

Chapter 37

Health Impact of Water– Related Diseases in Developing Countries on Account of Climate Change: A Systematic Review – A Study in Regard to South Asian Countries

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ABSTRACT

Human health is heavily dependent on clean water resources and adequate sanitation. According to the WHO, diarrhoea is the disease most attributable to quality of the local environment. It has been estimated that 88% of diarrhoea cases result from the combination of unsafe drinking water, inadequate sanitation, and improper hygiene. A meta-analysis has been conducted over the existing literature specifically targeting water-borne and water-related diseases in developing countries. The results are synthesized through the simplest meta-analysis strategy: vote-counting. Given the range of impacts on account of climate change there is an urgent need of proper intervention to counterbalance the expected increase of occurrence of water-related illness. But given the limited progress in reducing incidences over the past decade concerted actions effective implementation and integration of existing policies is urgently demanded.

INTRODUCTION

Impacts of Water Related Illness on Health

The Third Assessment Report of the IPCC (IPCC 2001) estimates that globally the average land and sea surface temperature has increased by $0.60 \pm 0.2^\circ\text{C}$ since the mid-19th century, with much of the change occurring since 1976. Of the many impacts of climate change, those on human health are often placed

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amongst the most worrying. The impacts of climate change on human health are many and complex. GHG emissions can in principle be considered as risk factor that could potentially be altered by human intervention, with associated effects on the burden of disease.

The increase in the frequency and intensity of extreme temperatures have direct and indirect effects on health. Direct effects include thermal stresses (cardio-vascular and respiratory diseases, heat exhaustion, heat cramps and dehydration), while indirect effects are related to the impact of heat extremes on urban air pollution and humidity (which can aggravate pre-existing morbidity).

Extreme temperatures tends to aggravate pre-existing respiratory and cardio-vascular diseases. In the recent years, extreme weather events, such as floods and landslides, storms, cyclones and droughts, have caused considerable damage and loss of life in China, Venezuela, Bangladesh and Mozambique. Direct impacts of extreme weather events include increased incidence of deaths, physical injuries and psychological stresses, while indirect impacts are related to increased risk of exposure to water-borne diseases due to water contamination, and impacts on malnutrition due to loss in agricultural production. Unsafe water and sanitation conditions and decrease water accessibility would further increase the transmission of infectious diseases (Markandya and Chiabai.,2009).

Climate change also leads to outbreak of water-borne diseases, with cholera and diarrhoea being potentially most problematic(McMichael *et al.*, 2006) The Intergovernmental Panel on Climate Change (IPCC) has declared with “very high confidence” that climate change already contributes to the global burden of disease (Confalonieri *et al.*, 2007).

Human health is heavily dependent on clean water resources and adequate sanitation. According to the WHO, diarrhoea is the disease most attributable to quality of the local environment. It is estimated that 88% of diarrhoea cases result from the combination of unsafe drinking water, inadequate sanitation, and improper hygiene (WHO 2006, Pruss-Ustun 2006). Environmental factors account for an estimated 94% of the global disease burden for diarrhoea (WHO 2006), which is a leading cause of death among children. One of the main sources of diarrheal disease is contamination by faecal-oral pathogens that are largely caused by a lack of safe drinking water and sanitation facilities. Additionally, inadequate sanitation poses threats to the environment from improper disposal and treatment of human waste. It is important for populations to have access to drinking water and adequate sanitation because these factors play large roles in human health.

The IPCC summarized the main health impacts as follows:

- Increases in malnutrition and consequent disorders, with implications for child growth and development
- Increased death, disease and injury due to heat waves, floods, storms, fires and droughts
- Increased burden of diarrhoeal diseases
- Increased frequency of cardio-respiratory diseases due to higher concentrations of ground level ozone related to climate change
- Altered spatial distribution of some infectious disease vectors.

According to Haines *et al*(2006) research studies on the health impacts of climate change addresses three main topics- current associations between climate and disease; the effect of recent changes in climate; and the evidence base for projecting the future impacts of climate change on health.

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