

Digital health and the climate crisis

Overview 2024

1. Introduction

Climate change – or more accurately, the climate and ecological crisis – is the greatest threat to health this century as it causes increased morbidity and mortality resulting from extreme weather and disease outbreaks. According to WHO, between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from undernutrition, malaria, diarrhoea and heat stress alone. Climate impacts health in many ways.

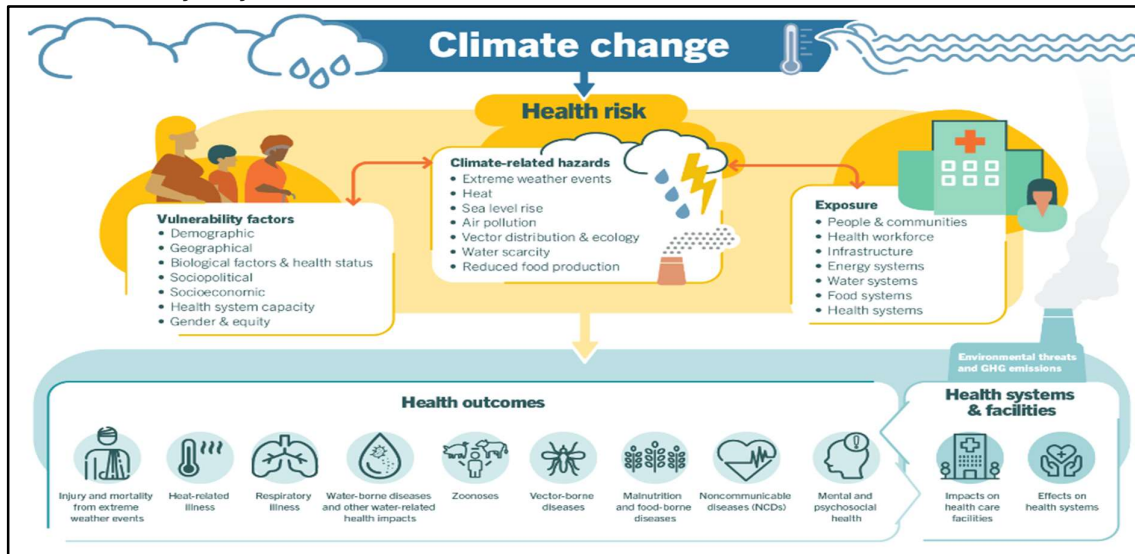


Figure 1: An overview of climate sensitive health risks, their exposure pathways and vulnerability factors. Source: [WHO](#)

Digital health¹ is increasingly becoming a major part of health systems throughout the world. As the climate crisis worsens, the role for digital health to improve the resilience of health systems increases.

The dual crises of climate change and global health inequalities are exacerbated by their interconnectivity. Climate change contributes to the excessive health issues including heat related illnesses, vector borne diseases and respiratory diseases. While digital health could be a good technology to mitigate the climate change crisis, its deployment faces barriers such as unequal access to technology, inadequate infrastructure and insufficient integration into existing health systems². Developing countries, where health systems are under resourced, face an uphill task to utilize

¹ Digital health is the systematic application of information and communications technologies, computer science and data to support informed decision-making by individuals, the health workforce, and health institutions for strengthened resilience and improved health and wellness for all. USAID, see [here](#)

² Watts et al. (2021). The 2021 report of the Lancet Countdown on health and climate change: Code red for a healthy future.

digital health to mitigate the climate crisis. The inequitable access to digital tools creates disparities in healthcare delivery; a lack of internet connectivity, electricity, and digital literacy leaves the rural and marginalized communities more vulnerable. The use of digital health can also pose problem in utilization as it contributes to carbon emissions, posing a paradoxical challenge in addressing climate change³.

During 2024, interest in digital health has grown rapidly. There are now major initiatives including with the World Health Organisation and World Meteorology Organisation, and activities in many countries around the world. This briefing document gives an overview of developments in digital health and the climate crisis at the end of 2024, produced by the Digital Health & Climate working group.

2. Typology of digital health and climate

There are three main categories of digital health interventions relevant to climate⁴.

Category 1: ADAPTATION to climate through digital health interventions

Digital health interventions for adaptation of healthcare delivery can enhance resilience and preparedness of the healthcare system to provide continuous access to quality care during climate events, natural disasters or other environmental events. There are four subcategories of digital health interventions:

- providing remote access to care;
- on-going care through remote patient monitoring;
- digital support for self-care, examples include Apps to support mental health during natural disasters such as Training for Life Skills and Sonoma Rises; and
- digitally-mediated health worker training, especially with new health challenges.

