

# Health



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## ► KEY MESSAGES

- **Health care service coverage in Africa is very low at 48 percent.** Every year, 15 million people are pushed into poverty due to out-of-pocket health care expenses.
- **Currently climate change is known to account for only a modest share of the health and disease picture in Africa.** But in the absence of suitable adaptation strategies, climate change will have a disruptive effect on population health in Africa. It will do so through a range of direct and indirect effects, including heatwaves, the spread

of infectious diseases like malaria, and a greater incidence of food- and water-related diseases because of climate shocks.

- **Without the impacts of climate change, projections show, the number of people in Africa facing chronic hunger would reduce by more than half between 2010 and 2050.** The impacts of climate change would slow this progress, with an additional 78 million people facing chronic hunger by 2050, over half of them in Sub-Saharan Africa.

- **In a quarter of African countries, a number equivalent to half the population is affected by a climate-related disaster each decade.** As the population of Africa grows from the current 1.3 billion inhabitants to a projected 2.5 billion by 2050, and urbanization expands in areas exposed to natural hazards, the number of deaths, injuries, and disabilities due to climate disasters will continue to increase rapidly if no adaptation measures are implemented.



**The health sector is one of the most vulnerable to the impacts of climate change, and a key priority for adaptation. Despite this, only 0.5 percent of multilateral climate finance is currently spent on health protection.”**

**Dr. Tedros Adhanom Ghebreyesus, Director-General of the WHO**  
Leader's Dialogue on the Africa Covid-Climate Emergency,  
April, 2021

## THE HEALTH CHALLENGE IN AFRICA

Health indicators and services in Africa have made substantial progress in recent years before the COVID-19 pandemic, but still lag behind the rest of the world. Figure 1 shows a composite measure of 40 out of the 41 performance indicators for the health-related Sustainable Development Goals (SDGs). This measure ranges from 0 to 100 to describe the overall progress worldwide towards meeting the health-related SDGs.<sup>1</sup> Only countries in northern and southern Africa show medium to considerable progress in meeting the health SDGs.

Health care service coverage in Africa is low at 48 percent. Approximately 615 million people do not receive the health care services they need. When the quality of services is considered, the coverage scores are even lower. Every year, 15 million people (1.4 percent of the region's population) are pushed into poverty due to out-of-pocket health care expenses.<sup>2</sup>

The COVID-19 pandemic continues to be a devastating shock to the region. As of end-June

2021, over 5.4 million confirmed cases of COVID-19 were reported in Africa, with the most cases and deaths in South Africa. Countries in North Africa have the next highest confirmed cases and deaths. The number of cases and deaths are widely acknowledged to be undercounted. The initial slow vaccine roll-out, with very small numbers of people vaccinated because of short supply, puts Africa at increased risk of new waves of infection.

This chapter reviews the impacts of climate change on various health factors in Africa, projected trends, and possible climate adaptation solutions. The chapter also examines progress towards mainstreaming adaptation in health systems.

## IMPACTS OF CLIMATE CHANGE ON HEALTH IN AFRICA

Climate change is a modest factor today in the overall burden of disease and health indicators in Africa. However, the trends are of concern and decisive action is needed to mainstream practical adaptation strategies in health services and sectoral factors that impact health outcomes.

Population health is impacted by climate change through multiple exposure pathways. The most significant factors linked to weather and climate shocks today and climate change trends in future years include:

- Heatwaves
- Infectious diseases
- Hunger and malnutrition, particularly due to the impact of climate shocks on agricultural production
- Water- and food-borne diseases linked to climate shocks
- Long-term health and developmental challenges on children
- Injuries, disabilities, and deaths resulting from floods
- Damage to health facilities and access disruptions caused by floods
- Inequality and vulnerability as amplifying factors

