocal. The Intergovernmental Panel on Climate Change (IPCC) estimates up to 3.6 billion people globally are highly vulnerable to climate change and on the frontline of the associated health risks[2]. Climate sensitive health threats cause millions of avoidable deaths annually and have far-reaching socioeconomic consequences. Climate change affects health directly, through heat waves and extreme weather events; indirectly via ecosystems exemplified as impacts on global food supplies such as declines in crop yields leading to food insecurity and malnutrition, changes in the distribution of vector-borne infectious diseases, and impacts on mental health; and finally through socioeconomic systems, such as loss of livelihoods, migration, and reductions in habitable land[3].

Globally, we are now witnessing the impacts on our health on an unprecedented scale. According to the Lancet Countdown, in 2022 alone[4]:

- A record hot summer contributed to most 62,000 deaths in Europe.
- Extreme floods affected 33 million people in Pakistan and 3.2 million people in Nigeria.
- A record drought in the Greater Horn of Africa, made more severe by climate change contributed to worsening local food insecurity, which now affects 46.3 million people.

It is the world's poorest and most vulnerable within low-income and lower-middle-income countries, and Small Island Developing States that face the greatest threat from climate change and increased health risk[5], despite contributing the least to historic global emissions[6].

3.0 Good climate policy and health policy go hand in hand

It is increasingly clear that climate policy is not just a geophysical and economic one, but instrinctially about health too. To tackle climate change fully, fairly and at speed, health must be prioritised within climate policy and diplomacy through a health centred response, where health research and evidence is used to ensure the decisions we make protect human health and wellbeing.

Embedding physical and mental health in climate policy and action, is an opportunity to achieve national targets and commitments within health and help to unlock greater public support and mobilise resources and financing for climate action. By evaluating climate interventions in terms of the risks and benefits they pose to human health, policy makers can ensure they are protecting against maladaptation and other unintended consequences which could put marginalized and vulnerable populations at new or greater risk.

The Paris Agreement, adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC) cites the right to health, with responsibility on all governments to employ actions to minimise adverse effects on public health. However, to date, efforts to integrate health outcomes into climate policymaking has fallen short, putting lives at risk[7]. The world is not yet responding to the scale of the climate and health challenge[8]. Health has only played a minor role in climate decisions, in both domestic and diplomatic contexts. The health sector's response to climate change remains largely fragmented and under resourced, leaving health systems and the communities they serve vulnerable.

COP28's first ever 'Health Day' – including a dedicated climate and health Ministerial meeting – is an opportunity to incorporate health messaging within global and national climate action. It is a key moment for national governments and policy makers to:

- Better understand the health impacts of climate change as well as commit to assess the health implications of climate mitigation and adaptation policy action.
- Unlock finance for climate and health action aligned with priorities set by those at the frontlines of climate change.
- Sustainably mainstream health into UNFCCC negotiations, future climate conferences, and more broadly into the global climate change agenda.

Without action, every important measure of global health will worsen as the climate changes. Action must be a priority for policy leaders and other stakeholders across global health and climate diplomacy. Mitigation and adaption efforts across various sectors can contribute to building health resilience, enabling communities to better withstand and recover from the adverse impacts of climate change.

4.0 Understanding the impact of a changing climate on health

Climate-related events and growing stresses such as floods, droughts and rising sea levels are impacting health. They are altering infectious disease distribution, affecting food security and nutrition, negatively impacting mental health, and undermining the socioeconomic determinants of health. The impacts will get worse with rising global temperatures. Evidence on how climate change is affecting morbidity and mortality in different geographical areas and population groups is crucial to our understanding of what health centred climate policies can and should seek to achieve.

Extreme heat

Extreme heat leads to more deaths than any other extreme weather event, with older people, pregnant people, newborn babies, those working outside and/or socially deprived areas are at particular risk.

- Extreme heat causes heatstroke, acute kidney injury, poor sleep quality, and adverse pregnancy outcomes like low birth weight and premature birth; and it exacerbates underlying cardiovascular and respiratory disease.
- Extreme heat can lead to psychological distress, trigger mental health problems and worsen pre-existing mental health conditions.
- Socioeconomic impacts of extreme heat include lost work capacity and labour productivity, undermining livelihoods and the socioeconomic determinants of health. Heat exposure, in 2022, resulted in a loss of 490 billion potential work hours, which is 42% more than the annual average two decades ago[9].

Extreme weather events

Increases in temperature and changes in rainfall patterns driven by climate change are increasing the frequency, intensity and duration of life-threatening extreme weather and weather-related events. These events pose direct and indirect risks to physical and mental health.