Category 2: LEARNING through environment informed data analysis

Environmental data (for example, weather, food, climate, pollution, animal health) can be used to model the relationship between the environment, climate and health. Data can be analysed and visualised using tools such as artificial intelligence (AI) and geographical information systems (GIS).

- Decision making for public policy and health professionals;
- Decision making in clinical practice; and
- Supporting decision making for individuals and communities.

Category 3: MITIGATION of climate through digital health interventions

Digital interventions can reduce the emissions and waste associated with health services by improving operational efficiency and/or reducing the use of materials. However, the development, use and disposal of digital technologies has a range of environmental impacts that need to be mitigated.

- Mitigation of digital health's environmental impacts; and
- Digital health interventions to mitigate health system's environmental impacts.

³ Pang et al. (2021). Health in a warning world: the role of digital health in climate adaptation.

⁴ Taken from Orton, Samuel, Blakstad et al (forthcoming) Towards a typology for the intersection of Digital Health, Environment and Climate Change. Available [here](#).

3. Initiatives, projects & country case studies

This section gives examples of digital health and climate initiatives and projects.

LEARNING

1. Digital Public Infrastructure for Climate and Health. This project is led by PATH partnering with Wellcome and the Rockefeller Foundation. the World Health

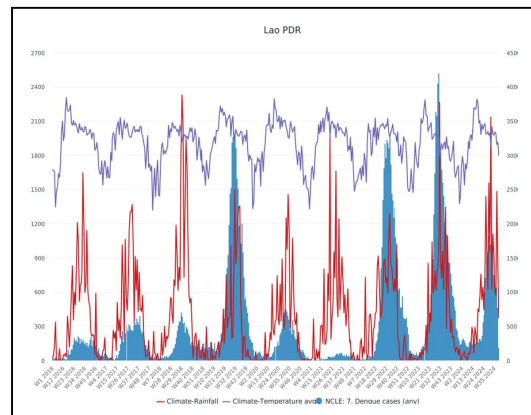
“Digital tools and technologies will be pivotal game-changers in scaling solutions to climate and health - but we need the collective effort of the global community to make this vision a reality.”

*Dr. Joy Shumake-Guillemot,
Lead, WHO-WMO Joint Office
for Climate and Health*

Organization (WHO) - World Meteorological Organization (WMO) Joint Office for Climate & Health to support the development of digital public infrastructure (DPI) and digital public goods (DPGs) aimed at enhancing climate- and health-informed data systems. This integration can improve global health resilience to the increasing threats posed by climate change. By combining satellite data, weather patterns, and health sector insights, we can better predict disease outbreaks, respond to changing health needs, and mitigate the impact of extreme weather events. Digital Square is leading an effort to

adapt and expand the Global Goods Guidebook to include climate-informed health use cases. The guidebook is a digital resource designed to support policymakers, procurement officials, and health leaders to identify, implement, and scale open-source digital health tools, including software, services, and content, that support climate- and health-informed services. See [here](#).

2. DHIS2 making an impact on climate and health in LMICs. The HISP Centre at the University of Oslo, supported by Wellcome, is using DHIS2 Climate App to combine health and climate data in 10 countries: Rwanda, Togo, Uganda, Ethiopia, Malawi, Mozambique, Tanzania, Lao, Nepal and Sri Lanka, with over six other countries interested. This project is forging links between Ministries of Health and National Meteorological Agencies. They are exploring how to work with local weather data as well as global. Climate and health data can be visualised together, e.g. comparing climate with cases of dengue fever in Lao (see right). The Climate Health Analytics Platform (CHAP, [here](#)) is an open platform harmonization and prediction modelling so countries can make health & climate predictions, and then test models against what actually happens, improving the models over time. Togo has used predicted rainfall to plan Seasonal Malaria Chemoprevention (SMC) campaigns.



3. Predicting malaria in Kenya. The Lwala Community Alliance in Kenya, support by Medic, is using climate data-driven to make small area predictions of future malaria case burden, using DHIS2 malaria data and the WHO Early Warning & Response System for Climate-Sensitive Diseases (EWARS) framework. They can predict malaria 4 months in advance, allowing prevention and health system strengthening activities. See [here](#).