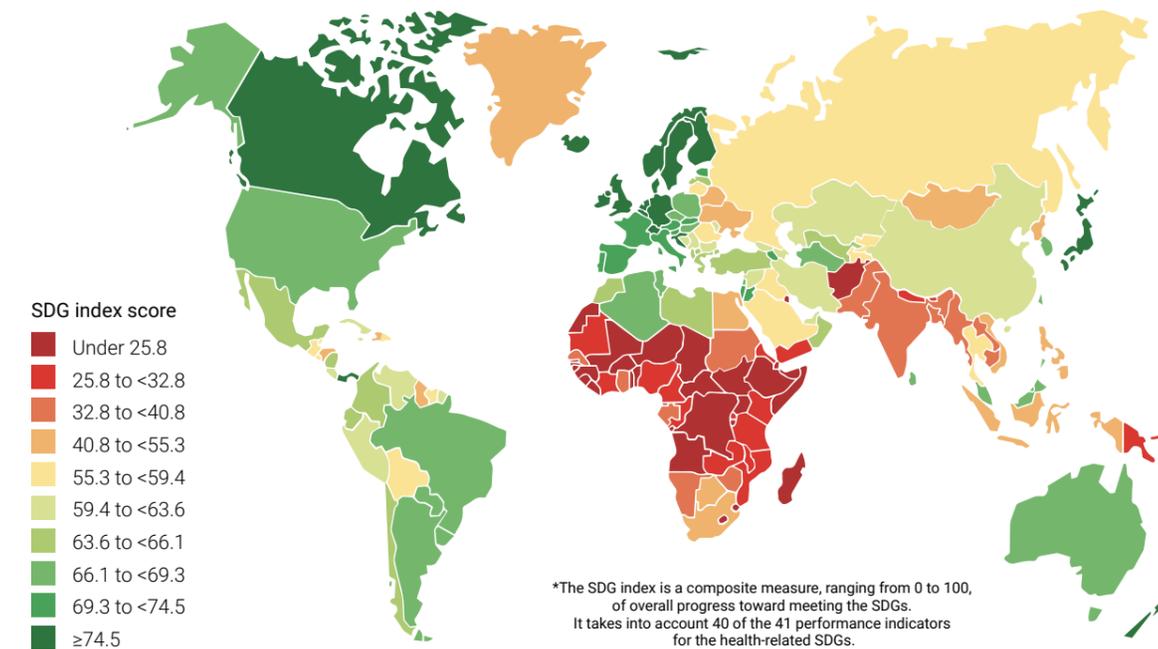
### Heatwaves

Worldwide evidence shows higher ambient temperature is associated with higher morbidity and mortality. Heatwaves are causing avoidable morbidity and mortality across Africa, with most evidence

available from South Africa.<sup>3</sup> Adverse health impacts increase mortality rates among the elderly or those with chronic non-communicable diseases. They also increase adverse pregnancy and birth outcomes such as pre-term birth and stillbirths, and also aggression and suicide. Rates of visits to emergency rooms and hospitalizations increase during heatwaves, with a concomitant escalation in health care costs. Further, temperatures in Africa are rising to levels that reduce worker productivity. It is important to note that limited information available in Africa suggests lower heat-related mortality than many other parts of the world, but this may mask lack of data and research. This hypothesis needs to be substantiated by further research and greater awareness and reporting of the health impacts of high ambient temperatures.<sup>4</sup> Until there is further Africa-specific information, global syntheses should be applied with caution. The chapter on Jobs discusses the growing impact of heatwaves on labor days lost.

The Urban Development chapter discusses practical measures cities can take to reduce the impact of heatwaves, from urban design and parks to early warning systems, and readiness of health facilities to respond to increased occurrences of heatstroke.

Figure 1: Health-related SDG index\* score 2017



Source: Healthdata.org (2017)



### Infectious diseases

Malaria continues to be a challenge in Africa. Of the estimated 229 million malaria cases in 2019, 215 million were in Africa in 2019 (94 percent). Most (67 percent) of the 386,000 deaths in Africa in 2019 comprised children under the age of five years. Nigeria (23 percent), DRC (11 percent), Tanzania (5 percent), Mozambique (4 percent), Niger (4 percent), and Burkina Faso (4 percent) accounted for about 51 percent of all malaria deaths globally.<sup>5</sup>

Climate change is likely to expand the range of areas subject to malaria risks. The trend will continue to worsen with climate change.

Further, diseases carried by *Aedes aegypti* and related species (e.g., dengue, chikungunya, and Zika virus) may increase in Africa.<sup>6</sup> Dengue is the most common arboviral disease globally, with approximately 390 million cases annually.<sup>7</sup> There is insufficient climate change research on a range of diseases from Rift Valley fever to schistosomiasis to understand the magnitude and pattern of risks and the extent to which weather and climate are causing shifts in the numbers of cases and deaths.

Figure 2 shows global projections for heat-related morbidity and mortality and for malaria, with different climate change and development pathways.<sup>8</sup> There are

minimal data on heat-related morbidity and mortality in Africa, but there is no evidence to suggest Africans would have greater resilience than other regions. The malaria embers are based primarily on projections for Africa. Risks for both are projected to increase with additional climate change, with higher risks under the 3°C scenario compared with 1.5°C.

Risks are highest under SSP3 because of more significant challenges to adaptation. Although the overall projections are for an increase in the risk of malaria, the pattern will be complex, with some regions becoming too hot or too dry, while others may become newly suitable for transmission of malaria along the current edges of its distribution.<sup>9</sup>

In Figure 2, SSP1 represents a world aiming for sustainable development, SSP2 a world with medium challenges to adaptation and mitigation, and SSP3 a world with high challenges to adaptation and mitigation. The dots show the confidence in the transitions, with four dots indicating very high confidence, three dots high confidence, two dots medium confidence, and one dot low confidence. White indicates that no impacts on heat or malaria are detectable and attributable to climate change. Yellow indicates that impacts or risks are detectable and attributable to climate change with at least medium confidence. Red indicates

severe and widespread risks. Purple indicates very high likelihood of severe risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or risk.

