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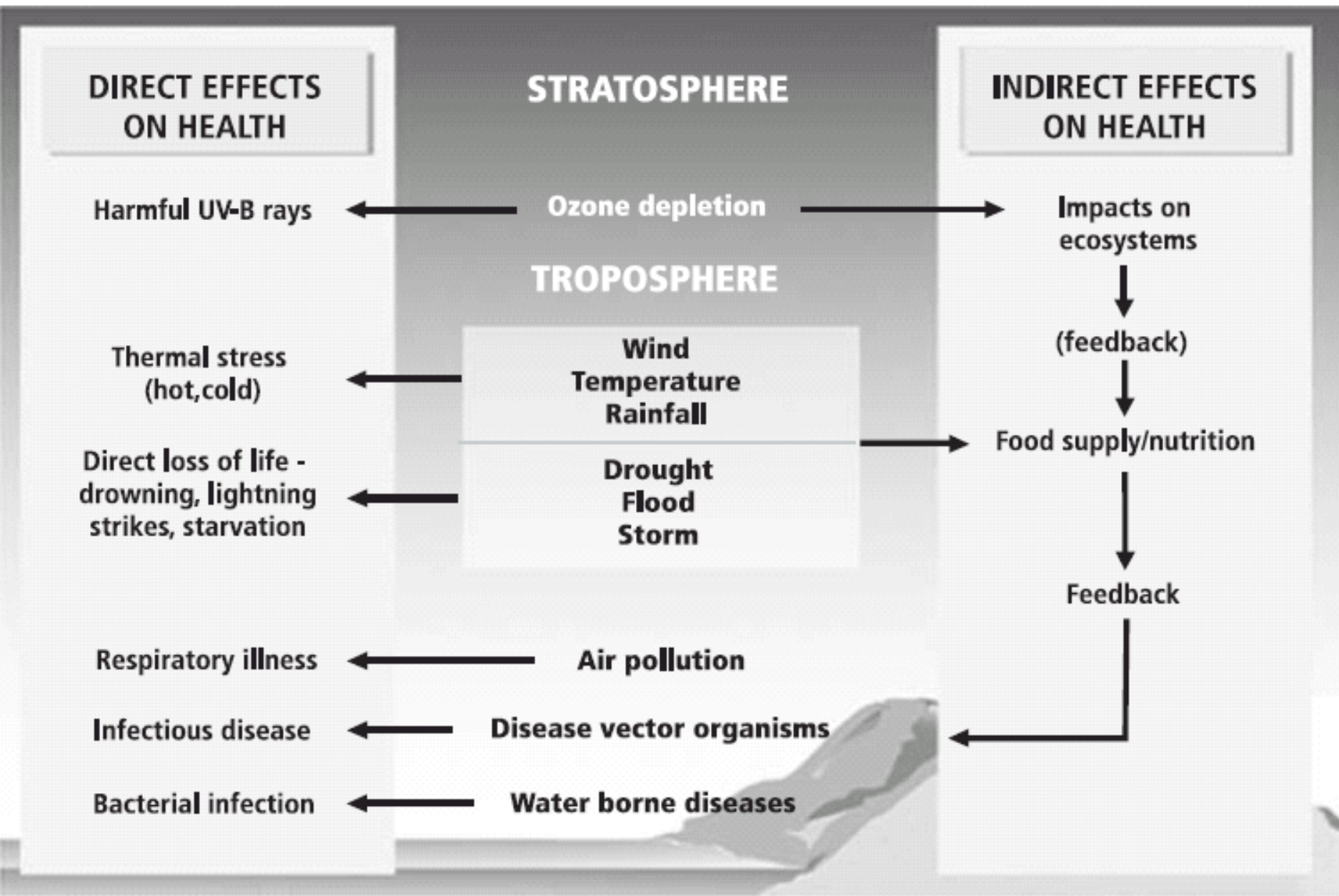
Climate Change and Health

