Lesson 1: Introduction to Health and Climate Change

It is increasingly evident that climate change has an impact on human health, reinforcing existing risks. For instance, the heat wave that struck Europe in 2003 led to over 70,000 excess deaths, affecting particularly the elderly. Over 60,000 deaths a year are registered, mostly in developing countries, from extreme weather events, which have become over 3 times more frequent since the 1960s. Also, extreme temperatures result in higher concentrations of allergens in the air (e.g. pollen), which can provoke asthma, a condition already affecting 300 million people around the world.

In addition, the current COVID-19 pandemic has highlighted the important interlinkages between human health and the state of our environment and economies.

In this lesson, we will explore:

- The health risks that are arising from climate change;
- The impact of these health risks across different communities; and
- The various possible health responses to climate change.

Introduction

Welcome to Lesson 1 of the Climate Change Negotiations and Health course.

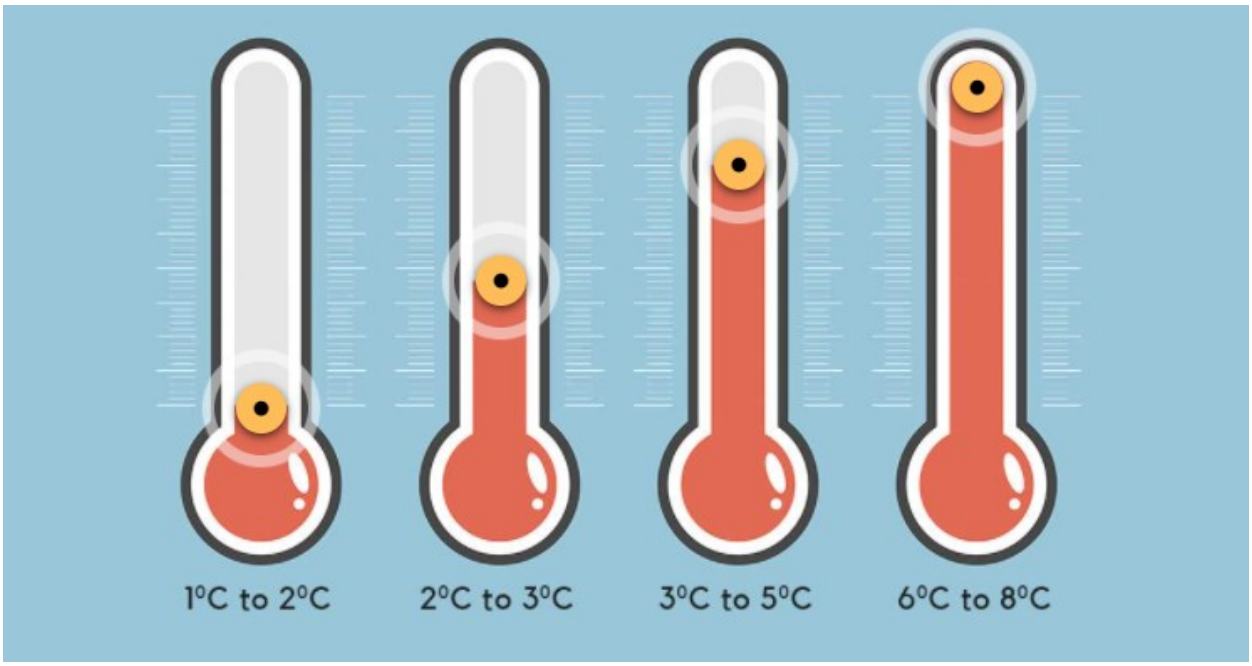
Let's begin our journey by watching a short introductory video (check online lesson)

The Impact of Climate Change on Human Health

Measuring the real impacts from climate change on human health can be a very complex exercise. However, there is **increased recognition** among governments across the globe that climate change poses a serious threat to human health.

How do you think the effects of climate change will impact human health?

Q1. What do you think is the average increase in temperature the planet is likely to record by 2100 if the current trend of climate change is maintained?



The planet is expected to record an average increase in temperature between 3 ºC and 5 ºC by 2100 if the current trend of climate change is maintained.

