

Protecting Health from Climate Change

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Introduction

The objective of World Health Day, celebrated each year in April is to catalyse public participation in the global campaign to protect health from the adverse effects of climate change. The Intergovernmental Panel on Climate Change (IPCC, 2007) asserted: Human beings are exposed to climate change through changing weather patterns and indirectly through changes in water, air, food quality and quantity, ecosystems, agriculture, and economy. At the early stage the effects are small but are projected to progressively increase in all countries and regions.

The extent and nature of impact on climate change on human health vary by region, vulnerability of population groups, extent and duration of exposure to climate change itself and by society's ability to adapt to or cope with the change.

Overview of Global Warming and Climate Change

The term 'greenhouse effect' refers to the rise in temperature that the Earth experiences when certain gases in the atmosphere, such as water vapor, carbon dioxide, nitrous oxide, and methane, trap incoming solar radiation from the sun. A certain degree of the greenhouse effect is necessary for human life. Without the

greenhouse effect, heat would escape back into space, and the Earth's temperature would be 30°C colder. As a result, life on earth would not be sustained. Scientists and others are concerned that the Earth is experiencing an enhanced greenhouse effect related to human activities. An increase in the amount of greenhouse gases in the Earth's atmosphere has led to a decrease in infra-red radiation back into space, causing an increase in the average Earth's temperature (Global warming), which in turn may contribute to changes in climate.

Vulnerability of India

The IPCC 2001 Report predicts that global temperatures will rise by 1.4 - 5.8°C over the next 100 years, including a 2.7 - 4.3°C increase over India by the 2080s. The panel also predicted an increase in rainfall over the sub-continent by 6-8 per cent and rise in sea level up to 88 cm by the year 2100. Changing rainfall patterns are likely to affect food security and extreme events, such as droughts, torrential rain, flash floods, cyclones and forest fires could become more common. Rising sea levels could threaten coastal mangrove and wetland systems, and increase the flood risk faced by a quarter of India's population that lives on the coast. Climate change could also threaten human health by favouring water and vector-borne dis-

eases such as cholera, malaria and dengue. The IPCC also estimates that by the 2080s, the change in climate could lead to increased breeding of mosquitoes and affect up to ten per cent of Indian population.

Scientists at the University of Liverpool have investigated the anticipated effects of climate change on India's monsoon and the impact that alterations in India's water cycle will have on the country's people, agriculture and wildlife. According to their report in the *Science* (dated March 12, 2007), changes to India's annual monsoon are expected to result in severe droughts and intense flooding in parts of India.

Effects of climatic changes

- ◆ A rise in sea level of about 50 cm by 2100.
- ◆ A progressive increase in temperature: an increased occurrence of very hot days, and a decrease in very cold days
- ◆ An intensification of the global hydrological cycle, with altered global pattern of floods and droughts

Direct effects of climatic change are relatively easy to assess.

- ◆ Sea-level rise, with population displacement and damage to infrastructure
- ◆ Altered frequency of extreme events (deaths, injuries and psychological disorders)
- ◆ Exposure to thermal extremes (altered rates of heat and cold-related ill-

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ness and death)

Indirect effects of climatic change are more difficult to assess, but expected to predominate

- ◆ Altered local ecology of water-borne and food-borne infective agents
- ◆ Altered food production due to change in the local climate
- ◆ Effects on the range and activity of vectors and infective parasites
- ◆ Social, economic and demographic dislocations due to adverse climatic change impacts on economy, infrastructure, and resources

Climate change has the potential to impact health in many ways. While some of these are unpredictable, others (shown in the table) are

supported by considerable evidence.

Climate-sensitive Diseases

Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects. These “vector-borne” diseases include malaria, dengue fever, yellow fever, and encephalitis. Also, algal blooms could occur more frequently as temperatures warm — particularly in areas with polluted waters - in which case diseases, such as cholera, that tend to accompany algal blooms could become more frequent. The first perceptible change in human health may well be alterations in the geographic range (latitude and altitude) and season-

ality of certain infectious diseases - including food-borne infections (e.g. salmonellosis) which peak in the warmer months. Warmer average temperatures combined with increased climatic variability would alter the pattern of exposure to thermal extremes and resultant health impacts, both in summer and winter.

