
Twenty to thirty years ago, consideration of the health impacts of climate change tended to focus on future scenarios of what might happen. Fast forward to the 2020s and we now see these scenarios unfolding in communities around the globe, with impacts on health part of the catastrophic impacts of unprecedented heatwaves, bushfires and flooding. Other climate-related health impacts, linked to the quality of our air, water and food, sea-level increase, the spread of diseases and mental health outcomes, are also increasing but rarely make the news.

This article will demonstrate how Health Impact Assessment (HIA) has been integrated with key climate change terminology and concepts to assess the health impacts of climate change and facilitate the development of adaptation plans in locations such as Western Australia, Solomon Islands, Nauru and Vanuatu (Dept Health WA, 2008; Spickett, Katscherian & McIver 2013; Spickett & Katscherian, 2014; WHO, 2015;). The Climate Health WA Inquiry also recommended the application of HIA to guide future action in Western Australia on climate change and health (Weeranmanthri et al, 2020).

The values and characteristics of HIA are highlighted as a useful approach to inform Vulnerability and Adaptation Assessments (VAA) related to health (Patz et al, 2008; WHO, 2009). The consideration of a broad range of environmental, social and economic determinants of health, with a strong focus on equity, sustainable development and stakeholder and community consultation, are characteristics of HIA that are well-suited to work on climate change and health.

## Key steps in the Process

### *Stakeholder and community consultation*

The knowledge required to inform the process of HIA extends across multiple disciplines and the community. In terms of disciplines, consultation needs those within the health sector, as well as the non-health sectors, such as emergency services, environment, indigenous affairs, planning, housing, water, energy, transport, community and cultural services, education and

agriculture. Community representation should include those with a strong understanding of traditional and/or local knowledge linked to the affected area, and groups who may be vulnerable to health effects of climate change. The increase in mutual understanding that emerges from this broad involvement is central to the identification of key areas of vulnerability and adaptation strategies and can provide long-lasting benefits.

### *Preliminary Scoping*

A preliminary scoping step is undertaken by the HIA Project Team who establish the key concepts and approaches that will be used throughout the assessment, including the temporal and spatial boundaries of the assessment, the stakeholder engagement strategy and a preliminary consideration of which health impacts will be considered. It is recommended that a single scenario for future climate change be used because multiple climate scenarios can become unwieldy. A rationale for the scenario should be provided and the impact of this selection discussed in the final report.

Previous applications of HIA have selected a time-frame of about 20 years. This provides greater certainty with respect to climate change projections and is a time period that participants can relate to. The spatial boundaries are also critical as location has a major influence on the types of impacts, levels of risk and the selection of effective adaptation strategies. Most locations will already have a good indication of which health impacts are of most concern in their area and this can inform the focus of the HIA.

### *Profiling*

The profiling step is undertaken by the Project Team and provides critical information about the climate scenario being considered, the local environment (natural and built) and the community. The climate scenario, obtained from sources such as the IPCC or national meteorological bodies, includes projections for temperature and rainfall patterns, sea-level rise and extreme weather events relevant to the location.

The basic characteristics of the natural and built environment should be described including the topography, identification of specific features and areas of human settlement. These should include descriptions of populated areas that are potentially more exposed to some aspects of climate changes, such as low-lying coastal areas or islands subject to sea-level increase, or areas that may be at higher risk due to other factors, such as urban areas contending with heatwaves and urban heat island effects.

A profile of the local community includes population demographics, current health status, leading causes of mortality and morbidity (especially for climate-related outcomes) and existing health inequities. Data from this step is critical to inform assessments of risk and to identify groups who may be more vulnerable to certain health impacts. The profile feeds into a comprehensive scoping workshop.

### *Comprehensive Scoping*

Comprehensive scoping is best conducted as a full-day workshop and should include a mix of stakeholders as previously outlined. To ensure that a wide range of factors is considered, a

health determinants checklist is categorised into the biophysical environment, the service and infrastructure environment, and the social environment. Participants are assigned to groups based on their areas of expertise and work to identify the links between each climate variable, determinants of health and health impacts, citing relevant sources of evidence.