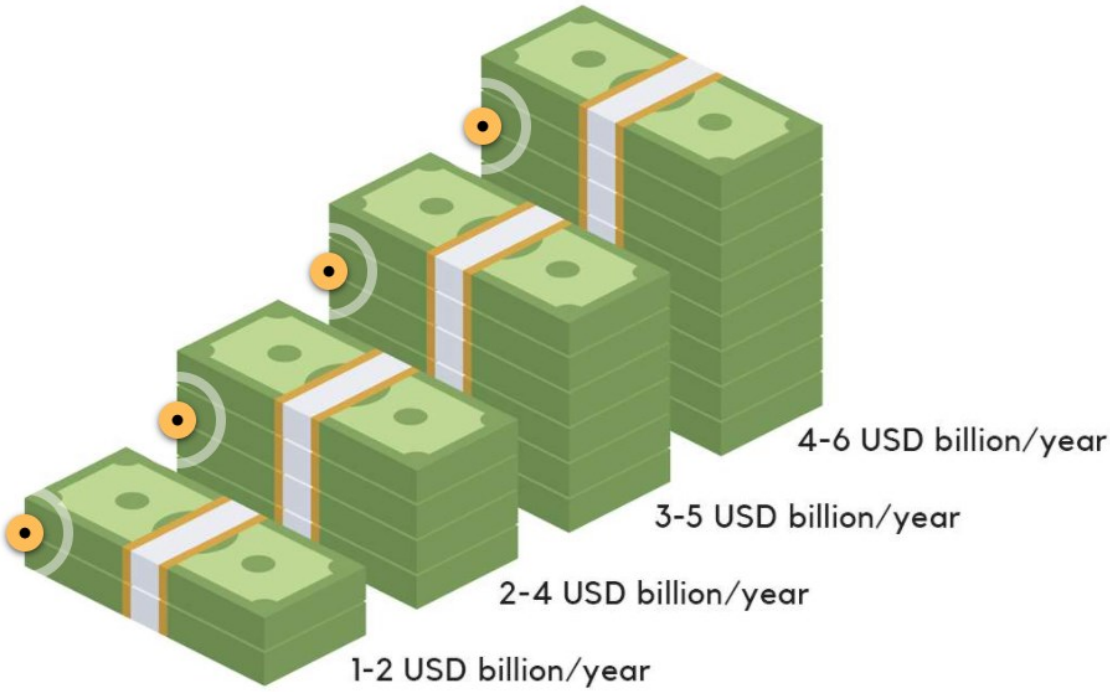
Q2. How many more people do you think will be exposed to heat stress during the next 30 years if the average temperature increases by 1.5 ºC?

350 million more people will be exposed to heat stress during the next 30 years if the average temperature of the planet increases by 1.5 ºC.

Q3. How many lives do you think can be saved each year through improvement in air quality associated with greenhouse gas (GHG) emission reductions?

It is estimated that over a million lives can be saved each year through improvement in air quality associated with greenhouse gas (GHG) emission reductions.

Q4. What do you think is the estimated cost of direct damage to health that will be caused by climate change by 2030?



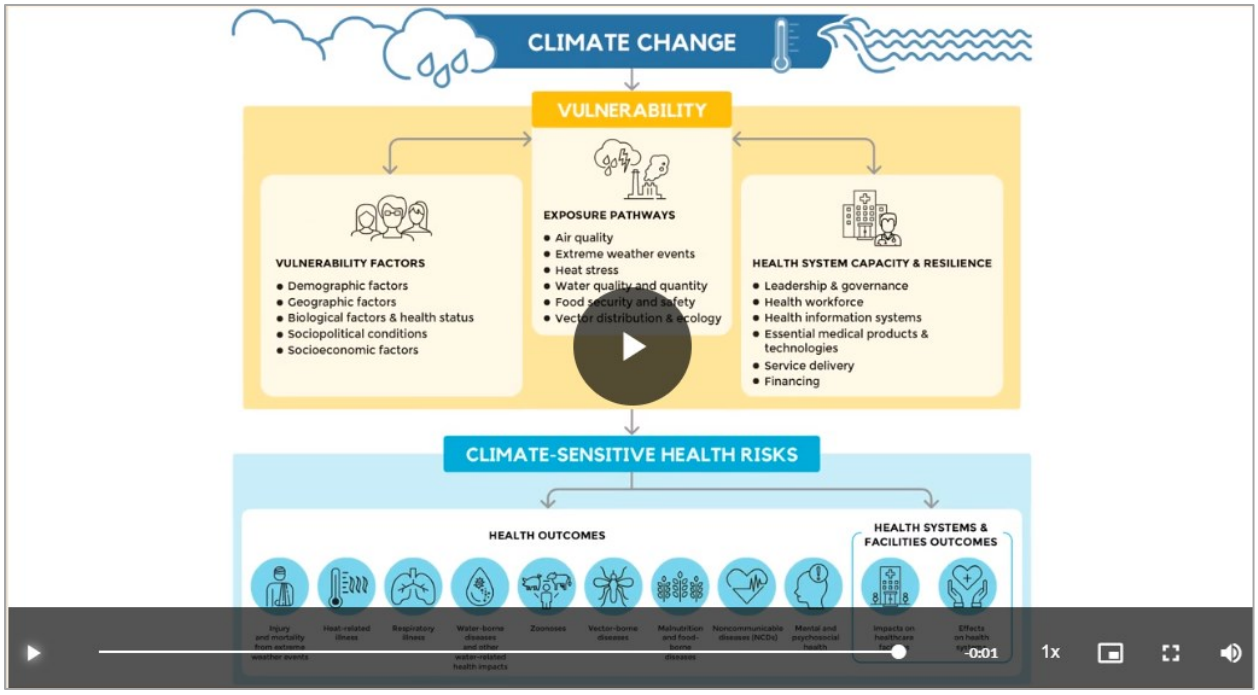
It is estimated that the direct damage that will be caused by climate change to health will be between 2-4 USD billion per year by 2030. In reality, the cost to our health will be even higher, as the indirect impacts on health (for example a decrease in the quality of life) are not taken into account in this number.

As you can see, climate change directly impacts our health and wellbeing. In the next segment, we will discuss the various health risks from climate change.

