

# Climate Change and Health: Introduction and Overview

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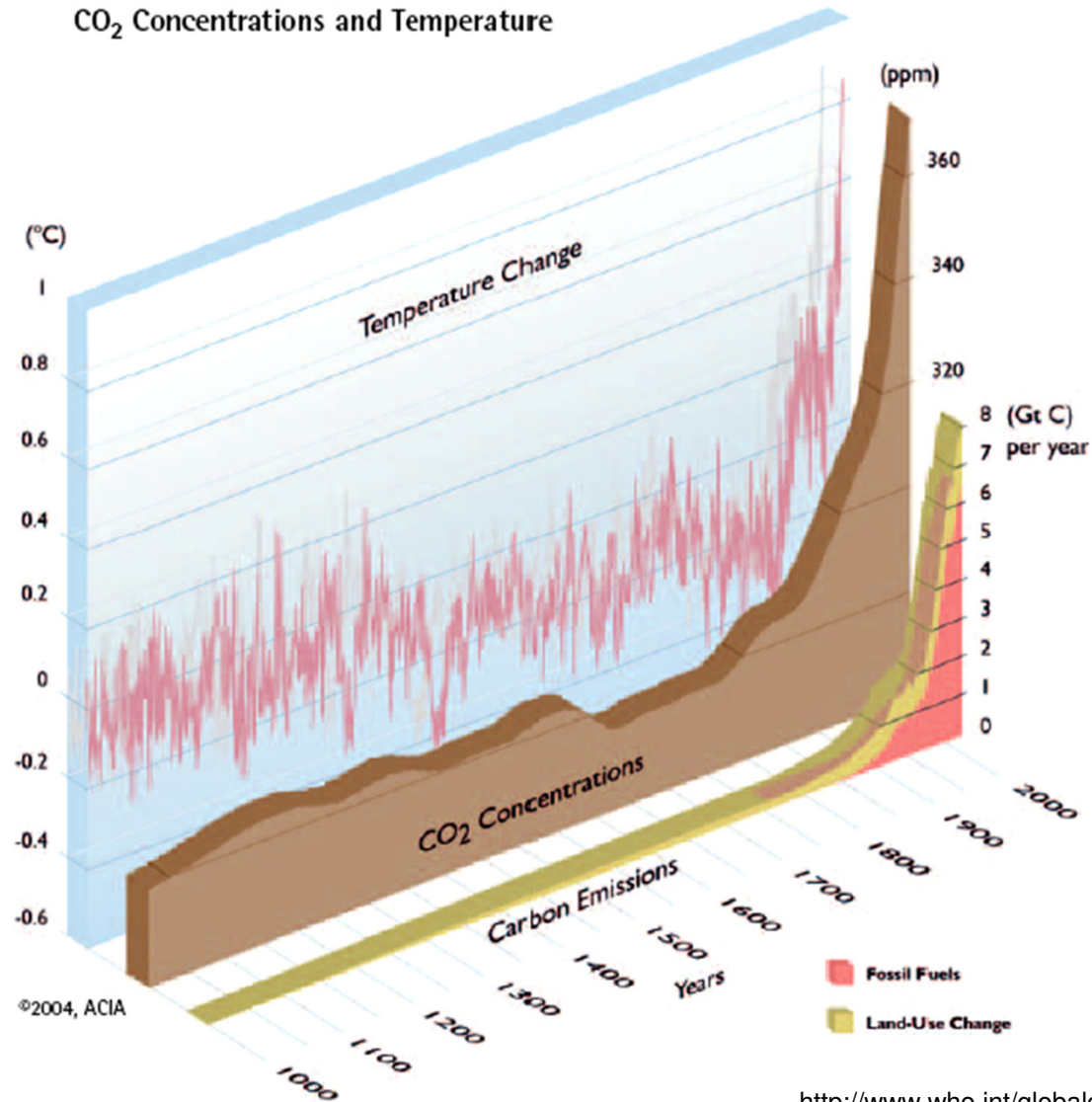


What is climate change?  
What does it mean for health?  
What has been done?  
What still needs to be done?

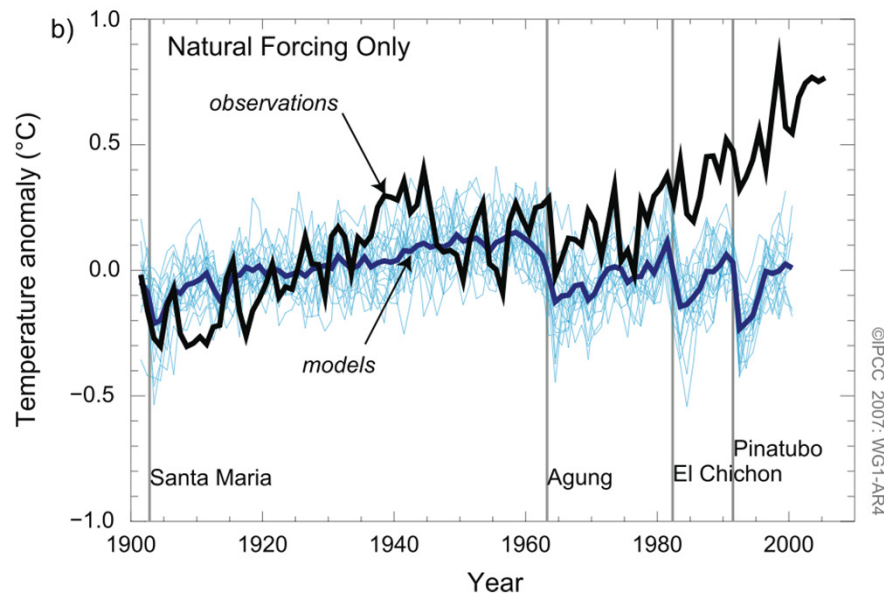
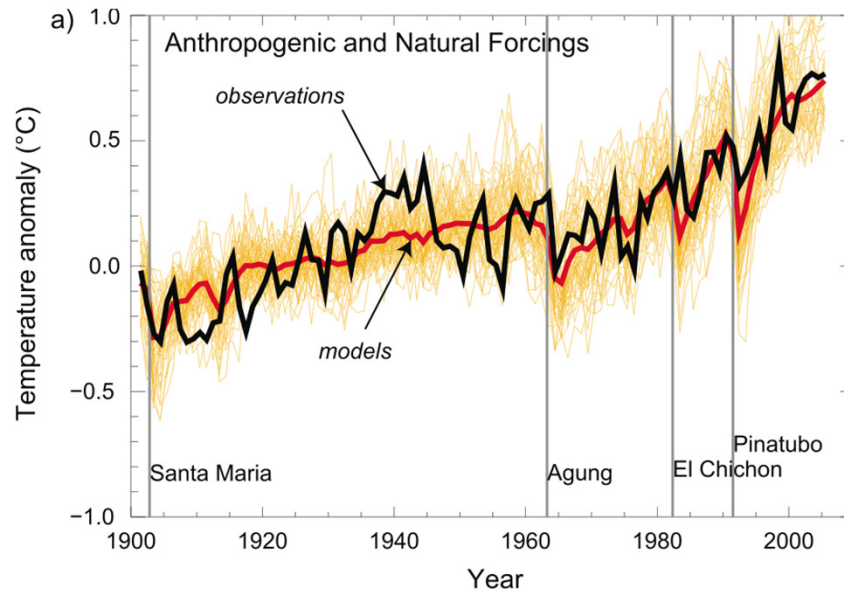