Higher temperatures, in combination with favourable rainfall patterns, could prolong disease transmission seasons in some locations where certain diseases already exist. In other locations, climate change will decrease transmission via reductions in rainfall or temperatures that are too high for transmission. For example, temperature and humidity levels must be sufficient for certain disease-carrying

Effects of Climatic Change on Health of Populations

Weather event	Health effects	Populations most affected
Heat waves	Heat stress	Extremes of age, athletes, people with respiratory disease
Extreme weather events (rain, hurricane, tornado, flooding)	Injuries, drowning	Coastal, low-lying land dwellers, low socio economic system
Droughts, floods, increased mean temperature	Vector-, food- and water-borne diseases	Multiple populations at risk
Sea-level rise	Injuries, drowning, water and soil salinization, ecosystem and economic disruption	Coastal, low socio economic system
Drought, ecosystem migration	Food and water shortages, malnutrition	Low socio economic system, elderly, children
Extreme weather events, drought	Mass population movement, international conflict	General population
Increases in ground-level ozone, air-borne allergens, and other pollutants	Respiratory disease exacerbations (COPD, asthma, allergic rhinitis, bronchitis)	Elderly, children, those with respiratory disease
Climate change generally; extreme events	Mental health	Young, displaced, agricultural sector, low socio-economic system

vectors, such as ticks that carry Lyme disease, to thrive. Further, climate change could push temperature and humidity levels either towards or away from optimum conditions for the survival rate of ticks.

Public Health measures to protect health from climatic change:

Building on existing programmes and the Essential Public Health Services, Centre for Disease Control (CDC) has identified the following priority health actions for climate change:

- ◆ Serve as a credible source of information on the health consequences of climate change for the global population.
- ◆ Track data on environmental conditions, disease risks, and disease occurrence related to climate change.
- ◆ Expand capacity for modelling and forecasting health effects that may be climate-related.
- ◆ Identify locations and population groups at greatest risk for specific health threats, such as heat waves.
- ◆ Communicate the health-related aspects of climate change, including risks and ways to reduce them, to the public, decision makers, and healthcare providers.
- ◆ Develop partnerships with other government agencies, the private sector, non-governmental organisations, universities, and international organisations to more effectively address global health aspects of climate

change.

- ◆ Provide leadership to state and local governments, community leaders, healthcare professionals, non-governmental organisations, faith-based communities, the private sector and the public, domestically and internationally, regarding health protection from climate change effects.
- ◆ Develop and implement preparedness and response plans for health threats such as heat waves, severe weather events, and infectious diseases.
- ◆ Provide technical advice and support to state and local health departments, the private sector, and others in implementing national and global preparedness measures related to the health effects of climate change.
- ◆ Promote workforce development by helping to ensure the training of a new generation of competent, experienced public health staff to respond to the health threats posed by climate change.

Individual measures to protect environment from climatic changes

In Your Home

- ◆ Run your washing machine only when it's full.
- ◆ Wash your laundry in warm or cold water, never hot.
- ◆ Move your thermostat down two degrees in winter and up 2°C in summer.
- ◆ Set your water heater to no higher than 120°F.

- ◆ If your water heater is over five years old, wrap it in an insulating jacket.
- ◆ Clean and replace air conditioning filters to reduce energy consumption up to 5 per cent.
- ◆ Replace standard light bulbs with compact fluorescent bulbs.
- ◆ Turn off lights and appliances when they aren't being used. Also, unplug cell phone chargers and other electronics from the wall (even when not in use!) Anything plugged into the wall uses energy.
- ◆ Install low-flow showerheads in order to use less hot water.
- ◆ Take shorter showers.
- ◆ Insulate walls and ceilings.
- ◆ Buy windows, appliances, and homes with energy-efficient appliances.
- ◆ Buy minimally packaged goods, and recycle where possible.
- ◆ Paint your home a light colour if you live in a warm climate or a dark colour if you live in a cold climate. Also, use latex paint rather than oil for less harmful fumes.
- ◆ Defrost your freezer - it won't work as hard.
- ◆ Regularly clean all heating ducts.
- ◆ Plant trees outside your home to provide shade and carbon storage.

On the Road

- ◆ Encourage your local government to improve streetlights with energy-efficient bulbs.
- ◆ Keep your car tuned up and your tires properly inflated.
- ◆ Use mass transit, or walk!

- ◆ Buy a fuel-efficient car or a hybrid model.
- ◆ Observe the speed limit.
- ◆ Remove excess weight from your vehicle.
- ◆ Use cruise control and overdrive gears.
- ◆ Use public transport.

Role of nurses

Nurses can take personal action to address the challenge of climatic change impact by making choices in their homes, workplaces, communities, and legislatures.

- ◆ In homes, nurses can make smart choices by buying energy-efficient appliances and cars and opting for public transport when available.
- ◆ In the workplace nurses can strive to reduce, re-use, and recycle in order

to decrease the health care impact on the environment.

- ◆ Nurses can also promote the safest, most advanced methods of waste disposal, never opting for incineration, which is a polluting and outdated method of waste disposal.
- ◆ Nurses can also join local communities, faith communities, and organisations that are already working to protect health from climatic changes.

Conclusion

Educate yourself, your family, your friends, your co-workers and everyone you meet. The more people are aware of these issues, the more likely they shall take constructive decisions. Our commitment to the

environment must override other priorities and facilities. We, as partners with community, industry, government, and environmental organisations around the world, can meet the challenges posed by climate change. The challenges are bigger than any one organisation can solve, but together we can make a difference.

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