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Climate Change Adaptation and Mitigation: Next steps for cross-sectoral action to protect global health

Authors:
Kathryn J Bowen (corresponding author) – National Centre for Epidemiology and Population Health, Australian National University and Department of Resource Management and Geography, University of Melbourne
Address: Australian National University, Canberra ACT 0200 Australia
Email: kathryn.bowen@anu.edu.au
T: +61 (0) 407299053

Kristie Ebi - ClimAdapt
Address: 424 Tyndall Street, Los Altos, CA 94022
Email: krisebi@essllc.org
T: +1 650 804 8005

Sharon Friel - National Centre for Epidemiology and Population Health, Australian National University
Address: Australian National University, Canberra ACT 0200 Australia
Email: Sharon.friel@anu.edu.au
T: +61 (0) 2 6125 4578

Climate Change Adaptation and Mitigation: Next steps for cross-sectoral action to protect global health

1. Introduction

Action to prepare for and manage the health risks of climate change is slowly gaining traction, despite more than thirty years of research demonstrating the magnitude and extent of possible impacts. Reasons for the slow incorporation of climate change into health sector strategies, policies, and measures include:

i. The health risks of current climate change are relatively small compared with other and more immediate challenges facing policymakers;
ii. some of the climate change related health risks are for health outcomes, such as diarrheal diseases, where there is extensive experience with often successful control. Policymakers have not understood the urgency for any actions to address the additional risks of climate change;;
iii. the demand by policy-makers of attribution of health impacts to climate change, to the detriment of taking win-win approaches in the face of considerable uncertainties about attribution but limited uncertainty about the benefits of action to better manage current and future risks;
iv. health sector researchers and practitioners only slowly realising the importance of engaging with other sectors whose actions can affect population health to share the message of climate change impacts; and
v. the difficulty of demonstrating quantifiable benefits for health of climate change adaptation and mitigation activities compared with hard infrastructure investments in other sectors that address issues such as dams, flood walls, diversification of crops.

Thinking about the risks of climate change started from a frame that this is an environmental problem, not an issue that will affect all aspects of human and natural systems. At the same time, non-health sector policymakers focused on

adaptation and mitigation have been slow to place a priority on considering health goals. These sectors often implicitly assume that actions taken will improve human health and well-being, without explicit confirmation, leading to well-intentioned but sometimes maladaptive actions.

The objective of this paper is to propose potential solutions to these reasons for slow action, with a focus on understanding and engaging with decision-making and governance processes. These solutions are not unique to the health sector – they have relevance to many sectors as they develop, implement, and monitor adaptation activities.

We first do a stocktake of the current global status of knowledge about the health risks of climate change, with reference to the way that health is (or is not) reflected in major international agencies' agendas. Then we remind readers of the co-benefits for health of tackling climate change mitigation and the subtleties of short versus long-term change and its relevance to climate change adaptation and health. Finally, we highlight the importance of understanding the web of stakeholders involved in the decision-making processes of climate change policies and activities, and how this understanding can present opportunities to collaborate with those organisations (and individuals) in developing climate change adaptation and mitigation policies and measures relevant to health. We conclude by suggesting approaches to strengthen the global response to the health impacts of climate change.

2. Brief recap of climate change and health risks

Recent academic reviews on the health effects of climate change leave no doubt about the severity of the health consequences of climate change inaction e.g. (Costello et al., 2009; Friel et al., 2008; McMichael, 2006). However, many of these papers do not focus on 'what's next'; the main (acknowledged) purpose is to present a coherent argument for action on health and climate change, with the aim to encourage appropriate responses. Climate change will, in general, exacerbate current health burdens, with the impact distributed inequitably. Less developed countries will be faced with the more severe outcomes (Friel et al., 2008; McMichael et al., 2008; Patz et al., 2007) due to current vulnerabilities such as underlying levels of disease, lack of infrastructure and services, weak economies, insufficient emergency management and poor governance and decision-making processes. The majority of climate change impacts on health will arise via indirect pathways, predominantly through sectors such as agriculture, water and natural disasters. Examples include an increase in water-borne diseases due to increasingly heavy precipitation events; an increase in childhood undernutrition due to decreases in some places in agricultural yield brought on by long-term drought and excessive flooding; and cases of vector-borne diseases such as malaria if vectors take advantage of changing weather patterns to move to new regions (McMichael & Lindgren, 2011).

