

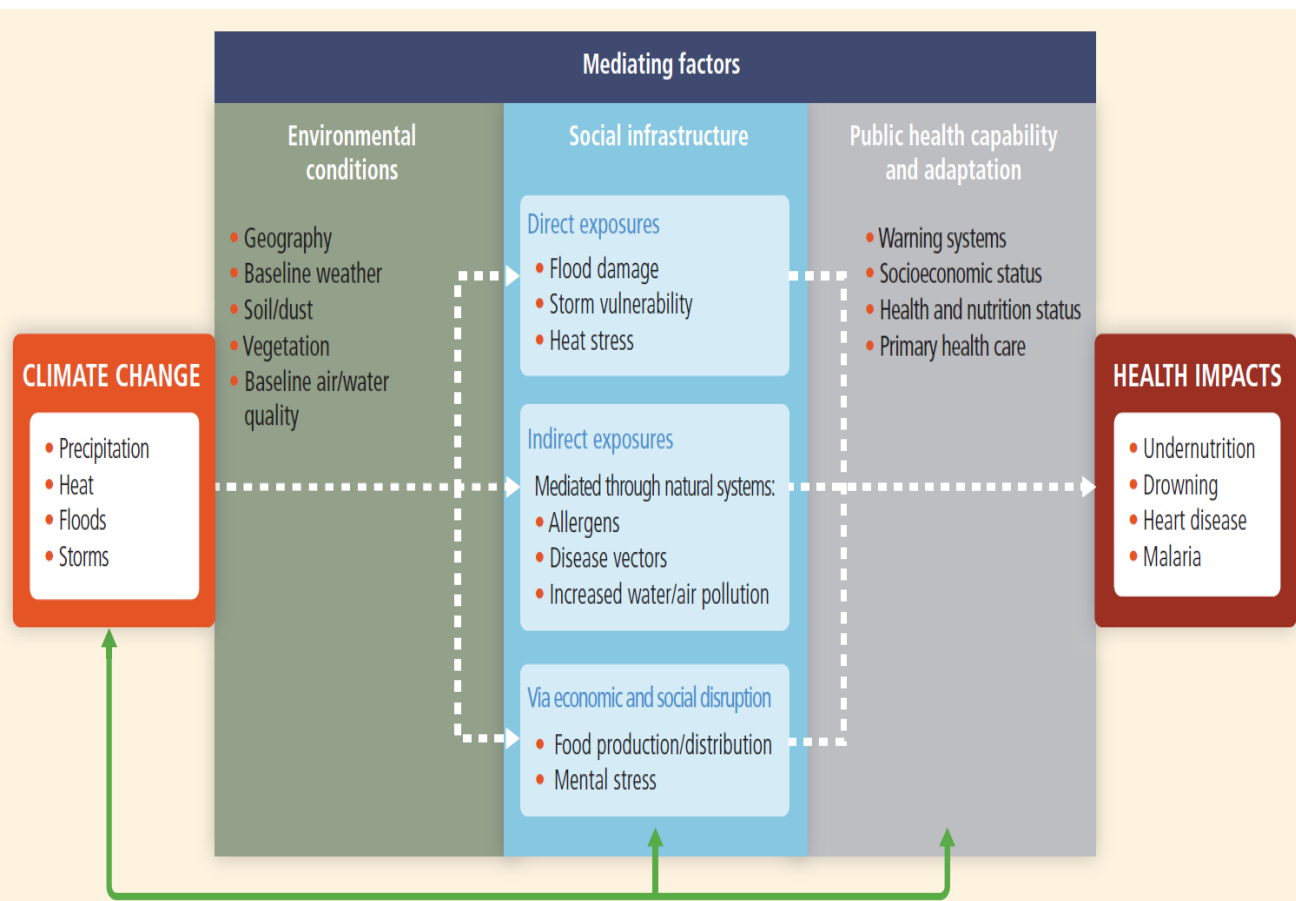
# Climate Change and Health: Nairobi Work Programme

**Dr. Diarmid Campbell-Lendrum,  
Climate Change and Health Team Leader**



**World Health  
Organization**

# Health risks from climate change



## Each year:

-Extreme weather events kill tens of thousands

-Malaria kills over 600,000

-Diarrhoea kills almost 600,000 children

-Undernutrition kills 3.1 million

**All are highly sensitive to climate conditions**

# Projected changes in health impacts

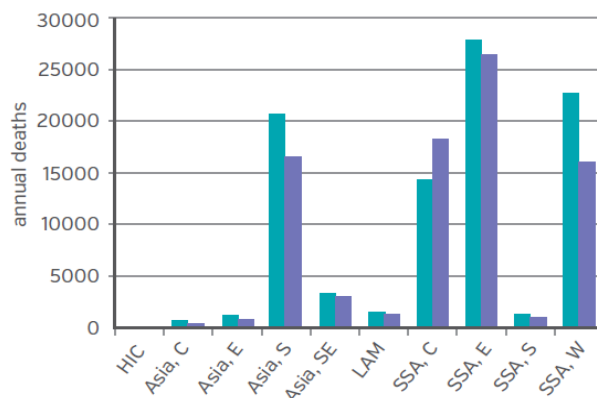
(WHO, 2015, based on IPCC 2014)

	Exposures affected by climate change	Health risks	Health impacts	Confidence rating
<b>Direct effects</b>	Increased numbers of warm days and nights; increase in frequency and intensity of heat waves; increased fire risk in low rainfall conditions	Excess heat-related mortality; increased incidence of heat exhaustion and heat stroke, particularly for outdoor labourers, athletes, elderly; exacerbated circulatory, cardio-vascular, respiratory, and kidney diseases; increased premature mortality related to ozone, and air pollution produced by fires, particularly during heat waves	Greater risk of injury, disease, and death due to more intense heat waves and fires	Very high
	Decreased numbers of cold days and nights	Lower cold-related mortality, reduced cardiovascular, and respiratory disease, particularly for the elderly in cold and temperate climates	Modest improvements in cold-related mortality and morbidity	Low
<b>Effects mediated through natural systems</b>	Higher temperatures and humidity, changing and increasingly variable precipitation, higher sea surface and freshwater temperatures	Accelerated microbial growth, survival, persistence, transmission, virulence of pathogens; shifting geographic and seasonal distributions of e.g. cholera, schistosomiasis, and harmful algal blooms; lack of water for hygiene; flood damage to water and sanitation infrastructure, and contamination of water sources through overflow	Increased risks of food- and water-borne diseases	Very high
	Higher temperatures and humidity, changing and increasingly variable precipitation	Accelerated parasite replication and increased biting rates; prolonged transmission seasons; re-emergence of formerly prevalent diseases; changing distribution and abundance of disease vectors; reduced effectiveness of vector control interventions	Increased risks of vector-borne diseases	Medium
<b>Effects heavily mediated by human systems</b>	Higher temperatures and changes in precipitation	Lower food production in tropics; lower access to food due to reduced supply and higher prices; combined effects of undernutrition and infectious diseases; chronic effects of stunting and wasting in children	Increased risk of under-nutrition resulting from diminished food production in poor regions	High
	Higher temperatures and humidity	Outdoor and unprotected workers obliged to work in physiologically unsafe conditions, or to lose income or livelihood opportunities	Consequences for health of lost work capacity and reduced labour productivity in vulnerable populations	High
<b>Combined effect</b>	<b>Overall climate change</b>	<b>Combination and interactions of risks above</b>	<b>Negative health effects will outweigh positive effects worldwide</b>	<b>High</b>