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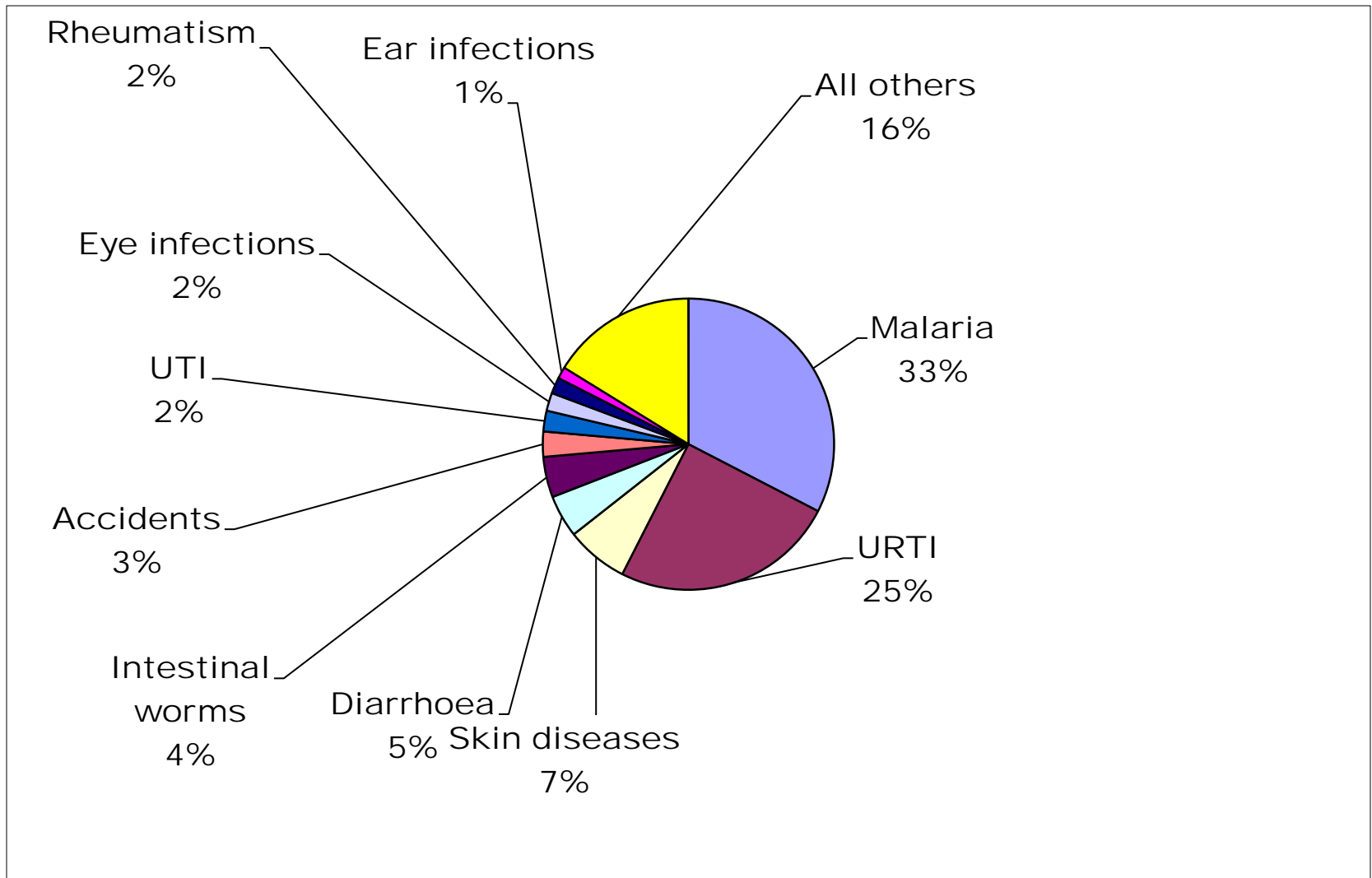
Kenya Meteorological Dept

CCAA Workshop

Climate Impacts on Health (Source BM-Melbourne)



Ten leading causes of morbidity in Kenya



Climate Sensitive Diseases

- It is estimated that by 2050, 6 billion people around the world will be at risk related to the 'big 7' climate-related diseases: malaria, dengue and other haemorrhagic fever viruses, schistosomiasis, sleeping sickness, Chagas' disease, Leishmaniasis and river blindness; 4 of the big 7 are zoonoses (Benniston, 2002).

Climate Change

According to the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC), climate change currently contributes to the global burden of disease and premature deaths.

Evidence of Climate Change Impacts on Human Health

Emerging evidence of climate change effects on human health shows that climate change has:

- altered the distribution of some infectious disease vectors;
- altered the seasonal distribution of some allergenic pollen species;
- increased heat wave-related deaths.

Climate Change Impacts on Health

- Since 1980, a new disease has emerged, on average, every seven months (CHWG, 2008). 60% of emerging diseases are zoonotic, that is, transmissible between animals and man.
- WHO estimates that changes to the earth's climate is already causing about 5 million extra cases of severe illnesses a year and more than 150,000 extra deaths.
- By 2030, however, the number of climate-related diseases is likely to more than double, with a dramatic increase in heat-related deaths caused by heart failure, respiratory disorders, the spread of infectious diseases and malnutrition from crop failures (Campbell-Lendrum, *et al.* 2003).

