Climate change: a time of need and opportunity for the health sector

A J McMichael, M Neira, R Bertollini, D Campbell-Lendrum, S Hales

Have we yet understood the profound significance of the connection between climate change and human health? More than any other issue on the public health agenda, climate change forces us back to basics—to recognise that the extent and trajectory of population health is, ultimately, dependent on the vitality of nature's life-support processes.

Contemporary biomedical and epidemiological research has evolved to explore details of relations, and their variants, within an essentially normally functioning, constant, external world. Climate change, however, shifts our focus far beyond the familiar and specific conceptualisation of disease as a result of individual behaviours, local environmental toxins, occasional heat waves, and genetics. Rather, climate change arises in the context of a world that is now experiencing systemic disruptions to environment—and hence risks to health, wellbeing, and social functioning. To address climate change, public health should therefore consider risks at the whole-population level, informed by an understanding of ecological relations and the imperatives of environmental sustainability.

The comprehensive and timely report on the health risks of climate change and of the consequent risk-management policy needs, published in *The Lancet*,¹ attests to the emerging, although belated, recognition of the real significance of this issue. Similarly, the Global Humanitarian Forum's report,² published in May, 2009, underscores the need for improved understanding of the risks to human health and survival.

The UN Framework Convention on Climate Change (UNFCCC; 1992) committed nations to work collectively to avoid "dangerous anthropogenic interference" in the climate system (Article 2), and to engage in "minimizing adverse effects on the economy, on public health and on the quality of the environment" (Article 4, Item f)—having previously defined adverse effects as those that have "significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare" (Article 1).³ Yet 17 years later, in preparatory submissions to the impending UNFCCC negotiations in Copenhagen in December, 2009, only four of 47 nations mention human health as a consideration.⁴

This absence of reference to health indicates a serious blind spot. Why, actually, do we care about climate change? In the melee of discourse about climate change science, emissions targets and trading, differential responsibilities, and threats to livelihoods and residential security, we have not recognised the real issue. Nearly all

the adverse environmental and social effects of climate change will ultimately threaten human health (physical, nutritional, microbiological, or mental). The dependence of human biology and of collective human ecology on the stability, productivity, and resilience of the natural environment is absolute. Food yields, water flows, air quality, fibre and timber supplies, natural medicinal substances, and climatic stability all underpin population health—and all are threatened by climate change.

Meanwhile, the assessments that have gained most attention from governments have focused mainly on economic effects, suggesting that the economy was the most important issue for society. A key diagram in the executive summary of the Stern review on the economics of climate change⁵ displays adverse effects of climate change across a future temperature increase of 1–6°C. Impaired food yields are mentioned, as are water shortages, weather disasters, and species losses—but not human health. Was the implied significance of these effects confined to economic losses, social disruption, and lost environmental amenity? Although there was an overtone of risks to human health, it was clearly not a central concern.

This failure to understand the full picture of the implications of climate change for human wellbeing is not surprising. A big gap exists between understanding the type of risk posed by climate change to the foundations for health and the way that most disease causation is conventionally construed. Indeed, on various contemporary health issues, high-income countries are now arguably paying a price for having adopted an incomplete and misleading model of disease causation. This model had early origins in the assumed primacy of specific causal agents inherent in the germ theory,⁶ bolstered by the rise of a view of free individual choice and behaviour as the main determinants of health. This perspective, criticised in the mid-1980s by Rose,⁷ has long overshadowed the earlier recognition of the fundamental role of population-level determinants of health—affecting, particularly, epidemic spread and the supplies of food.

The recent public discussion about the rise of obesity in modern populations is an example of this notion. Aberrant individual behaviours, fatness genes, and primary-care personal counselling are all relevant, but only as adjuncts to the major policy need. Gaining weight has, in modern times, become essentially a population-level problem, indicating a systemic imbalance within society of the typical pattern of daily metabolic energy flows.⁸ Resolution lies in the recreation of conditions of living that restore, as standard, a healthy metabolic energy profile. A more enlightened health sector would

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National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australia (Prof A J McMichael PhD); and Public and Environmental Health, World Health Organization, Geneva, Switzerland (M Neira MD, R Bertollini MD, D Campbell-Lendrum PhD, S Hales PhD)

Correspondence to:

Prof A J McMichael, National Centre for Epidemiology and Population Health, Australian National University, Canberra, ACT 0200, Australia
tony.mcmichael@anu.edu.au

have engaged early with other sectors in relation to a foreseeable (although mostly not foreseen) crisis, reducible by intersectoral planning in relation to urban design, transport systems, food production, and marketing.

