

climate change and health in least developed countries



CLACC

IIED, LSHTM, etc.

Background

- ❑ Least Developed Countries currently experience a high burden of **climate-sensitive diseases** indicating that their current **capacity** to address the health impacts of climate change is low.
- ❑ Climate change will affect health via a range of mechanisms
 - changes in vector-borne disease transmission,
 - increased risk of disasters (floods, landslides, droughts)
 - increased malnutrition due to declining food yields,
 - potentially increases in diarrhoeal diseases from contamination of water supplies.

Key findings 1

- ❑ Awareness of the potential impact of climate change on human health is generally low within “health sector”.
- ❑ Beyond the health sector, awareness of climate change varies between countries, with some countries like Bangladesh having high levels of awareness across the environmental sectors and in civil society.
- ❑ Very few national or local assessments on the impacts of climate change on key health determinants have been undertaken (e.g. food security, access to water, flood risk).
 - Such assessments would be more informative to health decision makers.

Key findings 2

- ❑ There is limited capacity of the health sector to address long term problems as it is primarily reactive, and little capacity for prevention.
- ❑ The current barriers to addressing environmental health problems need to be addressed before climate change can be considered.
 - There is need for the Ministry of Health to integrate climate risk management and adaptation measures into the national health policies and strategic plans to reduce current and future vulnerability to climate variability.

Impacts of climate

- ❑ Malaria, kala azar, and diarrhoeal diseases have strong seasonal and inter-annual patterns that can be related to climate variability.
- ❑ Differences in disease patterns in different districts within the same country can also be explained, in part, by different climate exposures (e.g. Sudan, Mozambique).

Climate and weather impacts on health – impacts on different scales

Weather exposure	Examples of CLACC studies
Extreme weather	Zambia, Nepal
Extreme weather – disaster	Mozambique floods
Seasonal extremes	Zambia
Interannual variability	Sudan, Uganda (ENSO)
Decadal or longer variability	Mali, Mauritania (Sahelian drought)

Impacts of climate II

- ▣ The importance of the monsoon (Asian, West African) in the burden of climate-sensitive diseases.

Impacts on health

- The impacts of extreme weather events are often underestimated, and not well reported
 - the impact in terms of deaths, injuries, and loss of health and other infrastructure is significant.
- Current limited capacity for short-term and long-term preparedness strategies
 - scope to provide effective ways to mainstream climate change responses into national and local policies and planning.

Barriers to research

- Lack of health data was a major limiting factor in undertaking epidemiological studies and other research
 - Time series data are often only available for a few years, due to changes in reporting systems over time, and loss of old data
 - Data not available in a digital format. Changes in the source populations (population growth, migration) over time also make interpretation of trends very difficult.
 - Data not available at the appropriate spatial resolution

Research recommendations

- ❑ There is need to use robust climate-health models or methodologies for quantifying the relationships between climate variability and disease prevalence at local and national levels.
- ❑ Community-based vulnerability and adaptation assessments of the health impacts of droughts and floods.
- ❑ Observational (qualitative and quantitative) studies on the influence of climate variability and other (non-climate) health determinants on morbidity and mortality rates of malaria, and respiratory and diarrhoeal diseases (including dysentery and cholera).

Case studies: climate variability

Country	Study area	Topic of case study
Bangladesh,	Chittagong Hill Tracts & Satkhira District	Highland malaria in CHT
Bhutan	All Bhutan	Adaptation to climate change and health
Nepal	Kathmandu	The effect of extreme weather on hospital cases of typhoid fever
Benin	Cotonou	Climate and malaria
Mauritania	Five homogenous regions within Mauritania	Climate variability and malnutrition and micro-nutrient deficiency.
Mali	Sikasso (southernmost region)	Effects of climate on malaria
Tanzania	Coastal areas including Dar es Salaam, Tanga, and Morogoro regions	Effect of climate on malaria
Uganda	Kabale District	Climate and other determinants of highland malaria
Sudan	Three districts: Alrahad, Atbra, Blue Nile	Climate effects on desert fringe malaria
Mozambique	All districts	Flooding and health
Zambia	Chadiza District	Effects of climate and extreme weather on malaria and diarrhoeal diseases
Malawi	Blantyre and Chikwawa districts	Climate effects on malaria and cholera

Case studies: CLACC

	Under 5 mortality rate (per 1000)		Coverage	
			Water supply	Sanitation
Mozambique	158	Urban	76	51
		Rural	24	14
Zambia	182	Urban	90	68
		Rural	36	32
Nepal	82	Urban	93	68
		Rural	82	20

Source: UNICEF, 2006

Mozambique

- ❑ Mozambique is perhaps the most flood-prone country in Africa
- ❑ 2000 flood event(s)
 - Caused by heavy rains, followed by 2 cyclones
 - flooded area of 30,000 square km
- ❑ Immediate impacts
 - 700 people died in the floods, mostly by drowning.
 - Approx 45,000 people were rescued
 - Additional 500,000 people were forced to leave their homes,
 - 140,000 ha of fields under crops were lost.