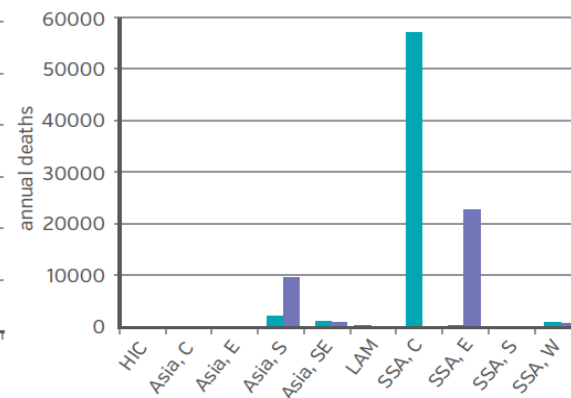
# Projected size of health impacts

**Estimated  
250,000  
additional  
deaths/ year by  
2030**

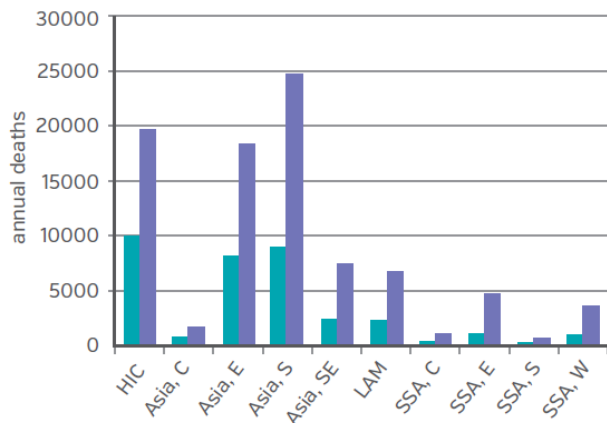
(a) Undernutrition (all-cause mortality in children aged under 5 years)



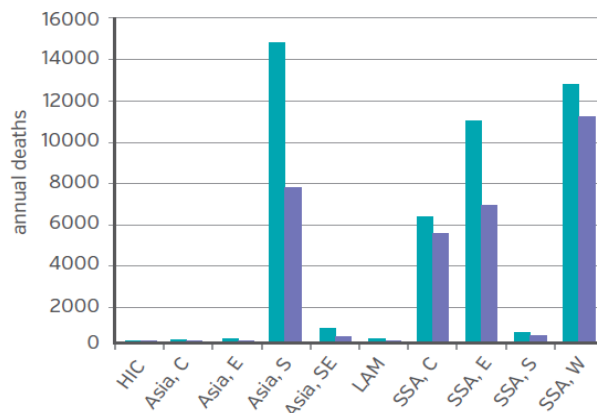
(b) Malaria (mortality in all ages)



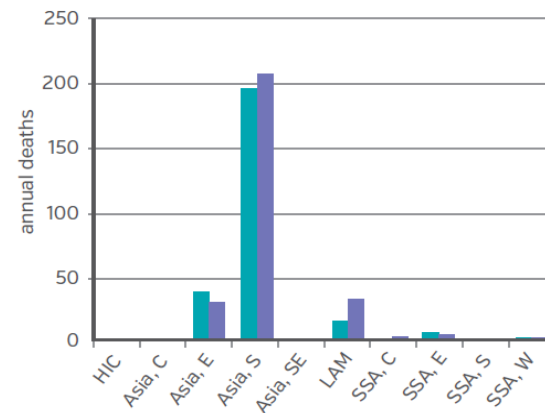
(e) Heat (mortality in people aged over 65 years)



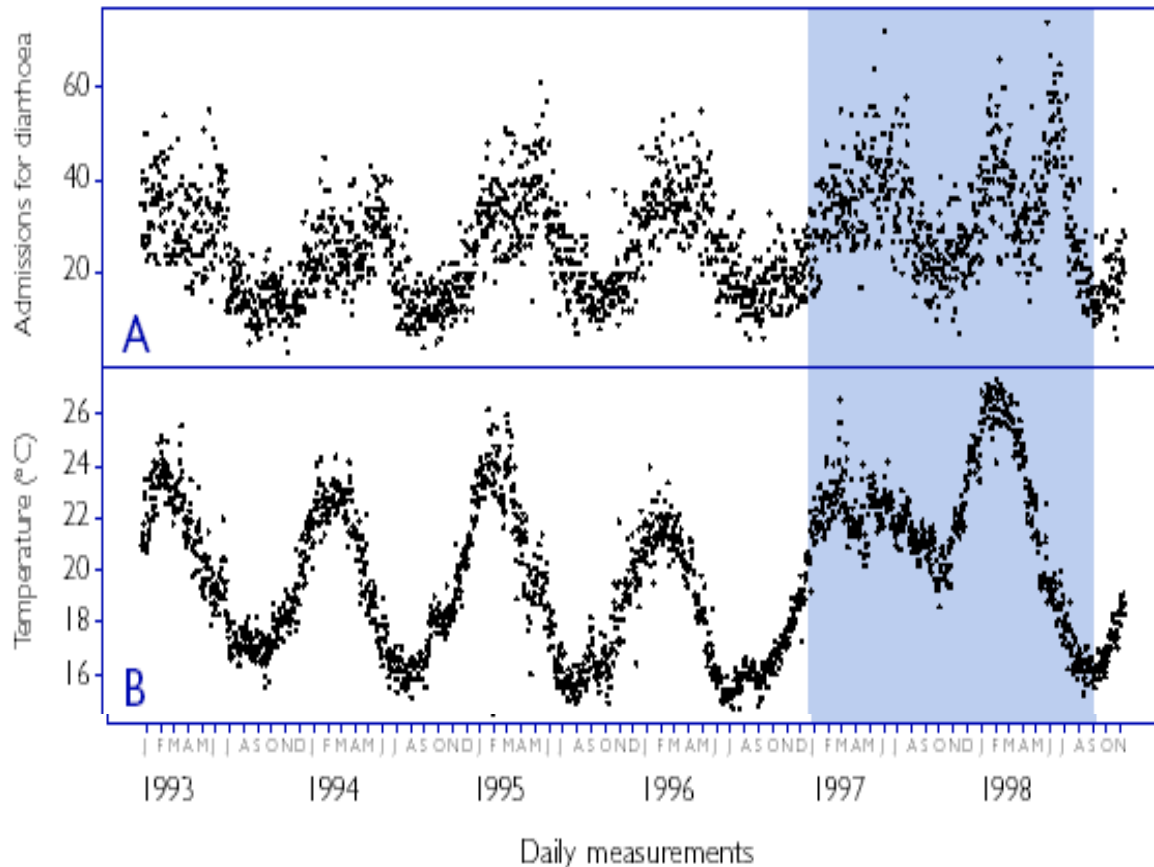
(c) Diarrhoeal disease (mortality in children aged under 15 years)



(d) Dengue (mortality in all ages)



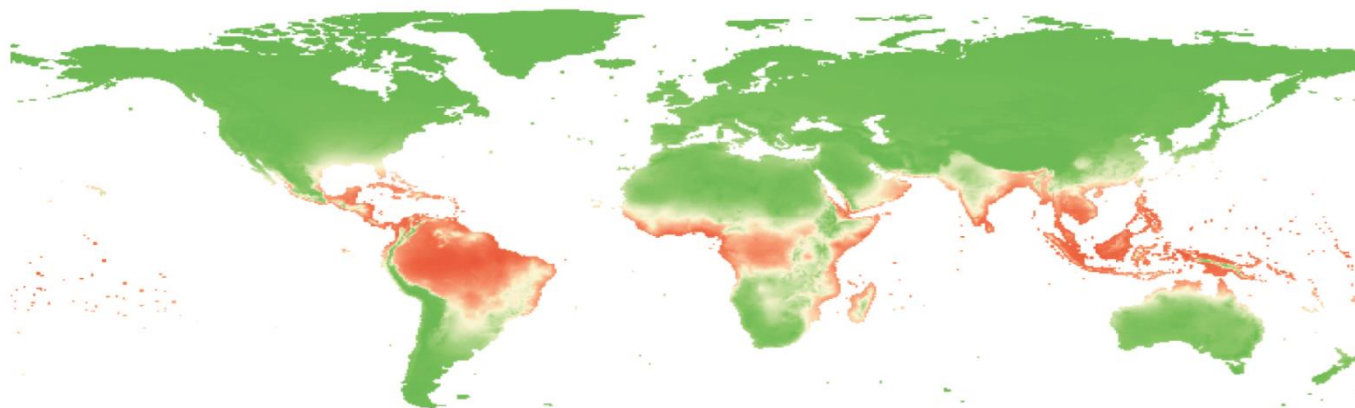
# Specific impacts: climate change and infectious disease



