

Climate Change- Biggest Healthcare challenge of the 21st Century!

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Climate Change is no longer about disappearing glaciers and melting ice caps. It is now haunting us in the form of extreme heat waves, unprecedented rain, and many natural calamities that affect human health and quality of life



It was a December that Chennai people can never forget! Its been almost a year and four months since the Chennai deluge took place. Roads of the city were filled with gallons and gallons of water. A City that generally struggles to receive its regular share of rainfall experienced heavy down pour that left millions of people stranded on roads with no electricity and food supply for days. Transport services were shut down. Ola boats were introduced, schools were closed. The city had received more than 270 mm of rainfall in a mere 24 hours, breaking a century-old record. Though unrestricted construction and improper sewage system can be cited as few reasons for the water clogging; the main question is where did all this rain come from? The answer is climate change. When we talk about climate change its no longer about polar bears stranded on melting glaciers! Climate change has come to our homes to haunt us in the form of extreme heat waves, unprecedented rain, rising sea-levels, changes in precipitation resulting in flooding and droughts, intense hurricanes, degraded air quality and without doubt this is one of the major threats to human health in the 21st century.

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), made it clear that, unless steps were taken, manmade climate change carried “the likelihood of severe, pervasive and irreversible impacts for people and ecosystems.” Health scientists have warned that in the coming years nearly 200 million people are at a risk of being displaced due to disappearing glaciers and melting polar ice caps.

“The global public health community views Global warming or Climate Change as the biggest public health threat of the 21st century,” noted Dr Banalata Sen, Advisor, Center for Environmental Health, Public Health Foundation of India. “Climate

change is manifested in events like extreme temperature changes like heat and cold waves, changes in rainfall patterns leading to floods and droughts, poor air quality, intense weather patterns giving rise to increase in number and intensity of storms including cyclones. All these environmental changes have direct or indirect effect on the physical, social, and psychological well being of the public. Climate change will also increase the risk of vector-borne diseases like malaria, dengue, etc. Vulnerable populations like the poor, children and the elderly, or those with pre-existing conditions like asthma or cardiovascular disease are particularly at risk.”

Developing nations in South Asia are highly vulnerable to climate change, warn experts. Recent earthquake in Nepal, ongoing erratic devastating winter rains/hailstorm in Pakistan's north and India, increased incidences of typhoons in Philippines, recent cyclone vardah in India are few incidents that provide a fresh reminder of how natural disasters can reverse economic and social gains, with massive loss of life and livelihoods. Reports state that people in Asia and the Pacific are four times more likely to be affected by disasters than those in Africa, and 25 times more likely than in Europe or North America. Incidents of precarious weather extremes are occurring in the Asia-Pacific region more often than any other region of the world. This gives the region, which accounts for nearly half of heat-trapping global greenhouse gas emissions, a huge stake in mitigating global temperature rise while adapting to already rising climate change impacts in shape of floods, typhoons, cyclones, sea level-rise and heat-waves.

The first major health impact of climate change is the rise in rates of mortality and diseases caused by extreme weather events. These include floods, droughts, tsunamis, heat-waves and other disasters which kill thousands of people in both the developed and developing worlds. “Many countries are experiencing more floods and landslides due to intense and frequent precipitation,” stated, Dr Poonam Khetrapal Singh, World Health Organization's director for Southeast Asia, “Several cyclones have hit the region in the last 10 years. Floods in Myanmar in 2015 and in Sri Lanka and DPRK in 2016 have killed and injured many people, displaced several hundreds of thousands of people and damaged health care facilities. A study in India showed an increase in heat wave. In 2015 over 2500 people died due to heat wave in south India. Droughts have affected parts of India and Sri Lanka in recent years which impact crop production, can increase the risk for under-nutrition as well as water and food borne diseases.”

Health Impacts of Climate Change:

Along with floods and droughts, climate change alters the global climate and brings about myriad human health consequences. Climate change induces extreme heat events. Young children, older people and people who are work in the sun like farmers, construction workers etc suffer from heat exhaustion and heat stroke. Dr Sen, explained, “Extreme heat disrupts the body's ability to control its temperature resulting in a variety of heat stress related conditions, such as heat stroke, which can cause death or permanent disability in the lack of prompt medical attention. Small children, elderly, and people with chronic diseases, low-income populations, and outdoor workers are at a higher risk for heat-related illness. Because higher temperatures contribute to the build-up of harmful air pollutants, higher temperatures and respiratory problems are also linked. Research has also shown that episodes of extreme heat pose a salient risk to the health and well-being of the mentally ill. Climate change will increase ground-level ozone, which is associated with many adverse health outcomes. A key component of smog, ground level ozone, is known to decrease in lung function and increase in premature deaths. Pollen allergies are also on the rise as plants undergo a shift in their growing seasons with warmer temperatures. Multiple exposures to air pollutants and allergens exacerbate pre-existing respiratory conditions.”