# Temperatures are rising rapidly, following increases in CO<sub>2</sub> emissions and concentrations

1000 Years of Changes in Carbon Emissions,  
CO<sub>2</sub> Concentrations and Temperature

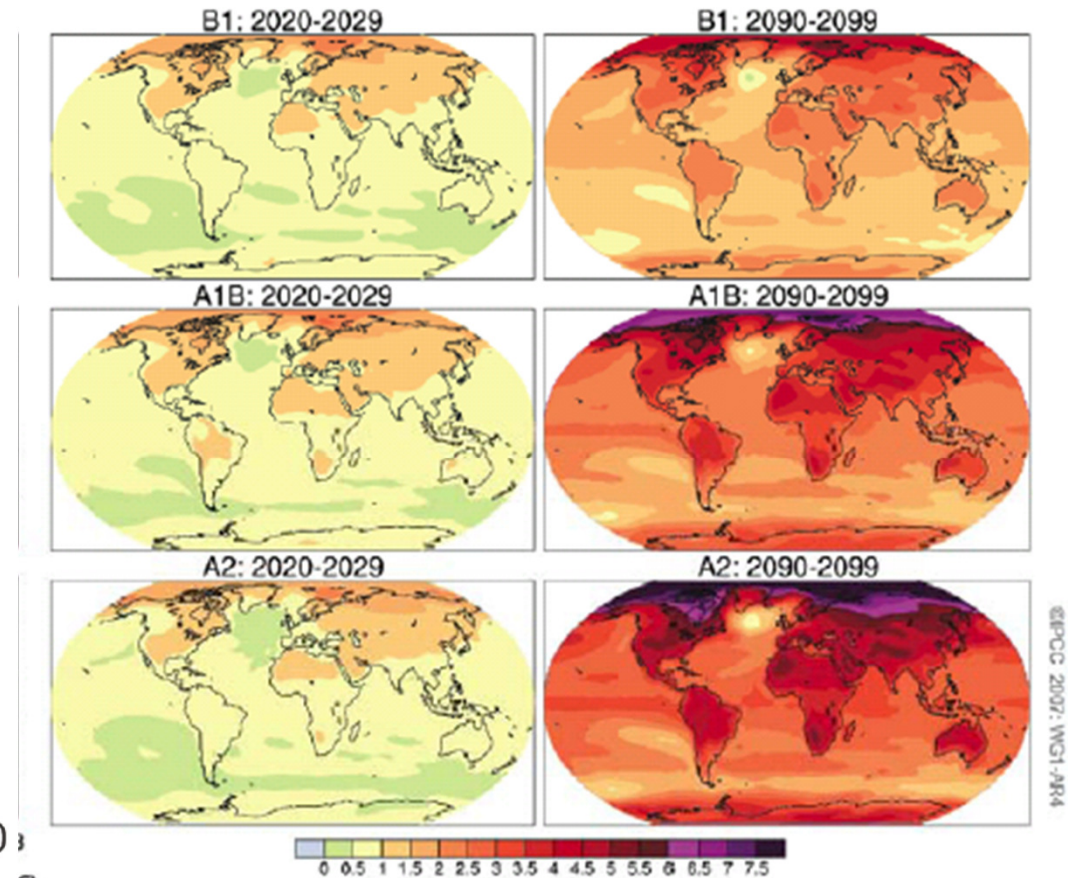
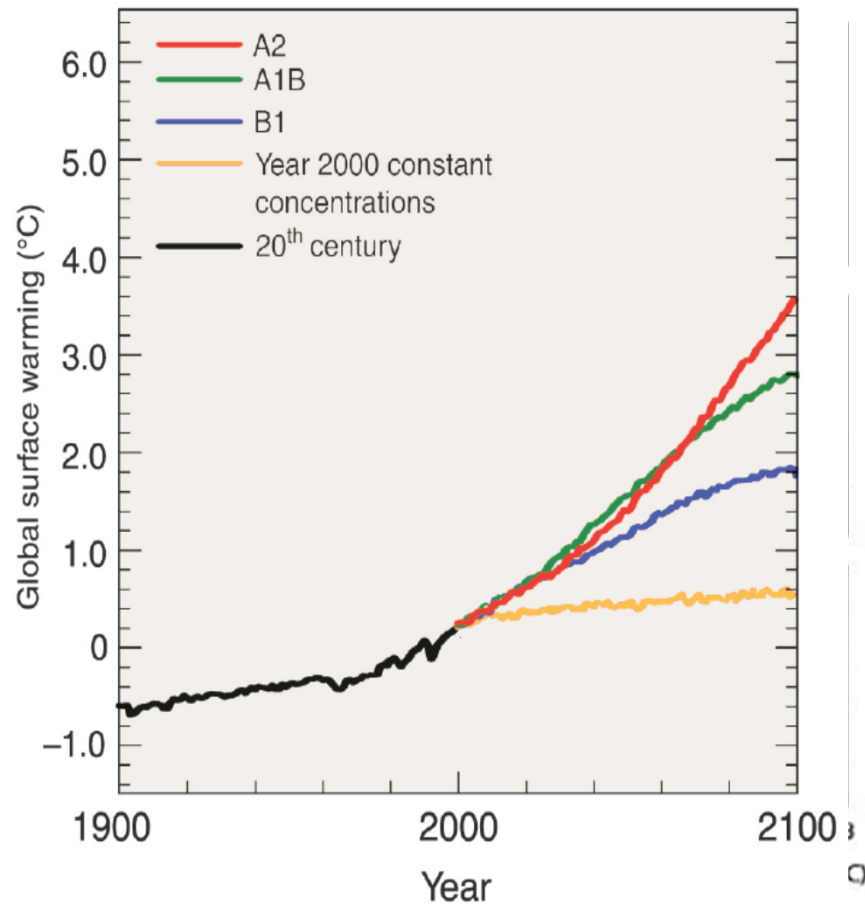