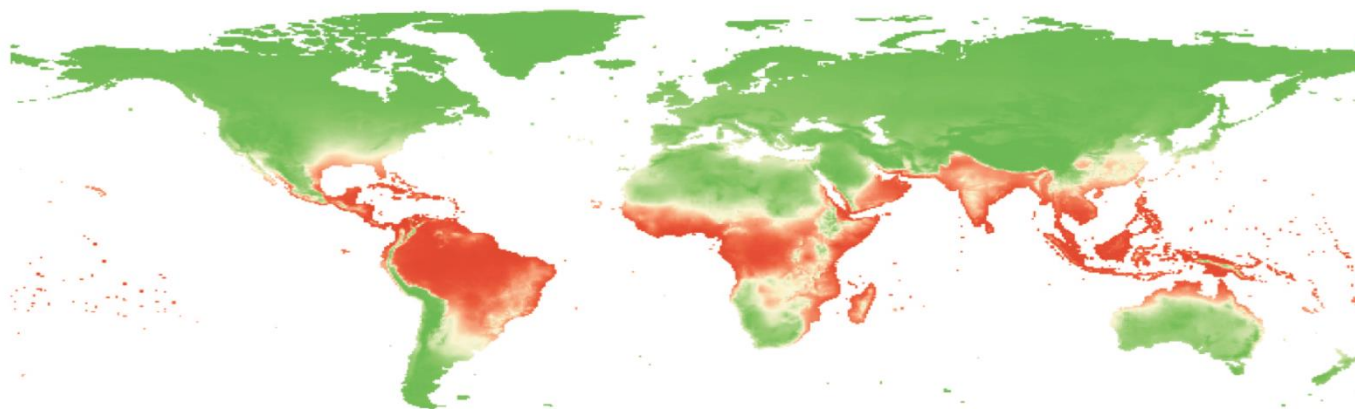
Incidence of diarrhoeal disease is related to variations in temperature and precipitation, over both space and time. In Lima, Peru, diarrhoea increased 8% for every 1°C temperature increase.

(Checkley et al, Lancet, 2000)

# Climate change and projected changes in disease distribution



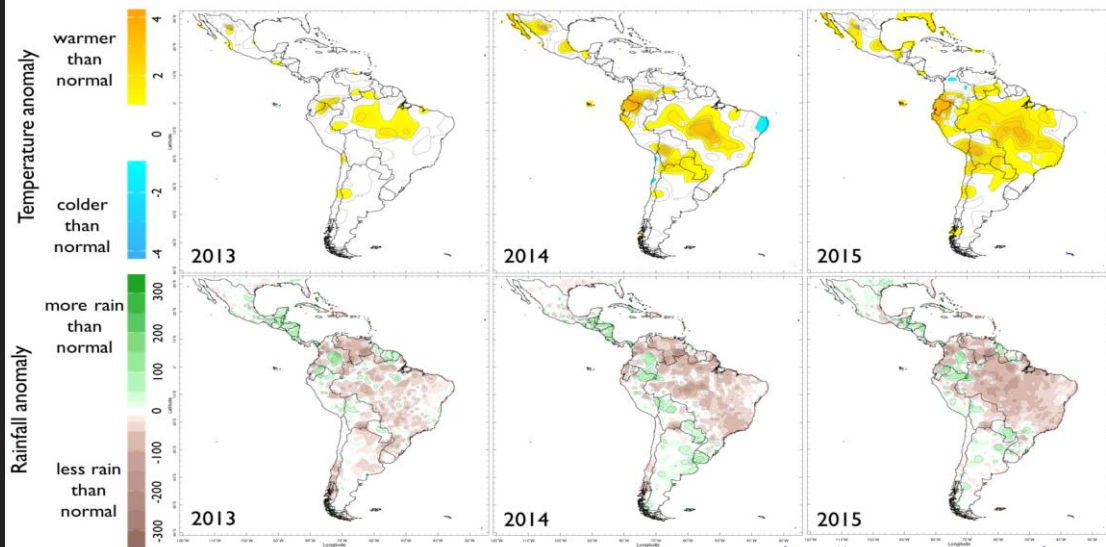
High : 0.99  
Low : 0



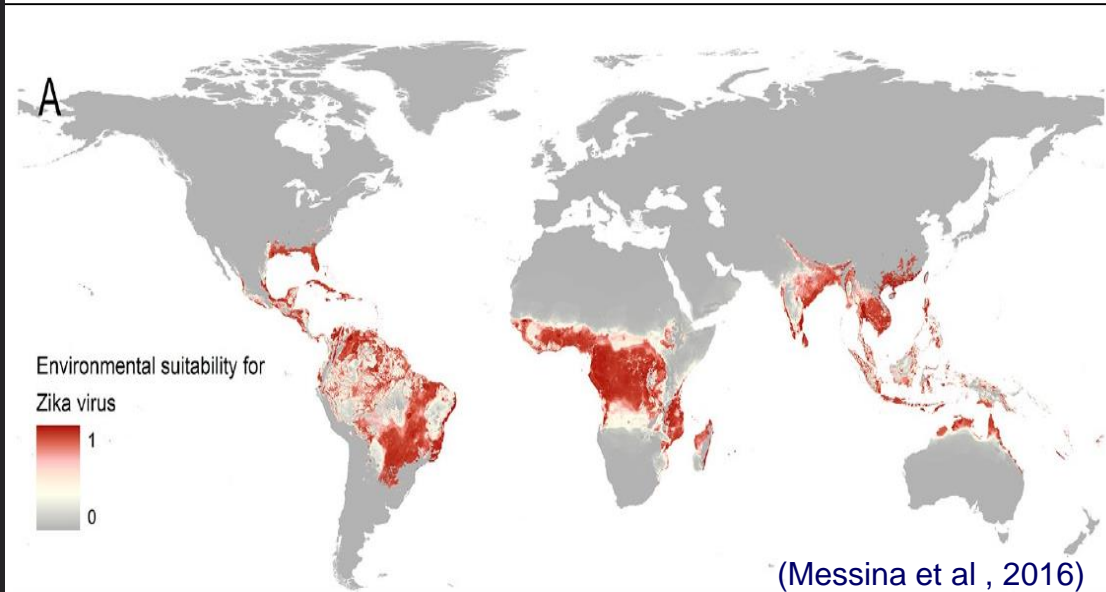
High : 0.99  
Low : 0

Distribution of dengue in 1990 (upper graph) and projected expanded distribution in the warmer, wetter and more humid conditions expected in the 2080s (lower graph), assuming no change in non-climatic determinants of dengue distribution. The colour code shows the predicted probability of dengue transmission occurring within each of the locations.