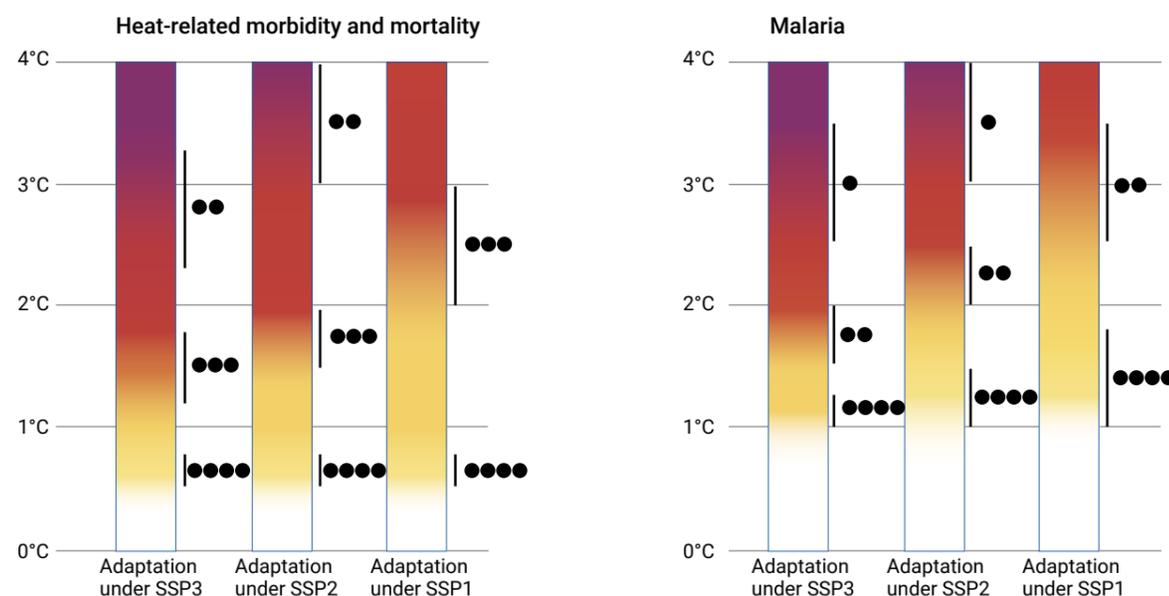
### Hunger and malnutrition

More than 250 million people in Africa (19 percent of the population) are undernourished. The number is growing faster than other world regions and with women and children more affected than men.<sup>10</sup> The majority of undernourished Africans are in Sub-Saharan Africa, which has showed an increase of about 32 million undernourished people since 2015.

Throughout Sub-Saharan Africa, at least 57 percent of the population cannot afford a healthy diet. Sub-Saharan Africa is the only subregion with a rising number of stunted children; 40 percent of all stunted children live in Africa.

According to IFPRI projections,<sup>11</sup> without the impacts of climate change the number of people facing chronic hunger would reduce by more than half between 2010 and 2050. The impacts of climate change would slow this progress, with an additional 78 million people facing chronic hunger in 2050, over half of them in Sub-Saharan Africa. The Agriculture and Food Systems chapter presents a variety of possible adaptation measures to reduce these impacts.

Figure 2: Burning embers for heat-related morbidity and mortality and for malaria under three adaptation scenarios



Source: Ebi et al. (2021)



Photo: CatherineLProd/Shutterstock

### Water- and food-borne diseases

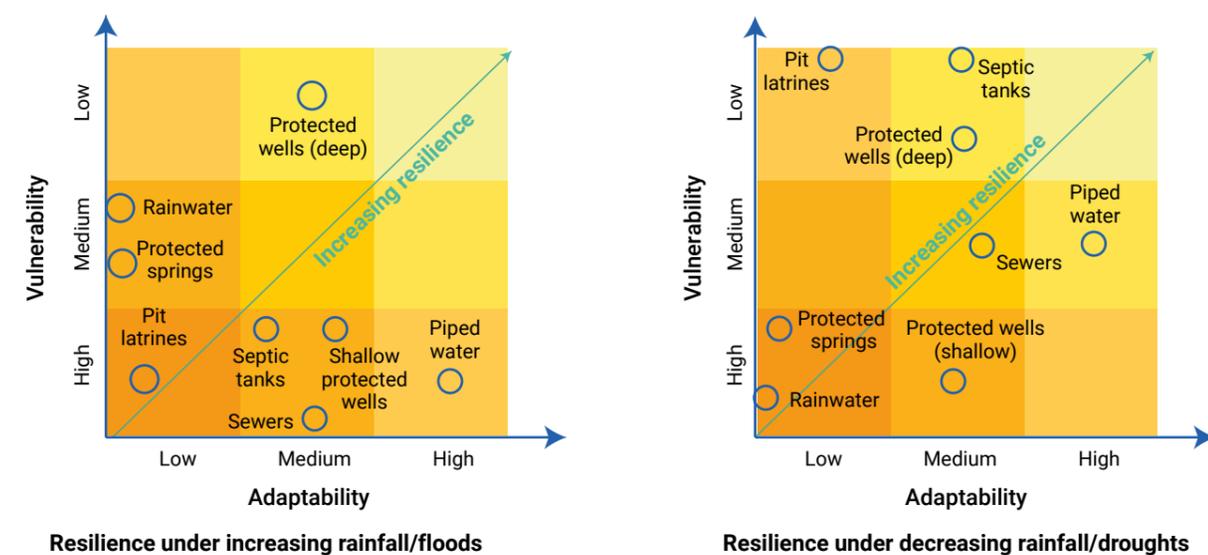
Diarrheal disease outbreaks are associated with heavy rainfall and flooding events.<sup>12</sup> A historical review of these outbreaks after extreme water-related weather events shows that they were often caused by the contamination of drinking-water supply sources.