Damage to infrastructure

□ Gaza Province

- >300 (out of 800) rural water points (hand pumps on wells or boreholes),
- > 40,000 pit latrines were destroyed

□ In urban areas

- cities of Chókwè and Xai-xai flooded to between 2 and 4 m depth causing 3,000 septic tanks to overflow,
- piped water supplies damaged in eight smaller towns

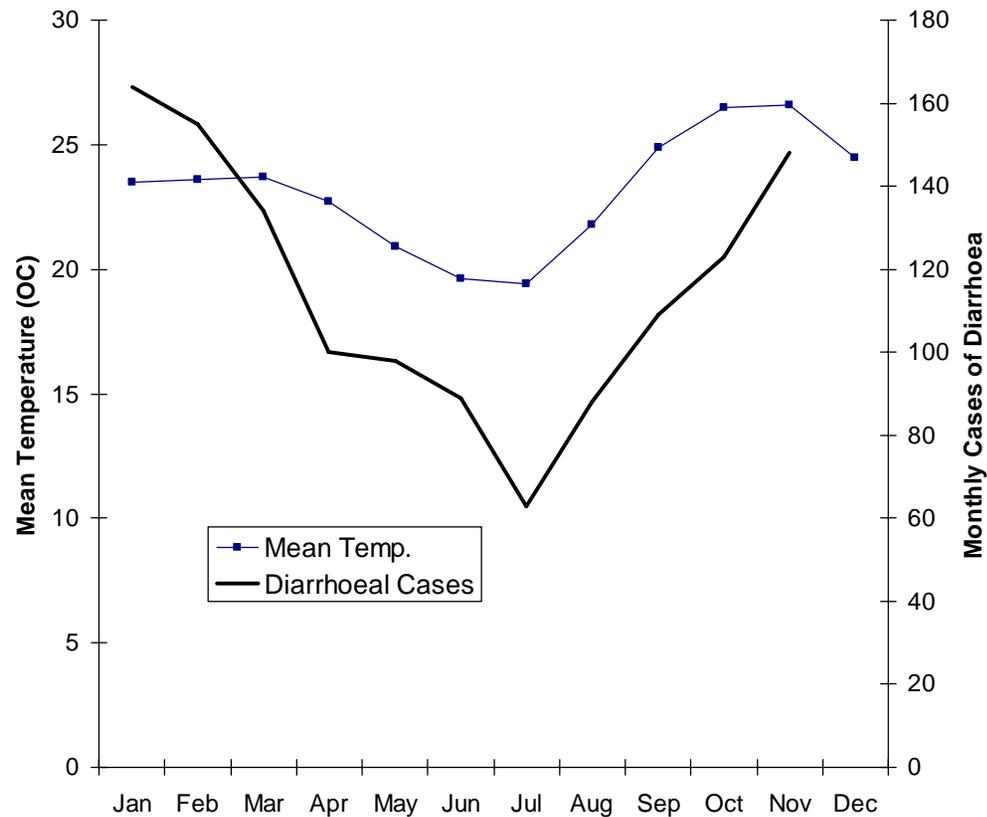


Zambia

- ❑ Increasing deprivation and disease (mainly HIV/AIDS).
- ❑ There are wide regional and rural/urban disparities.
- ❑ Child deaths are caused mainly by preventable environmental diseases.
- ❑ Zambia has experienced declining rainfall for each of the last 30 years, with a recurrent drought pattern in the last two decades.

Low Rainfall (Droughts)	1972/73	1981/82	1983/84	1991/92	1993/94	1994/95	1997/98	2000/01	2001/02	2004/05
High Rainfall (Floods)	1973/74	1977/78	1980/81	1988/89	-	-	1996/97	-	-	2005/06

Monthly Variation in Cases of Diarrhoea with Mean Temperature in Shampande Compound, Choma, Zambia



Health effects of heavy rainfall

Date	Outcome
16/03/06	<p>Wind and heavy rains destroy houses in Siavonga (Southern province) and about 6 families left homeless.</p> <p>Mpika (Northern province) experiences severe water shortage due to breakdown of water supply.</p>
20/03/06	<p>Flooding destroys crops in Nangambela (Western province) and a bridge in Solwezi (North-western province) is washed away causing certain areas inaccessible.</p> <p>Ngwesi river in Kazungula district floods, destroying crops and displacing over 500 families. The District Commissioner has summoned the District Disaster Management and Mitigation Committee for a report to the Provincial Minister, who should contact the Office of the Vice President for relief aid.</p>
21/03/06	<p>Food relief required in Chisomo valley (Serenje district) but the area is inaccessible due to the collapse of a bridge at Fukwe river. This year's cultivated crops have been damaged by floods of Lukusashi river.</p> <p>Floods destroy crops in Bweengwa and Banakaila areas of Monze district.</p>