# Temperature increases cannot be explained by natural processes



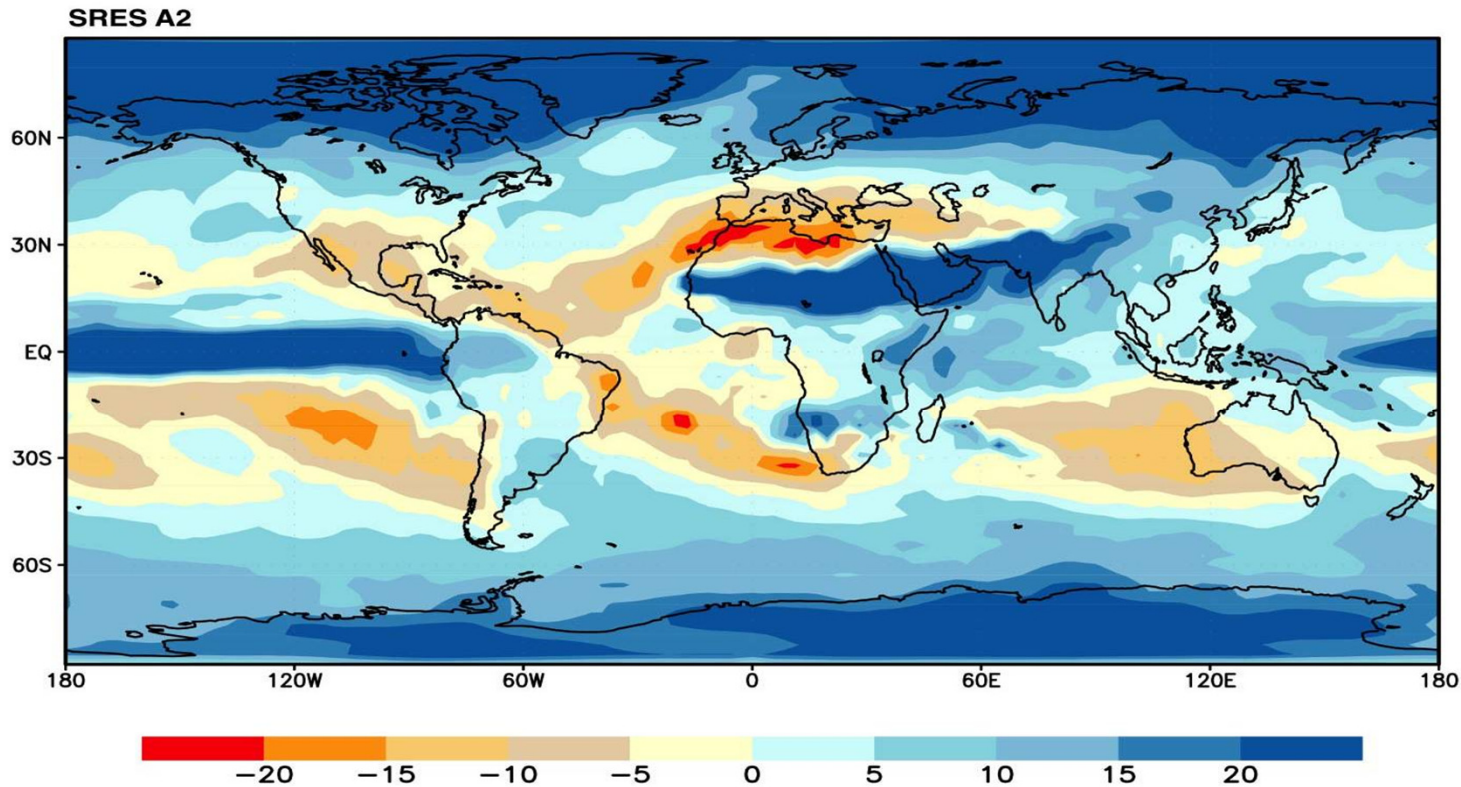
IPCC 2007: 4<sup>th</sup> assessment report

# Temperatures will rise further



IPCC 2007

# Precipitation will also change, and become more extreme



**Annual mean  
precipitation  
change: 2071 to  
2100 compared  
to 1990.**

IPCC, 2007

## Many aspects of weather have changed, and will continue to do so

Phenomenon and Direction of Trend	Likelihood that trend occurred in 20 <sup>th</sup> Century	Likelihood of a Human Contribution to Observed Trend	D	Likelihood of Future Trend Based on Projections for 21 <sup>st</sup> Century
Warmer and fewer cold days and nights over most land areas	Very likely	Likely	*	Virtually certain
Warmer and more frequent hot days and nights over most land areas	Very likely	Likely (nights)	*	Virtually certain
Warm spells / heatwaves: frequency increases over most land areas	Likely	More likely than not		Very likely
Heavy precipitation events: frequency (or proportion of total rainfall from heavy falls) increases over most areas	Likely	More likely than not		Very likely
Area affected by droughts increases	Likely in many regions since 1970s	More likely than not	*	Likely
Intense tropical cyclone activity increases	Likely in many regions since 1970s	More likely than not		Likely
Increased incidence of extreme high sea level	Likely	More likely than not		Likely

# Climate change undermines the environmental determinants of health

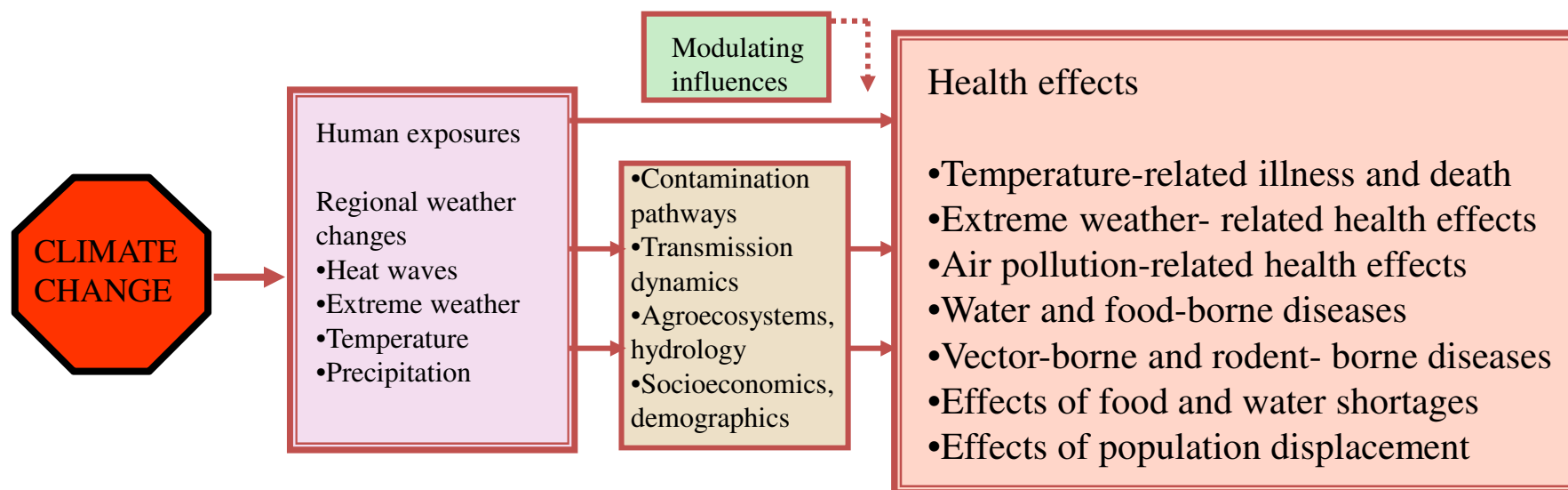
**Without effective responses, climate change will compromise:**

- **Water quality and quantity:** Contributing to a doubling of people living in water-stressed basins by 2050.
- **Food security:** In some African countries, yields from rain-fed agriculture may halve by 2020.
- **Control of infectious disease:** Increasing population at risk of malaria in Africa by 170 million by 2030, and at risk of dengue by 2 billion by 2080s.
- **Protection from disasters:** Increasing exposure to coastal flooding by a factor of 10, and land area in extreme drought by a factor of 10-30.