Diarrhea is the leading cause of disease and death in children under five in Africa. In 2015, there were an estimated 30 million cases of severe diarrhea and 330,000 deaths.<sup>13</sup> About 45 percent of all child deaths are associated with malnutrition.

There is a perverse correlation between diarrhea and undernutrition. Undernourished children are more susceptible to diarrheal disease, and children with diarrheal disease are more prone to undernutrition.

Diarrheal diseases are preventable through access to safe drinking water and adequate sanitation and hygiene; they also are treatable. The design and operation of safe drinking water and sanitation needs to take climate change into account. Different technologies are more or less resilient to a changing climate depending on the extreme event, as shown in Figure 3.<sup>14</sup>

Figure 3: Climate resilience of water supply technologies



Source: WHO (2009)

Pit latrines are highly vulnerable to floods, but little affected by droughts. They have low adaptability to both floods and droughts and so should be avoided wherever possible.<sup>15</sup> An alternative, septic tanks, are also highly vulnerable to floods, but there are more opportunities to adapt them by modifying construction techniques to prevent the septic system from being flooded. They have low vulnerability to droughts, but they should also be adapted to recycle or minimize water use and are thus the better choice. But the extent of resilience will vary by the local context, requiring careful evaluation.<sup>16</sup> The Urban Development chapter presents a variety of possible adaptation measures to reduce these impacts.

### Long-term health and developmental challenges on children

Climate disasters and related shocks have long-lasting impacts on child development and health. Impact of climate disasters on parents' nutrition and income can have profound consequences on children. Inadequate nutrition in pregnant women can cause permanent impairments to cognitive and social development to their children. Reduced parental income results in increased child mortality, malnutrition, and stunting. The impact of climate disasters on education facilities, even if temporary, can have serious impacts on children's education, particularly those in disadvantaged situations and especially girls. Setbacks to a child's early health and education can have long-term impacts on their development and productivity.<sup>17</sup>

### Injuries, disabilities, and death caused by climate disasters

Over the last decade (2010–2019), climate-related disasters have caused about 46,000 deaths in Africa, with droughts responsible for 46 percent and floods for 32 percent, respectively. In recent years the share of deaths in Africa has risen. There is insufficient data on injuries and disabilities caused by climate disasters like floods and storms. In a quarter of African countries, a number equivalent to half the population is affected by a climate-related disaster each decade. This represents a massive loss of livelihoods, assets, and educational opportunities, and exposes those affected to disease and nutrition-related health risks. As the population of Africa grows from the current 1.3 billion inhabitants to a projected 2.5 billion by 2050, and urbanization expands in areas exposed to natural hazards, the number of deaths, injuries, and disabilities due to climate disasters will continue to increase rapidly if no adaptation measures are implemented.

### Damage to health facilities and access disruptions caused by floods

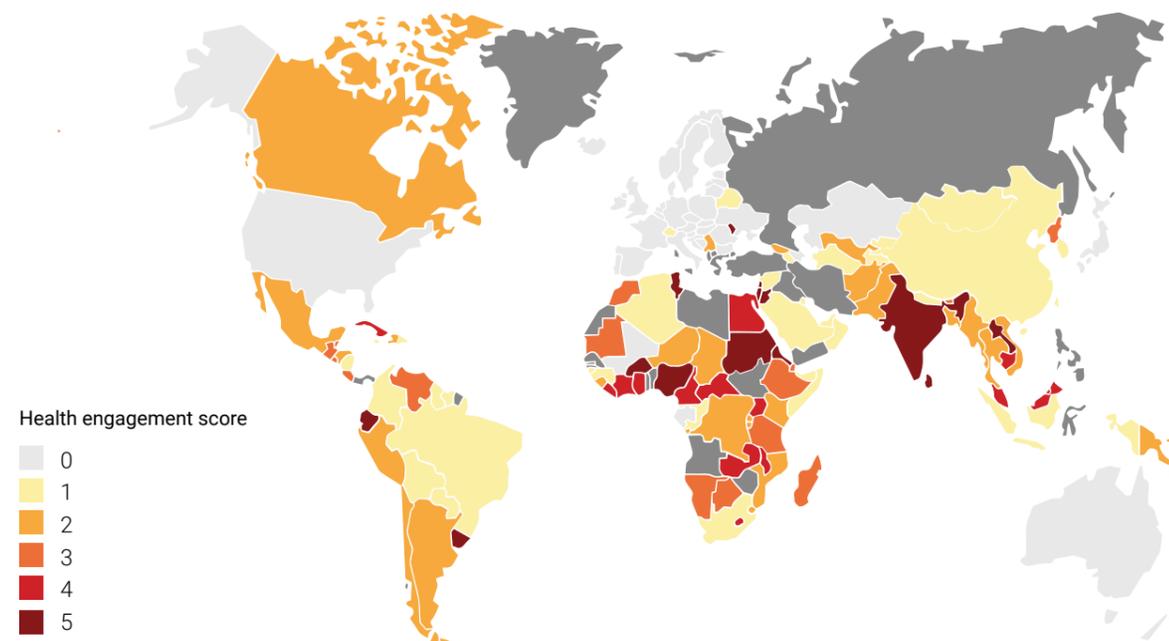
Health care services are also impacted by climate change. Health care infrastructure is vulnerable to floods, storm surges, landslides, and other extreme events that can cause physical damage. If located in coastal areas, water quality, waste management, sanitation, and other infrastructure can be threatened by sea-level rise and unpredictable, more intense rainfall. The delivery of health services in Africa is vulnerable to disruptions in transport, energy and communication networks brought on by extreme weather events. In the medium-term, health facilities in many places in Africa will need relocation away from hazardous areas affected by floods, storm surges and landslides.