Zambia - Summary of outcomes

- ❑ Deaths caused by drowning, lightning
- ❑ Outbreaks of infectious plant, zoonotic and human diseases.
- ❑ Destruction of agricultural crops resulting in food shortages and potential malnutrition.
- ❑ Displacement of populations: - a condition that might bring about anxiety, depression, overcrowding and the likelihood of infectious disease outbreaks among the affected persons.
- ❑ Damage of road, housing, power and water supply infrastructure: - conditions that can disrupt the accessibility and delivery of health services, and relief assistance or cause ill health in the affected communities.

Recommendations for adaptation

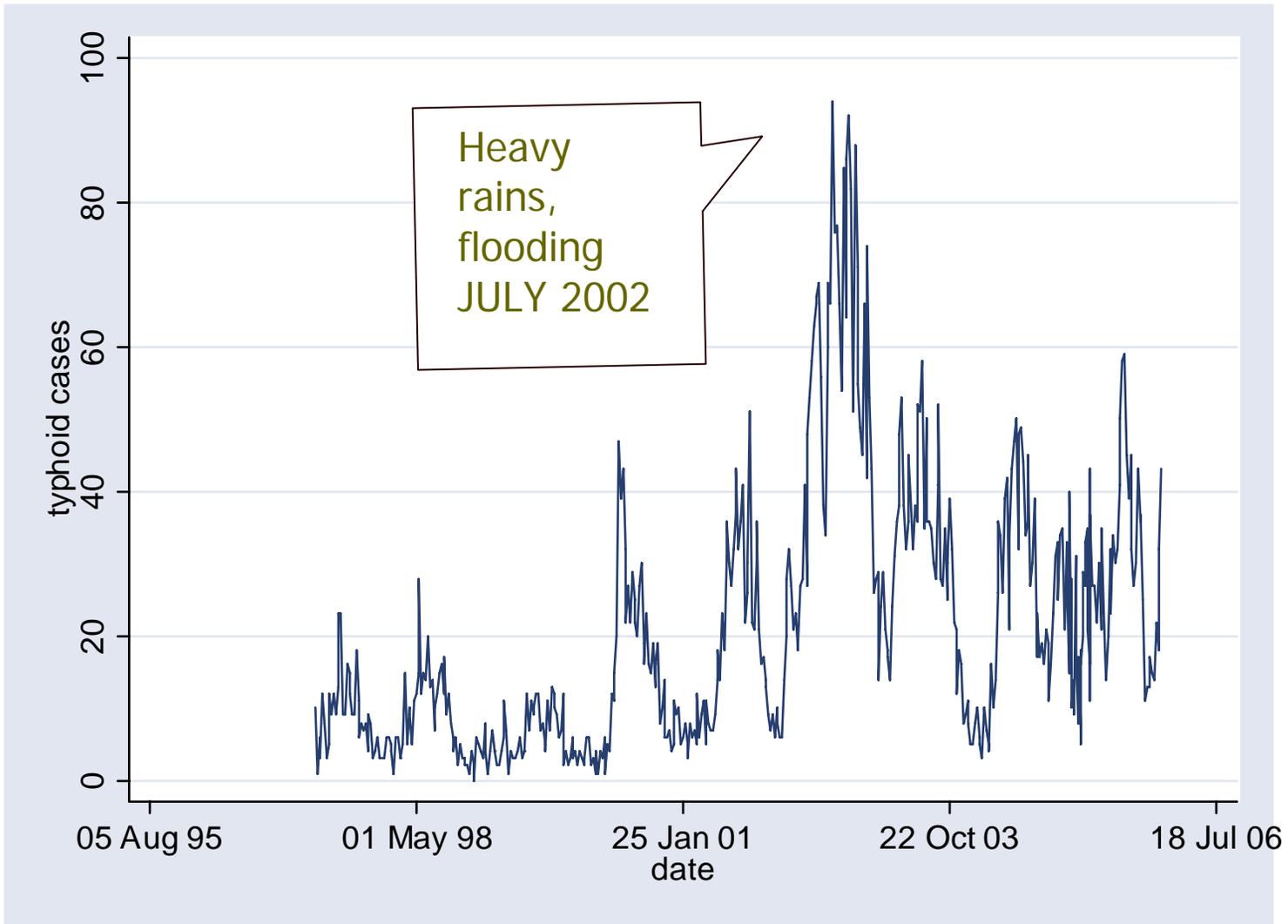
- ❑ Preventing and reducing morbidity and mortality amongst the people of Zambia.
- ❑ Enhancing the adaptive and coping capacities of the various communities.
- ❑ Building a multi-sectoral capacity to deal with the health impacts of climate variability and change.
- ❑ Reforming health policies to incorporate dimensions of climate impacts, and;
- ❑ Increasing awareness, within the health and other related sectors, of climate change and its health impacts.

