Politicians must heed health effects of climate change

The UCL *Lancet* Commission on climate change and health (May 16, p 1693)[1] concludes: "Climate change is the biggest global health threat of the 21st century". In this report, the authors emphasise not only the immediacy and gravity of this threat, but also the directness: while the poorest in the world will be the first affected, none will be spared. The escalating carbon footprint of the developed world has led to the present situation, but the rapid impact on developing countries such as the encroaching deserts in Africa is the immediate price.

This is one reason why doctors must take a lead in speaking out. Another is that there are important co-benefits of tackling climate change for those with long-term conditions in the developed world, such as those that come from more exercise with less use of cars and dietary change with reduced meat consumption. In December of this year, world governments meet in Copenhagen, Denmark, to negotiate a new UN Framework Convention on Climate Change. There is a real danger that politicians will be indecisive, especially in such turbulent economic times as these. Should their response be weak, the results for international health could be catastrophic. Doctors are still seen as respected and independent, largely trusted by their patients and the societies in which they practise. As leaders of physicians across many countries, we call on doctors to demand that their politicians listen to the clear facts that have been identified in relation to climate change and act now to implement strategies that will benefit the health of communities worldwide.

We declare that we have no conflicts of interest.

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1 Costello A, Abbas M, Allen A, et al. Managing the health effects of climate change. *Lancet* 2009; **373:** 1693–733.

Climate change is not the biggest global health threat

The UCL *Lancet* Commission (May 16, p 1693)[1] claims that "climate change is the biggest global health threat of the 21st century". But it offers no comparison of the relative magnitude and severity of various health threats to justify this claim.

It claims that climate change was responsible for 5·5 million disability-

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	Leading risk factors for DALY loss	DALYs	Leading risk factors for total mortality	Total mortality
1	Underweight	137 801	Blood pressure	7141
2	Unsafe sex	91 869	Tobacco	4907
3	Blood pressure	64 270	Cholesterol	4415
4	Tobacco	59 081	Underweight	3748
5	Alcohol	58 323	Unsafe sex	2886
6	Unsafe water, sanitation, and hygiene	54 158	Low fruit and vegetable intake	2726
7	Cholesterol	40 437	Overweight	2591
8	Indoor smoke from solid fuels	38 539	Physical inactivity	1922
9	Iron deficiency	35 057	Alcohol	1804
10	Overweight	33 415	Unsafe water, sanitation, and hygiene	1730
11	Zinc deficiency	28 034	Indoor smoke from solid fuels	1619
12	Low fruit and vegetable intake	26 662	Iron deficiency	841
13	Vitamin A deficiency	26 638	Urban air pollution	799
14	Physical inactivity	19 092	Zinc deficiency	789
15	Risk factors for injury	13 125	Vitamin A deficiency	778
16	Lead exposure	12 926	Unsafe health-care injections	501
17	Illicit drugs	11 218	Risk factors for injury	310
18	Unsafe health-care injections	10 461	Airborne particulates	243
19	Lack of contraception	8814	Lead exposure	234
20	Childhood sexual abuse	8235	Illicit drugs	204
21	Urban air pollution	7865	**Climate change**	154
22	**Climate change**	5517	Lack of contraception	149
23	Noise	4151	Carcinogens	146
24	Airborne particulates	3038	Childhood sexual abuse	79
25	Carcinogens	1421	Ergonomic stressors	0
26	Ergonomic stressors	818	Noise	0

Table: **Ranking of 26 global public health risk factors based on the global burden of disease (measured as disability-adjusted life years [DALYs]) and on global mortality for 2000[2]**

adjusted life-years lost globally in 2000. But this estimate came from a WHO global burden of disease study[2] which indicated that climate change presently (2000) ranks 21st or 22nd out of 26 health risk factors (table).

Moreover, British-government-sponsored analyses[3] based on the Intergovernmental Panel on Climate Change's (IPCC's) warmest scenario, which would increase average global temperature by 4·0°C from 1990 to 2085, suggests that by 2085 climate change's contribution to global mortality from hunger, malaria, and flooding would be just 10%.[4] Notably, several authors of these analyses helped develop the IPCC's latest assessment.