Equally important are the disruptions caused by climate disasters on the transportation network and access to health facilities. For example, in inner Kampala, a network analysis shows that health service providers can be reached from most locations within 15 minutes by car. Usually, a timespan of 60 minutes after an incident is considered as a threshold for higher survival rates in case of life-threatening health issues. However, a flood with a 10-year return period in Kampala causes severe disruptions to roads. The consequence is that about one-third of locations in inner Kampala would not be accessible by an ambulance from a health center within 60 minutes.<sup>18</sup>

### Inequality and vulnerability as amplifying factors

Climate change predominantly affects children, exacerbating leading causes of death. The risks are unevenly distributed, with poor and marginalized communities at higher risk, as has been discussed in other sections of the report. Populations living in low-income urban communities and in vulnerable drylands and lagging rural areas are not only less prepared for climate shocks, but the health services that they can access are of poorer quality. This combination results in higher health impacts today to climate shocks and, if no adaptation actions are taken, worse health outcomes in the future. Adaptation in health systems must take inequality and exclusion into account.

Figure 4: Health engagement score in NDCs by country



Source: Dasandi et al. (2021)



### ADAPTATION, PLANNING AND RESILIENCE FOR HEALTH

Health care systems in Africa face enormous challenges due to the many and varied vulnerabilities of its population. These systems are in the frontline of responding to crises of various kinds, from flood-induced cholera outbreaks to hunger caused by droughts. Equally important, health care systems are indispensable to mitigate the severe and long-lasting effects of climate shocks on children as discussed earlier. These challenges need decisive action to increase not only the quality and coverage of health care systems but also their resilience to disasters, shocks, and a rapidly changing climate.<sup>19</sup>

Improved health outcomes for the population of Africa will not depend only on health systems, but also on investments to make progress on the SDGs in ways that are adapted to a changing climate. These investments range from safe water and sanitation to food security, and from basic services in low-income urban communities to early warning systems.

This section reviews the importance assigned to health in adaptation planning processes in Africa. It also covers indicators to monitor progress towards enhanced adaptation in health systems; suggests areas of action to enhance the resilience of health systems to climate shocks; and emphasizes the importance of early warning systems.

#### Health in adaptation planning processes

An analysis of the Nationally Determined Contributions (NDCs) to evaluate how public health was incorporated, including impacts, adaptation, and co-benefits, concluded that most countries in Africa referred to health in their NDC.<sup>20</sup> Figure 4 shows the degree of health engagement based on a score measuring health engagement based on the specificity and detail of health references. Nearly 100 percent of countries in the Africa region had a mention of health in their NDCs, and more than 40 percent had a section on health. As of 31 March 2021, only Burkina Faso, Togo, Cameroon, Sudan, Kenya, and Ethiopia have completed their National Adaptation Plans: all identified health as a high-priority sector.

### Indicators to measure climate adaptation in health systems

The *Lancet Countdown* is an international collaboration established to provide an independent, global monitoring system dedicated to tracking the emerging health profile of the changing climate.<sup>21</sup> The Lancet Countdown has proposed four groups of indicators to track adaptation, planning and resilience for health:

1. Adaptation planning and assessment
  - a. National adaptation plans for health
  - b. National assessments of climate change impacts, vulnerability, and adaptation for health
  - c. City-level climate change risk assessments
2. Climate information services for health
3. Adaptation delivery and implementation
  - a. Detection, preparedness, and response to health emergencies
  - b. Air conditioning
  - c. Urban green space
4. Spending on adaptation for health and health-related activities