The Health Risks from Climate Change

We know that the overall health effects of a changing climate are overwhelmingly negative. So, what are the health risks that we are exposed to from climate change? And what factors increase our vulnerability to climate-sensitive health risks?

Let's watch a video that explains the various health risks from climate change and the different exposure pathways through which climate change affects our health (check online lesson).



Climate change directly and indirectly impacts our health and wellbeing. But is the impact of climate change equal for everyone? We will find out in the next segment.

Health Inequity and Climate Change

Is climate change just an environmental issue, or is it also a social justice issue?

Read the stories of Baldev and Olivia - both impacted by a warmer planet although they are located at different corners of the world - and then answer the question that follows.

Baldev Singh is a farmer from Punjab, India. Baldev says that last summer his wheat crop produced much lower yields than normal. His productivity decreased due to the extreme heat and he made less money from his crops than in previous years.

Olivia Manyard is an investment advisor from Tucson, Arizona. Olivia says that last summer her income was lower than usual. The air conditioning system had to work overtime due to the extreme heat and the high electricity bills ate into her profits.

Which of these two people will be impacted more by climate change?

- Baldev Singh
- Olivia Manyard

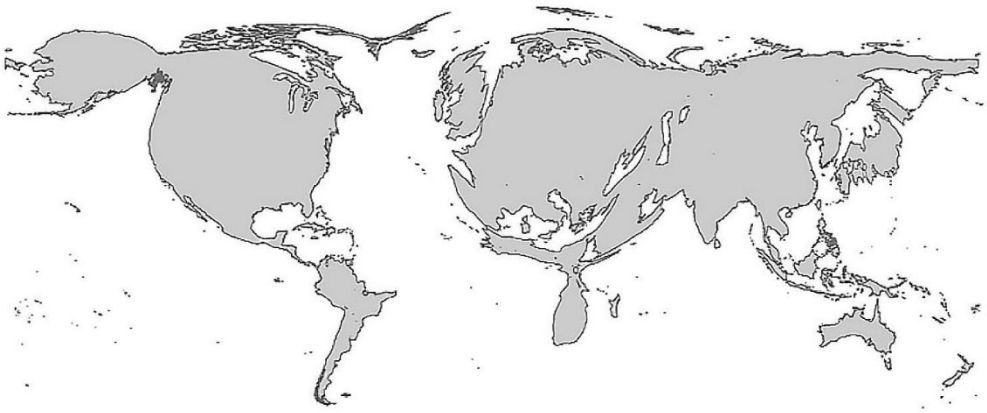
Climate change is both an environmental issue and a social justice issue. The impacts of a warmer planet will not affect everyone equally - its impacts will largely be determined by a confluence of environmental and socioeconomic factors.

Indeed, climate change affects natural systems and societies in ways that not only aggravate existing health inequities - in other words "*the systematic differences in the health status of different population groups*" (WHO, 2021) - but also generate new ones.

Emissions of Greenhouse Gases

This cartogram shows the world map with the sizes of countries made bigger or smaller to represent cumulative emission of greenhouse gases.

Notice how the size of the African continent and Latin America has shrunk relative to its actual geographic size due to the low amount of greenhouse gases emitted by countries located in those regions. Also notice how the size of other geographic areas like North America and Europe have expanded due to higher emissions of greenhouse gases in these regions.

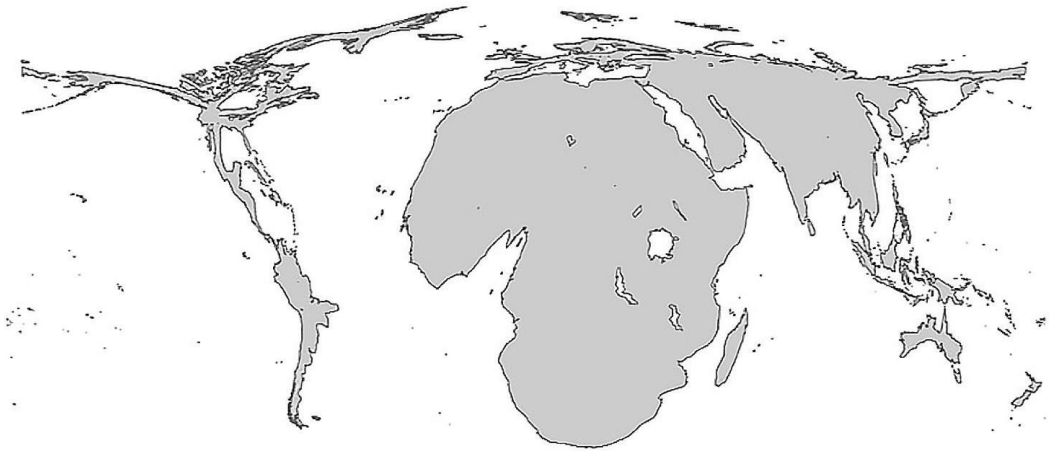


Source: [WHO adaptation of Patz et al., 2007]

Mortality for Climate Change

This cartogram shows the world map with the sizes of countries made bigger or smaller to represent World Health Organization (WHO) estimates of per capita mortality from climate change.