3. Global responses to climate change and health risks: Funding and programmatic support

Globally, countries are moving at different rates in developing their responses to climate change. The main vehicles by which low-income countries advance their climate change-related activities are via National Communications and by National Adaptation Programmes of Action (NAPAs) (for least-developed

countries). One goal of both is to identify immediate and urgent national adaptation needs; this priority setting is required to receive financial support under the UNFCCC. A challenge for the health sector is that the inclusion of public health in NAPAs and most National Communications has been fairly limited. Further, a WHO-commissioned review of Annex 1 countries (industrialised countries and countries in transition) reported that no countries recognised health vulnerability within their Fifth National Communications (Lesnikowski et al., 2011).

International organizations supporting efforts for health adaptation include the Global Environment Facility (GEF), the World Bank, the regional development banks, the European Union, bi-lateral donors, and the World Health Organization (WHO). The WHO World Health Assembly of 2008 adopted a resolution urging Member States to take decisive action to address health impacts from climate change (World Health Organization, 2008). The WHO has provided technical support for vulnerability and adaptation assessments in over 30 countries. One example of this is the Western Pacific Regional Office (WPRO) of the WHO that commissioned work in 2009 in Samoa, Cambodia and Mongolia with cooperation from country WHO offices. The NAPA produced by Cambodia in 2006 identified 39 priority projects, only six in public health. All six projects were narrow in their scope, focusing only on malaria.

Several adaptation funds have been established under the United Nations Framework Convention on Climate Change (UNFCCC) in recognition that the needs for current and future adaptation exceed the financial or human resources of low-income countries, and because developed countries bear a responsibility to

help developing countries because of past GHG emissions (Friel et al., 2011). The GEF administers most of the funds. Until recently, access to GEF funding was through a limited number of implementing agencies, including UNDP, UNEP, and the World Bank. There have been few applications from the health sector because, in part, ministries of health do not have strong relationships with these development agencies on the issue of climate change. To address the challenges associated with indirect access to funds, the Adaptation Fund, established under the Kyoto Protocol and funded through a levy on most Clean Development Mechanism projects, is providing direct access for countries.

Another challenge has been that proposed projects were required to demonstrate the adaptation activities address the additional risks of climate change and not be part of normal development. This requirement is particularly difficult for the health sector to satisfy, where there are multiple drivers of climate-sensitive health outcomes. For example, it is challenging to isolate changing weather patterns due to climate change from other drivers of the geographic range and incidence of malaria to demonstrate that a project would only address new climate change risks in a particular region.

One result of these challenges is that health makes up less than 3% of GEF adaptation projects (GEF). Efforts are underway to correct this imbalance.

4. Not all adaptation is good adaptation

Effective management of the health risks of climate change includes measures to reduce the current adaptation deficit as well as measures to increase resilience to longer-term risks. Designing adaptations to address the longer-term risks is

challenging because of the greater uncertainty about the magnitude and extent of climate change and its possible consequences. Most health adaptation has focused on the shorter term, emphasizing enhancing current health protection to climate sensitive health outcomes, such as implementing heatwave early warning systems (St Louis & Hess, 2008). Although such actions are vital, they will not necessarily decrease vulnerability in a future climate. Changing baselines mean that current measures could be neutral or, in at worst, maladaptive under new weather patterns. For example, many heatwave early warning systems do not explicitly taking climate change into account (Lowe et al., 2012). If projected changes in the frequency, intensity, duration, spatial extent, and timing of heatwaves do occur, then these systems may not be adequate to protect vulnerable groups. Explicit consideration of climate variability and change are needed in the design, implementation, monitoring, and evaluation of these and other policies and measures to increase the resilience of communities to a changing climate (Ebi, 2011).