Climate change – A driver of disease migration

Increase in rainfall provides a fertile breeding ground for vector borne diseases. Natural calamities result in food, water supply shortage. Many people lose their houses and belongings and are forced to take shelter in safe places. This accumulation of large numbers of people in unhygienic conditions facilitates disease spread resulting in epidemics. Dr Sen, outlined that apart from the mental stress associated with loss of life, property, and livelihood related with floods and droughts, other health hazards include spread of diseases during floods resulting from contaminated water. Floodwaters can become contaminated with pollutants like agricultural waste, chemicals, and untreated sewage and disease causing bacteria. Contaminated water can cause contamination of agricultural produce leading to an increase in food-borne illnesses. Living in damp conditions increases exposure to molds which affect indoor air quality and lead to respiratory tract ailments like asthma and pneumonia. Heavy rainfall also increases exposure to diseases caused by contaminated water. Besides, the obvious lack of availability of food leading to hunger and malnutrition; drought conditions can also result in dust storms and wildfires – all of which can lead to respiratory and cardiovascular adverse health outcomes.

Scientists have cautioned that a warmer world can bring changes in "disease vectors"—the mechanisms that spread some diseases. Insects previously stopped by cold winters are already moving to higher latitudes (toward the poles). Warmer

oceans and other surface waters may also mean severe cholera outbreaks and harmful bacteria in certain types of seafood. "A study in Nepal showed that a 1°C increase in mean temperature increased malaria incidence by 25 percent, noted Dr Singh. "A study in Bangladesh showed the disproportionate health risks of vulnerable population groups from climate changes mainly as malaria, dengue, childhood diarrhea and pneumonia. A sentinel surveillance conducted as part of a pilot project on health adaptation in Bhutan has found culex and anopheles vectors at very high altitudes (>2100m) which could be due to warmer temperature at higher altitude compared to 10-20 years ago."

Experts now think that climate change is raising rates of malnutrition and mental health. With prolonged droughts or floods, crops are failing which result in less produce. As a result, people go hungry and children in particular suffer from malnourishment. The impact of climate change on mental health should also not be underestimated. People who have survived droughts, floods, tropical storms and similar extreme weather events often lose their homes and their families. As a result, they can experience post-traumatic stress disorder, severe depression and other mental health problems. In developing countries, where the impacts of climate change are at their most severe, there is less access to mental health services, so symptoms go untreated and unchecked.

Climate change is a global issue that requires global action

The principal forum for international climate change action has been the United Nations, which has led to the Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. However, more recently other international approaches have been put in place, the Asia Pacific Partnership and agreements under the G8, starting with their 2005 meeting in Gleneagles, UK. Recently in New York, 175 countries signed the historic Paris agreement on climate change, with commitments to reduce greenhouse gas emissions. "The landmark Paris agreement on climate change reflects an aspiration to keep global average temperature below 2°C," pointed out Dr Singh. "Right to health is mentioned in the preamble and the agreement explicitly recognizes the health impacts of climate change. With all these developments, we are hopeful health action will increase both globally and at the population level where adaptation levels are needed."

What are the Asian governments doing?

A few years ago Maldives government had made an eye-catching plea for climate change action by holding the world's first underwater cabinet meeting. The nation's president had voiced fears the archipelago will be swamped by raising sea levels soon unless proper action is taken to reduce carbon emissions. With many such dire warnings many Asian countries have stepped up their efforts to address climate change. Under the Paris Agreement, Australia has committed to reduce emissions by 26 to 28 per cent below 2005 levels by 2030. This will see emissions per capita halved and the emissions intensity of the economy fall by around 65 per cent. The Emissions Reduction Fund provides incentives for emissions reduction activities across the Australian economy. The fund is made up of three components: crediting, purchasing and safeguarding emissions reductions. Realizing the importance of a healthy climate Indonesia, one of the world's largest greenhouse gas emitters, pledged an ambitious new target last year for reducing carbon emissions and slashing greenhouse gas output by 29 percent by 2030. In the submission to the UN climate conference in Paris, the government set aside 12.7 million hectares of forest for conservation to help realize its target. The government also hoped to derive nearly a quarter of its vast energy needs from renewable sources within a decade.