# Risk of emerging infections

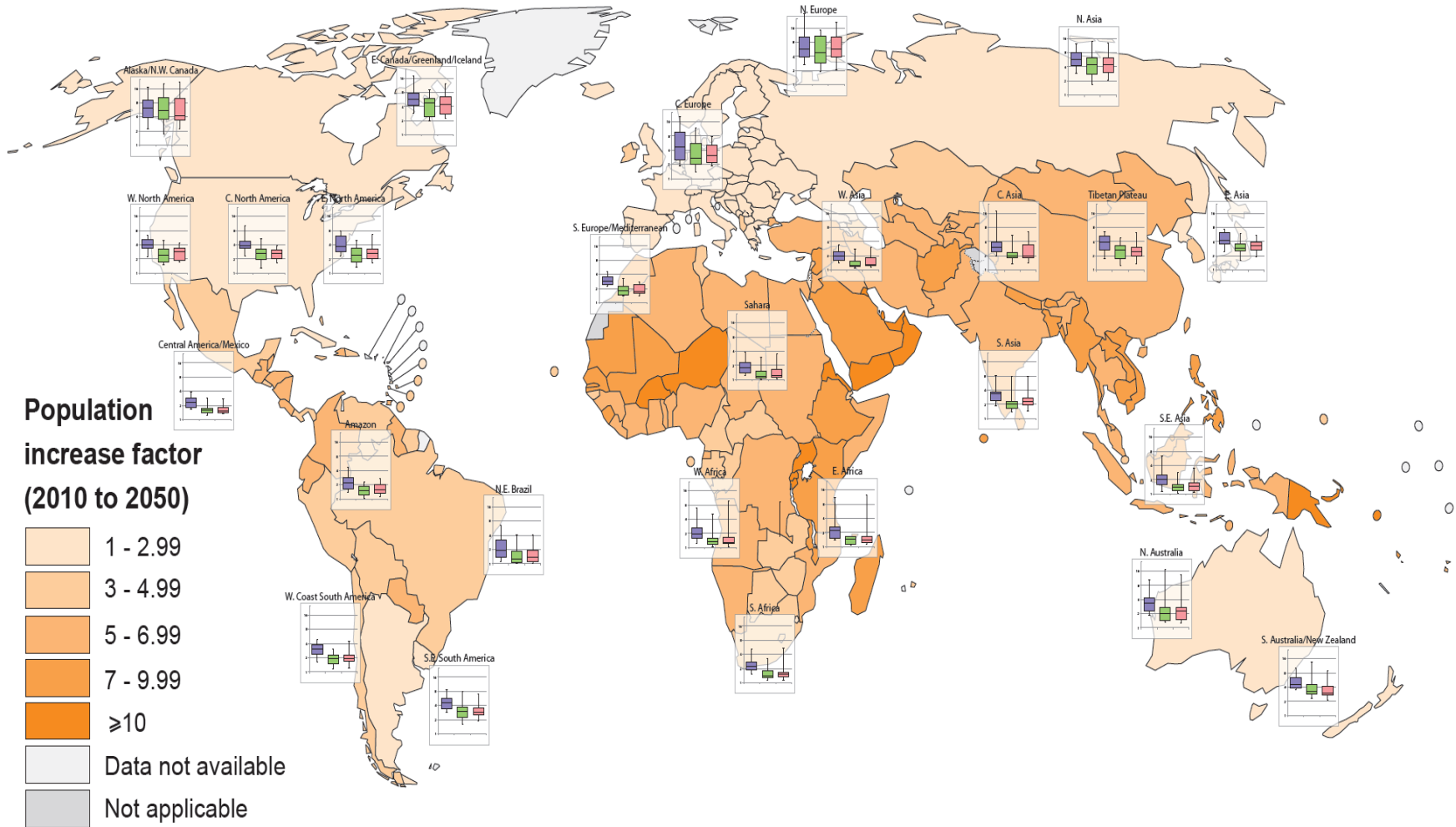


(Muñoz et al, 2016)



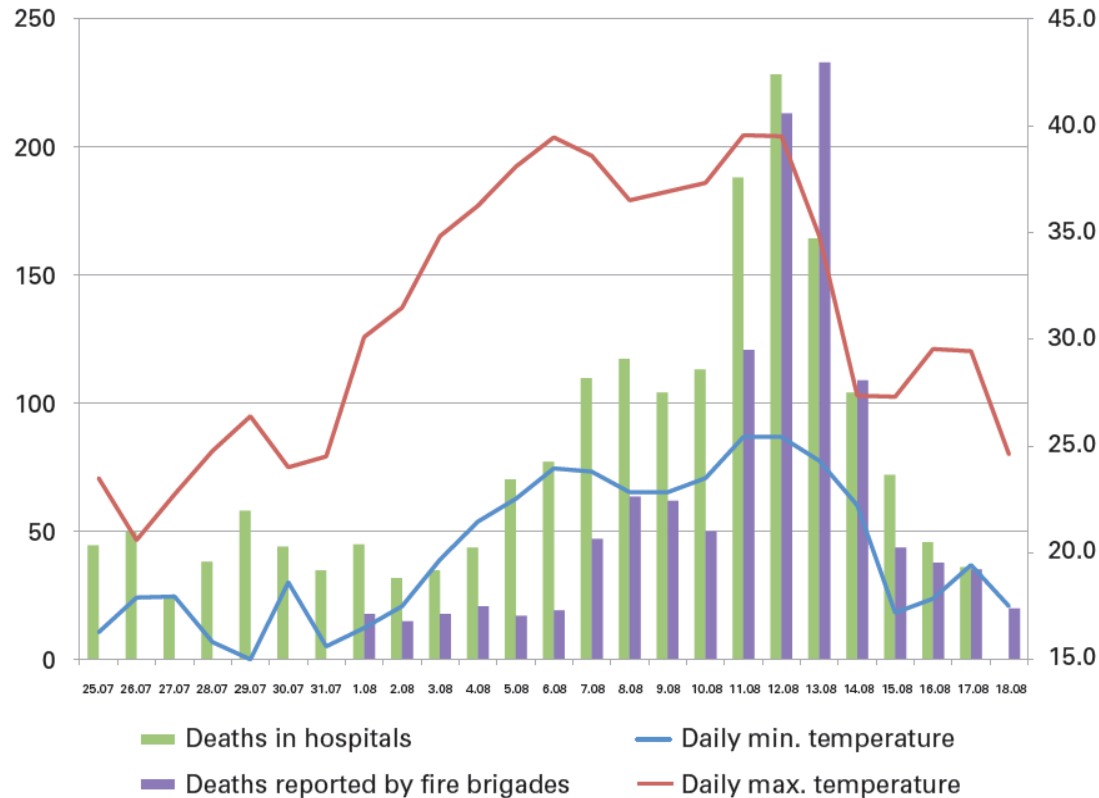
(Messina et al , 2016)