Notice how the size of the African continent has expanded due to the estimated per capita mortality in the region from climate change events. Also notice how some other regions like North America have shrunk due to low per capita climate change mortality, although these regions account for high emissions of greenhouse gases.



Source: [WHO adaptation of Patz et al., 2007]

Climate change has a disproportionate impact on vulnerable groups.

For example:

- People with disabilities are more affected by extreme weather events. Women and children are 14 times more likely to die during such events.
- Disadvantaged communities, with limited power and access to basic resources and services (including healthcare) will suffer the most.

Although vulnerable and disadvantaged people are particularly affected by climate change, building climate resilient health systems can help reduce health inequity. In the next segment, we will discuss different strategies for responding to climate change.

Health Response to Climate Change

Mitigation and Adaptation Strategies

The health response to climate change should involve a two-pronged approach that cover both mitigation strategies, which focus on reducing and removing greenhouse gas emissions, and adaptation strategies, which aim to support health systems and communities in preparing for and adjusting to the impacts of climate change.

Whereas mitigation strategies tackle the causes of climate change, adaptation strategies are designed to reduce our vulnerability to the harmful effects of climate change.

Both strategies are important to protect and promote health.

So, what adaptation and mitigation measures can be taken to address climate change?

Here are a few examples of climate change adaptation and mitigation measures that could be promoted in different sectors, including the health sector, to respond to climate change.

ADAPTATION	MITIGATION
• Developing a Heat Action Plan to protect vulnerable population groups during heatwaves • Recycling water and reducing its use • Building climate resilient health care facilities	• Promoting the use of active and public transport • Limiting the use of harmful fossil fuels • Adopting clean cookstoves to reduce air pollution

The health co-benefits of taking climate actions considerably outweigh their costs, particularly through the reduction of air pollution.

The IPCC defines co-benefits of climate change mitigation as "*the positive benefits related to the reduction of greenhouse gases*".

For example, switching to cleaner energy can both reduce climate change and simultaneously save lives endangered by air pollution. Low-carbon and active transport can help reduce many Non-Communicable Diseases (NCDs), such as obesity, diabetes, heart disease, and cancer, which are in part related to physical inactivity.

Now, let's explore some case studies that provide concrete examples of adaptation and mitigation measures adopted by countries and governments across the world.

- **Climate Resilient Water and Sanitation in Ethiopia**

To ensure its water and sanitation services are resilient to the growing impacts of climate change, Ethiopia created a national framework for climate resilient water and sanitation safety planning (CR-WSP). This national framework was informed by a water resources vulnerability and adaptation assessment (V&A). Using this framework, 25 pilot training events were initiated across the country, to develop simple, low-cost interventions to enhance the resilience of water supply systems under climate change. This has led to the development of CR-WSPs for 31 different water supply systems, serving a population of over 1.2 million people.

- **Building a Climate Resilient Health System in Lao PDR**

In its effort to respond to the climate change risks for health and well-being, Lao People's Democratic Republic has recently developed a Health National Adaptation Plan (H-NAP). It lays out interventions to protect the health of its population, including (a) the implementation of climate resilient water safety plans, (b) strengthening the climate resilience and environmental sustainability of health care facilities, (c) integrating climate and weather variables into health surveillance systems, and (d) building capacity on climate change and health at the country level.

- **Building Climate Proof and Sustainable Health Care Facilities in Fiji**

In 2017, the Ministry of Health and Medical Services of Fiji committed the country to 'Green Health Care'. These efforts in the health care sector would complement Fiji's national and international climate change efforts. After a series of consultations, Fiji has now launched its national Guidelines for Climate Resilient and Environmentally Sustainable Health Care Facilities (CRESHCF), in partnership with WHO.

Recent cyclones have exposed the country's vulnerabilities, and this includes several health care facilities, e.g. because of inundation due to rising sea levels or the loss of potable drinking water due to saltwater intrusion, while other remote facilities frequently see their health services impacted by prolonged dry weather.

Click here to view more case studies and examples of adaptation and mitigation measures.

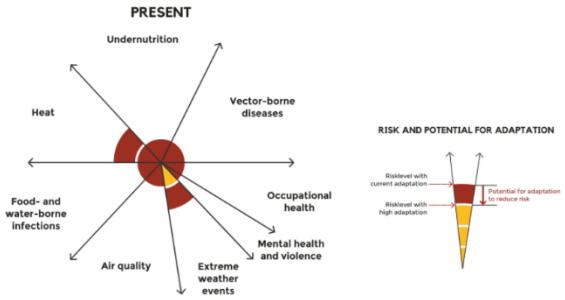
In the next segment, we will look at how adaptation strategies can minimize the risks to health due to climate change.

Adaptation: Minimizing Climate Risks to Health

We have evidence-based, cost effective interventions against every climate-sensitive health impact. All of these interventions can save lives now and reduce vulnerability to climate change in the future.