India has also made significant efforts by improving waste management systems and reducing emissions. Speaking about India's efforts to address climate change, Dr Sen highlighted, "There are national, regional, and local efforts underway in India to address climate change. India's National Action Plan on Climate Change, launched in 2008, identifies a number of measures that simultaneously advance the country's objectives in development and climate change related adaptation and mitigation. Examples of these measures include initiatives to make India a global leader in solar energy; to promote sustainability of habitats through improvements in energy efficiency in buildings, urban planning, improved management of solid and liquid waste including recycling and power generation, modal shift towards public transport and conservation. Examples of efforts at the regional level include city-level readiness to deal with extreme heat events. The Ahmedabad Heat Action Plan which has been instrumental in reducing heat-related morbidity and mortality in the city is now being adopted by other cities across India. Communities in Ladakh are designing ice stupas to alleviate their climate change induced water crisis. The Boat Clinics of Brahmaputra ensure climate resiliency and provide access to healthcare services in the northeastern corner of the country."

Ranked among few countries suffering from severe air pollution and bad air quality, China has pulled up its socks and is also going green! The country released three new Thirteenth Five Year sub-plans on controlling greenhouse gas emissions, environmental protection and development of the power sector. The plan begins by reiterating a key climate goal and sets out a range of targets and policies related to controlling and reducing CO2 emissions, including reiterating goals to reduce China's carbon intensity (CO2 emissions per unit of GDP) by 18 percent by 2020 compared to 2015, reduce energy intensity by 15%, increase non-fossil energy to 15 percent of the energy mix (from [12 percent](#) at the end of 2015), and increase forest stock volume and coverage to 16.5 billion cubic meters (bcm) and 23.04 percent, from [15.14 bcm and 21.66 percent](#) as of 2015.

"Most Ministries of Health in the SEA region have established climate change and health program and appointed focal points," said Dr Singh. "National high level advocacy workshops and trainings have been conducted in most countries. Bangladesh and Nepal are implementing health adaptation project with WHO technical support. Maldives is implementing a low carbon climate resilient project in one island. Bhutan has completed a five year health adaptation project. Nepal is the first country in the region to prepare its Health-National Adaptation plan (HNAP). Bhutan, India, Indonesia, Sri Lanka and Thailand have drafted their HNAP while remaining countries have plans to start this year."

More efforts are needed:

"There is no time to talk, only time to act!" said Dr Sen. "Climate change will affect every part of society. The effects of climate change will be economic, social, and environmental and will alter people's lives in ways that we are only beginning to understand. A multi-level and multi-sectoral response will therefore need engagement of one and all - individuals and families at home, students and educators in schools, leaders and workers in organizations, and local, state, national and international governmental bodies. Sustainable Development Goals were put together by the international community to address the global development agenda in the face of climate change. These need to be achieved and will only be possible when everyone takes the threat of climate change seriously."

Research demonstrates that both mitigation (efforts to reduce future climate changes) and adaptation (efforts to reduce the vulnerability of society to climate change impacts) are needed in order to minimize the damages from human-caused climate change and to adapt to the pace and magnitude of changes that will occur. Health care sector must play an active role in education and advocacy of climate change. Health care professionals, especially doctors and nurses, enjoy an unprecedented role as positive messengers for health in society. As we begin to calculate the enormous health care and social costs of climate change, health care professionals are in a position to educate their patients about the public health impacts of climate change and help prepare them for these impacts, and also become potent spokespersons for policies at all levels of government that would rein in climate change.

Dr Singh concluded, "The best measure is to reduce greenhouse gas emissions to slow down climate change. Hopefully the Paris agreement will be able to achieve this. Reducing emissions will not only mitigate climate change but will also have health co-benefits. For example, promoting active transport and less use of motorized vehicles will give health benefits through better air quality and greater physical activity. The next measure would be to develop resilience and prepare for eventuality so that any system including health and people are able to cope with and adapt to the risks posed by climate change."

The core problems driving climate change are not going to disappear, but sustained efforts towards better management of health impacts of climate change and robust disaster management systems are necessary to create a better world.