# Climate change and urban heat stress



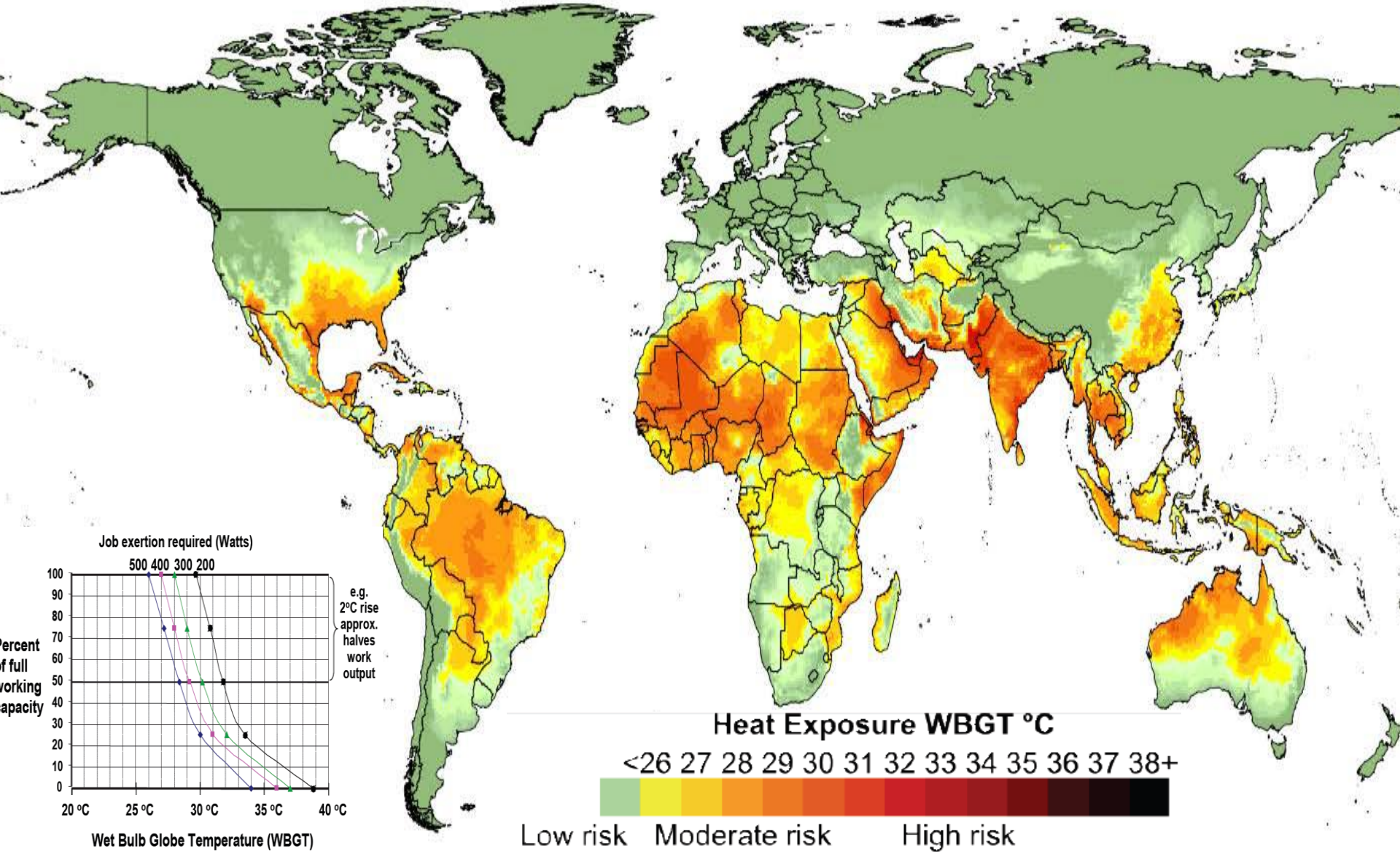


# Heat stress and mortality

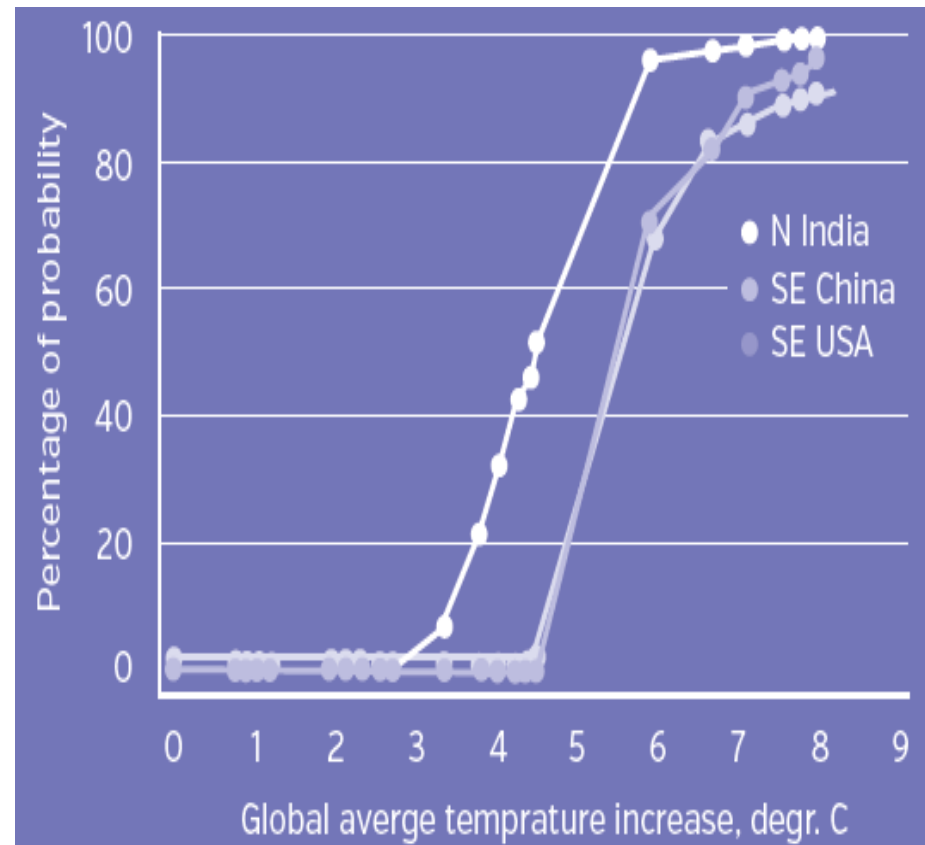
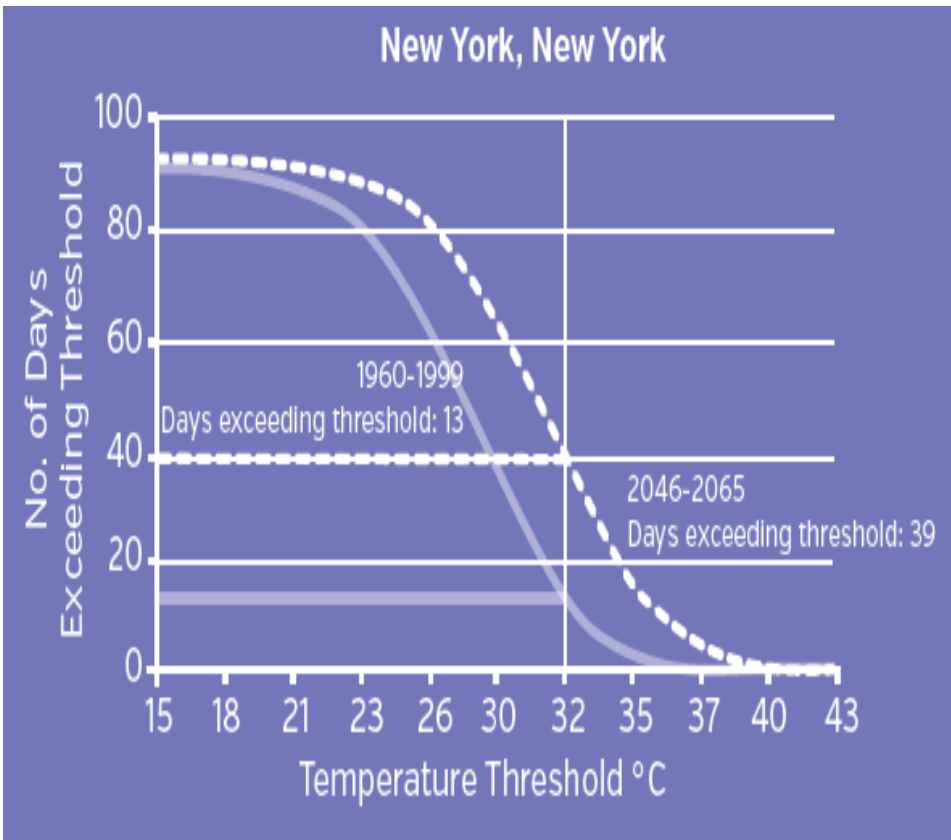


*Extreme heat is lethal in developed and developing countries: Daily maximum and minimum temperatures, and number of deaths: Paris, Summer 2003<sup>9</sup>*

# Temperature and productivity



# Heat stress and limits to adaptation



# Evidence and monitoring at national level

<http://www.who.int/globalchange/resources/countries/en/>

## CLIMATE AND HEALTH COUNTRY PROFILES - 2015 A GLOBAL OVERVIEW





CLIMATE AND HEALTH COUNTRY PROFILES - 2015  
A GLOBAL OVERVIEW

**OVERVIEW**

Bangladesh is one of the most vulnerable countries to extreme weather events mainly due to its low coastal area, high population density, high poverty rate and reliance on natural resources. Almost 20% of the population live in coastal areas and are prone to at least of flooding, storms, sea level rise and tidal-cyclones. Current saline intrusion reaches 50 km from the line of change separating agriculture, drinking water and fisheries. The health sector currently does not have adequate funding, infrastructure, human resources capacity, logistics and services required to fully address the impact of climate change on human health.

**SUMMARY OF KEY FINDINGS**

- Under a high emissions scenario, mean annual temperature is projected to rise by about 0.8°C on average from 1990 to 2050. If emissions decrease rapidly, the temperature rise is limited to about 0.2°C.
- Under a high emissions scenario, and without large technological breakthroughs, an annual average of 22 million people are projected to be affected by flooding due to sea level rise between 2030 and 2050. If emissions decrease rapidly and there is a major scale-up in protection (i.e. construction of coastal defences), the annual affected population could be limited to about 14.5 million people. Adaptation costs will be higher in a long term scenario, with high emissions scenario bringing increasing impacts well beyond the end of the century.
- By 2050, over 50 million people are projected to be at risk of malaria occurring in a high emissions scenario. If emissions decrease rapidly, projections indicate the number could decrease to about 17 million.

**OPPORTUNITIES FOR ACTION**

Bangladesh has conducted national assessments of climate change impacts, vulnerability and adaptation for health and the national health adaptation strategy. Country reported data from sections 1-5 indicate there remain opportunities for action in the following areas:

- Adaptation**
  - Strengthen adaptive capacity by building climate resilient infrastructure, including health infrastructure.
  - Enhance the level of implementing health response to climate change, including allocations from international and domestic funds.
- Mitigation**
  - Contact valuation of co-benefits to health of climate change mitigation policies.
- National policy implementation**
  - Develop an inclusive national policy for climate change.
  - Utilize a Rights Based Approach and take action for addressing gender in climate change policy and programs to address the disproportionate impact of climate change on the health of women and children.