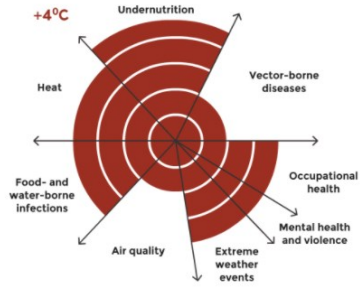
The charts below show the estimated burden of ill-health due to climate change for the period 2080-2100, when temperatures are expected to increase by 4 °C compared to preindustrial levels - unless significant mitigation efforts take place. It highlights the difference that can be made by strong adaptation measures.

Current Risk



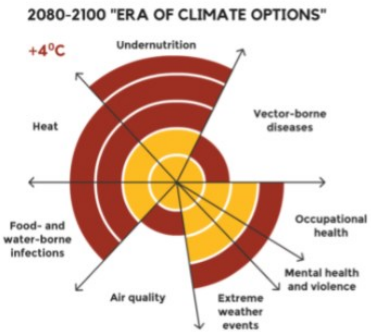
This chart shows a conceptual presentation of various health risks due to climate change. The impact levels are estimated for the current state of adaptation and the present timeframe.

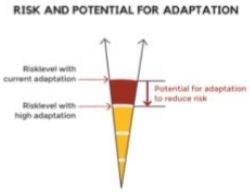
Future Risk (Current Adaptation)



This chart shows the estimated burden of ill-health due to climate change for the period 2080-2100, when temperatures are expected to increase by 4 °C compared to preindustrial levels. The impact levels are estimated for the current state of adaptation.

Future Risk (High Adaptation)





This chart highlights the potential to reduce risk by implementing strong adaptation measures. The impact levels are estimated for a hypothetical highly adapted state, indicated by different colors.

Source: Reproduced from the health chapter, Working group II of the IPCC Fifth assessment report.

The above conceptual presentation of the future burden of ill-health due to current climate change clearly indicates that strengthening preventive public health functions, including climate resilience, provides the best protection for the future.

So, what should we keep in mind when strengthening health resilience to climate change? There are five key elements to consider for health resilience to climate change.

- **Assessing Health Impacts from Climate Change and Health Co-Benefits of Mitigation and Adaptation in Other Sectors**

What are the impacts of climate change on health and the potential health co-benefits of climate change mitigation?

Risk assessments are a key tool to find out what the impacts of climate change on health are in a specific country or region. They help to generate evidence on the nature and scale of local health risks and help inform health system preparedness and policy development. The most common risk assessment is the Climate Change and Health Vulnerability and Adaptation Assessment (V&A).

- **Climate Change and Health Planning**

How do we develop comprehensive plans and strategies to address climate-sensitive health risks and build climate resilient health systems and facilities?

Climate change and health planning assists health organizations, authorities and programmes to be able to better anticipate, prevent, prepare for and manage climate-related health risks, and ultimately develop climate resilient health systems.

WHO developed an Operational Framework for building climate resilient health systems, consisting of 10 different components. This operational framework provides a useful structure for health national adaptation plans. Learn more about the WHO operational framework in the next section.

- **Financing Climate Change and Health**

How do we access climate financing for climate change and health, including the Green Climate Fund (GCF) Readiness programme?

Countries most vulnerable to the impacts of climate change are often also the least able to finance the actions necessary to address these impacts. Various funds and mechanisms have therefore been established to help countries with limited financial capacity to prepare and cope with the impacts of climate change, such as the Green Climate Fund (GCF), the Global Environment Facility (GEF) and the Standing Committee on Finance (SCF). Unfortunately, the health sector is particularly underfunded, with less than 1% of multilateral climate finance currently going to health protection.

- **Implementing Climate Change and Health Interventions**

What interventions can be implemented to address climate-sensitive health risks and strengthen the resilience and environmental sustainability of health systems and facilities?

Time for action, by implementing plans and strategies – such as the Health National Adaptation Plan and the Nationally Determined Contribution – to address climate-sensitive health risks. The WHO Operational Framework for building climate resilient health systems, as well as integrated risk monitoring and early warning systems play an important role in this process.

- **Monitoring Climate Change and Health Progress**

How do we monitor progress made at national level on climate change and health?

Regular monitoring of key indicators helps us understand (1) if our plans and interventions are achieving the desired outcomes and impact, (2) whether there is a change in health vulnerability and the capacity to respond to climate change, and (3) what the barriers might be in achieving health adaptation and mitigation priorities. WHO tracks the global progress of the health sector response to climate change through a regular global survey.

Reference Resources:

- WHO Operational Framework for Building Climate Resilient Health Systems
- WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities

In the next segment, you will get an opportunity to check your understanding of adaptation and mitigation strategies by completing an activity.

Adaptation & Mitigation Strategies

Mitigation tackles the causes of climate change and, when properly designed, can bring health benefits.

Health adaptation tackles the health effects of climate change and provides the opportunity to strengthen health systems' resilience.

Here's a list of climate change measures for protecting health. Try to consider which strategy (adaption or mitigation) they refer to.

- Develop an early warning system for malaria.
- Introduce and promote a clean transport policy
- Restore a natural ecosystem to provide clean air
- Promote agriculture practices that are climate resilient

- Adopt clean cookstoves to reduce air pollution
- Introduce a system to harvest rain water
- Design health facilities that use solar panels for energy.