Two of the indicators on adaptation and planning are drawn from the WHO Health and Climate Change Survey, a voluntary national survey sent to all WHO member states, to be completed by ministry of health focal points. Of the 194 WHO member states, 101 participated in the 2018 survey. The main findings were:

- National planning on health and climate change is advancing, but the comprehensiveness of strategies and plans need to be strengthened
- Implementing action on key health and climate change priorities remains challenging
- Results from Vulnerability and Adaptation Assessments are influencing policy prioritization
- Barriers persist in accessing international climate finance
- Multisectoral collaboration on health and climate change policy is evident, with uneven progress

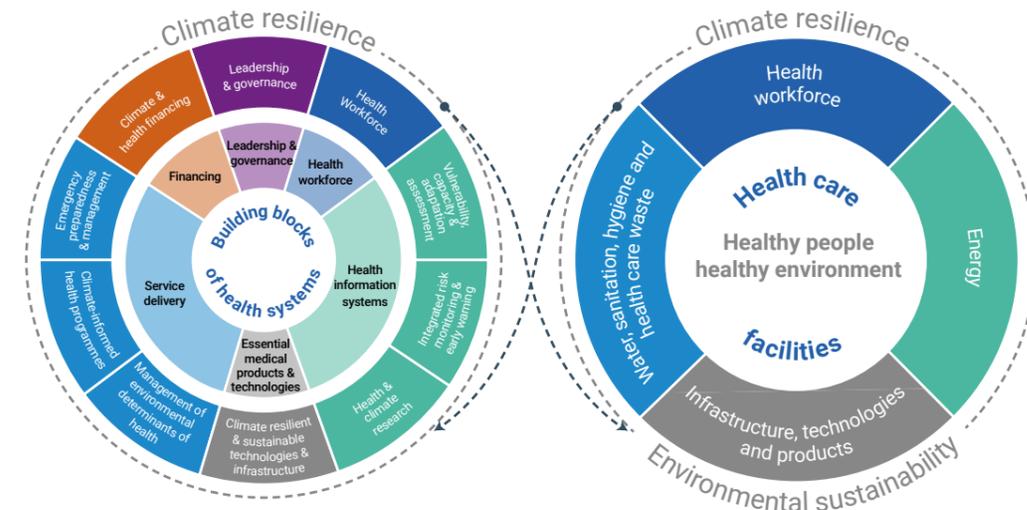
In 2019, only 12 of 47 countries in the WHO Africa region reported having medium-to-high levels of multi-hazard preparedness and capacity for a national health emergency, as reported under the International Health Regulations.<sup>22</sup>

### Climate-resilient and environmentally sustainable health systems

Figure 5 shows the components of climate-resilient health systems, and on the right, the components of climate-resilient and environmentally sustainable healthcare facilities. There are six building blocks of

health systems shown in the center of the left circle; implementing strategies, policies, and measures shown in the ten surrounding components can build climate-resilient health systems. The right figure shows the components of healthcare facilities where strengthening can build resilience and sustainability.

Figure 5: Components of climate-resilient and environmentally sustainable healthcare facilities



Source: World Health Organization (2021)



Becoming resilient to today's disasters is a step towards making health systems better adapted to climate change. The interlinkages with emergency response systems and infrastructure planning are equally important.

These principles are designed not only for climate disasters, but also to support health systems respond better to a wide range of shocks and stresses. Table 1 summarizes these pillars and recommendations for government action.<sup>23</sup>

**Table 1: Five pillars of resilient health systems and associated priority actions**

Resilience in Health Systems	Objectives	Examples of policy actions
Resilient health facilities	Enhanced capacity and resilience of facilities by:	<ul style="list-style-type: none"> <li>Understanding climate risks today and in the future</li> <li>Upgrading structures to withstand climate shocks</li> <li>Enhancing staff capacity to deal with climate shocks and emergencies</li> <li>Preparing crisis protocols, business contingency plans, and emergency stocks of essential supplies</li> </ul>
Resilient health systems	Integrate individual health facilities into a coordinated network by:	<ul style="list-style-type: none"> <li>Using data-driven decision-making process to optimize resources during climate shocks</li> <li>Improving communication and cooperation between diverse entities of health system</li> <li>Leveraging facilities outside the health system to delivery emergency services</li> <li>Deploying mobile clinics to underserved and disaster-hit areas to boost capacity during crisis</li> </ul>
Integrated emergency response	Integrate health care into climate shock response systems by:	<ul style="list-style-type: none"> <li>Coordinating closely with search and rescue agencies to manage health needs</li> <li>Establishing inter-agency communication channels and coordination before climate shocks</li> <li>Clearly defining roles and mandates for crisis response</li> <li>Enhancing early warning systems and disseminating information to the health system</li> <li>Integrating health system needs in climate risk finance strategies</li> </ul>
Resilient infrastructure	Ensure resilience of critical infrastructure systems on which health facilities depend by:	<ul style="list-style-type: none"> <li>Upgrading transport, water, electricity, and telecommunications assets vulnerable to climate shocks, especially those needed for health systems operations</li> <li>Identifying redundancy in infrastructure assets</li> <li>Leveraging new technologies for service and supply delivery</li> </ul>