**DEMOGRAPHIC ESTIMATES**

Population (2015)	157 million
Population aged 65+ (2015)	12%
Population living in urban areas (2015)	32.2%
Population under five (2015)	12%
Population aged 15-64 (2015)	47%

**ECONOMIC AND DEVELOPMENT INDICATORS**

GDP per capita (current US \$, 2014)	1,014 USD
Human Development Index (2014)	0.510
Percentage share of income for lowest 20% of population (2012)	8.8%
Share of population living on less than \$2.00 a day (2012)	19.33%

**HEALTH ESTIMATES**

Life expectancy at birth (2012)	71 years
Under-5 mortality per 1,000 live births (2012)	45.6

## CLIMATE AND HEALTH COUNTRY PROFILE - 2015 PHILIPPINES

### CLIMATE AND HEALTH COUNTRY PROFILE - 2015 ETHIOPIA

### CLIMATE AND HEALTH COUNTRY PROFILE - 2015 EGYPT

### CLIMATE AND HEALTH COUNTRY PROFILE - 2015 CHINA

### CLIMATE AND HEALTH COUNTRY PROFILE - 2015 BRAZIL

### CLIMATE AND HEALTH COUNTRY PROFILE - 2015 BANGLADESH

**OVERVIEW**

Under a high emissions scenario, it is anticipated that 30.3 million people could be living in extreme high risk areas by 2050 compared to 8.3 million in present. Under a high emissions scenario, an additional 7.6 million people could be exposed to very high quality (4-5 parts per thousand by 2050) compared to current levels.

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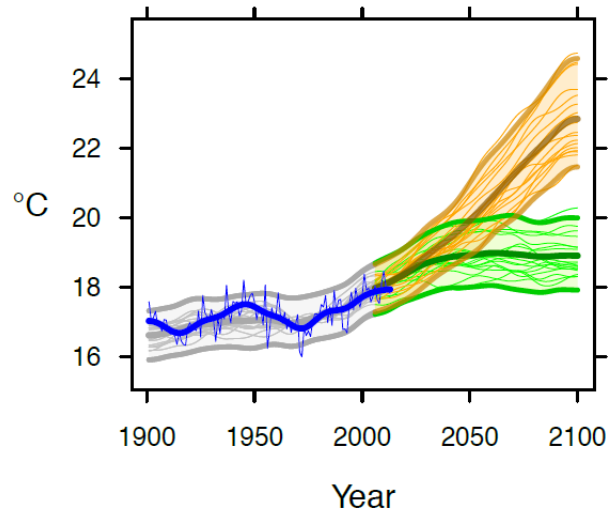
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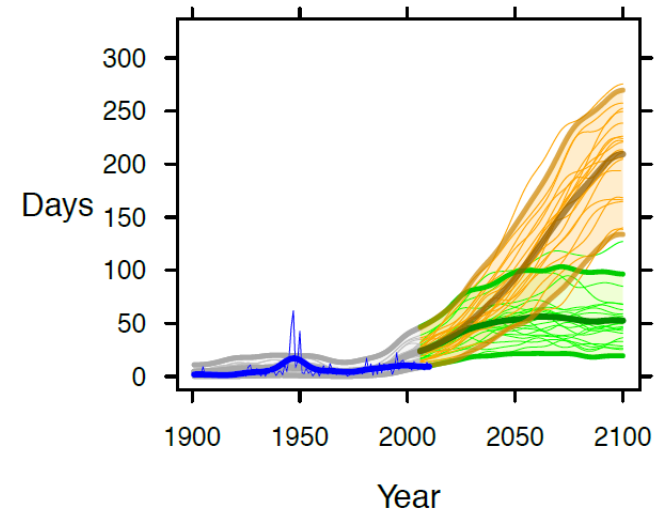
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# Climate Hazards at National Level: Example of Morocco

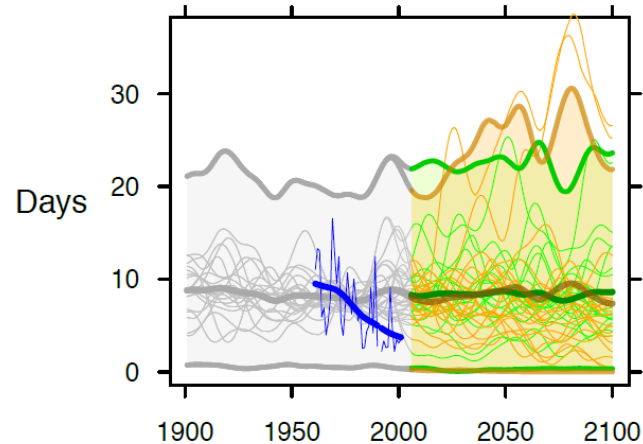
## MEAN ANNUAL TEMPERATURE



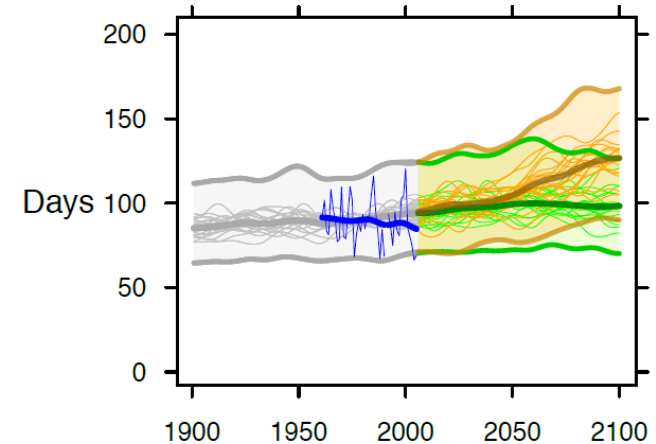
## DAYS OF WARM SPELL ['HEAT WAVES']



## DAYS WITH EXTREME RAINFALL ['FLOOD RISK']



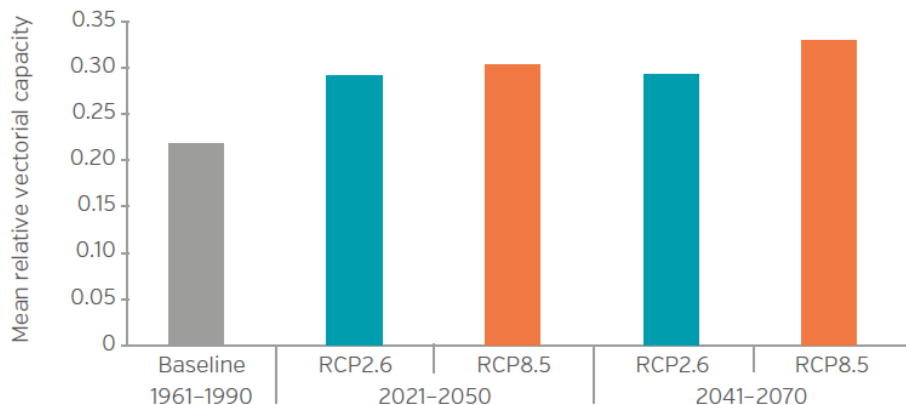
## CONSECUTIVE DRY DAYS ['DROUGHT']



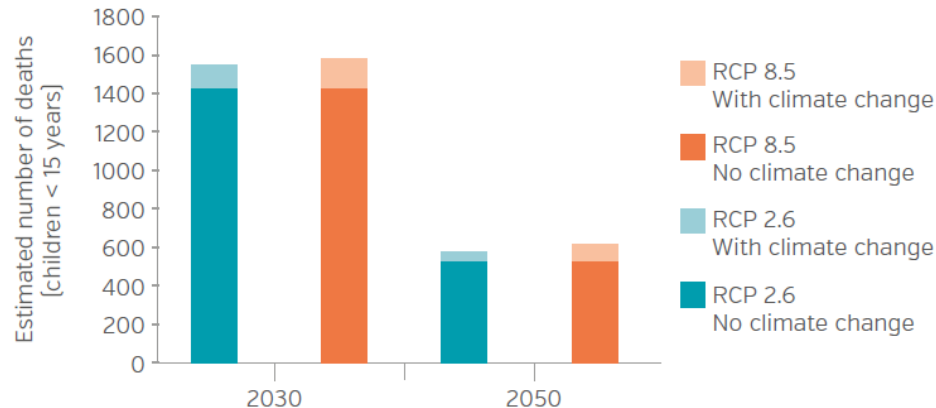
# Health Risks at National Level: Example of Morocco