# Climate change connects to many health outcomes

Some expected impacts will be beneficial but most will be adverse. Expectations are mainly for changes in frequency or severity of familiar health risks



Based on Patz et al, 2000

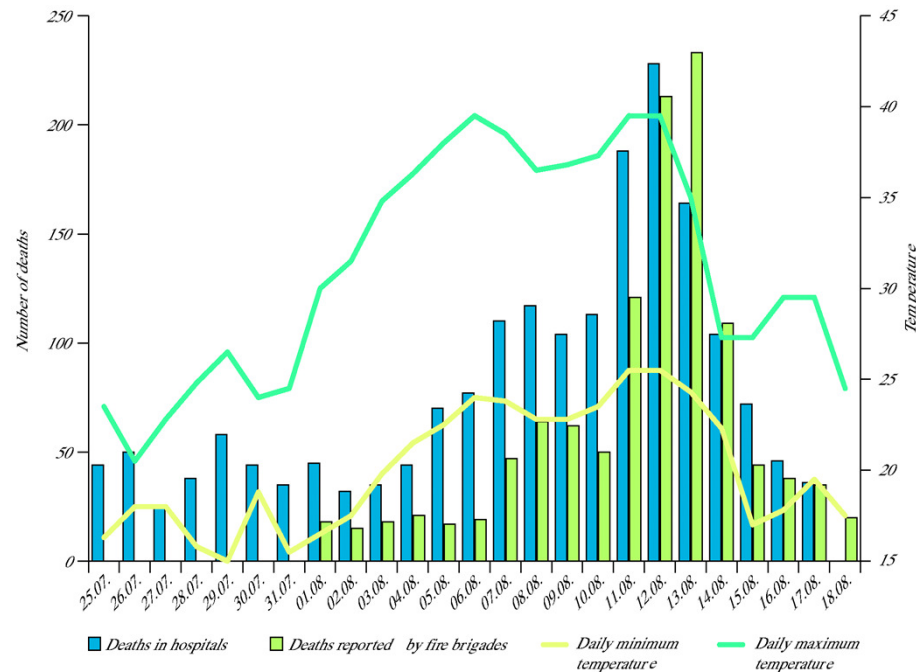
# Some of the largest disease burdens are climate-sensitive

## Each year:

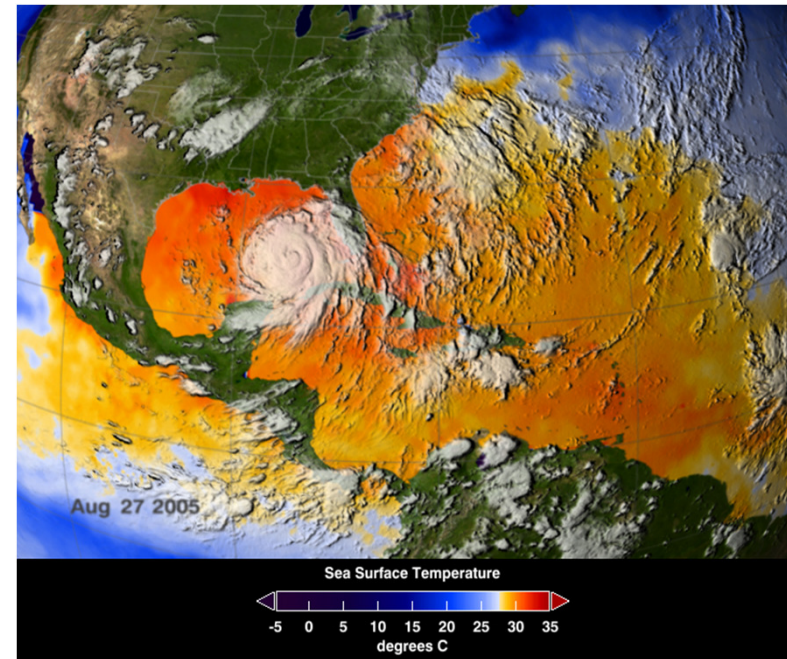
- Undernutrition kills 3.5 million.
- Diarrhea kills 2.2 million.
- Malaria kills 900,000.
- Extreme weather events kill 60,000.
- WHO estimates that the climate change that has occurred since the 1970s already kills over 140,000 per year.