Source: Adapted from World Bank (2021), *Frontlines*



Photo: sqofield/Shutterstock

### Capacity building of climate adaptation in health systems in Africa

The importance of coordination of health and environment (including climate change) institutions and programs in Africa has received increased attention in Africa in the last decade. The 2008 Libreville Declaration on Health and Environment in Africa, signed by African ministers responsible for health and environment,<sup>24</sup> calls for the development of frameworks to address the environmental impacts more effectively on health, and for stronger capacities to prevent environment-related health problems. A second interministerial conference on health and environment was held in Luanda, Angola, in 2010. A self-assessment for the third such conference in 2018 indicated that while progress has been made, only nine countries implemented at least 10 of the 11 priority actions of the Libreville Declaration, with the pace remaining slow or uneven for many countries. It was concluded that there is a need for more harmonized national tools for monitoring and evaluation of intersectoral health and environment projects; for increased capacity building and technical assistance, especially in areas of risk analysis and research; for a more integrated functional health-environment surveillance system; and for increased allocation of funds to the health and environment sectors for the implementation of joint activities.

The WHO is supporting countries in Africa to build climate-resilient health systems and to track national progress in protecting health from climate change. Recent examples from 2020 include the implementation in Tanzania and Malawi of the "Global Framework for Climate Services Adaptation Programme in Africa"; the implementation in Mozambique, Malawi, and Ethiopia of the "Delivering Climate-Resilient Water and Sanitation in Africa and Asia" program; support of the WHO Ghana country office for strengthening climate change and health interventions;<sup>25</sup> and a rapid assessment of health facilities in Zimbabwe of readiness to deal with climate change-induced drought and subsequent undernutrition.<sup>26</sup>

There is a need for larger investment programs to mainstream adaptation in health systems in Africa. The few projects under implementation typically focus on:

- Service delivery, including climate-informed health policies and programs; management of the environmental determinants of health; and emergency preparedness and management.
- Health information systems, including health and climate research; integrated risk monitoring and early warning; and vulnerability, capacity, and adaptation assessments.

The projects include key enabling conditions, including leadership and governance, and a health force with training and capacity to manage changing risks.<sup>27</sup>

Finally, adaptation projects that enable community engagement in developing and piloting interventions can facilitate health-promoting environments to prevent climate-sensitive diseases. This include establishing community-level knowledge exchanges, and developing participatory monitoring, evaluation, and learning.

### Climate-informed advisory services and early warning systems

A critical component of adaptation action in health systems is climate-informed advisory and management services. These services include early warning and response systems for climate-sensitive infectious diseases, such as malaria, dengue fever, Rift Valley fever, and schistosomiasis, among others.

Early warning systems based on temperature, precipitation, and other environmental data provide an opportunity for early detection, leading to early action and response to potential pathogen threats.<sup>28</sup> Improving the timing and confidence of seasonal climate forecasting, coupled with knowledge of exposure-response relationships, can identify prior conditions conducive to disease outbreaks weeks to months in advance of outbreaks. This information could then be used by public health professionals to improve surveillance in the most likely areas for threats. Early warning systems are more effective and have higher uptake when developed in collaboration with vulnerable populations and communities.

Developing and deploying early warning and response systems at scale can effectively reduce the burden of some infectious diseases and of heat-related morbidity and mortality. The high correlation between precipitation and malaria in rainforest and mangrove zones can be combined with seasonal to sub-seasonal forecasts to create early warning and response systems to protect vulnerable populations. Such early warnings were shown to be skillful at regional and local scales in Uganda up to four months ahead of an outbreak, providing time for health authorities to put into place preventive measures.<sup>29</sup> Longer-term evaluation is needed, as is research to identify how to most effectively modify current early warning systems to maintain their relevance in a changing climate.

The collaboration between ministries of health and national meteorological and hydrological services is essential for the development and effective operation of climate-informed advisory services and early warning systems. The World Meteorological Organization reports that out of the 86 member states that reported such collaborations, 19 were from the African region.<sup>30</sup>

#### Health and Africa at the UNFCCC COP26

In May 2021, the African Regional Consultation on Climate Change and Health was co-organized by HQ and Global Climate and Health Alliance (GCHA), and co-chaired and facilitated by the WHO Regional Office for Africa (WHO-AFRO). The aim of the Regional Consultation was to bring together important health leaders of the Africa region to further work on growing and enhancing health action for climate. The Consultation was designed to generate country- and region-specific feedback on climate-health priorities, and opportunities to inform global advocacy efforts and advance the process of integrating health messaging into all COP26 priority areas.

In the frames of the Regional Consultation, specific case studies on climate change and health have been presented to showcase the important climate change and health initiatives undertaken in the region. Specifically, climate change and health case studies were prepared from São Tomé & Príncipe, Mozambique, Ethiopia, and Ghana. Other countries, including Malawi, Kenya, South Africa, and Zimbabwe are preparing additional case studies to feed into a special COP26 Health Report to be presented during the UNFCCC COP26 in Glasgow.