Waterborne Diseases

Diarrhoeal diseases

- Diarrhoeal diseases have multiple modes of transmission, such as via water, food, insects or contact between humans. The relative importance of the various pathogens that cause diarrhoea varies between locations and is influenced by the level of sanitation.
- Temperature and RH directly influence the rate of replication of bacterial and protozoan pathogens and the survival of enteroviruses in the environment. The potential impact of an increase in temperatures depends on the burden of disease at that time
- Diarrhoeal disease endemic areas are therefore expected to bear the brunt of global warming.

Impacts on vector-borne diseases

Malaria

- Both parasite (Plasmodium) and vector (mosquito) are affected by temperature and rainfall. Parasites differ in the minimum temperature for parasite development and in current health impact and distribution
- Although temperature extremes kill Anopheles mosquitoes, higher temperatures increase their rate of development. The gonotrophic cycle (interval between blood meals) shortens with increasing temperature, and the effect of a small temperature increase is greatest at the cooler ambient temperatures
- Thus, a small rise in temperature from 19°C to 21°C shortens the gonotrophic cycle from 4 to 3 days and increases the vectorial capacity of the mosquito

Impacts on vector-borne diseases

Schistosomiasis /Bilharzia—Disease of the poor

- Schistosomiasis is currently endemic in the coastal, central and Lake Victoria Basin regions of Kenya. The distribution of the disease is associated with climate factors (mainly temperature), geomorphology and habitat stability.
- Models on current and future distributions show that *Schistosoma haematobium* could extend its distribution inland and estimated the additional population at risk (restricted to those aged 5–14 years) under a medium-range climate scenario (Health and Global Environmental Change, 2009).

Schistosomiasis contd.

- Under this scenario, the *Schistosoma* parasites may be rapidly and widely transmitted within human hosts and may infect new snail species in previously risk-free areas. Schistosomiasis may therefore expand into newly climatically suitable areas.
- However, given the relative immobility of the snail hosts, climate change may be expected to have greater short- and medium-term effects on the local distribution and abundance than on the global distribution of suitable vectors.

Rift Valley Fever

- Rift Valley Fever (RVF) is a viral zoonosis that primarily affects animals but also has the capacity to infect humans. Infection can cause severe disease in both animals and humans, leading to high rates of disease and death. The disease also results in significant economic losses due to death and abortion among RVF-infected livestock.
- Outbreaks of RVF have been found to be common during El Niño events, which is characterised by heavy rainfall and warm weather conditions.
- Increased frequency of these events could therefore imply more RVF outbreaks

Adaptation

- Adapting to climate change and variability in the Health sector therefore calls for a re-orientation of public health practice in Kenya so that prevention should be emphasized while minimizing reactionary practices.
- A better coordinated and sustained surveillance and response systems allows for improved health management in situations of emergencies and natural disasters.
- Increasing systems flexibility of health and related systems assures efficient mitigation and response mechanisms.

Adaptation contd.

Key action areas in Kenya include:

- Public health education and risk reduction
- Enhance systems for information gathering and dissemination
- Document, adopt and adapt relevant indigenous / traditional knowledge and endogenous technologies
- Stocking drugs for climate-sensitive diseases ahead of impending disaster

Adaptation contd.

- Foster political support in mainstreaming of Climate Change impacts and disaster management in national development planning.
- Enhance national, regional and international collaboration on Climate Change issues. The health and environment ministries in Kenya are currently working on a situation analysis and needs assessment document, based on the 11 Action points of the Libreville Declaration of 2008.

Assessment Questions

- What is the current burden of climate-sensitive health outcomes?
- Which regions and populations currently are more vulnerable to climate variability and change? What factors other than climate determine this vulnerability?
- How is the burden of climate-sensitive health outcomes likely to change over the coming decades, irrespective of climate change? This includes consideration of demographic trends, development plans, etc.
- What current programs and activities address the burden of climate-sensitive health outcomes? What changes are planned to these programs and activities over the next 5 to 10 years?
- Using expert judgment or statistical projections, what are the most likely health impacts of climate change over the next 20 and 50 years? Which regions and populations will be at highest risk?
- What additional public health interventions are likely to reduce the projected health impacts? What are likely to be the costs of such interventions?
- How can the results of the assessment be communicated to all relevant stakeholders?