Please note that some mitigation actions can also contribute to adaptation efforts and vice versa. For instance, providing health care facilities with clean energy sources, such as solar panels, will both limit greenhouse gas emissions, while also increasing the resilience of the facility to extreme weather events that might disrupt its energy supply.

If you are interested in learning more about the interlinkages between climate change and human health, as well as adaptation and mitigation measures that can both address climate change and improve health outcomes, please do not hesitate to access the free e-learning course on Health and Climate Change, also available on this platform.

In the next segment, we will review the WHO Framework that guides health professionals and decision-makers in building climate resilient health systems.

Building Climate Resilient Health Systems

In order to provide a comprehensive health response to climate change, health decision-makers have to consider the full range of functions that need to be strengthened to increase climate resilience. The WHO Operational Framework for Building Climate Resilient Health Systems elaborates on 10 components that together provide a comprehensive approach for the integration of climate resilience into the different building blocks of existing health systems.

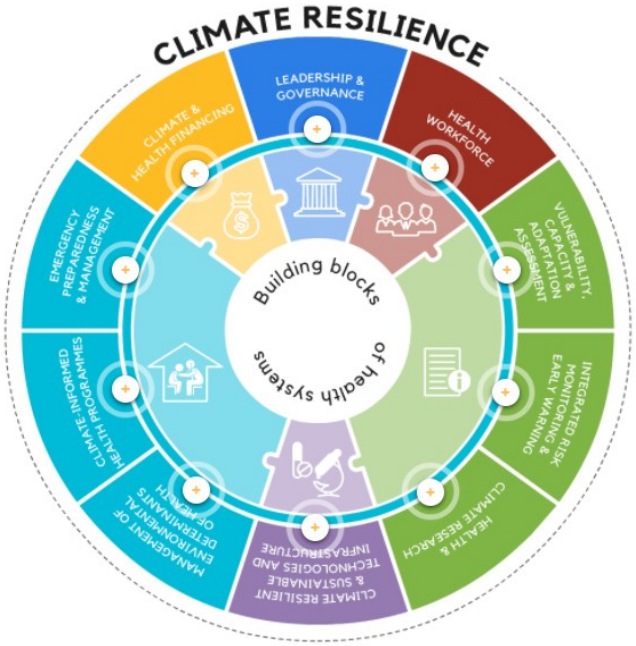
By implementing the 10 key components laid out in this Operational Framework, health systems, authorities and programmes will be better able to anticipate, prevent, prepare for and manage climate-related health risks.

The infographic below shows the ten components of the climate resilience framework and how they connect to the six building blocks of health systems, namely:

- Leadership and governance
- Service delivery
- Essential medical products and technology
- Health workforce

- Health information systems
- Financing

Let's find out how these ten components, when connected to the six building blocks, provide the structure for a health adaptation plan, including the allocation of roles and responsibilities, as well as human and financial resources.



Leadership and governance

Within the health sector, political leadership and commitment are essential to effectively address the health risks of climate change across sectors and programmes. This includes ensuring that climate change considerations are reflected in main health policies and programmes, cross-sectoral collaboration, and developing national and sectoral strategies.

Health workforce

Resilient health systems rely on an adequately trained workforce and robust organizational structures. It is therefore crucial to develop the technical and professional capacity of health staff to ensure the effective identification, prevention and management of climate-sensitive health risks.

Vulnerability, capacity and adaptation assessment

Climate change and health vulnerability and adaptation (V&A) assessments help to assess which populations are most vulnerable to different kinds of climate-sensitive health risks, identify weaknesses in the systems that should protect them, and specify adaptation options and interventions to respond.

Integrated risk monitoring and early warning

Integrated risk monitoring refers to the use of surveillance and early detection tools used in combination with direct and remote sensing technologies to monitor key environmental risks. These monitoring and early warning systems can play an important role in the adequate prevention of, and response to, both acute and long-term health risks from climate change.

Health and climate research

Health and climate research, at the local and global level, is an important basis for evidence-based decision-making on protecting health from climate impacts. Applied research can also help develop and test new technologies, create data tools and instruments, and inform strategies for risk management. Large research gaps on climate change and health still remain today.

Climate resilient and sustainable technologies and infrastructure

Climate resilient health infrastructure and services are crucial for efficient health system functioning in a changing climate. This includes ensuring a climate-safe location for health facilities and climate resilience of essential services to health facilities, such as water and sanitation services and electricity, as well as ensuring medical technologies and products have a low environmental footprint.

Management of environmental determinants of health

Climate change threatens health through environmental factors, strongly mediated by social conditions. The health sector can help by providing evidence and raising awareness, monitoring the environmental exposures and outcomes for people's health, collaborating with other sectors, and defining regulatory standards for managing health risks.

Climate-informed health programmes

Health programmes and operations should increasingly be designed and implemented considering current and projected climate change, as climate factors will increasingly influence the functioning of health systems. For example, seasonal nutritional screening can be performed in high-risk communities to reduce nutritional or food scarcity threats, and air quality forecasts can be conducted to protect cardiopulmonary health.