# Weather-related disasters kill thousands in rich and poor countries

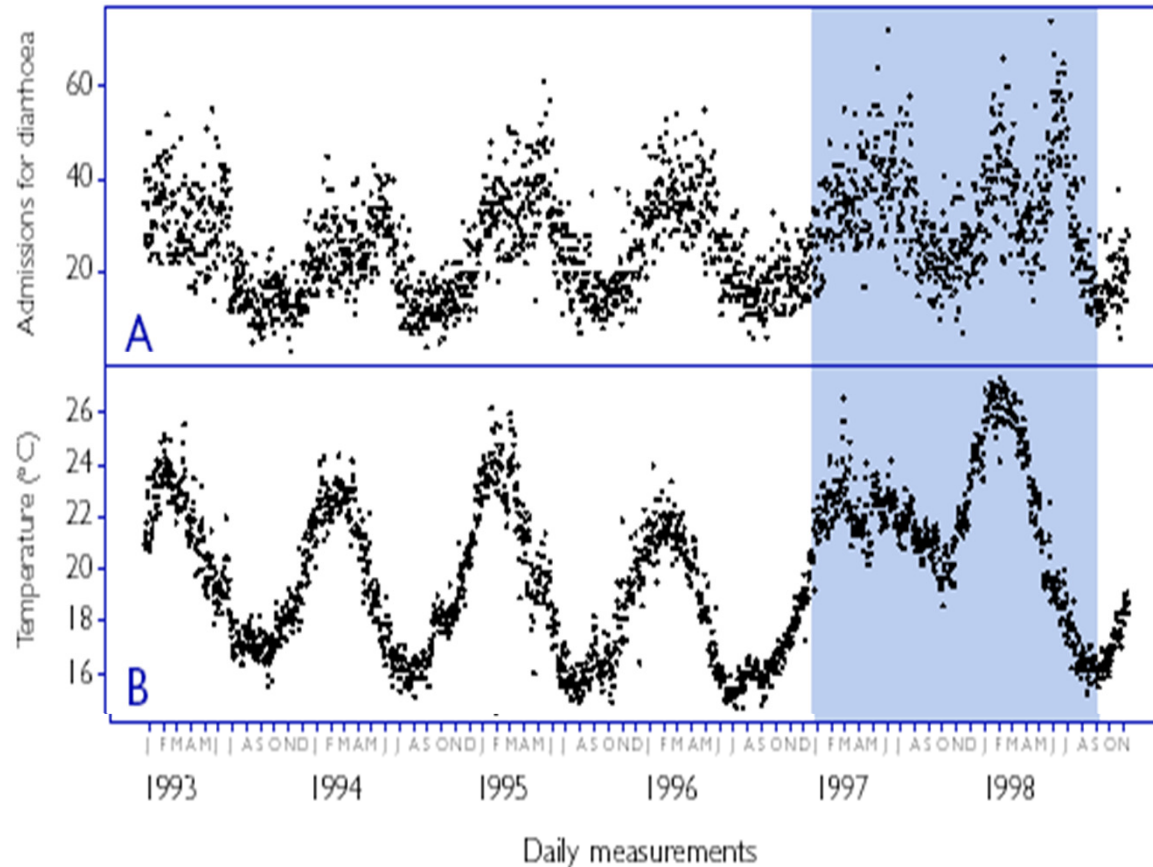


Deaths During Summer Heatwave. Paris Funeral Services (2003)



Hurricane Katrina, 2005

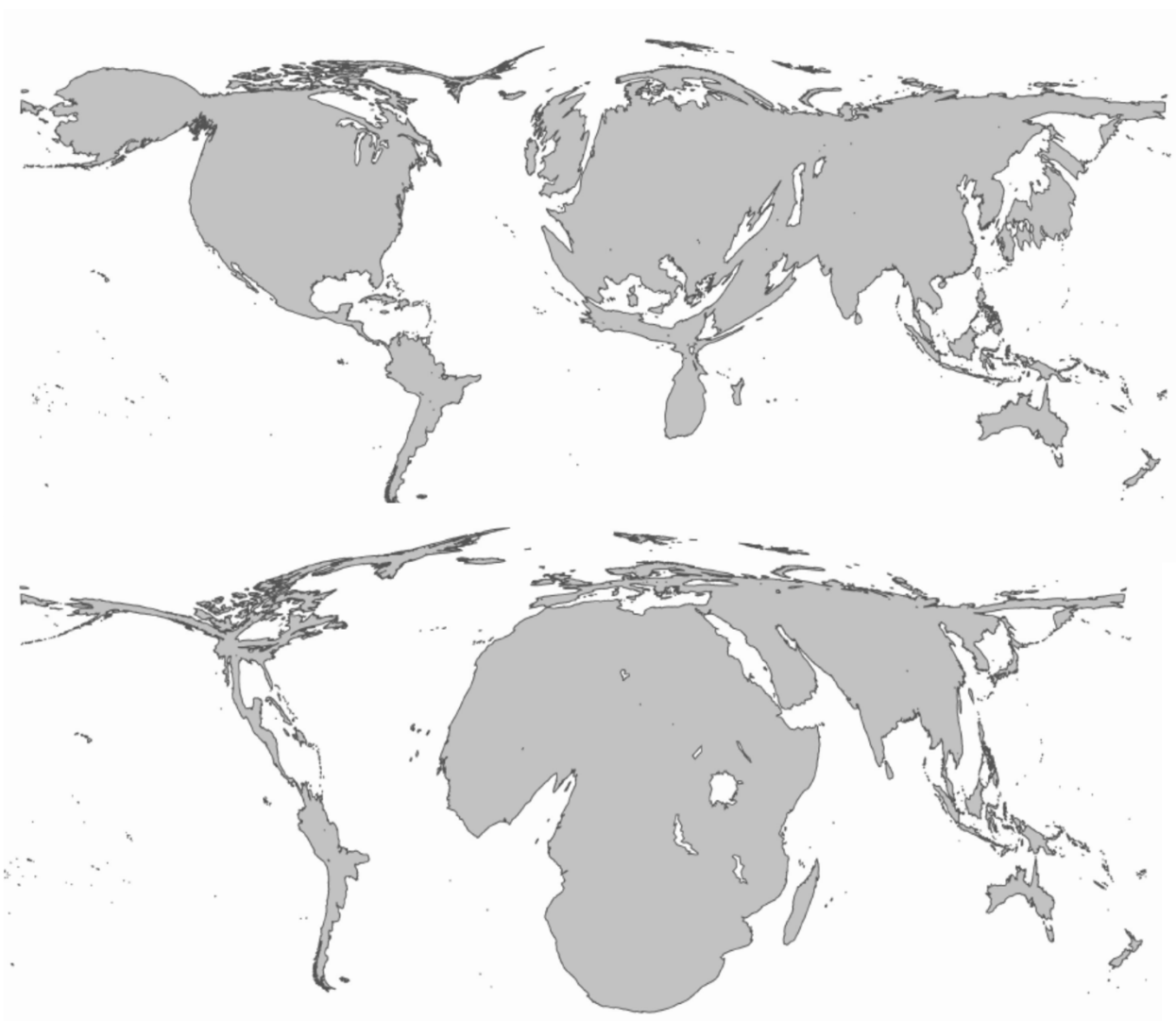
# Increases in diseases of poverty may be even more important



**Diarrhea is related to temperature and precipitation. In Lima, Peru, diarrhea increased 8% for every 1°C temperature increase.**

(Checkley et al, Lancet, 2000)

# Health impacts are unfairly distributed



**Cumulative  
emissions of  
greenhouse  
gases, to 2002**

**WHO estimates  
of *per capita*  
mortality from  
climate change,  
2000**

Patz et al., 2007; WHO, 2009

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

What has been done?

