

# Climate change and health



Last modified: 23 June 2015

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Climate change can affect people's health in a number of ways: by reducing availability of food and drinking water, increasing extreme weather events such as floods and heatwaves, and exacerbating infectious diseases. The poorest countries are likely to be worst affected. However, the scale of impacts is uncertain, and societies can take measures to reduce them in many cases.

Measures to combat climate change could bring health benefits by moderating impacts, and also by reducing air pollution, which currently causes about 30,000 excess deaths each year in the UK and seven million worldwide.



*Climate change is expected to increase risks of vector-borne and water-borne diseases in some regions. Image: Julien Harnais, Creative Commons licence*

## Links between climate change and health

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The UN Intergovernmental Panel on Climate Change (IPCC) [groups](#) climate change impacts on health into three categories:

- **direct impacts** relate primarily to changes in the frequency of extreme weather events including drought and heavy rain. This also includes heat exhaustion due to the projected increase in extreme heat events
- **changes in natural systems** due to warmer (and in some cases, wetter) conditions are changing infectious disease patterns. These include diseases transmitted in water and food, but also those carried by mosquitoes and ticks, like malaria and West Nile virus
- there are also effects on **human and social systems** such as social disruption, forced migration, conflict, under-nutrition and mental stress.

Impacts will vary greatly across regions and populations. They will depend on how the climate changes within each region, and on the society's capacity to respond. In general, the greater action that governments take collectively to reduce greenhouse gas emissions, the lower the impacts are likely to be in future decades.

## Extreme weather and physical impacts

Extreme weather events are one of the most obvious ways in which climate change may affect human health. Some types of extreme event [are already increasing in some regions](#) – for example, heatwaves in Europe, Asia and Australia, and extreme hurricanes in the North Atlantic. Further increases in both frequency and intensity of some extreme events are expected in future, with wide regional variations.

Extreme events can lead to an increased risk of death, injury, ill-health, or disrupted livelihoods, especially in low-lying coastal areas. Storm surges can add to the flood risk. Flooding can spread water-borne disease, increase the risk of malnutrition, and cause mental stress.

There will likely be increased risk of ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions. There may be a breakdown of infrastructure networks and critical services that help maintain health and wellbeing, such as electricity, water supply, and health and emergency services.

## Heatwaves

In Europe, the 2003 heatwave [caused an estimated 70,000 deaths](#) (2,000 in the UK). Climate change may have [at least quadrupled the risk of extreme summer heat events in Europe](#) over 1999–2008. Research in other regions such as the [US](#) and [Russia](#) confirms that heatwaves increase the death rate, particularly among the elderly, children and those with pre-existing health conditions. In the UK, the Committee on Climate Change, the government's statutory advisor, [said in 2014](#) that health risks from heatwaves are not being taken into account sufficiently, with buildings such as old people's homes being designed for 'yesterday's climate' rather than the higher temperatures likely to materialise.

An increase in death and ill-health from more extreme heat would be partially offset by a decrease in conditions related to extreme cold. The balance is likely to vary between countries and regions, but overall the negatives are likely to strongly outweigh the positives.

Rapid changes in temperature may also [alter the balance between humans and parasites](#), increasing opportunities for new and resurgent diseases.

## Water and food

Climate change may cause crop yields to decline in the decades ahead, although some regions may see yields increase. Harvests are likely to become more variable.

A global temperature rise of more than 4 °C above pre-industrial levels, combined with increasing demand, would pose large risks to food security because it would perturb production through warming, drought, increasingly variable rainfall and extreme weather. Water scarcity is projected to become a problem for many communities, rural and urban, in the second half of the century.

## Vector-borne diseases

Many diseases carried by insects are considered 'climate-sensitive' because changing temperatures and rainfall patterns can create [new habitats](#) for the insects – flies, mosquitoes, ticks and others.

In the case of malaria, socioeconomic development and preventative measures such as bednets have played a far more important role in changing risks than climate change. But [cases of dengue fever have increased 30-fold in the last 50 years](#), with climate change a likely factor. The IPCC reports that the first sustained transmission of dengue in Europe since the 1920s was reported in [2012 in Madeira](#), Portugal.

Diseases transmitted through food and water are projected to be exacerbated by climate change. Cholera, leishmaniasis and Lyme disease [are highlighted](#) as emerging risks for Europe.

## Air quality

Air pollution and the substances that cause climate change have common origins in many cases. Burning fossil fuels, especially coal, produces carbon dioxide and the particles that cause smog. The World Health Organisation [estimates](#) that air pollution causes seven million deaths per year. Many are due to the use of old, inefficient cooking stoves in poor countries.

Climate change may increase air pollution directly by increasing ozone levels, although this is uncertain. In addition, climate change may already be [increasing levels of allergens](#) including pollen.

## Managing and reducing risk

Until around the middle of the century, climate change is expected mainly to affect health by exacerbating health problems that already exist. The most effective measures in the near-term are measures that control risk factors. In the UK and Europe, these would include better flood defences and buildings better suited to keeping cool in higher temperatures; in developing countries, measures include better

access to clean water and sanitation, vaccination and child health services.

However there are physiological limits to adaptation. The IPCC reports that a global mean warming of [roughly 7°C](#) above current temperatures would call the habitability of some regions of the world into question.

Measures that reduce greenhouse gas emissions can bring health benefits, for example, reducing air pollution or providing better-insulated homes. [The UK government says](#) that action to tackle both climate change and air pollution simultaneously 'makes sense'. Moves to replace stoves and/or fuel [are projected](#) to reduce deaths and carbon emissions simultaneously, at minimal cost.

## Lancet Commission on Health and Climate Change

The [2015 Lancet Commission report on Health and Climate Change](#) says that the threat to human health from climate change is so great that it could undermine the last fifty years of gains in development and global health.

However the report provides evidence showing that because responses to mitigate and adapt to climate change have direct and indirect health benefits – from reducing air pollution to improving diet – concerted global efforts to tackle climate change represent one of the greatest opportunities to improve global health this century.

The potentially catastrophic risk to human health posed by climate change has been underestimated, say the authors, and while the technologies and finance required to address the problem can be made available, global political will to implement them is lacking.

The report shows that the direct health impacts of climate change come from the increasing frequency and intensity of extreme weather events, especially heat waves, floods, droughts and storms. Indirect impacts come from changes in infectious disease patterns, air pollution, food insecurity and malnutrition, involuntary migration,