The report of the WHO Commission on the Social Determinants of Health (2008)⁹ redirects attention to the role of social and economic conditions in establishment of the levels and distribution of health within and between populations. Without attention to social-structural deficits and to inequalities in circumstance and opportunity, enduring health gains cannot be made and health differentials will persist. Rudolf Virchow¹⁰ famously made a similar argument in his report of 1848, on the causes of the typhus epidemic in the rural peasantry in Silesia.

Climate change now ups the ante further. It will also need a transformation in how we think about achieving the conditions for sustaining good population health. Not only will climate change impinge at population scale, but, unabated, it will also progressively erode the underpinnings of population health, often in conjunction with other widespread adverse environmental changes that typify the world nowadays.¹¹ Food systems (on land and sea) could be irreversibly damaged; glacier-dependent river flows could dwindle; regional weather extremes could become unmanageable; some infectious diseases could spread and the emergence of novel others might be enhanced. Especially in situations of social instability and population displacement, geopolitical stability might falter.

Climate change thus poses the additional, troubling, prospect of environmental non-sustainability via the loss of global and regional life-supporting capacity, and this is why human population health has to become a central criterion of policy making for climate change. As policies and actions across diverse sectors embrace the social goal of achieving human health, they will become more environmentally sustainable.

As climate change increases over (at least) the next half century; as the related health research expands in scope, including more investigation into vulnerable populations; and as datasets and linkages improve; so the evidence will become more complete and useful to direct policy. At this year's Commonwealth Health Ministers' Meeting, in Geneva in May, attended by 43 countries, most of the discussion about climate change (the meeting's formal focus) came from tropical countries and small island states. In their general view, local adverse health effects due to climate change are now occurring. Further, they argued that these effects needed expanded public health capacities, to reduce rates of diarrhoea, malaria, and malnutrition before climate change further increases them.

Three major challenges for the health sector in relation to climate change are clear. Each needs an unusually high amount of intersectoral collaboration to address a complex, composite, and longacting process that is

ill-suited to single-sector action. Each needs, therefore, a commensurate broadening of how the health sector understands the underlying determinants of population health, and its professional role in optimisation of these challenges, at this extraordinary time when environmental trends pose risks of actual non-sustainability.

The first challenge is to undertake structured assessments of the health risks (including any observable effects). That task is now underway in response to the mandate that the 2008 World Health Assembly gave to WHO to launch an international work programme on climate change and health.¹² This work will provide information about the range of risks to health, their differential distribution between groups and locations, and their likely time-course under several plausible trajectories of climate change. That accruing knowledge should help to motivate the crucial international task to reduce greenhouse-gas emissions (fundamental prevention in public health terms). It also underscores the second challenge.

Since climate change is now occurring and more warming is already committed, the second challenge comprises development of adaptation strategies that span primary, secondary, and tertiary prevention. Unavoidable health risks have to be countered as best we can, by reduction of hazardous exposures, detection and modification of shifts in health risk or effect, and responding well to actual health effects.

The third challenge offers a positive message: well judged mitigation policies, to reduce greenhouse-gas emissions, can bring immediate collateral health gains (see *The Lancet Series on Health and Climate Change*). Indeed, this message opens a major pathway for revitalisation of health-promotion strategies, embedding them in enduring structural changes, and promoting primary prevention. Health co-benefits will accrue locally if societies change their energy-generating systems in ways that improve outdoor and indoor air quality, choose transport methods that encourage physical activity and social contact, rethink urban and housing design to counter exposures to heat extremes and infectious disease transmission, and modify carbon-intensive food choices and production practices in ways that reduce dietary risks to health.

Meanwhile, monitoring for any adverse health effects of mitigation, especially in vulnerable groups, is needed. Energy policies have to allow for the crucial role that increased access to energy has in socioeconomic development and population health gains. Diversion of food crops into biofuels will cause some food prices to rise, affecting low-income households most. Carbon taxes could prove regressive if passed on indiscriminately to all consumers via increased prices of health-related necessities.

Climate change is creating for the health sector a formative moment, a moment of need and opportunity to affirm the role of population health as a criterion for

For *The Lancet Series on Health and Climate Change* see <http://www.thelancet.com/series/health-and-climate-change>

achieving ways of living that are environmentally sustainable and equitable. Meanwhile, pleasingly, policies for climate change mitigation can provide quick and positive population health dividends on investments in restructuring of society's basic technological, commercial, and social practices—including investments in stronger multisectoral public health and primary prevention capacities.

Contributors

AJMcM wrote the preliminary draft, following a series of discussions with all co-authors. Each of those co-authors (MN, RB, DC-L, and SH) then supplied specific ideas and examples and contributed to the final drafting.

Conflicts of interest

We declare that we have no conflicts of interest.

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