# International community has given clear direction

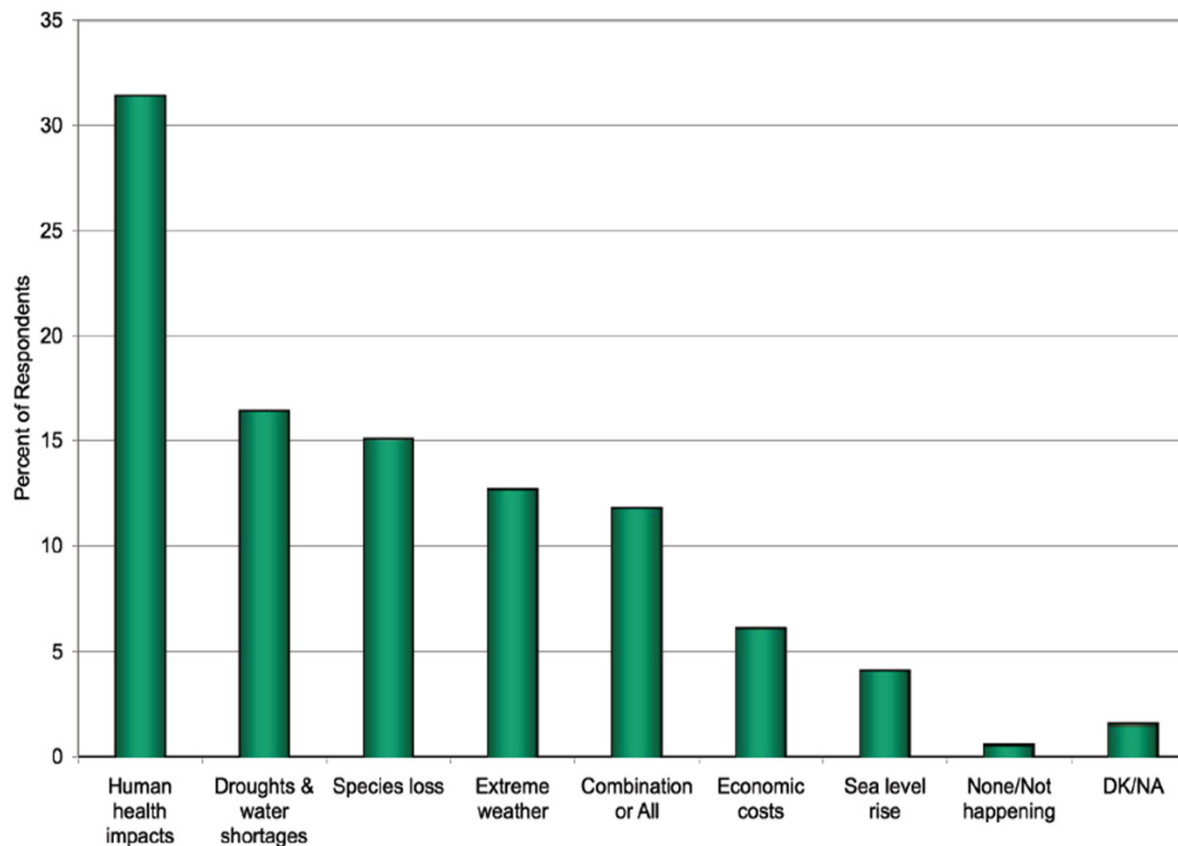
- **UN Framework Convention on Climate Change (UNFCCC)**, Article 1, paragraph (1) states need to minimize adverse effects on "*natural and managed ecosystems or on the operation of socio-economic systems or on **human health and welfare.***"
- World Health Assembly Resolution WHA/61.R19, and Executive Board Resolution EB124.R5, request WHO to ***develop capacity to assess the risks from climate change for human health and to implement effective response measures***, and support countries through ***Awareness raising, Partnerships, Evidence, and health system strengthening.***



# Awareness raising: High public concern over climate risks to health

Globescan poll in 30 countries (UNDP 2007):

“Now I would like to ask you some questions about climate change, which is sometimes referred to as global warming or the greenhouse effect. Which ONE of the following possible impacts most concerns you personally, if any?”





# Awareness raising: Governments request international support

- 193 countries endorse WHA resolution calling for action to protect health from climate change.
- 95% (39/41) of National Adaptation Programmes of Action (NAPAs) from least developed countries identify health as a priority sector affected by climate change.
- 73% (30/41) of the NAPAs have included health interventions within adaptation needs.



# Awareness raising: WHO Achievements

- **Among health leaders:** WHA resolution, backed by regional Ministerial declarations and frameworks for action.
- **Among health and meteorological professionals:** Workshop series, covering over 50 countries across all WHO regions.
- **Among climate leaders:** Representation of health in the UNFCCC, formation of "Friends of Public Health" network of negotiators and NGOs.
- **Among the general public:** World Health Day 2008 on "Protecting health from climate change, supported by advocacy products and key messages.

# Partnerships: UN system working together, and with others

- UNFCCC provides international framework for climate action, with health as a key justification.
- UNFCCC operational mechanisms include health; Nairobi Work Programme on Adaptation, Social Dimensions of Climate Change.
- "One-UN" country teams implementing health adaptation projects.
- Establishment of networks of health NGOs campaigning on climate change.