## INFECTIOUS AND VECTOR-BORNE DISEASES

Mean relative vectorial capacity for dengue fever transmission in Morocco

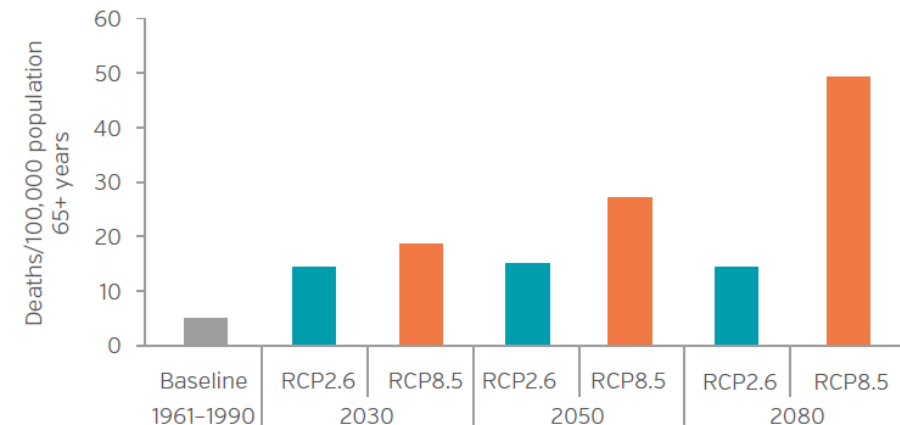


Estimated number of deaths due to diarrhoeal disease in children under 15 years in Morocco (base case scenario for economic growth)



## HEAT-RELATED MORTALITY

Heat-related mortality in population 65 years or over, Morocco (deaths / 100,000 population 65+ years)



## KEY IMPLICATIONS FOR HEALTH

Climate change is expected to increase mean annual temperature and the intensity and frequency of heat waves resulting in a greater number of people at risk of heat-related medical conditions.

The elderly, children, the chronically ill, the socially isolated and at-risk occupational groups are particularly vulnerable to heat-related conditions.

# Overall agenda for the health response

- Health adaptation to climate change: Increasing climate resilience of health systems, and health determinants
- Gaining the health “co-benefits” of climate mitigation, particularly reducing 6.5 million annual air pollution deaths
- Ensuring support for health and climate action – New economic approach, and scale up financial investments.
- Engaging the health community and civil society in mitigation and adaptation.
- Measuring national progress and reporting through the WHO/UNFCCC country profiles and SDG indicators

# Climate Change at the World Health Assembly

**Climate change adds a new urgency to protect health**

**193 Nations agree on actions to protect health from climate change**

**Describe functions for which they need support**

## Climate change and health

The Sixty-first World Health Assembly,

Having considered the report on climate change and health;<sup>1</sup>

Recalling resolution WHA51.29 on the protection of human health from risks related to climate change and stratospheric ozone depletion and acknowledging and welcoming the work carried out so far by WHO in pursuit of it;

Recognizing that, in the interim, the scientific evidence of the effect of the increase in atmospheric greenhouse gases, and of the potential consequences for human health, has considerably improved;

Noting with concern the recent findings of the Intergovernmental Panel on Climate Change that the effects of temperature increases on some aspects of human health are already being observed; that the net global effect of projected climate change on human health is expected to be negative, especially in developing countries, small island developing States and vulnerable local communities which have the least capacity to prepare for and adapt to such change, and that exposure to projected climate change could affect the health status of millions of people, through increases in malnutrition, in death, disease and injury due to extreme weather events, in the burden of diarrhoeal disease, in the frequency of cardiorespiratory diseases, and through altered distribution of some infectious disease vectors;

Noting further that climate change could jeopardize achievement of the Millennium Development Goals, including the health-related Goals, and undermine the efforts of the Secretariat and Member States to improve public health and reduce health inequalities globally;

Recognizing the importance of addressing in a timely fashion the health impacts resulting from climate change due to the cumulative effects of emissions of greenhouse gases, and further recognizing that solutions to the health impacts of climate change should be seen as a joint responsibility of all States and that developed countries should assist developing countries in this regard;

Recognizing the need to assist Member States in assessing the implications of climate change for health and health systems in their country, in identifying appropriate and comprehensive strategies and measures for addressing these implications, in building capacity in the health sector to do so and





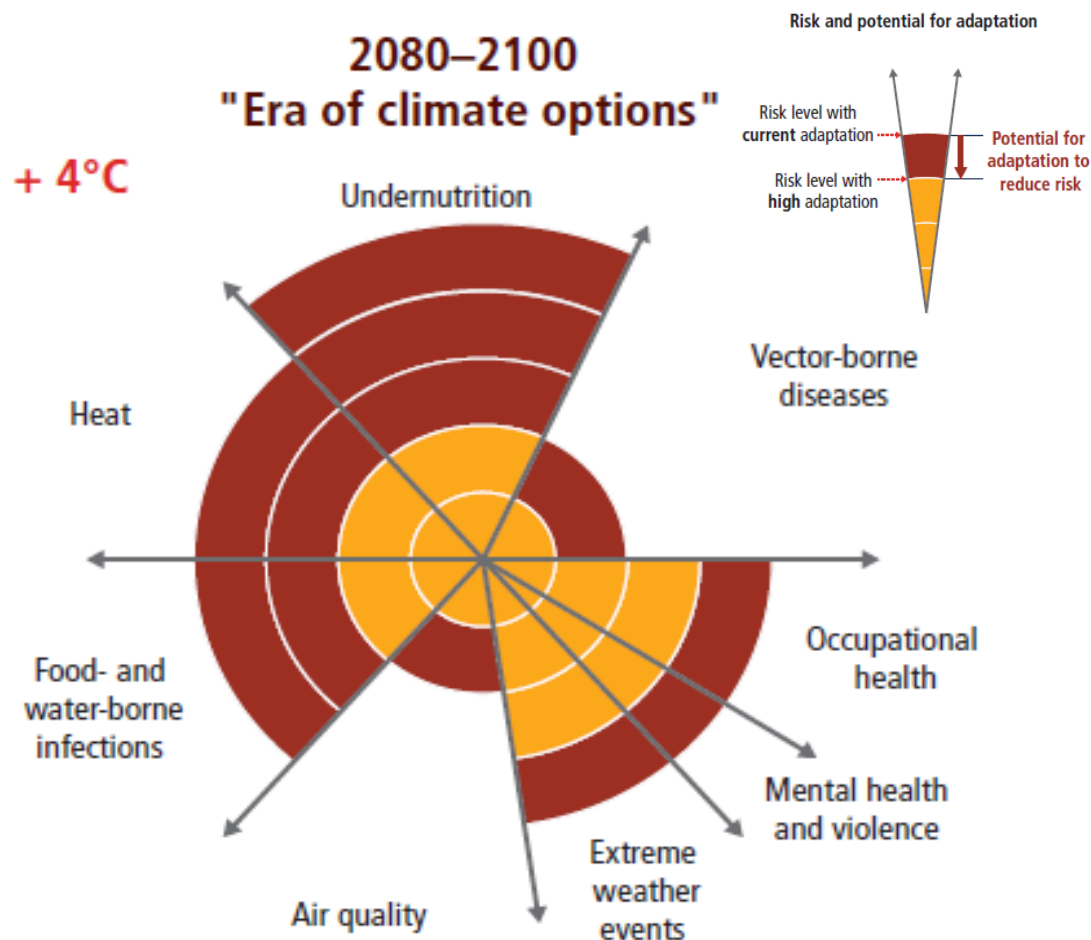


# Increasing the resilience of health systems and determinants of health to climate risks.

1. Adopt a **comprehensive approach to mainstreaming** the management of climate risks into health systems, including public health interventions within the formal health sector, and cross-sectoral action to improve the environmental and social determinants of health.
2. Show **leadership and engage in inter-sectoral governance**.
3. Develop **the capacity of the health workforce** to address climate risks.
4. Enhance **health information systems**.
5. Promote climate resilient and sustainable **infrastructure and technologies**.
6. Strengthen the management of **environmental determinants of health, climate informed health programming and emergency preparedness**.
7. **Scale up financial investments** to develop and sustain health resilience to climate change.



