

# THE LANCET

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## EDITORIAL

### Climate-and-health debate warms up

Climate change is once again centre stage. Publication this week of a report by the Intergovernmental Panel on Climate Change ensures that it will stay there. *Climate Change 1995* tells us that the more people burn fossil fuels, clear forests, irrigate rice-fields, and raise flatulent livestock, the more the lower atmosphere will be loaded with heat-trapping "greenhouse gases", especially carbon dioxide and methane. These changes will almost certainly raise the surface temperature of the planet; the IPCC reckons that this is happening already, and it is foretelling an increase in average temperature of around 2.5°C by the year 2100. IPCC's latest report (see p 1612) refers to "a discernible human influence on climate"—to which we would add "and a likely discernible influence of climate on human health".

Like the world itself, the tempo of scientific and public concern with climate change seems to be hotting up. The second report of the UK Government's Climate Change Impacts Review Group is expected shortly, presenting climate change scenarios for Britain and their possible consequences. Both IPCC and the UK review group issued their first reports in 1990, when they focused on financial aspects of forestry, agriculture, water supply, and even insurance, the implicit question being "How will climate change disrupt our economic activities?" Scant attention was paid to the social consequences, and even less to health. The 1996 reports both contain substantial chapters on the potential public health impacts of climate change.

Health scientists have had to peer at a distant and hazy horizon armed with the sketchiest of maps. Epidemiology tells us about the world as it is or has been, not how it will be. Only when climate scientists provide reliable scenarios about how the world will be—and that, with increasing confidence, is what they are doing—can medical scientists assess how such change might affect human health. Inevitably, we have to rely on extrapolation. If

heatwaves currently cause a 10% increase in average daily deaths and if most of those deaths occur when a local population's "threshold temperature" (reflecting physiological and behavioural tolerance) is passed, what might the consequences be of a doubling of the frequency of heatwaves in future? More complex projections are needed for vector-borne infections, exposure to aeroallergens, the nutritional consequences of altered patterns of food production, and the consequences of population migration as sea levels rise. Mathematical modelling helps but the uncertainties remain: scientists are most certain when looking backwards or sideways rather than forwards.

The ozone/skin cancer argument shows how unsatisfactory modelling can be. Data on self-assessed exposure to sunlight combined with incidence figures for skin cancer have provided risk estimates in relation to relative cumulative exposure (person-years) or to the frequency of sunburn in childhood, but not to measured ultraviolet irradiation. Stratospheric ozone depletion could lead, at mid-latitudes, to a sustained 15% rise in ultraviolet irradiation over the next two decades. However, our best epidemiological information is unhelpful here, and we have to rely on crude data about geographical gradients in cancer rates, some due to ambient ultraviolet but much reflecting unrecorded differences in, for instance, clothing, occupation, and recreation.

If climatologists are becoming more confident than they were a decade ago, it is because their models have been improved and are better able to "predict the past". Medical scientists will recognise the risk of self-fulfilling circularity here but it is a start, and they must strive for similar validation for health-impact predictive models. Predictions of a rising toll of mosquito-borne infections as temperatures increase will otherwise be dismissed as alarmist scare stories.

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