Nepal: Priority ranking of climate change impacts

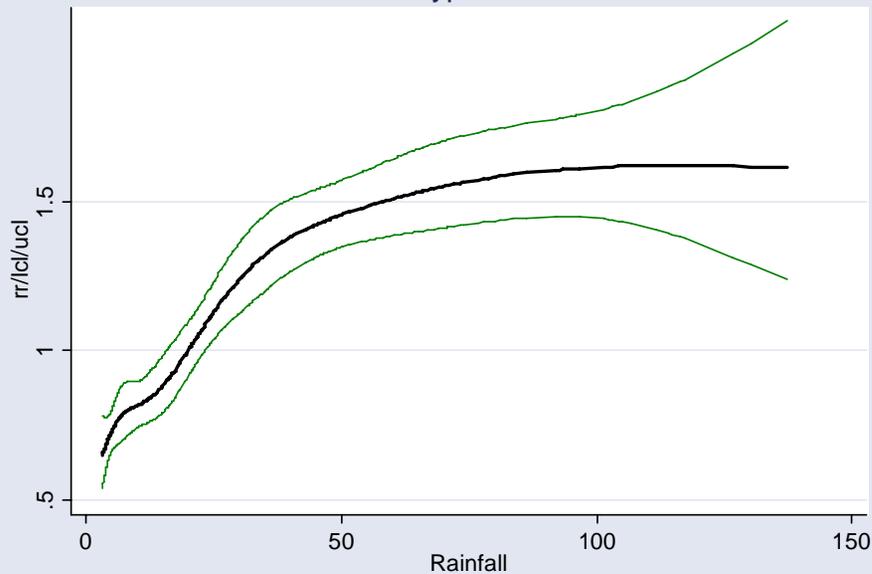
Ranking	Certainty of impacts	Timing of impact	Severity of impact
Water resources and Hydropower	High	High	High
Agriculture	Medium-low	Medium	High
Human health	Medium	Uncertain	High
Ecosystems/Biodiversity	Uncertain	Uncertain	Medium-high

Source (OECD, 2003)

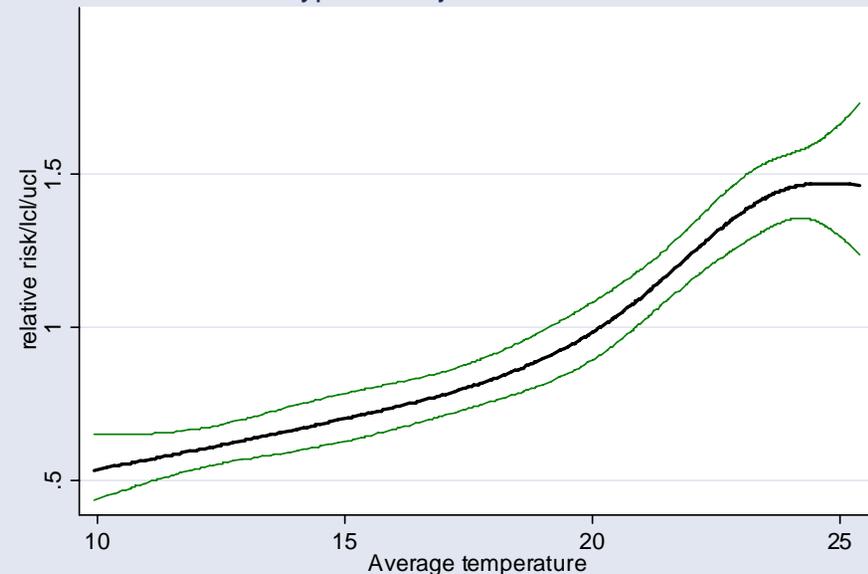
Weekly typhoid cases: Kathmandu



Typhoid



Typhoid adjusted for rainfall



Effects of increasing winter temperature

Observed warming trend (1977-1994)
(Shrestha et al. 1999).

most pronounced during the dry winter season, and least during the height of the monsoon.

-Increased cases of Typhoid in winter months

-Pandit et al. 2007