5. Co-benefits of health and climate change mitigation

The UNFCCC states that mitigation measures bringing about societal benefits, such as health, should be prioritised. Mitigation measures can offer an opportunity not only to cost-effectively reduce the risks of climate change but also deliver improvements in health.(Haines et al., 2009)

Characteristics of modern global society – especially economic priorities and processes, social conditions and technological choices –underlie the problem of climate change and exacerbate health problems. Governments around the world are working to reduce GHG emissions. Within a global framework of contraction

and convergence, scientists and policy makers are paying increasing attention to strategies in agriculture, transport, fuel, buildings and industry sectors, each of which is relevant to the mitigation of climate change. Policies in these sectors often have potentially large effects on population health.

Take the food sector for example. Food production for human consumption results in at least 10-12% of global greenhouse gas (GHG) emissions (Smith et al., 2007; Steinfeld, 2006). Agriculturally-related land use change, such as deforestation, overgrazing and the conversion of pasture to arable land accounts for a further 6-17% of global GHG emissions. Four-fifths of agriculture's emissions arise directly from the livestock sector. Livestock products, while a source of some essential nutrients, provide substantial amounts of the saturated fats that are a known risk factor for cardiovascular disease. Using two case studies in the UK and Sao Paulo, Brazil, Friel and colleagues estimated that a combination of agricultural technological improvements and a 30% reduction in livestock production would meet GHG emission reduction targets for this sector by 2030, and at the same time reduce the total burden of ischaemic heart disease in the population by around 15% in the UK and 16% in Sao Paulo, Brazil (Friel et al., 2009).

6. Importance of understanding how decisions are made to effectively advocate for health and climate change adaptation and mitigation

To effectively advocate for the inclusion of public health in climate change adaptation and mitigation activities, it is vital to understand where intervention opportunities exist within governance frameworks. By this, we mean identification of the prominent and influential organisations and individuals who

are involved, or may act as bridging organisations, with the decision-making processes. By identifying those organisations and individuals who are central to and influential in this process, advocacy and intervention actions can be targeted appropriately. This approach, which focuses on issues of systems, processes and power, is a major shift away from the dominant public health approach of education and individual behaviour change. Of most interest here is the adoption of a strategic approach for the health sector to appropriately engage in policy decisions in other sectors, to ensure health is explicitly and effectively incorporated. Health-related organisations (including Ministries of Health and the World Health Organisation) are perceived to hold a high level of influence (blank), and are very active in partnering across different sectors and within different types of organisations (both state, and non-state based). However, despite this apparently high level of influence and partnering displayed by health-related organisations, this does not seem to be translating into a greater emphasis on health in climate change policies.

7. Potential solutions for strengthening health and climate change adaptation activities

Practical approaches to incorporating health within all major related sectoral climate change policies fall into three main categories: i) capacity development of local health officials to increase their understanding of health and climate change (national level initially); ii) wider and stronger engagement with relevant sectors; and iii) continual evaluation of decision-making processes and the identification of the most active and influential organisations (both government and non-government).

In terms of capacity development, it is clear that climate change is a competing health concern within health ministries in many countries (both developed and developing). It is difficult to address the climate change and health risks when more 'immediate' health issues (such as clean drinking water and access to nutritious foodstuffs) are more urgent to health officials. It is, though, precisely such examples that provide the entry point to advocate for action on climate change, as changing weather patterns will exacerbate current health burdens, particularly food and water availability, in most regions. Local health ministry staff requires support to better advocate for and explain the climate change and health links. This support has commenced – for example, WHO has produced slide presentations to illustrate the basic links between health and climate change. While potentially helpful, a broader need is connection of the health ministry with ministries involved in water, agriculture, energy, and ecosystem management. Such linkages cannot be mandated by international organizations, but must be achieved within a country, encouraged by the highest levels of government.

The second practical way to strengthen adaptation and mitigation efforts to prepare for and respond to the health effects of climate change is to incorporate health within all related sectoral policies, which aligns with a Health in All Policies (HiAP) approach (Kickbusch, 2008). Key factors for the successful implementation of HiAP have been identified as leadership and support from central government, the allocation of dedicated resources, clear timelines, a supportive culture, and the articulation of outcomes (Kickbusch, 2008).