- In 2022 extreme drought affected every continent and the global land area affected by extreme drought increased to 47% per year in 2013-2022[10]. Extreme drought impacts crop yields, loss of livestock and water shortages, worsening food and water security in vulnerable areas.
- Flooding due to climate change already affects millions of people, with future risk highest in Asia, the USA and Europe[11]. Added to the immediate threats to life and wellbeing, through drowning and building collapse, flooding leads to increased risk of the emergency and spread of infectious disease, ranging from noroviruses to cholera.
- Rising temperatures and incidence of drought increase the risk of wildfires, which affect health through thermal injuries, smoke exposure, and loss of essential infrastructure.

Food insecurity

Climate change affects food production, nutritional quality of food, and storage of produce for distribution. These impacts reduce availability of nutritious food and can increase food prices beyond the reach of those living in poverty[12]. The IPCC projects that over one billion people could suffer from climate-induced food insecurity and undernutrition by 2050[13]. The worst affected by food insecurity include smallholder farmers, pastoralists, agricultural labourers, poorer households, refugees, indigenous groups, women, children, older people and those who are socioeconomically marginalised.

- Staple crops like rice, wheat and soybean are already getting harder to grow due to hotter temperatures and unpredictable rainfall patterns, making food systems vulnerable globally.
- Acute or chronic undernutrition increases the prevalence of long-term health conditions even after the period of undernourishment[14]. In children this can include increased susceptibility to infections, a higher risk of developing diabetes, hypertension, and lower birth weights of offspring in adulthood[15].
- A higher frequency of heatwaves and droughts in 2021 was associated with 127 million more people experiencing moderate or severe food insecurity compared to 1981–2010, putting millions at risk of malnutrition and potentially irreversible health effects[16].

Infectious disease

Warming temperatures, floods, droughts as well as changing land-use and other forms of socio-economic development, are predicted to increase the distribution of regions where infectious disease vectors, like mosquitos and ticks, transmit disease. This is expected to put more than one billion people newly at risk of dengue fever, zika virus and chikungunya[17].

- Climate change can increase the geographic spread of where vectors – such as mosquitoes and ticks – can survive and breed. Driven by climatic changes, urbanisation, and human movement, cases of dengue have doubled every decade since 1990, and almost half of the world population is now at risk of this potentially life-threatening disease[18].
- Climate change is changing the climatic and environmental conditions for the transmission of many infectious diseases. This may lead to an increase in the duration of disease transmission seasons.
- Temperature change can affect the behaviour of vectors. For example, increased temperatures change the biting behaviour of mosquitoes, reducing the effectiveness of barriers such as bed nets.

Mental health

Climate change negatively affects the environmental, social, and economic determinants of mental health The effects of climate change on mental health impacts are disproportionately felt by already marginalised communities[19].

- Heat waves are known to exacerbate underlying mental illnesses and contribute to higher rates of morbidity, mortality and hospitalisations among people with mental health conditions[20].
- Those with existing mental health conditions can also be particularly vulnerable to heat-related illness as certain medications, including some antidepressants and antipsychotics, can make it harder for the body to regulate its temperature.
- There is a well-established link between extreme weather events, such as flooding and storms, and acute mental health conditions, including post-traumatic stress, anxiety and depression[21]. It has been suggested that between 25% and 50% of those exposed to extreme weather events will experience negative mental health outcomes. These outcomes typically diminish over time for most but not all individuals[22].

5.0 Towards health centred climate action

The health and economic costs of inaction on climate change are projected to be extremely significant. At the same time, the benefits to health and the economy of bold climate action, such as an accelerated fossil fuel phase-out are under-recognised in policy making.

In 2023, WHO reported that only 30% of nationally determined contributions (NDCs) to the Paris Agreement formally accounted for the health co-benefits expected from climate change mitigation[23]. This reflects the need for more comprehensive and coordinated efforts to prioritise health within climate governance frameworks. Countries must also have the adequate financial resources and capacity to do so.

Climate action across sectors can yield health co-benefits, and by recognising the immediate and substantial benefits of addressing climate change, governments and communities can prioritise and implement effective health centred climate policies and interventions. 'Climate-health' interventions, defined by WHO, seek to protect and promote population health and well-being, while strengthening climate resilience and/or materially reducing greenhouse gas emissions (GHGs) and air pollution[24]. While priority interventions differ depending on the country context, there is a global opportunity for health centred climate action to lead to improved public health, a more resilient economy, and a sustainable future for all.