Emergency preparedness and management

Climate-informed preparedness plans and emergency systems are essential for building climate resilience. An example of building preparedness into a health system includes ensuring that healthcare facilities and service routes are appropriately located and robust enough to be safe and remain functional during extreme weather events projected for the area.

Climate and health financing

Additional funds and resources will be required to enhance the climate-resilience of health systems. For example, resources to expand the coverage of surveillance programmes for climate-sensitive infectious diseases, or to retrofit health facilities to withstand more extreme weather events. For many countries, adequate financing is one of the key barriers to develop climate resilient health systems.

Since health systems and their challenges vary, the framework is not to be considered as a definitive and rigid structure. Instead, it is used as a flexible approach that can be adapted to the local context of each community.

The WHO Operational Framework provides guidance for the health sector to address the challenges posed by climate change. But does the health sector recognize climate change as a critical challenge? Let's discuss that in the next segment.

The Rising Climate Change and Health Agendas

Climate Change is Rising on the Health Agenda

There is increased recognition of the challenges that climate change poses to human health.

What is WHO doing to focus on the emerging threat to public health due to climate change?

- **Since 1992 - WHO Participates in the UNFCCC Process**

As a specialized UN agency, WHO participates as an observer in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations.

- **2008 – WHO Identifies Climate Change as a Priority**

Climate change was identified by the WHO Director-General as a top priority, and selected as the theme for World Health Day, in 2008.

The same year, the World Health Assembly (WHA) passes a resolution on the serious risk of climate change to global health, and since then has developed regular workplans and reports.

- **2009 – WHO Develops its First Workplan on Climate Change and Health**

The Executive Board endorses a new WHO action plan on climate change and health for the period 2008-2013. Activities are divided under the objectives of:

- advocacy,
- partnerships,
- science and evidence, and
- health system strengthening.

In the years following, workplans for 2014 – 2019 and 2019 – 2023 will also be adopted.

- **2019 – WHO Adopts a Global Strategy and SIDS Action Plan**

WHO adopts a global strategy on health, environment and climate change, which provides a vision on how the world and the health community need to respond to environmental health risks and challenges until 2030. WHO also initiates the plan of action on climate change and health in small island developing States (SIDS).

WHO recognizes climate change as a central issue in the health sector. However, is health receiving the necessary focus in the climate change debate?

Health is Rising on the Climate Change Agenda

Health is emerging as a key area in the climate change debate, as evidenced by the actions and events listed below:

- Health is included the UN Climate Convention definition of "adverse effects of climate change" (United Nations Framework Convention Climate Change (UNFCCC), Article 1)
- Public Health is outlined as a key consideration in the UNFCCC for governments taking climate actions (UNFCCC, Article 4)
- The Right to Health is highlighted in the Preamble of the Paris Agreement
- WHO has received the mandate to support countries with their adaptation efforts. It assists governments to develop health-relevant strategies and plans.
- A majority of countries recognize the health sector as a priority sector vulnerable to the impacts of climate change and include health in their national climate strategies to the UNFCCC (we will discuss NAPs and NDCs in subsequent lessons).

This concludes our introductory lesson on health and climate change. In the next section, we will recap the key points covered in the lesson.

Recap

➢ Health Risk from Climate Change

Climate change represents one of the most serious threats to public health in the 21st century.

Climate change impacts health directly (such as injury and death resulting from extreme weather events) and indirectly (such as increased vector-borne disease spread, malnutrition and mental health issues), and undermines the social and environmental determinants of health, including clean air, safe drinking water, food and nutrition security, and safe shelter.

The extent to which these pathways translate into actual health burdens is moderated by individual's and community's existing vulnerability factors and the capacity and resilience of the current health system.

➢ Health Inequity and Climate Change

Climate change will not affect everyone equally - its impacts will largely be determined by a confluence of environmental and socioeconomic factors and will mainly be felt in those countries where health systems are already weak.

In addition to exacerbating existing health inequities, climate change will also generate new inequities.

Disadvantaged communities and vulnerable groups – who contributed the least to climate change – will suffer the most. Therefore, climate change is not just an environmental issue, but also a social justice issue.

➢ Health Response to Climate Change

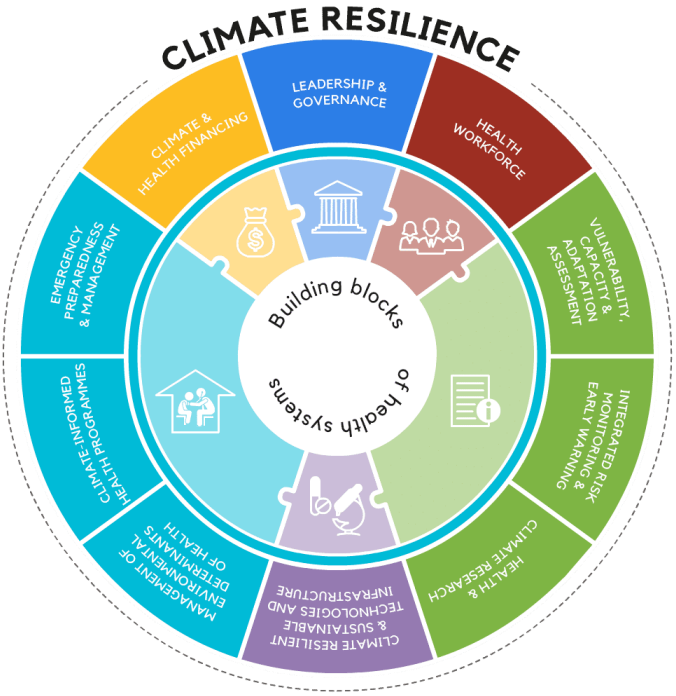
The health response to climate change should involve a two-pronged approach covering both adaptation and mitigation.

