ENBEL
Connecting HEALTH & CLIMATE CHANGE

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CLIMATE SERVICES FOR HEAT-HEALTH PROTECTION

Extreme heat affects health and wellbeing. Climate services developed in partnerships between national weather agencies and the health sector can protect populations from heatwaves and manage health services better.

Key messages

- Climate information and services are crucial for understanding how and when extreme weather events affect health systems and populations, and climate services are needed for managing climate-related risks.
- Heat-health warning systems, along with public health measures, can help reduce heat-related illnesses and mortality.
- Climate services need to be developed in conjunction with users of services.
- Developing and implementing climate services require adequate resources, including funding, personnel, and technology.
- Heatwave warnings should be available to everyone, including individuals who may be socially disadvantaged as they are more likely to be at risk from the health effects of heat.
- More evidence is needed on effectiveness and cost-benefit assessment of heatwave interventions and heat health warning systems.

What are climate services?

Climate services include weather forecasts, climate information, seasonal forecasts, and projections of future climates. Climate services can be developed through an iterative process in which health sector partners identify, generate, and build the capacity for using reliable climate knowledge to enhance health decisions. Many countries are already working with National Meteorological Services to develop heat-health warning systems using daily temperature forecasts. Heat-health warning systems provide timely warnings to emergency management and health authorities during heatwaves, and cascading alerts allowing individuals or care givers to undertake preventive actions during heatwaves.

This policy brief summarises evidence on climate services for heat and health developed through research projects funded by the Belmont Forum and the EU Horizon 2020 programmes.

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Evidence for the effectiveness of climate services for heat-health protection

Heat-health warning systems are usually a part of national Heat Health Action Plans (HHAPs) and are used to initiate various public health measures to prevent heat-related mortality and morbidity and prepare health and social care services for heatwave emergency management. Heat-health warning systems can contribute to making the health system more resilient to climate change. A review of the evidence on the climate services for heat health adaptation conducted by the Norwegian Institute of Public Health in 2023 found:

- There are few evaluations of the effectiveness of climate services or heat-health warning systems in reducing health impacts.
- Twenty three studies examined changes in health outcomes or healthcare utilisation following heat warnings or public health measures outlined in health adaptation plans.
- Evidence is very limited on the economic value of climate services for heat-health protection.
- The cost of heat-health warning systems is difficult to estimate. Heat action planning often lacks a dedicated budget and there is limited information about the personnel and time devoted to each action. This makes it difficult to quantify the true cost of a heatwave warning system.
- Projects and organisations involved in providing climate services offer capacity-building on how to use their tools and services. Common approaches include developing infographics and short videos on reducing heat stress, creating guidelines and checklists for employers, and establishing user support or national helplines for stakeholders to access information. Websites, apps, workshops, conferences, and stakeholder events are common channels for disseminating information about the tools.
- Effective climate services have used co-creation approaches to identify issues and needs and discuss potential solutions by involving stakeholders. However, there is a need to collect more evidence regarding which co-creation methods are effective, sustainable, and equitable.

Challenges in the development and implementation of climate services for heat-health

Data collection, reliability and sharing	• Meteorological data is not always available at the local level to inform service planning. Sometimes, this data isn't offered for free or at a low price. • Climate or health data may not be available at appropriate spatial resolution or of sufficient quality to develop a climate-based warning system. • The development of personalised climate information products is limited by lack of data on individual characteristics and/or lack of access to individual data due to privacy concerns.
Working across disciplines	• Collaboration between experts in public health and climate services is not always simple and requires dedicated personnel and resources to develop the services. • Operational climate services require inter-sectoral working groups or bodies to support collaboration. • Communication between different disciplines can be challenging due to different terminology.
Heat risk communication	• Climate information messages need to be evidence based and include practical guidance regarding what to do in case of extreme heatwaves. This requires resources to produce accessible, user-friendly, understandable information in multiple languages. • Health care staff may not be aware of the risks of heat or impact on health services. • Climate service for health need to produce accessible, user-friendly, understandable information, and in multiple languages. • Climate information messages targeted at vulnerable groups need to be evidence based. Vulnerable people may not consider themselves to be at risk or are not aware of symptoms and risks. Climate information should include practical evidence-based guidance regarding what to do in case of extreme heatwaves.
Funding	• Lack of long-term and reliable funding to maintain climate services for health over time. • Insufficient funding for active measures linked to heat warnings, and to communicate heat warnings.

Interventions and climate services for heat-health warnings and advice: examples from projects funded by Belmont Forum and the EU

ClimApp's personalised heat and cold stress warning mobile phone application

ClimApp project (2017-2021), Global

https://www.lth.se/climapp/dissemination/download-climapp/

This project developed an application for mobile phones that integrated weather forecast data into human heat balance models. The app provides personalised alerts and advice for individuals, the public and private sectors to cope with heat and cold stress during extreme weather events making it effective for predicting heat and cold strain across diverse user profiles. Users can manage their thermal strain in hot environments as it highlights signs to watch-out for such as dehydration, and advice to reduce heat and cold risks. ClimApp was funded by European Research Area for Climate Services (ERA4CS), and participating countries Sweden, Denmark and The Netherlands.