Health centred climate action must start with urgent, concerted and committed action across society to significantly reduce GHGs. Rapidly accelerating mitigation efforts to reduce greenhouse gas emissions across all sectors including energy, food, housing, transport can reduce the health risks associated with extreme weather events, changes in disease patterns, and food and water insecurity, amongst other climate related health challenges. Gains to public health from climate mitigation action are twice as large as the cost of implementing mitigation policies at the global level. It has been shown that meeting the goals of the Paris Agreement could save a million lives a year worldwide by 2050 through the reduction to air pollution alone, whilst also reducing the risks to health posed by global temperature rise[25]. When designing climate policies, quantifying the health co-benefits allows for a more considered cost-benefit analysis. Inclusion of these policies into NDCs provides the catalyst to accelerate a just transition, where health protective actions are embedded.

As the urgency of climate sensitive health threats escalates building effective adaptive capacity, is essential to protect human health, reduce health inequities and can yield economic savings through improved health. Investing in health as part of broader climate resilience strategies can contribute to long-term development goals. As with mitigation action, adaptation strategies must be enacted throughout government. Climate-related health adaption across sectors is crucial to shape the overall health of populations, globally; measures within water and sanitation sectors, for example, as well as resilient buildings and cities.

At the 2021 Conference of the Parties of the UNFCCC, national governments committed to the UN's 26th Climate Change Health Programme to develop climate resilient and environmentally sustainable health systems and to safeguard the well-being of populations, especially those at greatest risk. This requires countries to undertake national vulnerability and adaptation assessments (V&As) to formulate and implement appropriate Health National Adaptation Plans (HNAPs) and facilitate access to climate change funding for health[26].

In response to the impacts of current and projected climate change, health systems and facilities will be required to adapt to ensure the provision of sustainable healthcare services. The health sector is one of three sectors (alongside agriculture, and water and sanitation) that has been prioritized for adaptation in governments' NDCs under the Paris Agreement[27]. Prioritising the health sector within NDCs is an acknowledgement of the significant impact of climate change on public health and the urgent need to build resilience within healthcare systems.

Health centred climate actions that directly benefit health can include:

Shifting away from fossil oils and gas to clean energy

Globally, most of the energy used continues to be derived from fossil fuels. This includes the use of coal, oil, and natural gas a primary source of energy for electricity generation, transportation, industrial processes, and heating. Transition to clean energy will have significant positive impacts on public health and plays a vital role in mitigating climate change. Clean energy sources, such a solar, wind and hydroelectric power can significantly reduce air pollution and improve air quality. This can lead to a decrease in respiratory illnesses such as asthma, bronchitis and other respiratory conditions in both adults and children. Cleaner air can also alleviate the severity of symptoms in individuals with existing respiratory conditions, improving overall quality of life.

Transitioning to healthier, sustainable, and climate-resilient transport systems

It is estimated annually 460,000 deaths are caused by transport-derived PM2.5 pollution[28], and a further 3.2 million deaths relating to physical inactivity. Fossil fuels continue to dominate the energy used in road transport – which has significant implications for energy consumption, air pollution, and GHGs. Global efforts to promote zero-emission public transport, and active transportation modes such as walking and cycling can lead to improved public health outcomes and reduced healthcare costs[29].

Implementing policy measures to support the transition to sustainable transportation systems and promote safe active travel – such as fuel efficiency standards, emission regulations, and incentives to the adoption of low-emission vehicles – can drive a more people centred, climate resilient transportation sector[30]. Increased access to green and blue spaces – such as parks, forests, and water bodies – can also help communities tackle heat impacts and provide opportunities for physical activity that can contribute to improved physical and mental health and wellbeing. Green spaces can improve local air quality through absorption of pollutants and particulate matter, reducing the risk of respiratory illnesses, and helps create healthier and more sustainable living environments[31].

Building climate resilient food systems

The impact of climate change on food systems is already being felt in many parts of the world, contributing to global hunger and malnutrition from food insecurity, and threats to the livelihoods of farmers[32]. Building climate resilient food systems is essential for promoting public health. Under the Sharm el-Sheikh joint work programme (2023-2026)[33] governments are mandated to safeguard food security, and build inclusive, sustainable and climate-resilient agriculture systems[34]. Encouraging adoption of climate-smart farming techniques, resilient crop varieties, and water-efficient irrigation methods to mitigate the impacts of extreme weather events can ensure food security in a changing climate.

