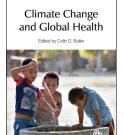


Climate change—what health professionals might do about it



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See The Lancet Commissions page 1973 Climate Change and Global Health Colin D Butler, ed. CABI, 2014. Pp 328. £76-50 ISBN 9781780642659 For IPCC's Fifth Assessment

Report see https://www.ipcc.ch/ report/ar5/ "This is absolutely unacceptable." The delegate was so agitated he almost bit off the end of the microphone. It was a meeting of the Intergovernmental Panel on Climate Change (IPCC) in 2014 to wrap up a major assessment. The final draft of the IPCC's Summary for Policymakers was being scrutinised, line-by-line, and until every country agreed with every phrase the report could not be released.

We were stranded on a graph. The problem was the vertical axis, which showed global mean temperature relative to 1986–2005. The delegate demanded that this be changed, since what mattered was how much the globe had warmed since preindustrial times. At one level this argument was trivial, since a shift in starting points added only a small increment compared with the rise in temperatures that was projected to occur in the future: unmitigated, greenhouse forcing would rack up another 2.5-5.0°C by 2100. The scientists who prepared the graph explained that the climate models used a late 20th-century reference point because there were sufficient data to provide a robust anchor for the calculations.

But it wasn't a trivial issue. What countries—more than one delegate weighed in here—were concerned about was the implication that warming before 2000 didn't register. Re-zeroing the climate change thermometer would be most convenient for countries that industrialised early: was this an attempt to wriggle out of historical liabilities?

An apparently innocuous graph brought the meeting to the global warming crunch point of climate equity, a reminder that scientific assessments of this kind are complex social constructions. The effort spent on signing off the IPCC summaries for policy makers was just the final stage in a long labour. More than 830 authors from 85 countries worked for 3 years, along the way logging, debating, and responding to roughly 140 000 comments from expert reviewers, before delivering the IPCC's Fifth Assessment Report.

"The longer we wait, the more painful and difficult it will be to turn around the global industrial machine and its effects on our planet."

This process is a strength to the extent it avoids hasty conclusions, engages many parties, and allows more voices to be heard than would be the case with a conventional scientific review. But do the checks and balances and many, many iterations cause large-scale assessments to veer too far towards the safe middle ground? The IPCC assessments have, indeed, underpredicted some of the physical changes associated with anthropogenic global warming, such as the loss of Arctic sea ice. Rather than being alarmist, as sometimes claimed, there is reason to believe the painstaking reviews undertaken by the IPCC run a greater risk of being overly conservative.

All the more value, then, in books such as *Climate Change and Global Health* edited by Colin Butler. This volume does not compete with the reports of the IPCC, the US National Academies of Science, or the two *Lancet* Commissions on climate change and planetary health. But the 30 fairly short chapters cover a great variety of topics: Will Steffen locates climate change in the Anthropocene; the late Tony McMichael interrogates the "global" in global health; Menno Bouma and Mercedes Pascual give a master-class in the well-chosen case study (climate and malaria in the highlands of Ethiopia); while Butler himself elaborates the distal and in many ways most powerful "tertiary" effects of climate change on human health, acting through mechanisms such as economic disruption and population displacement. Throughout there is a fresh and uninhibited style.

For instance, climate change and conflict is one of the most contentious subjects, but in Butler's book the line is drawn without hesitation between climate extremes, resource shortages, civil disorder, and armed conflict. The connections are so plausible it is only a short step to the conclusion: climate change has been, is, and increasingly will be a cause of violence and state conflict. In the IPCC's Fifth Assessment Report, the argument moves in a more measured way, still heading in the same direction, but cautiously. In the foreground are concerns about data quality, multiple causation, and variations in susceptibility. Studies of severe climate shifts are limited by the scarcity of historical data; research into the effects of (relatively minor) recent warming is well documented but struggles to distinguish a climate-attributable signal from background noise. The IPCC headline is, not surprisingly, "evidence on climate change and violence is contested". The view from the Butler position in this book is (I paraphrase) "of course there are many causes of conflict, and prediction is highly uncertain, but let's not lose sight of the risks we run if we stay on the present path of high consumption and rising greenhouse emissions".

Given that all forms of disease and injury (not just those secondary to conflict) are multicausal, how can the unique effects of climate variability and climate change be teased out? Attribution studies have generally followed the empirical trail, comparing observed events with what would be expected assuming "no effect", and applying statistical tests to judge whether any difference is significantly unlikely to be due to chance. But attribution by observation of discrete events is not the only route. Epidemiologists are comfortable with the conclusion that smoking causes lung cancer, although it is not possible to determine whether a particular case of cancer was due to cigarettes: we are guided by the odds. The same approach can be applied to climate change. In fact, an 80-90% probability that a particular cancer was caused by smoking is a little higher, but not greatly dissimilar to the probability that recent extreme heatwaves resulted from anthropogenic global warming. And if the conventional calculus is applied, should "no change" be the null hypothesis? The IPCC's Fourth Assessment Report concluded that recent warming was "very likely" due to human activities; the IPCC's Fifth Assessment Report upgraded the confidence statement to "extremely likely". On this basis perhaps the Bayesian prior should be reversed, and the relevant statistic is the probability that observed changes are not due to human-induced warming. As Hilary Bambrick and Simon Hales, authors of the chapter on dengue in Climate Change and Global Health, say, "proof of a role for climate change is challenging, but disproving it may be even harder".

Mark Walport, Chief Scientific Adviser to the UK Government, declared "science isn't finished until it is communicated". That is something many climate scientists struggle to do well: journalists with a critical bent described the IPCC's Fifth Assessment Report



as undoubtedly important, but frequently impenetrable. No doubt it is important to tell the story more effectively, but is the job done when we have translated complicated statistics into media sound bites? What about action, change, implementation-are these part of the scientific endeavour also? The answers to those questions are no and yes, according to Climate Change and Global Health, in which the final chapters tackle how scientists and health professionals might make a difference to global warming outcomes. Included is a short history of health activism, from the anti-slavery movement to prevention of nuclear war, and a brief review of levers that might be applied to shift greenhouse gas emission trajectories. On the list are financial strategies, such as divestment from fossil fuel stocks, "social vaccines" (interventions that strengthen communities and enable them to resist harmful environmental changes), models of low-carbon lifestyles (bike racks for doctors instead of reserved car parks?), and seriously green health care.

These are weighty issues, and you would need to go elsewhere (Roger Pielke's The Honest Broker: Making Sense of Science in Policy and Politics for instance) for a nuanced analysis of the roles that science can have in policy formation. But it is notable, and I think refreshing, that what might otherwise be a rather dry review of mechanisms and impacts of climate change wades into the difficult and terribly important question of how to bring about fundamental social change. The longer we wait, the more painful and difficult it will be to turn around the global industrial machine and its effects on our planet. The Rockefeller Foundation-Lancet Commission on Planetary Health summed up the urgency this way: "our societies face clear and potent dangers that require urgent and transformative actions to protect present and future generations". Butler's book is a passionate and valuable addition to moving this debate forwards.

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