# High potential to minimize health impacts through adaptation

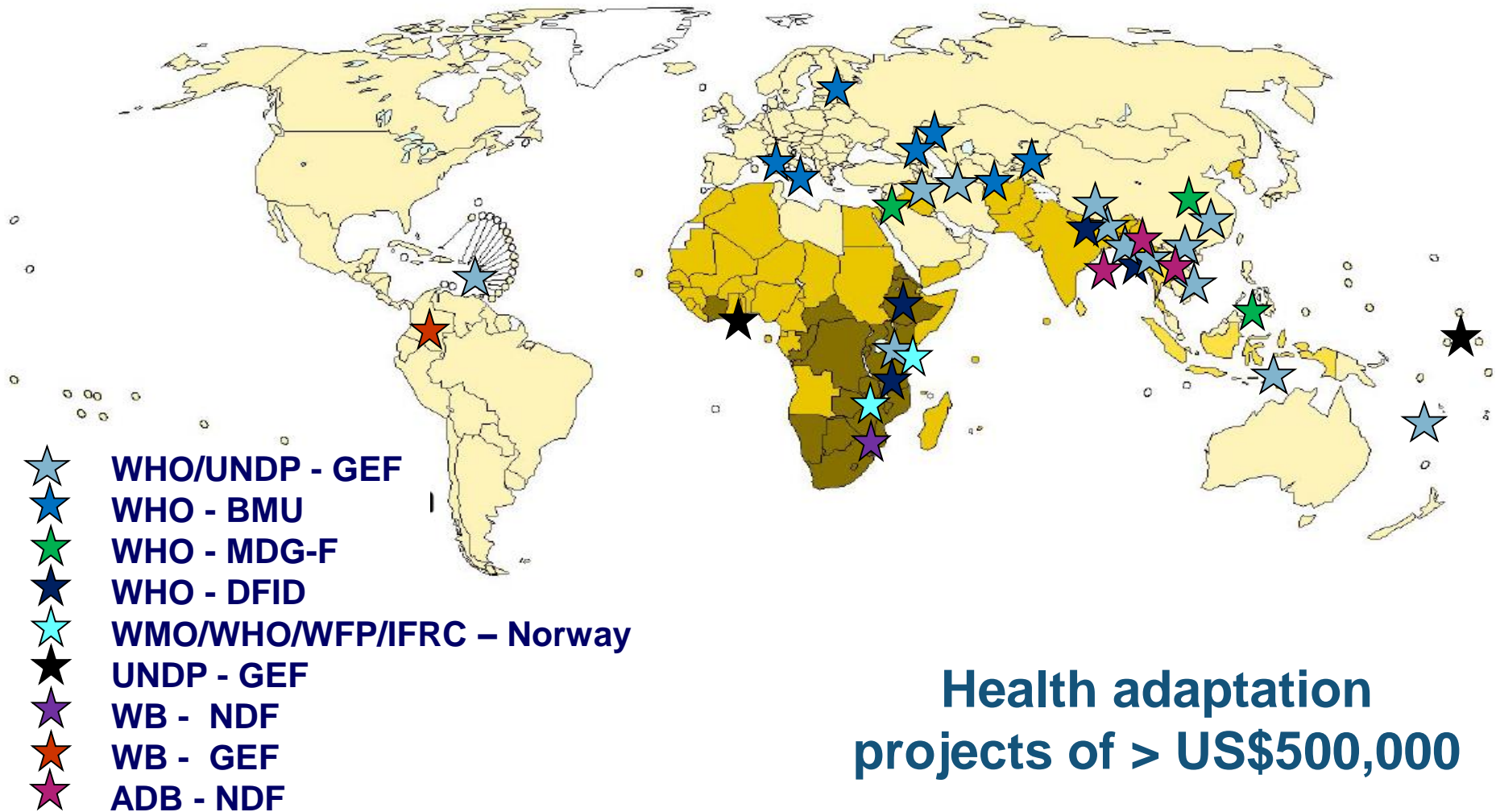


We have proven, cost-effective interventions against every climate-sensitive health impact

All of these can save lives now, and reduce vulnerability to climate change

**Strengthening of preventive public health functions, including climate resilience, is the best protection for the future**

# Expanding range of adaptation projects

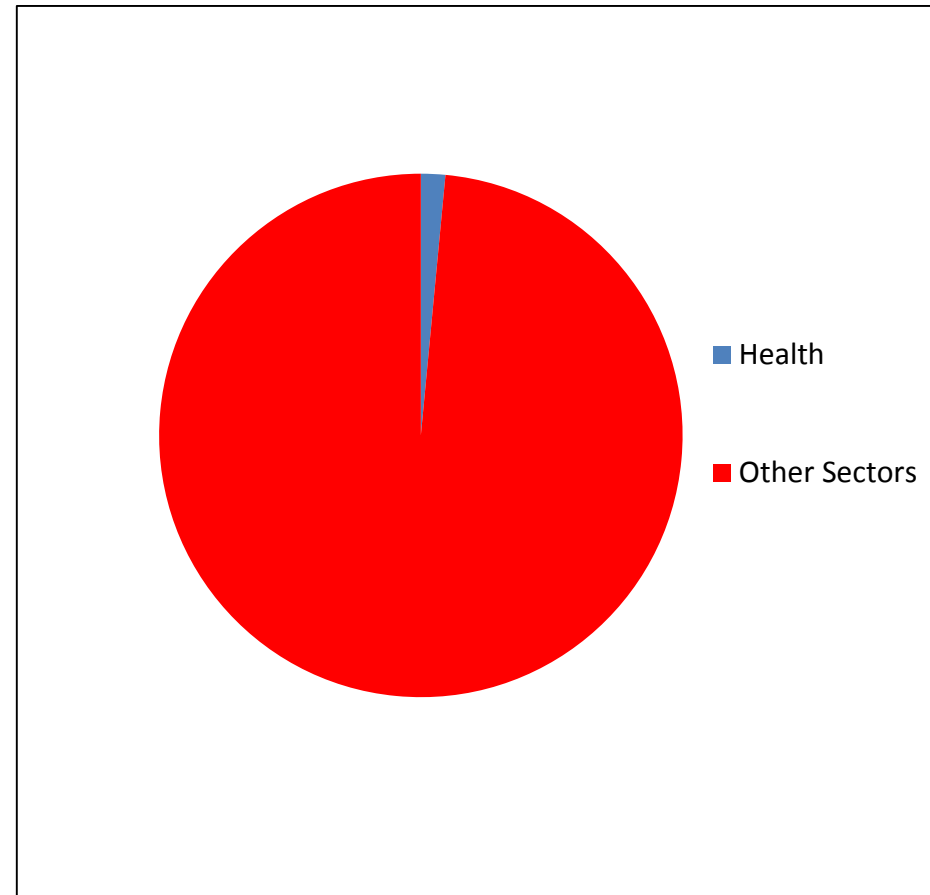


# Status of health response at global level

	High income	Low income
Total number of parties represented by an INDC	53	136
Any mention of health	15.09%	85.29%
Mitigation	3.77%	19.12%
<b>Adaptation</b>	<b>9.43%</b>	<b>64.71%</b>

## Coverage of health in Paris INDCs

(Tcholakov, Wiley et al, for WMO and WHO, 2015)



Climate change adaptation funds allocated to health projects ( up to 2016)

# Status of Response at National Level: Example of Morocco

## GOVERNANCE AND POLICY

Country has identified a national focal point for climate change in the Ministry of Health	✓
Country has a national health adaptation strategy approved by relevant government body	✓
The National Communication submitted to UNFCCC includes health implications of climate change mitigation policies	✓

## HEALTH ADAPTATION IMPLEMENTATION

Country is currently implementing projects or programmes on health adaptation to climate change	✓
Country has implemented actions to build institutional and technical capacities to work on climate change and health	✗
Country has conducted a national assessment of climate change impacts, vulnerability and adaptation for health	✓
Country has climate information included in Integrated Disease Surveillance and Response (IDSR) system, including development of early warning and response systems for climate-sensitive health risks	✗
Country has implemented activities to increase climate resilience of health infrastructure	✓

## FINANCING AND COSTING MECHANISMS

Estimated costs to implement health resilience to climate change included in planned allocations from domestic funds in the last financial biennium	✗
Estimated costs to implement health resilience to climate change included in planned allocations from international funds in the last financial biennium	✗