In addition to these factors, climate change and health risks should be linked to issues that are of strategic importance for each country. For example, some

contexts (such as low-lying island states) will be more concerned than others with migration as a result of sea-level rise. In this case, it is vital that the current policy context is attended to, by (for example) highlighting the health issues that may arise from migration (McMichael, 2010). Further, it is important to determine the extent to which it is useful for health risks of climate change be seen as a separate issue versus to be mainstreamed into issues such as water, food, and transport. Opportunities should be actively explored to simultaneously address adaptation and mitigation within policies.

To minimise the sense of competing issues for countries, it is important to ensure that as far as possible, health-related adaptation and mitigation activities are integrated within development plans and poverty reduction strategies. If climate change and health is seen as a competing issue, it hampers addressing both as vitally important. Ultimately, addressing the health risks of climate change will also promote improved development outcomes (such as safe drinking water and access to health services).

A practical approach to incorporating health and climate change within all sectoral policies is to ‘embed’ health professionals within the ministries with climate change responsibilities (as well as other related sectors), and incorporate environment, water, agriculture and other professionals within ministries of health. Supporting such joint positions would lead to a greater understanding of mutually relevant issues, with positive outcomes for policy development and action. In some contexts strong partnerships already exist between health and other sectors, but local input on how these can be strengthened (paying attention to different contexts) is vital.

For example, a health professional embedded within a ministry of agriculture may be tasked to undertake a mixture of program and policy activities. A program activity may include conducting site visits to vegetable growers in a flood-prone district to explain ways by which the farmers can diversify their crops and increase their number of annual croppings to help ensure that not all crops are lost during a flood. By using a health professional in this role (which may include other team members) the message of the importance of food security and healthy nutrition for the local community can thus be communicated. A policy activity may include the health professional having a designated mandate to ensure that all policies that the agriculture ministry drafts or has some other involvement with (as external reviewer/collaborator etc.) incorporates a thorough and rigorous assessment of health needs and impacts.

The final component of the proposed three-pronged approach is to understand decision-making processes in relation to the development of climate change adaptation policies and strategies. This requires identifying which organisations and individuals are central in developing policies and actions in climate change adaptation. Formal studies to evaluate these networks in different countries (blank) identified the national health ministries as prominent and influential organisations, along with cross-sectoral government and non-government agencies. Understanding the organisations that are active and influential in decision-making processes can be used to directly target advocacy activities to include health on the policy agenda. There are many organisations active within the decision-making sphere, and many are non-state based (e.g. non-government organisations, private organisations and others). There are also networks that do

not follow formal structures. Hence, an understanding of how these actors and the formal and informal networks influence decision-making is crucial for an accurate assessment of the governance structure in different contexts.

In parallel with understanding and linking in with key individuals and organisations involved with climate change adaptation decision-making, engaging with national-level decision-makers can occur via the UNFCCC processes. The writing and dissemination of policy briefs that succinctly and persuasively convey the health and climate change message could be provided to directors of government departments, other relevant ministry officials, non-government organisations working closely on climate change issues, and national-level government negotiators. All of these individuals are central to the policy process. Researchers should realise and respect the way that policy-makers and negotiators need accessible and easily understood information, particularly with respect to implications and ways forward. Policy briefs addressing climate change and health could provide a suitable platform to encourage policy-makers and negotiators to more easily incorporate health concerns within the UNFCCC processes.

8. Conclusion

This paper moves beyond the current body of literature that sets out the need for action on climate change adaptation and mitigation, and focuses on systems, processes and power issues that influence the inclusion of health in climate change adaptation and mitigation policy making. The paper argues that there are three main practical ways to strengthen our efforts to prepare for and respond to

climate change. These solutions focus on strengthening the capacity and understanding of health officials in relation to climate change and health, improving cross-sectoral partnerships with sectors relevant to health and climate change, and identifying organisations influential to the development of climate change adaptation and mitigation strategies and policies.

Ultimately, all climate change effects will impact on health, and this reality demands a more cross-sectoral approach. The health sector can only do so much on its own; the synergy that is created when different sectors work effectively with each other has the potential to advance actions and responses to reduce current and future health impacts and their inequitable effects. The engagement between health and other sectors (such as water, agriculture, disaster management, transport, housing and others) needs to be contextually specific, incorporating national and sub-national concerns around current development priorities. Strategies to reduce the health impacts of climate change often dovetail with other development goals, such as many of the Millennium Development Goals (MDGs), including child and maternal mortality, hunger and environmental sustainability.