4. Climate Health Vulnerability Index. The Khushi Baby project uses their Climate Health Vulnerability Index to assess the community's vulnerability to climate-related health risk. This has been done in Rajasthan, India, using AI and GIS tools. See [here](#).

MITIGATION

5. Solar PHEOC. In Nigeria, eHealth Africa has installed solar renewable energy systems in four Public Health Emergency Operation Centers. This allowed continuous operation of digital health systems even during climate events. An analysis over three years revealed that the renewable energy systems contributed largely to consistent power supply across the PHEOCs, and significantly reduced carbon dioxide (CO₂) emissions. See [here](#).

6. Measuring the carbon impact of digital pharmacy. The International Committee of the Red Cross has carried out an assessment of the carbon emissions related to their Digital Pharmacy Stock Management (PSM) Tool in at 13 health facilities in Nigeria and Somalia. In this early analysis, "PSM appears to have reduced carbon emissions from travel, transportation of office supplies and the use of digital devices by 557kg CO₂, despite increases in the use of tablets and the distance travelled by car."

7. Climate Impact Assessment Toolkit. The 'Health Care Without Harm Climate Impact Assessment Toolkit' has been used to measure the carbon footprint of health services in Kiambu County Hospital, Kenya. See [here](#).

ADAPTATION

8. Health Early Warning System. Heat stress has greatly increased in Senegal. The Ministry of Health and Social Action has developed a 'Heat-health early warning system', with USAID and other partners. Meteorologists predict heatwaves and these are communicated, e.g. by community radio and targeted outreach to vulnerable groups. See [here](#).

9. ClimateSmart Indonesia has developed a digital early warning system for national coordination. This initiative's early warning systems and climate-informed malaria planning tools support climate-proofing malaria elimination efforts. See [here](#).

10. Telemedicine service central to response to Cyclone. VillageReach's Chipatala Cha Pa Foni (CCPF) health hotline began operating in Malawi in 2009. During Cyclone Freddy in 2023 most of the health system collapsed. CCPF became central to the health response, from medical advice, coordinating emergency response, and even assisting people stuck by floods in trees. See [here](#).

4. Resources and links

These are useful resources on digital health and climate issues.

- WHO resource on climate change ([here](#)).
- Green Digital Health Tool: Prototype planning and monitoring tool for a responsible and sustainable digital health system ([here](#)). SHADE Newsletter and newsletter archive ([here](#)).
- SHADE research hub at the intersection of Sustainability, Health, AI, Digital technologies and the Environment ([here](#)).
- From human-centric digital health to digital One Health ([here](#))
- Generative AI technologies applied to ecosystems and the environment ([here](#))
- Environmental costs of Artificial Intelligence for Healthcare ([here](#))
- The 2024 report of the Lancet Countdown on health and climate change ([here](#)) finds that 10 of the 15 indicators monitoring the health threats from climate change have reached worrying record high levels. The [report overview](#) highlights that, “While people in every country face unprecedented health threats from the changing climate, continued investment in fossil fuels and lagging funding for action to protect health persist”.
- Podcast on reducing the environmental impact of digital tech: GreenIO ([here](#)).
- Podcast at the health & environment intersection: One World, One Health ([here](#)).
- Reducing the carbon footprint of research computing: [video](#) and [this article](#).
- Interesting graphics of cartography of generative AI ([here](#)).
- This [video](#) shows simple ways to reduce the carbon footprint of research computing. [This article](#) gives a more recent angle on the methods used in the video.
- This cartography of generative AI ([here](#)) “aims to map the phenomenon, taking into account the tensions, controversies and ecosystems that make it possible”.

5. Please join us

The objective of the digital health and climate working group is that all digital health implementations are environmentally responsible: by mitigating the climate crisis through reducing carbon emissions, supporting the use of data techniques to improve health and healthcare in the climate crisis, and adapting to the climate crisis by building the resilience of health systems and providing services to empower individuals.

Please help us build responsible digital health for a heating planet

The digital health and climate working group meets monthly, on the final Monday of each month, usually at 14h00 UTC. We are open to anyone interested. To join us, please email digitalhealthclimate@gmail.com

This document has been put together by the Digital Health & Climate working group. Peter Benjamin, Deborah Lupton, Gabby Samuel, Kaing Sanary, Lindokuhle Sibiya, Akaninyene Obot, Mary Pitt.

Creative Commons. This work is licensed under [CC BY-NC-SA 4.0](#)