## CONCLUSION

Africa is presently confronted with a huge and complex health care challenge, with its current health care capacity and coverage grossly inadequate to meet the needs of a rapidly growing population. The looming impacts of climate change could therefore have a very disruptive impact on its long-term health care picture. This chapter shows how climate change can exacerbate some kinds of disease linked to warmer climates and extreme weather events, disproportionately affecting the most poor and vulnerable sections of the population. In such a scenario, efforts to apply the insights and strategies of a well-thought-out and systematic climate adaptation strategy can go a long way in forming a strong line of defense against the health impacts that will almost inevitably accompany a warming climate. There is a need for larger investment programs to mainstream adaptation in health systems in Africa, and for thoughtful leadership and governance to ensure that such investment is directed towards adaptation projects that prioritize climate-informed health advisory services and community engagement.



**Climate change is a common threat and severe challenge faced by humanity (...) We must raise the importance of adaptation to be at the same level as mitigation.”**

**Huang Runqiu, Minister of Ecology and Environment, People's Republic of China**

High-Level Dialogue “An adaptation acceleration imperative for COP26”, September, 2021





Photo: R. Bociaga/Shutterstock

## Strengthening Public Health Surveillance and Early Warning System Capacity



**Geography:** Ethiopia



**Adaptation measures:** The project has focused on strengthening health surveillance systems with climate and weather data, improving management of groundwater resources, mainstreaming climate resilience measures in national WASH programs, building the capacity of health surveillance professionals and water managers and formulating norms and standards to improve access to water and sanitation during extreme weather events.

**Key outcomes:** The project goals are to develop resilient water and sanitation services and ensure that health surveillance systems are effective in assessing future risks, as well as to help in mainstreaming adaptive planning for public health amid climate change.



**Partners and funding:** World Health Organization; Government of Ethiopia; Ministry of Health; Ministry of Water, Irrigation and Energy ; National Meteorology Agency; Water Development Commission; National Disaster Risk Management Commission; Ministry of Agriculture; Environment, Forest and Climate Change Commission; Ethiopian Public Health Institute; United Kingdom's Department for International Development (DFID). 2018-2022.

### PROJECT SUMMARY

Climate impacts on health may be the result of direct causes like heat stress and weather-related extreme events or of indirect causes such as incidence of infectious diseases, water scarcity and impacts on health infrastructure.<sup>31</sup>

Climate change has created conditions that are increasingly conducive to the transmission of numerous infectious diseases.<sup>32</sup> Anecdotal evidence from Ethiopia reveals a high burden of morbidity and mortality linked to water-, food- and vector-borne diseases and therefore to climate change.<sup>33</sup> Studies have identified malaria, yellow fever and dengue fever, meningitis, leishmaniasis and diarrheal diseases as some of the most common climate-sensitive diseases.<sup>34</sup>

The effects of climate change in Ethiopia are expected to cause an increase in temperature between 1.2 and 2.6°C by 2040-2059;<sup>35</sup> greater variability in precipitation, with a decline of up to 20 percent in summer and spring rainfall in the southern, central and northern regions; and higher frequency and magnitude of extreme events, particularly droughts.<sup>36</sup> Nearly 25 percent of Ethiopia's population (27 million people) lives in areas of high-water stress, with only 13 percent of the population (14.5 million) having access to safely managed drinking water and only 7 percent (7.8 million) having access to safely managed sanitation services.<sup>37,38</sup> The risks to the water supply will be exacerbated by recurrent droughts, the effects of which will be continually compounded by increasing demand and watershed degradation. These factors will affect the reliability, quality and quantity of water available, disrupting the vulnerable population's access to drinking water and sanitation services and resulting in compromised personal hygiene.

Cholera and acute watery diarrheal disease in Africa have shown a higher occurrence due to water shortages during dry periods, while diseases like leptospirosis that result from the contamination of water supplies are likely to increase due to more frequent instances of flooding.<sup>39,40</sup> Increasing temperatures are fostering more favorable conditions for the transmission of malaria into the highlands of Ethiopia. While the dynamics of malaria transmission are complicated and control efforts may significantly limit the impact of these temperature changes, studies show a clear softening of the climate barrier to transmission in the Ethiopian highlands, potentially putting more people at risk of malaria outbreak.<sup>41</sup>

In an effort to better monitor the impacts of climate change on health and build resilience in Ethiopia, the WHO launched a project to strengthen the country's public health surveillance and early warning system capacity. This project is part of a broader DFID funded endeavor to deliver climate-resilient water and sanitation in Africa and Asia, which is also targeting Malawi, Mozambique, Bangladesh and Nepal. The program aims to build resilience through two major components. The first of these works to improve disease surveillance systems through an integrative and resource-efficient approach, wherein countries receive support to integrate national health and climate/weather data for better monitoring and surveillance of climate-sensitive diseases. The second component aims to improve the management of water, sanitation and hygiene (WASH) services to make them more resilient to increasing climate variability.