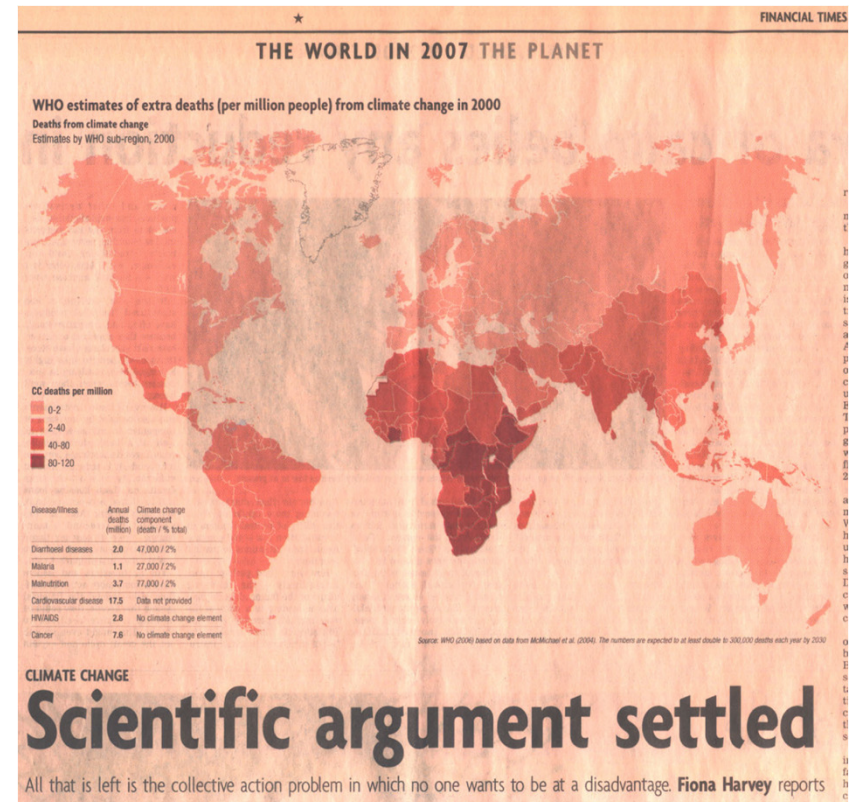


# Partnerships: WHO Achievements

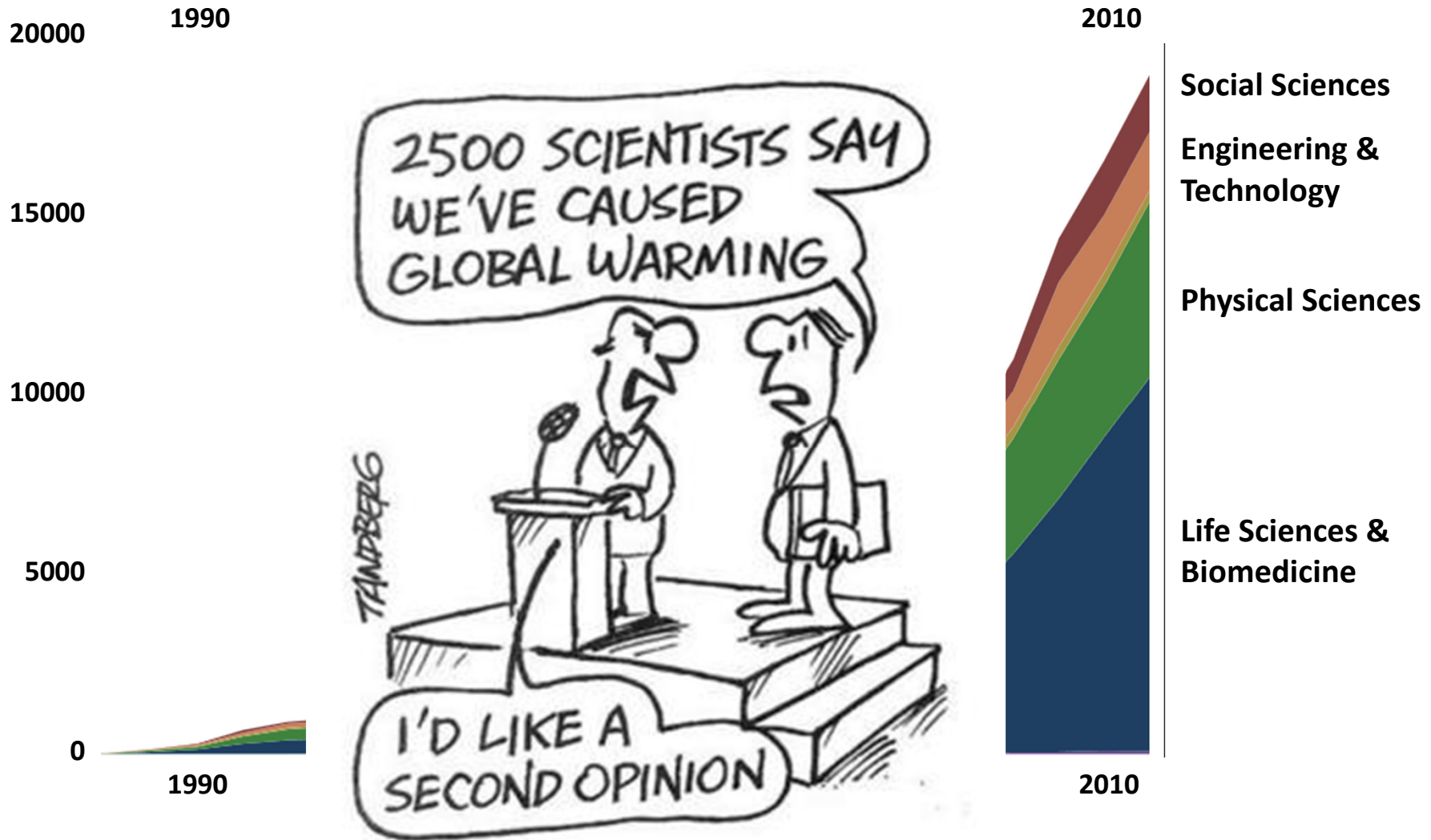
- **Awareness raising partnerships:** Establishment of "Friends of Public Health" network, coordination with major health NGOs.
- **Policy partnerships:** Representation of health in UNFCCC negotiations and support mechanisms; co-convenor of UN task team on Social Dimensions of Climate Change.
- **Scientific and technical partnerships:** Representing health on IPCC, technical guidance with WMO and UNEP.
- **Operational partnerships for health adaptation:** Projects implemented through UN country teams; with UNDP and GEF; with bilateral aid agencies.

# Evidence: Definition of health risks and responses

- Over 2000 papers on health and climate change in peer-reviewed journals.
- Research covering risks, costs, cobenefits of mitigation, resource requirements.
- Evaluations of health risks in three IPCC assessment reports.



# Number of Articles Published About Climate Change, 1987-2012



## Evidence: Benefits of healthy mitigation measures have already been documented

- Sustainable urban transport – could cut heart disease and stroke by up to 20%.
- Improved stoves could save 2 million lives over 10 years in India alone, and reduce warming from black carbon.
- Health benefits from actions to reduce greenhouse gas emissions could substantially offset mitigation costs.



*"while the climatic effects of mitigation measures are long-term and dispersed throughout the world, the health benefits are immediate and local"* – WHO director-General Margaret Chan, 2009

# Evidence: WHO achievements

- Well over 50 books, reports and papers on climate change - health links.
- Guidance and systematic review of research output vs. requests of countries.
- Quantitative assessment of global health impacts of climate change.
- Technical guidance on vulnerability and adaptation assessment, and specific risks.
- Comprehensive review of health implications of mitigation policies across major sectors.





# Health system strengthening: Identification of principles for health adaptation



- Proven, cost-effective interventions against every climate-sensitive health impact.
- Clean water and sanitation, vector control, disaster risk reduction, early warnings, humanitarian aid...
- All of these are "win-wins": saving lives now, and reducing vulnerability to climate change.
- Adaptation to climate change is part of a preventive approach to public health – not a distraction.

# Health system strengthening: Documentation of country needs

- Less than 30% of least developed countries have adequate health vulnerability assessments and health adaptation plans.
- Only 11% of proposed adaptation projects, and only 3% of requested funds, are for health protection.
- Health adaptation projects comprise just 1% of international climate finance, and less than 0.5% of estimated health damages from climate change.