In conclusion, if we can make advances to reduce the risks to health from climate change, via adopting these proposed three solutions, we will also be making substantial progress on reducing broader health burdens. Only by shifting to a solutions-focused approach that engages wide and influential audiences will we see a change in action. This will be a win-win situation for all, particularly communities in less-developed contexts, and will help governments meet their health, social and development goals in an efficient way.

References

Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., et al. (2009). Managing the health effects of climate change. *The Lancet,* 373, 1693-1733.

Ebi, K.L. (2011). Resilience to the health risks of extreme weather events in a changing climate in the United States. *International Journal of Environmental Research and Public Health*, 8, 4582-4594.

Friel, S., Butler CD, & McMichael AJ. (2011). Climate change and health: Risks and Inequities. In S. Benatar, & G. Brock (Eds.), *Global Health Ethics* pp. 198-209). Cambridge: Cambridge University Press.

Friel, S., Dangour, A.D., Garnett, T., Lock, K., Chalabi, Z., Roberts, I., et al. (2009). Public health benefits of strategies to reduce greenhouse-gas emissions: food and agriculture. *The Lancet*, 374, 2016-2025.

Friel, S., Marmot, M., McMichael, A.J., Kjellstrom, T., & Vagero, D. (2008). Global health equity and climate stabilisation: a common agenda. *Lancet,* 372, 1677-1683.

Haines, A., McMichael, A., Smith, K., Roberts, I., Woodcock, J., Markandya, A., et al. (2009). Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers. *The Lancet*, 69-79.

Kickbusch, I. (2008). Healthy Societies: addressing 21st century health challenges. Department of Premier and Cabinet, South Australia.

Lesnikowski, A.C., Ford, J.D., Berrang-Ford, L., Paterson, J.A., Barrera, M., & Heymann, S.J. (2011). Adapting to health impacts of climate change: a study of UNFCCC Annex I parties. *Environmental Research Letters*, 6, 044009.

Lowe, D., Ebi, K.L., & Forsberg, B. (2012). Heatwave Early Warning Systems and Adaptation Advice to Reduce Human Health Consequences of Heatwaves. *International Journal of Environmental Research and Public Health*, 8, 4623-4648.

McMichael, A.J., Friel, S., Corvolan, C., & Nyong, T. (2008). Global environmental change and human health: Implications for health inequalities, social policy and the health professions. *British Medical Journal*, 336, 191-194.

McMichael, A.J., & Lindgren, E. (2011). Climate change: present and future risks to health, and necessary responses. *Journal of Internal Medicine,* 270, 401-413.

McMichael, A.J., McMichael, C., Berry, H., Bowen, K.J. (2010). Climate change, displacement and health In J. McAdam (Ed.), *Climate Change and Displacement: Multidisciplinary Perspectives*. Oxford: Hart Publishing

McMichael, T., Woodruff, R.E. & Hales, S. (2006). Climate change and human health: present and future risks. *Lancet,* 367, 859-869.

Patz, J.A., Gibbs, H.K., Foley, J.A., Rogers, J.V., & Smith, K.R. (2007). Climate change and global health: Quantifying a growing ethical crisis. *EcoHealth*, 4, 397-405.

Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H.H., Kumar, P., et al. (2007). Agriculture. In B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, & L.A. Meyer (Eds.), *Climate Change 2007: Mitigation. Contribution of Working*

Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. New York, NY: Cambridge University Press.

St Louis, M.E., & Hess, J.J. (2008). Climate change: Impacts on and implications for global health. *American Journal of Preventative Medicine,* 35, 527-538.

Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, C. & de Haan, C. (2006). Livestock's long shadow: environmental issues and options. Rome, Italy: Livestock, Environment and Development Initiative, Food and Agriculture Organization of the United Nations.

World Health Organization. (2008). Protecting Health from Climate Change. Geneva: World Health Organization.