The Commission's figure 3 also asserts that climate change would expose "hundreds of millions... to increased water stress". But this statement's original source also estimates that climate change would reduce water stress for even greater numbers, thereby reducing the net global population at risk.[4,5]

These results indicate that other global health threats outrank climate change now, and probably for the foreseeable future. They also show that rolling climate back to 1990 levels through "primary mitigation"—eg, drastic emission reductions—would at most reduce mortality from hunger, malaria, and flooding in 2085 by 10%, while increasing the prevalence of water stress.[4] Alternatively, one could endeavour to reduce 100% of the mortality by focusing on reducing society's vulnerability to the health-related problems that climate change might exacerbate.[3] And whereas mitigation indiscriminately reduces positive and negative effects of climate change, "focused adaptation" allows society to capture its benefits (eg, on water stress) while reducing its damage.

Or adaptive capacity could be advanced more broadly, particularly in developing countries, through poverty reduction via sustainable economic development. This would treat the underlying disease—shortage of economic and human resources needed to harness technologies to cope with adversity in general—rather than the symptom, namely, their vulnerability to climate change in particular.

Analysis, based on UN Millennium Program reports, indicates that either adaptive approach—focused adaptation or sustainable economic development—will deliver far greater benefits than mitigation, at lower cost, faster (because the climate system's inertia delays benefits from emission reductions), and more surely (because while hunger, malaria, and extreme events are real, the contribution of climate change to these problems is uncertain).[4]

In summary, the Commission has misdiagnosed the world's primary health problem, and its costliest remedy—mitigation—is also probably the least effective.

I am an assistant director for policy analysis in the US Department of the Interior. The views expressed in this letter, which was written in my own time, are mine alone and not those of either the Department of the Interior or the US Government.

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1 Costello A, Abbas M, Allen A, et al. Managing the health effects of climate change. *Lancet* 2009; **373:** 1693–733.
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3 Parry ML, ed. An assessment of the global effects of climate change under SRES emissions and socio-economic scenarios. *Global Environ Change* 2004; **14:** 1–99.
4 Goklany IM. Is climate change the "defining challenge of our age"? *Energy Environ* 2009; **20:** 279–302.
5 Arnell NW. Climate change and global water resources: SRES emissions and socio economic scenarios. *Global Environ Change* 2004; **14:** 31–52.

Authors' reply

We agree with Indur Goklany on the importance of adaptation to reduce countries' vulnerability to the health-related problems of climate change. But his views on the relative unimportance of primary mitigation are too complacent. They are based on incorrect projections about future warming, and a 9-year-old WHO report. The ranking of climate change at 21st out of 26 risk factors was made at a time when global temperature rise was only 0·74°C, and when the effects of climate change on the other risk factors was unclear. This situation has changed substantially.

Two recent papers[1,2] show that about 1 trillion tonnes is probably the cumulative limit for all carbon emissions if we wish to stay within the 2°C "safety" limit, and that, without action, we shall exceed this limit before 2050. Schneider[3] raised the prospect of worst case scenarios: warming at 3°C gives a 90% probability that Greenland will melt, raising sea levels by many metres, and that on present evidence and trends there is a 5–17% chance that temperatures will go up by 6·4°C by 2100, "a risk way above the threshold at which people would usually buy insurance".

The likely population and health effects of climate change will be much more severe than the WHO 2000 report suggested. Parry and colleagues[4] report that, by 2100, with unmitigated climate change, global warming will reach 4–5°C; up to 3·2 billion people will face increased water stress; there will be an accelerated extinction rate around the globe; more than 40% of ecosystems will be affected; the production of all cereal crops will fall; there will be an increasing burden of malnutrition and cardiorespiratory and infectious diseases; deaths from heat waves, floods, and droughts will increase; and more than 30% of coastal wetlands will be lost, with a major reconfiguration of coastlines worldwide and inundation of low lying areas.[4]

We must protect current efforts to improve global health by ensuring that all the gains are not undermined by the effects of climate change. These problems can be avoided if the

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