# Health system strengthening: Estimation of required resources for health adaptation

Estimated global annual cost of climate change adaptation (US\$ billion):

Sector	World Bank (2005 prices)	UNFCCC (2007 prices)
Period or time point	2010-2050	2030
<b>Health sector</b>	<b>2.0</b>	<b>3.8 - 4.4</b>
Water supply	13.7	9.0 - 11.0
Agriculture, forestry & fisheries	7.6	14.0
Extreme weather	6.7	-
<b>Total health-related</b>	<b>30.0</b>	<b>26.8 - 29.4</b>
<b>Total (all)</b>	<b>89.6</b>	<b>56.8 - 193.4</b>
<b>% health-related</b>	<b>33.4%</b>	<b>13.8 - 47.1%</b>

All estimates derived by applying unit costs to WHO estimates of health impacts of climate change

# Health system strengthening: Definition of an essential public health package

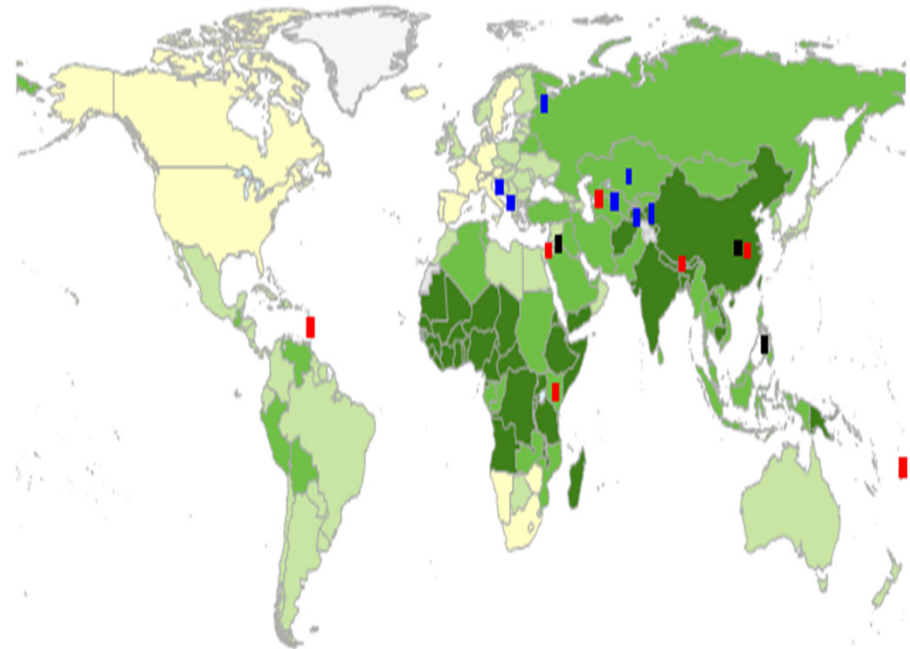
Most health risks in next 20-30 years could be averted through:

- Comprehensive assessments of climate risks to health and health systems
- Integrated environment and health surveillance
- Delivery of preventive and curative interventions for identified climate-sensitive public health concerns
- Preparedness and response to the public health consequences of extreme weather events
- Applied research
- Strengthening of human and institutional capacities and inter-sectoral coordination



# Health system strengthening: WHO Achievements

- 17 major projects on health adaptation to climate change, in 14 countries, in all WHO regions.
- Assessments of health vulnerability to climate change in over 30 countries.
- Review of country requirements, clearinghouse of current adaptation projects.
- Guidance and pilot projects on green and safe health services.



What still needs to be done?

# Goal: Policy makers and general public recognize health as a practical and positive argument for climate policy

Requires: More effective engagement of health actors and messages in climate policy debate.

WHO contribution:

- Production of targeted awareness-raising products for specific audiences.
- Mobilization of health networks on evidence-based advocacy messages.
- Sustained engagement with health and climate policy-makers.



# Goal: Coherent, evidence-based health and climate policy, matching demands of Governments and the public

Requires: Sustained partnerships to design and implement climate and health policy, and health access to financial support.

WHO contribution:

- Articulating health opportunities and resource requirements within the UN system response.
- Convening operational partnerships of health and climate actors at national, regional and global levels.
- Establishing and maintaining networks to guide, implement and monitor applied research, in response to country needs.





# Goal: Policy-relevant evidence on health adaptation, and healthy mitigation policy, accessible to decision-makers

Requires: Greater emphasis on applied research, and on knowledge management for practical application.

WHO contribution:

- Systematic review and guidance of research output to match the needs of decision-makers.
- Specific evidence products, on the benefits and costs of health adaptation interventions, and on health promoting mitigation.
- Translation of research into practical guidance for health protection from climate change, and health-enhancing mitigation policy.



# Goal: Populations protected from climate change by essential package of public health interventions

Requires: Technical guidance, institutional collaboration mechanisms, and approximately US\$1 billion/year financial support.

WHO contribution:

- Country, regional, and global presence to convene and support intersectoral health and climate policy.
- Technical guidance, policy and capacity building support, building on established capacity in managing climate-sensitive disease risks.
- Project design and management, building on existing portfolio of climate change and health projects.



# Conclusions

- Governments, the health community and the general public, agree on the importance of health within the response to climate change.
- A package of health protection from climate change is feasible, comparatively cheap, and likely to be effective.
- Well-designed mitigation measures could bring major health gains, giving local and immediate repayment on investments.
- Countries need additional policy, technical, capacity building, and (in many cases) financial support to protect and promote health.
- WHO has a unique contribution to make to achieve these goals.

# Objectives and Goals of the Training Sessions

## Specific objectives are to:

- Train health professionals to become trainers on climate change related health impacts
- Enhance the knowledge of trainees on the principles and basic concepts of global warming and climate change with emphasis on vulnerability of SIDS
- Develop the capacity of trainees to integrate climate change health risks and effects in the health sector projects and programmes.
- Reinforce the skill, competency and ability of trainees to become themselves trainers of other health professionals on the basic concepts of climate change and its health impacts, as well as how to programme mitigation and adaptation in the health sector.

# Objectives and Goals of the Training Sessions

**Upon completion of the course participants will:**

- Understand the principles and basic concepts of global warming and climate change
- Understand how climate change can impact human health and know the major health effects from climate change
- Become aware of the special vulnerability of public health in Mauritius and the subregion
- Better analyze the health sectors' vulnerability to climate change effects
- Have an improved understanding of the epidemiologic methods used to analyze associations between climate change and health outcomes

# Objectives and Goals of the Training Sessions

**Upon completion of the course participants will (cont.):**

- Develop skills in critical thinking for making management decisions to reduce the potential adverse impacts of climate change on health
- Incorporate the health dimensions of climate change in the national work plans
- Facilitate the training of other health professionals and other staff on the basic concepts of climate change and its effects as well as how to programme mitigation and adaptation in the health sector including emergency response (disasters, disease spread etc.)

# Objectives and Goals of the Training Sessions

## Results of sessions should:

- More readily incorporate climate change risks into health policies, plans and programmes in Mauritius
- Strengthen national capacities to develop and implement strategies and plans on mitigation and adaptation to climate change
- Encourage promotion of research on health effects of climate change

## Discussion:

Questions? Thoughts? Concerns? Suggestions?





# Acknowledgements

- Based in part on lectures developed by the author for courses taught at the University of Michigan, Ann Arbor, MI, USA.
- Some material was taken or modified from the WHO “Training course for public health professionals on protecting our health from climate change (2009).”
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