Mitigation strategies focus on addressing climate change by reducing the emission of heat-trapping greenhouse gases into the atmosphere. Adaptation strategies help communities to adjust to the actual and expected challenges brought by climate change, lowering their vulnerability to its harmful effects. Mitigation actions should be designed in a way that they maximize their health co-benefits.

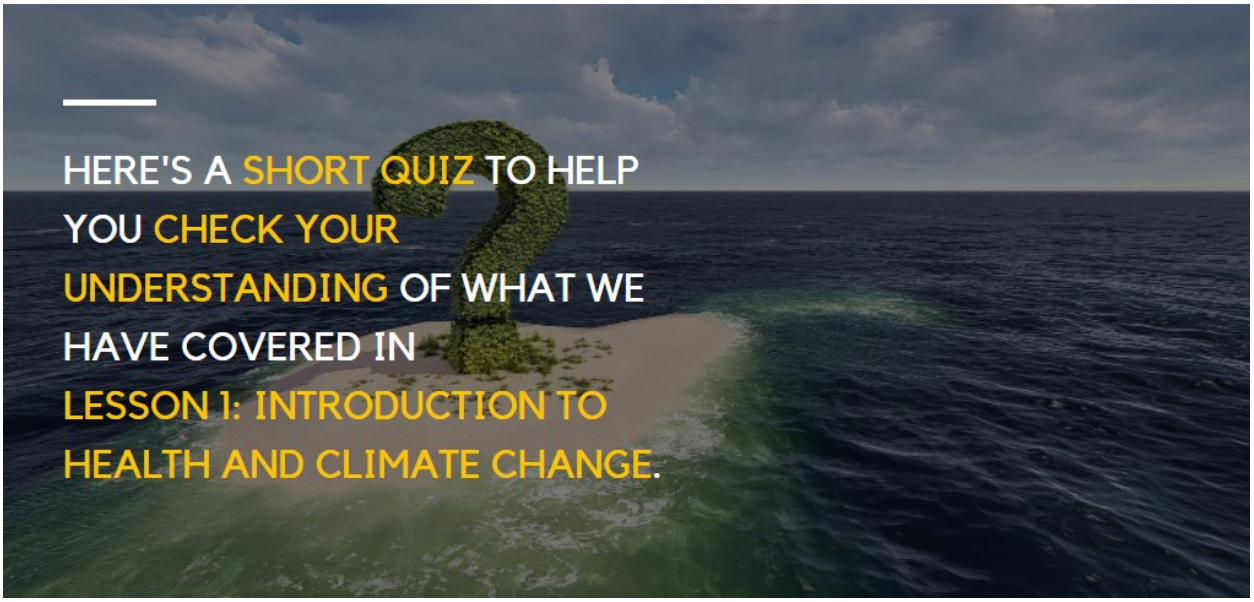
Examples of climate change health adaptation and health promoting mitigation measures include the building of climate resilient health systems, the promotion of climate-smart agriculture, and the reduction of air pollution by shifting towards renewable sources of energy.

➢ Climate Resilient Health Systems

Building resilience to climate change can reduce health inequity. The [WHO Operational Framework for Building Climate Resilient Health Systems] elaborates on 10 components, summarized in the infographic below, that together provide a comprehensive approach for the integration of climate resilience into existing health systems.



Check Your Understanding



1. **Fill in the blank.**

The WHO Operational Framework for Building Climate Resilient Health Systems elaborates on ten components that, when connected to the _____ building blocks of health systems, can provide the structure for a health adaptation plan.

2. **Match the correct strategies to the climate change responses.**

Adaptation, Mitigation

a. Replacing traditional cookstoves with clean cookstoves.
b. Building health care facilities that withstand extreme weather events.
c. Replacing internal combustion vehicles with active modes of transport and e-vehicles.
d. Reducing and recycling water use due to drought.

3. **Which of the following statements is/are TRUE?**

a. Climate change is both an environmental issue and a social justice issue.
b. Those who contribute the most to climate change will be hit the hardest.
c. Women and children are 14 times more likely to die during climate related disasters.
d. Building resilience to climate change can reduce health inequity.

4. **Which of the following are climate-sensitive health risks?**

a. Respiratory diseases like asthma
b. Vector-borne diseases like malaria
c. Mental and psychological issues
d. All the options above.

Answers

1. *Six*
2. *Adaptation – b, d; Mitigation – a, c*
3. *a, c, d*
4. *d*

Useful Resources

- WHO Guidance to Protect Health from Climate Change through Health Adaptation Planning
- WHO Climate Change and Health Factsheet
- WHO Operational Framework for Building Climate Resilient Health Systems
- WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities