



## The role of Health Impact Assessment in the setting of air quality standards: An Australian perspective



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### ABSTRACT

The approaches used for setting or reviewing air quality standards vary from country to country. The purpose of this research was to consider the potential to improve decision-making through integration of HIA into the processes to review and set air quality standards used in Australia.

To assess the value of HIA in this policy process, its strengths and weaknesses were evaluated aligned with review of international processes for setting air quality standards.

Air quality standard setting programmes elsewhere have either used HIA or have amalgamated and incorporated factors normally found within HIA frameworks. They clearly demonstrate the value of a formalised HIA process for setting air quality standards in Australia.

The following elements should be taken into consideration when using HIA in standard setting. (a) The adequacy of a mainly technical approach in current standard setting procedures to consider social determinants of health. (b) The importance of risk assessment criteria and information within the HIA process. The assessment of risk should consider equity, the distribution of variations in air quality in different locations and the potential impacts on health. (c) The uncertainties in extrapolating evidence from one population to another or to subpopulations, especially the more vulnerable, due to differing environmental factors and population variables. (d) The significance of communication with all potential stakeholders on issues associated with the management of air quality.

In Australia there is also an opportunity for HIA to be used in conjunction with the NEPM to develop local air quality standard measures. The outcomes of this research indicated that the use of HIA for air quality standard setting at the national and local levels would prove advantageous.

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### 1. Introduction

Many diverse factors influence human health so the equitable regulation of potentially harmful environmental pollutants such as those in ambient air is a complex process. Over the recent years many studies have reported links between ambient air quality and a range of adverse health outcomes in the general population (World Health Organisation, 2005). The effects of air quality on sub-groups in populations and a variety of exposure conditions and animals have been used to investigate health impacts from exposures. The outcomes provide the basis for considering potential health impacts under current standardised air quality levels as well as the potential improvements in the health of the population that may be anticipated by improving the quality of the air.

In 1987, a working group of the World Health Organisation (1987) (WHO) established four basic principles to assist in the incorporation

of issues relating to the protection of human health into the Environmental Impact Assessment (EIA) process. In 1989, the WHO First European Conference on Health and the Environment unanimously approved the European Charter on Environment and Health (World Health Organisation, 1989). The Charter recognises that every individual is entitled to an environment conducive to the highest attainable level of health and wellbeing and underlines the shared responsibilities of individuals, public authorities and economic sectors of society.

Health Impact Assessment (HIA) has been defined as “a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of the population, and the distribution of those effects within the population” (World Health Organisation, 1999). It is a systematic, and structured, process which aims to identify and examine both the positive and negative health impacts, intended or not, single or cumulative of an activity and provides decision makers with information about how the activity may affect the health and wellbeing of people (Harris et al., 2007). HIA has the values of sustainable development, promotion of health, democracy, equity and ethical use of evidence.

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It provides stakeholders with the opportunity to participate in community engagement processes to act proactively to share possible community benefits as well as to minimise potential future problems.

Assessment of the risk associated with potential adverse impacts that could arise from implementation of activities, is a key element of the HIA process (Spickett et al., 2012). A review of risk assessments in HIAs acknowledged that quantitative methods were valuable as they enabled a confident quantitative estimate of health impact to be made where adequate research data was available on which to make the calculations (O'Connell and Hurley, 2009). However a tendency existed to attribute certainty to such values without a full appreciation of the complexity of the factors involved, particularly in the case where multiple determinants interact. It was also concluded that the ability of the HIA process to incorporate qualitative aspects is an important strength including, as it does, the necessity for involving a multidisciplinary team.

The European Community created a system for undertaking HIAs of outdoor air pollution in 1999 in order to assess the benefits of reducing PM<sub>2.5</sub> (fine particulates) in a number of European cities. Called the "Air Pollution Health: A European Information System" (APHEIS) programme it operates continuously and produces periodic reports (Medina et al., 2004). By the end of the first decade of the twenty first century the application of HIA has spread as more practitioners became skilled in its use (Wismar et al., 2007; Dannenberg et al., 2008; Harris and Spickett, 2011; National Health Commission Office of Thailand, 2012). A growing appreciation has emerged that this practical approach is well suited to judge the potential health impacts of a policy, programme or project on a population, particularly on vulnerable or disadvantaged groups.