Each impact is then considered in terms of the key elements of the IPCC risk model—exposure, sensitivity and adaptive capacity. The process to this point can take up to half a day and all information is recorded in pre-prepared working tables. Ideally, groups will also have the opportunity to report back key findings to all participants.

The final task of the workshop is to identify current management practices for each impact and to list the potential limitations of these in the chosen year and climate scenario. This can be presented as *'if the climate change scenario of 20 years' time was to arrive tomorrow, what are the likely outcomes with the current management strategies in place?'* Participants also identify the stakeholders who are likely to be involved in addressing potential management actions, which informs the selection of participants for the final workshop.

The Project Team compiles the outcomes of the first workshop in an interim report which informs the next steps.

### *Assessment*

This step assesses and ranks the level of risks to public health associated with the health impacts identified in the first workshop. This is best conducted as a smaller workshop with health experts, including those who attended the first workshop. Each impact is considered in terms of the likelihood of occurrence and the extent of health consequences, assuming the climate scenario has occurred and that only current management practices are in place. Likelihood and consequence scales are defined, and outcomes are entered into a basic risk assessment matrix to estimate the level of risk.

Given the range and complexities of the links between health and climate, the volume and type of evidence to inform the assessments will be highly variable. Some may have extensive modelling and quantitative estimates, others will rely on qualitative data and expert opinion. Whatever the case, a clear rationale for the assessment is required, including commentary on the quality of evidence informing the decision. The resulting risk rankings are discussed in a plenary session where potential adjustments can be discussed and justified. A useful outcome of this approach is to highlight gaps in the evidence on impacts that can subsequently be addressed as part of the adaptation step.

### *Adaptation (Management)*

The third and final workshop focuses on development of adaptation strategies for the impacts at the upper end of the risk rankings. The workshop is typically a whole day. Prior to the workshop, the Project Team compiles a list of potential adaptation strategies drawn from the first two workshops, consultation with key stakeholders and the literature. These strategies are divided into eight categories: regulations and legislation; public education and communication;

surveillance and monitoring; ecosystem intervention; infrastructure development; technological and engineering; health intervention; research/further information. Ideally, the list is expanded as different jurisdictions undertake the process, providing a valuable shared resource. Unfortunately, there is currently no coordinated approach or resources to support this integrated approach.

Workshop groups are allocated a limited number of health outcomes based on their area of expertise and discuss the relevance and current capacity of the adaptation strategies, as well as any additional strategies. Suggestions to increase capacity for suitable strategies are outlined, including an indication of stakeholders who would be involved in the process.

## *Recommendations*

A mechanism to present the findings to decision makers is required. It is recommended that the Project Team compile a "Climate Change and Health Adaptation Strategies Report". The report should include: an overview of the process; a clear health impact statement including the final risk rankings and vulnerabilities; and key adaptation actions, especially for priority risks and vulnerable groups. Aspects such as an overall strategic direction, a summary of lead government agencies, ongoing community involvement, and key activities and projects should also be included.

## *Conclusions*

The Sixth IPCC Assessment report rang alarm bells on the intensification of climate change and the urgency required to deal with the climate emergency (IPCC, 2021). While this article has focused on health impacts of adaptation strategies, it must be said that there are limits to adaptation and without strong and urgent action to reduce greenhouse gas emissions, adaptation will be less likely, less effective and far costlier in human and economic terms.

Adaptation planning for health impacts of climate change can be a challenging prospect. A key objective of the HIA-based process outlined in this article is to provide guidance and tools to support that challenge. The resulting outcomes can inform planning and decision making by all levels of government and communities to deliver better and fairer outcomes in the face of the climate emergency. A more detailed description of the process, including a series of working tables is provided in the document *"Climate Change, Vulnerability and Health: A Guide to Assessing and Addressing the Health Impacts"* (Spickett, Katscherian and Brown; 2015).

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