Upgrading housing and buildings

Poor living and working environments can lead to a number of health concerns including respiratory diseases, heat stress, cold-related illnesses, mental health impacts and infectious diseases. Sustainable, climate-resilient housing and redesigning building infrastructure to promote energy efficiency can create healthier living and working environments. Upgrading housing and buildings to withstand the impacts of heat can enhance their resilience to extreme weather events and temperature fluctuations. Retrofitting buildings and weatherisation efforts such as sealing air leaks and improving ventilation can improve indoor air quality and enhance thermal comfort. By recognising and prioritising the health benefits, policy makers can implement effective strategies to improve environmental quality, promote well-being, and create sustainable and resilient built environments for all.

Developing accessible tools and early warning systems

Public health agencies, and climate service functions have a critical role in responding and adapting to challenges presented by the changing climate[39]. Climate informed early warning systems and health integrated disease surveillance mechanisms for heat-related mortality and infectious disease are crucial adaptation strategies. They allow for timely detection of climate-sensitive health risks, enabling the health sector, and decision makers to respond to meteorological variables and inform the development of targeted interventions to manage health impacts. The World Meteorological Organization (WMO) recommends high-quality tailored climate information must be integrated into key health systems function and the data must be used across governments to inform decision-making and action[40]. In its annual State of Climate Services 2023 report focusing on health, WMO warns less than one quarter of Ministers of Health globally utilise meteorological information through their health surveillance system to monitor climate-sensitive health risks. Efforts to improve the use of meteorological information must include increasing awareness among health officials, enhancing data-sharing mechanisms between agencies and providing training on the interpretation of meteorological data for health purposes.

Building sustainable, climate-resilient health systems and workforce

Enhancing the resilience of health infrastructure and service delivery system is a critical component of adaptation priorities[35]. This involves investing in climate-resilient healthcare facilities, strengthening all core functions of a health system, including supply chains for essential medical resources, and developing continuity plans to ensure uninterrupted healthcare services during climate-related emergencies, including access/ routes to clinics or hospitals[36].

Alongside activities to make existing health infrastructure more resilient, health infrastructure as itself is a resilience tactic, as access to the life-saving services health provides protects communities from the rising health impacts of climate change. Universal Health Coverage (UHC) is enshrined in the UN Sustainable Development Goals and been a goal of the WHO since its inception. As highlighted by the IPCC, supporting UHC is key to securing population health under a changing climate whilst addressing structural inequalities, especially as regions of the world with the highest levels of vulnerability to the health impacts of climate change also have low levels of UHC[37].

In 2023, WHO released its new operational framework for building climate resilient and low carbon health systems – providing a roadmap to improve the overall adaptive capacity and resilience of the health sector. The Framework focusing on leadership, training for health workforce, GHG emissions tracking, health and climate research, infrastructure, emergency preparedness, and sustainable financing – provides a resource for not only the health sector, but the health determining sectors to ensure communities are protected in a changing climate, and countries can achieve their global health goals[38].

6.0 Recommendations – time to deliver ambitious and decisive climate action

Realising the ambition of the Paris Agreement and safeguarding human health in climate policies will drive healthy climate action and improve global public health[41], but realising this requires policy makers, health professionals, civil society, and private and financial institutions to work together to ensure health is at the heart of climate action.

To maximise the health benefits of tackling climate change and deliver ambitious and decisive action on climate change and health, we call on relevant stakeholders to:

1. Mainstream health assessments in all decision making on climate change, to ensure all climate policies across mitigation and adaptation are evaluated in terms of risks and benefits to human health. As a starting point, conduct a systematic health analysis for all national and international policy development, to maximize the multiple, including economic, opportunities from climate action, and embed health within national strategies such as NDCs, NAPs, climate finance pledges and national communications to the UNFCCC.
2. Commit to an equitable transition from fossil fuels to renewable energy sources, and promote action to reduce carbon emissions, and that of short-lived climate pollutants, in alignment with the Paris Agreement, recognizing the inherent public health benefits.
3. Prioritise, fund and support targeted transdisciplinary research on climate and health to unlock adequate finance for solutions in climate action, public health and sustainable development, at scale. Routinely track and report on the health impacts of climate change, to build evidence to support adaption and mitigation investments – including how the effects on climate change vary by region, sector, population groups and engaging across these contexts.
4. Advocate for the inclusion of health targets and metrics within UNFCCC formal processes including in the Global Goal on Adaptation (GAA), as well as committing to harnessing health opportunities of climate action in the Global Stocktake (GST).
5. Building on the commitments made at COP28, including the climate and health Ministerial, commit to taking this agenda forward through support of the expected climate and health Resolution at the 77th World Health Assembly, and harness opportunities at COP16, COP29 and throughout the rest of 2020s.

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