HEAT-SHIELD's Multi-lingual heat-health warning platform for outdoor workers in Europe

HEAT-SHIELD project (2016-2021), Europe

heat-shield.eu

HEAT-SHIELD's occupational heat stress warning system web-based platform provides location-specific heat stress forecasts using data from 1800 meteorological stations across Europe. It also provides a personalised local heat-stress-risk forecast based on workers' physical characteristics, clothing, and behavioural characteristics and the work environment, also considering heat acclimatization. The service was primarily developed as a concept and is currently not operational, although some warnings may be available to already-registered users. The project also developed a heat defence plan and guide for employers and enterprises.

hackAIR Integrated web and mobile platform for monitoring air pollution, thermal comfort, and probability of forest fires

EXHAUSTION project (2019-2024), Europe

https://www.hackair.eu/

hackAIR provides a web platform and mobile application - to raise citizens' awareness on extreme heat episodes, air pollution and fire probability. With hackAIR, citizens can report air quality in their neighbourhoods by providing measurements with their own self-built sensors and taking photos of the sky to estimate air quality using the hackAIR app. Information on thermal comfort combines data on temperature, humidity and other parameters including wind that affect people's comfort. Personalised recommendations based on environmental data are also provided by the app. hackAIR was created as part of an EU-funded project on 'Collective Awareness Platforms for Sustainability and Social Innovation' (2016-2018) and was enhanced as part of the EXHAUSTION project.

Intervention for heat risks in pregnant women and children in Kenya

CHAMNHA project (2020-2023), Kenya, East Africa

www.lshtm.ac.uk/research/centres-projects-groups/chamnha

The project investigated the effects of heat on pregnant and postpartum women and new-borns to develop an intervention to protect health and improve maternal health care in Kilifi Country in Kenya. Using co-production methods, key information tools about heat risks and advice was developed using images and methods for women in the community. Interviews with women found that some women did not have access to weather warnings because they did not have access to electronic devices, or the warnings were not in the local language. Women in Kilifi, Kenya, also used indigenous methods for early weather warnings.

Policy recommendations

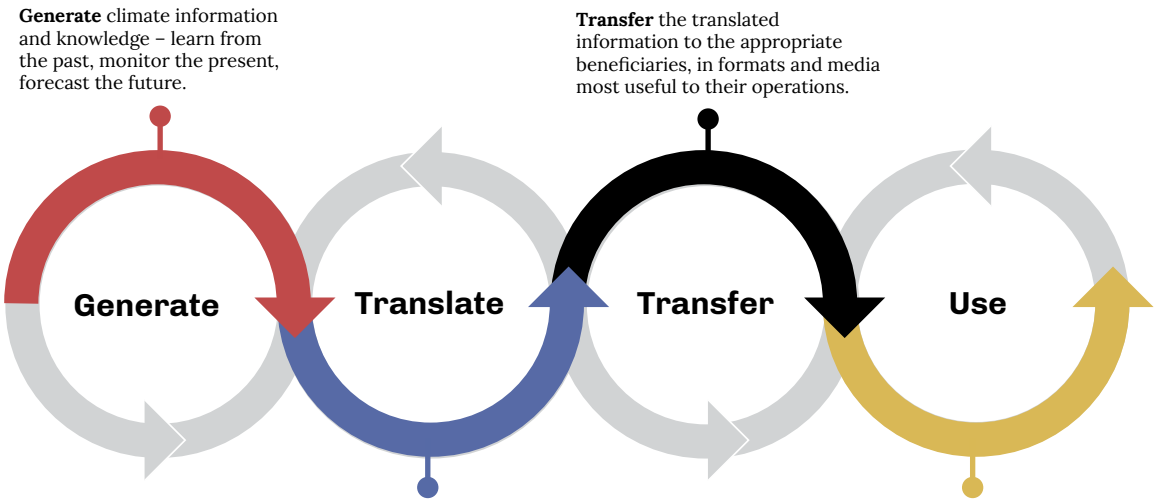
- Climate services require sustainable investment to develop and operationalise effective services in partnership with the health sector.
- Personalised apps are likely to be effective but may have limited use in persons who are not able to change their behaviour.
- Heatwave warnings should be available to everyone, including individuals who may be socially disadvantaged as they are more likely to be at risk from the health effects of heat.
- Promote collaboration between national meteorological services and health services at national and regional levels.
- Climate service providers need to work with employers to develop targeted services and allow workloads to be reduced during extreme heat days.

Research recommendations

- More research is needed on climate services for populations in South and Central America, Africa, and Asia.
- Evaluation of climate services for health in terms of their effectiveness in reducing heat impacts on health and wellbeing, and to estimate the economic value of climate information.
- Research is needed to develop more sophisticated models that incorporate heat and other important environmental exposures, such as air pollution.
- More research is needed to evaluate the benefit of using new digital technologies and the dissemination of heat messages.
- Social science research is needed to develop effective risk communication for heat messages for specific groups, including older persons, outdoor workers and children.

The four pillars of climate services

Source: Columbia Climate School International Research Institute for Climate and Society



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