*Climate Change Toolkit for Health Professionals*

# Factsheet: Global Health Impacts of Climate Change

## Direct Health Impacts

Climate change can impact health directly or indirectly. Direct impacts can occur from trauma, displacement and deaths associated with floods, storms, and wildfires, and via heat-related illness.

### Heat

The health impacts of heat will increase substantially with 1.5°C of global warming, but will be much greater with 2°C or 3°C of warming. Heat exposure can produce heat stress and heat stroke and aggravate adverse heart, lung and kidney conditions. In fact, 157 million more people were exposed to heat waves in 2017 than the average number between 1986 and 2005. The World Health Organization (WHO) estimates that, with no adaptation, climate change will produce over 92,000 additional deaths among people over 65 in 2030, and over 255,000 deaths in 2050.

### Wildfires

Extreme wildfires are increasing and are associated with burns, trauma, deaths, emergent evacuation of healthcare structures, subsequent post-traumatic stress disorder, and cardiorespiratory and wellness impacts from smoke exposure.

### Floods and storms

Floods and storms can result in both, direct health impacts such as drownings, injuries, hypothermia, and adverse mental health impacts, indirect health impact such as the spread of infectious diseases, and those resulting from damage to health services and other infrastructure.

House destroyed by a Superstorm.
Photo by Acrylik.

## Indirect Health Impacts

The indirect health impacts of climate change mediated through natural systems include insect-borne diseases such as malaria and air pollution resulting from the increased production of pollen or smoke from wildfires. Health impacts mediated heavily through human systems include food insecurity, migration, displacement, and conflict.

## Infectious diseases

Climate change will affect the risk of vector-borne diseases, including malaria, dengue fever, tick-borne encephalitis, West Nile virus, Lyme disease, Leishmaniosis and Chagas disease. Temperature, rainfall and humidity affect the range and risk of malaria. The WHO estimates that climate change will result in an additional 60,000 deaths from malaria in 2030, and put more that 200 million more people at risk from malaria by 2050 despite malaria control efforts.

*In 2017, there were a total of 712 climate change-related events, resulting in overall economic losses of US $326 billion; 99% of those losses occurred in low-income countries and were uninsured . It is estimated that an additional 52 million people in 84 developing countries will be affected by a 1-in-100 year storm-surge by 2100.*

Warmer temperatures increase the ability of dengue fever to be transmitted and the geographic distribution of the mosquito that carries the dengue virus. The same mosquito carries the viruses that cause chikungunya, yellow fever and Zika. It is estimated that an additional 520 million people around the world will at risk from dengue fever in 2050.

Diarrhoeal disease transmission is affected by changes in temperature and rainfall.

The WHO estimates that rising temperatures due to climate change will cause an additional 48,000 deaths per year due to diarrhoeal diseases in children aged 0-15 years in 2030 and an additional 33,000 deaths per year in 2050.

## Air pollution

Climate change can affect air quality by increasing concentrations of ground-level ozone, increasing air pollution from wildfires, and increasing the concentration of allergens such as fungal spores and pollens that are in the air. Many of the solutions to climate change can create significant health co-benefits by simultaneously reducing levels of air pollution and emissions of GHGs.

Air pollution in Jodhpur India.
Photo by PauFranch.

## Food Production, Food Security and Undernutrition

Undernutrition is currently the cause of almost half of the deaths of children worldwide. An increase in undernutrition is expected to be the most severe global health impact of climate change in the 21st century. Climate change affects the yields of many major food crops, with countries already seeing reduced yields of wheat, rice, maize, and soybean. As global warming increases, global production of wheat, rice, maize, and soybean will decrease. Additionally, increasing levels of carbon dioxide ($CO_2$) will decrease levels of zinc and iron in staple crops, exacerbating harmful nutrient deficiencies.

Climate change also poses many threats to fisheries and aquaculture through rising temperatures, ocean acidification, introduced species, disease, rising sea levels, storm intensification and ongoing rapid degradation of key ecosystems, even with smaller increases in global warming.

Undernutrition. Photo by Parijatha Budidhi.

## Poverty

Three to 16 million people could be forced into extreme poverty due to climate change. Unmitigated climate change could reduce global average incomes and widen global income inequality, with the most severe impacts projected for urban areas and some rural regions in sub-Saharan Africa and Southeast Asia.

## Mental Health

Climate change impacts are expected to increase: mental health hospital admissions during heatwaves; post-traumatic stress, anxiety and depression following extreme weather events; and chronic psychological distress; and the risk of suicide due to slow-developing events such as droughts.

## Migration and Displacement

Climate change has been the sole reason for forced migration for at least 4,400 people due to rising sea levels, changing ice conditions, coastal erosion and damage to infrastructure. Millions of people are currently on the move worldwide, with varying estimates for climate-related migra-

tion. Mobility is known to take place on a spectrum from forced displacement to voluntary migration, with the majority of climate-related migration likely to be in-country.  Tropical populations may have to move distances greater than 1000 km to escape the impacts of climate change which could increase population densities in the subtropics by up to 300% if global warming rises to 2°C above pre-industrial levels.

## Conflict

A number of studies have demonstrated links between climate change and conflict in regions across the globe. A further 1°C increase in global warming, or more extreme rainfall, is expected to increase the frequency of conflict by 14%. Unmitigated climate change will exceed the capabilities of medical humanitarian relief actors and put not only health, but global security and the healthcare systems at risk.

Dead cow.
Photo by 1a_photography.

## Vulnerable populations

On a global scale, people who are more vulnerable to the health effects of climate change include:

- people living in the arctic, on islands, in coastal regions, in rural areas, and tropical regions;
- indigenous populations that rely on local resources for food;
- women, children, and the elderly who are more vulnerable to undernutrition and extreme heat;
- developing countries that are already struggling to feed their people;
- low income populations in all societies; and
- people with existing medical conditions who are more sensitive to environmental stressors such as heat and air pollution.

**Note: References for this factsheet can be found in Module 2 of CAPE's Climate Change Toolkit for Health Professionals.**