The HIA process provides for a broad approach and can be used to assess high-level policies and programmes as well as individual developments in all sectors (Dannenberg et al., 2008; Harris and Spickett, 2011). It is flexible so that it can use a variety of assessment procedures depending on the purpose of the assessment and recommendations are produced for decision-makers and stakeholders with the aim of maximising the proposal's positive health effects and minimising its negative health effects. Increasing attention has been given to the contribution that it can make to promoting community input and building capacity through participation and consultation.

## 2. Australian air quality standards

The main objective of most air quality standards is to protect human health without imposing unacceptable economic and social costs. In 1998 in Australia, the National Environment Protection Council (NEPC), a statutory entity charged with consideration of matters of national significance on environment and water, prepared the National Environment Protection (Ambient Air Quality) Measure, the NEPM (AAQ). This Measure set uniform air quality standards for six 'criteria' pollutants: carbon monoxide, ozone, sulphur dioxide, nitrogen dioxide, particulate matter and lead (National Environmental Protection Council (NEPC), 1998). The NEPM (AAQ) states "The desired environmental outcome of this Measure is ambient air quality that allows for the adequate protection of human health and well-being" and includes the goal that the air quality standards will be achieved within ten years (i.e. by 2008) with an allowable number of exceedances. The intended application of these standards is to act as benchmarks against which the ambient air quality can be assessed. The responsibility for their implementation rests with individual jurisdictions.

The air quality standards of the NEPM (AAQ) are therefore designed to ensure that the health of the general population is protected from the adverse effects of air pollutants. However, they are not intended for use with individual emissions and do not take into consideration population subgroups that may have greater susceptibility. Further, they are set for ambient (outdoor) air only despite the fact that people can be at risk from exposure to air pollution released indoors and in some

circumstances exposure can occur in microenvironments such as underground car parks and busy roadways. In 2005, the NEPC in its review of the AAQ NEPM, indicated that some jurisdictions use the AAQ NEPM to assess air quality at locations for which the AAQ NEPM was not intended to apply such as for local air quality issues.

To protect individuals and communities potentially affected outside the influence of the NEPM, NEPC recommendations that health and environment sectors should develop guideline values outside the AAQ NEPM framework have resulted in the formulation of other standards, regulations and guidelines. These are used by individual jurisdictions to assist in assessing the impact of industrial emissions from specific industrial facilities on affected communities and other situations where a gap exists.

In 2009, the NEPC Working Group comprising predominantly experts in epidemiology, toxicology and risk assessments, released a public consultation paper (National Environmental Protection Council (NEPC), 2009) to reach an agreement between the health and environment sectors on establishment of a framework and methodology for setting new air quality standards. A risk assessment approach was recommended, however the paper identified shortcomings with respect to a range of additional issues. Feedback was requested on:

- the level of health protection to be built into standards
- the application of uncertainty or safety factors
- approaches to dealing with non-threshold pollutants
- approaches to exposure assessment
- equity and social justice issues
- application and approaches to cost-benefit analysis.

Given that these apply to HIA, especially consideration of equity, sustainability and social justice, it was proposed that research was undertaken to consider the potential use of HIA within the policy area of standard setting for ambient air quality in Australia. This article provides an overview of the air quality standard setting process in this country is followed by an analysis of the extent to which the HIA process could become part of this process.

## 3. Method

The aim of this research was to examine the feasibility of integrating HIA into the Australian air quality standards setting process as a tool to improve decision-making and as a way to engage external partners on initiatives that could influence health outcomes.

This investigative research project was generated by government to consider the potential value of HIA in the setting of air quality standards. As the AAQ NEPM were set to assess general trends in the general air quality in cities in Australia it was considered that the inclusion of HIA would enable a greater focus on the way air quality was affecting health and well-being, especially in the more vulnerable sections of the community.

A Steering Committee was established with staff from the Department of Health in Western Australia to provide guidance on the overall project, which was overseen by the National Environmental Health Committee (enHealth) of the Department of Health and Aging. A process was used to:

- review the standard setting process in Australia (at the time?) and internationally
- consider the application of HIA to air quality standard setting
- compare the strengths and weaknesses of HIA against the recommendations for this process, and
- analyse the application of HIA in the air quality standard setting process including advantages and disadvantages

The process included consultation with health experts in a range of fields relevant to this research including air quality, risk assessment, policy development and implementation and HIA specialists.

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