

How climate change might affect health

The impact of climate change on human health could be wide ranging, according to a recent report. Clare Bellingham investigates

Climate change is happening. So says the Intergovernmental Panel on Climate Change, the world's leading authority on climate change (see Panel), and its opinion is supported by renowned scientific bodies, including the Royal Society. The IPCC predicts that climate change will result in an increasing global temperature, more frequent heat-waves, more rain, more extreme weather events and rising sea levels.

Last week, the IPCC published a report setting out the impact of climate change on humans. For pharmacists, the most relevant aspect of this is how climate change will affect human health. "Projected climate change-related exposures are likely to affect the health status of millions of people," the report states.

The impacts will undoubtedly be more serious for the world's poorer and more vulnerable populations, but people in every country are likely to be affected in some way. The effects on health are wide-ranging and, although interlinked, can be broadly divided into effects of temperature change, cardio-respiratory disease, results of extreme weather events, infectious disease and nutrition.

Temperature change World-wide, the predicted increase in global temperature will result in increased risk of heat-related mortality, the IPCC report says. At particular risk are old people and children, people with chronic illness and the socially isolated.

In temperate areas like northern Europe, an increase in temperature is initially expected to result in reduced mortality since there will be fewer deaths from cold exposure. However, there will be increased likelihood of heat waves, which can have serious health risks, as was demonstrated by the 2003 European heat wave when 15,000 people died in France. Another concern is that increased sun exposure will result in more skin cancer.

Cardio-respiratory disease Climate change is likely to reduce air quality, particularly in towns and cities. The report states there will be an increased frequency of cardio-respiratory diseases "due to higher concentrations of ground level ozone related to climate change". This is because the formation of secondary air pollutants such as ozone increases at higher temperatures. The IPCC has previously stated that this increase in pollutants is one of the most important environmental health problems facing Europe.

Heat waves will also increase the burden of cardio-respiratory disease, and the report notes that more frequent heavy rain could have an impact on respiratory disease. Another possible, although less serious, result

of a changing climate is different patterns of hay fever due to the earlier or later appearance of pollen.

Extreme weather The IPCC says that there is now increased confidence in the belief that extreme weather events will become more frequent, widespread and intense in the 21st century. Such events include storms, flooding and droughts.

Immediate health impacts of extreme weather events are increased risks of injury and death, eg, from collapsing buildings in high winds or drowning in floods. In the short term, extreme events will result in water and food shortages, contamination of water supplies, increased incidence of water- and food-borne disease, and more people suffering from post-traumatic stress disorders. Infrastructure could be destroyed, with disruption in electricity supplies, hospitals unable to provide health services, and supplies (including medicines) via road and rail unable to get through.

In the long term, areas frequently hit by extreme weather events, such as low-lying coastal areas and America's hurricane alley, are likely to face population decline as people migrate to "safer" areas. These safer areas will face the knock-on effect of population overcrowding, including stresses on the availability of food, water and health services.

Infectious disease The impact of climate change on infectious disease comes in two forms: increased risk of water- and food-borne disease, and changes in vector-borne disease.

The IPCC report predicts a world-wide increase in diarrhoeal disease. It highlights particular problems with cholera in Asia, but notes that diarrhoeal disease could occur wherever water or food becomes contami-

nated (eg, cryptosporidia in water following floods). Warmer weather also leads to more cases of food poisoning due to incorrect food storage.

Climate change is likely to alter the global distribution of insects and, with them, the diseases they carry. These include malaria, dengue fever, leishmaniasis, Lyme disease and tick-borne encephalitis. A more detailed report from the IPCC, which will look at the distribution of each of these diseases, is to be published shortly. In 2001, the IPCC concluded that climate change could exaggerate the existing risk of malaria in eastern and southern Europe but that, although localised outbreaks would be more likely in northern and western Europe, re-emergence of malaria was unlikely in these areas.

Nutrition Rising temperatures are predicted to decrease crop productivity in dry and tropical regions, but initially increase production in colder areas. In addition, droughts, floods and water shortages will have a negative impact on productivity, the report says. Fishing will be negatively affected by rising water temperatures. Together, these changes could lead to food shortages and, consequently, malnutrition.

Africa is one of the regions of the world that will be hardest hit by reduced agricultural production, with the IPCC stating that the area suitable for agriculture, the length of the growing season and crop yields are all expected to decrease. But Europe will be affected too: higher temperatures will reduce crop production in southern Europe and, although crop yields will increase in northern Europe, the benefit will not be felt for long. "As climate change continues, its negative impacts (including more frequent winter floods, endangered ecosystems and increasing ground instability) are likely to outweigh its benefits," the report says.

Nutrition will also be affected if infrastructure problems (resulting from extreme weather events) result in difficulties in food supply.

Responding to climate change

The IPCC states that past carbon emissions mean that some global warming is now unavoidable. Although tackling emissions is still essential for the long-term future, a realistic response must include some adaptation to climate change. Part of this will be to work out strategies to cope with the health problems described above. And it is worth considering that the international community's response to climate change might have its own effect on health — for example, policies to reduce carbon emissions may mean long-distance transport of medicines and food is no longer viable.

What is the IPCC?

The Intergovernmental Panel on Climate Change was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme. It has members from 130 countries. The IPCC's role is to assess objectively the scientific evidence for climate change, mainly from peer-reviewed literature. From this evidence, the IPCC produces regular reports on the potential impact of climate change and the options for adaptation. It does not carry out its own research.

The IPCC's latest report, "Climate change 2007: climate change impacts, adaptation and vulnerability", is the work of over 2,500 reviewers and 800 authors. A summary is available at www.ipcc.ch and the full report will be published in mid-2007.