

# Health Impact Assessment Guidelines

*September 2001*



**enHEALTH**

*Health Impact Assessment*

***Guidelines***

September 2001

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## Abbreviations

ABS	Australian Bureau of Statistics
DOH	Department of Health (UK)
E&HIA	Environmental and Health Impact Assessment
EIA	Environmental Impact Assessment
EMPCA	Environmental Management and Pollution Control Act (Tasmanian)
HIA	Health Impact Assessment
HIS	Health Impact Statement
NHMRC	National Health & Medical Research Council
PAH	Polyaromatic hydrocarbon
PCB	Polychlorinated biphenyl
PHA	Public Health Authority
WHO	World Health Organization

## Glossary

### Environmental health

A subset of public health which focuses on environmental conditions and hazards which affect, or have the potential to affect, human health, either directly or indirectly. It includes the protection of good health, the promotion of aesthetic, social and economic values and amenity, and the prevention of illness and injury by promoting positive environmental factors and reducing potential hazards – physical, biological, chemical and radiological.

### Hazard

The capacity of an agent to produce a particular type of adverse health or environmental effect.

### Health Impact Assessment

The process of estimating the potential impact of a chemical, biological, physical or social agent on a specified human population system under a specific set of conditions and for a certain timeframe.

### Health Impact Statement

The report which presents the findings of a Health Impact Assessment.

### Risk

The probability that, in a certain timeframe, an adverse outcome will occur in a person, group of people, plants, animals and/or the ecology of a specified area that is exposed to a particular dose or concentration of a hazardous agent, i.e. it depends on both the level of toxicity of the agent and the level of exposure.

### Risk assessment

The process of estimating the potential impact of a chemical, physical, microbiological or psychosocial hazard on a specified human population or ecological system under a specific set of conditions and for a certain timeframe.

### Risk communication

An interactive process involving the exchange among individuals, groups and institutions of information and expert opinion about the nature, severity, and acceptability of risks and the decisions taken to combat them.

### Risk management

The process of evaluating alternative actions, selecting options and implementing them in response to health risk assessments. The decision making will incorporate scientific, technological, social, economic and political information. The process requires value judgements, eg. on the tolerability and reasonableness of costs.

# Preface

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The critical link between human health and our surroundings is highlighted in the National Environmental Health Strategy (1999)<sup>1</sup>. In particular, it calls for greater attention to the impacts of developments – “...health considerations should form part of any impact assessment for developments or decisions that could have health consequences.”

There is overwhelming evidence that development can have a beneficial effect on health and wellbeing; through the creation of employment, promotion of economic advancement and providing circumstances which can improve living standards. Development can also have adverse effects, however, through problems such as noise, water and air pollution, and increased risks of injury and disease transmission. Development may also impact on the social and emotional status of individuals and communities through, for example, alienation and dis-empowerment. Some community members may be particularly susceptible to both the physical and social impacts, such as children and the elderly.

Health Impact Assessment (HIA) is a process that systematically identifies and examines, in a balanced way, both the potential positive and negative health impacts of an activity.

These Guidelines specifically address the use of HIA when conducting Environmental Impact Assessment, further developing the National Health and Medical Research Council *National Framework for Environmental and Health Impact Assessment* (1994)<sup>6</sup> in the light of experience in implementing HIA in Australia and overseas. In this planning context the outcomes of HIA provide the ideal starting point for efforts to maximise positive health impacts and prevent or minimise negative impacts. Rectifying problems during planning is usually the preferred approach; rather than having to deal with them once a development is under construction or in place.

By ensuring that immediate and future human health can be protected, the possibility of sustainable development is strengthened by HIA.

In addition to health professionals, HIA involves a number of other sectors, including planning, environment, social science, economics and the wider community. These Guidelines are intended to assist these sectors to better understand the rationale for HIA and the processes involved. In particular, the Guidelines provide insight into the health benefits that can be derived from better health-based decision making.

For proponents the Guidelines will assist understanding of what needs to be done and promote a more balanced approach by ensuring positive impacts are given appropriate consideration. For the wider community HIA can help to ensure our surroundings are best able to enhance health for all into the future.

Maximising the economic and other benefits of development while managing the adverse impacts is an important but often difficult balance to strike. These Guidelines are intended to assist with the achievement of that balance.

# Executive summary

These Guidelines aim to promote and enhance the incorporation of Health Impact Assessment (HIA) into environmental and planning impact assessment generally, thereby improving the consideration of health issues.

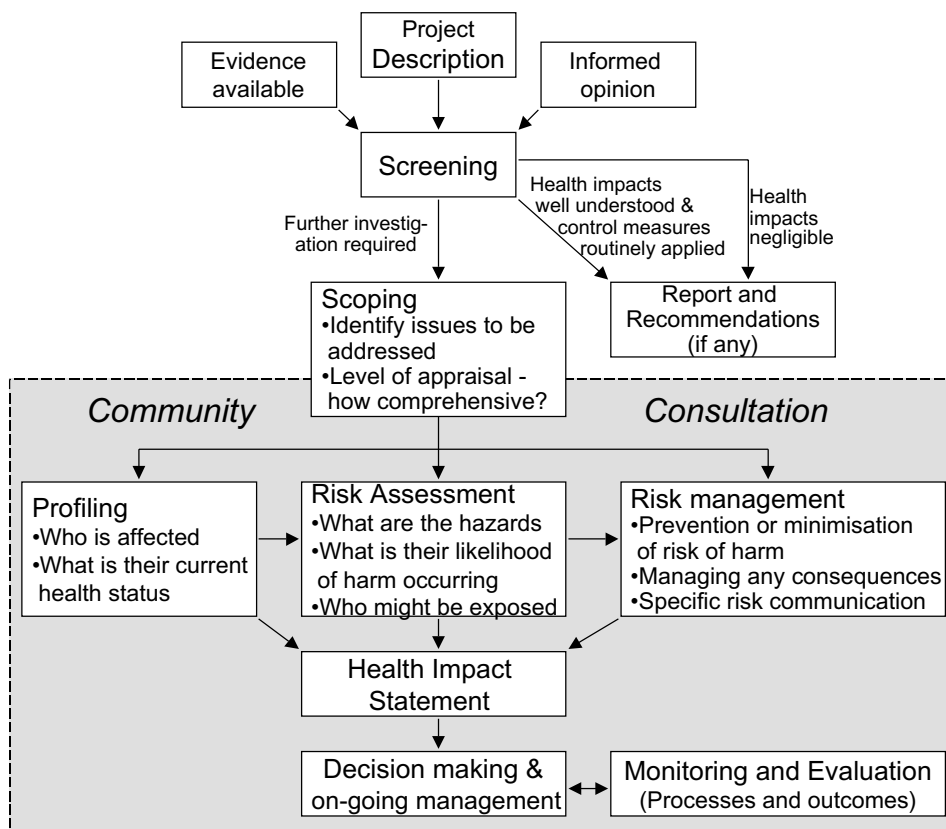
In particular they seek to provide those involved in impact assessment across all levels of government and developers, along with their advisers, with an introduction to HIA and general guidance on the key steps involved.

The intent of the Guidelines is to achieve this without the addition of another layer of 'bureaucracy' to the impact assessment processes already in operation across Australia, through the integration of HIA with the processes already in place.

The current consideration given to human health in Environmental Impact Assessment (EIA) is often unstructured and confined to negative impacts. An EIA may not properly recognise the positive effect on health that development can have, for example financial status.

Health is determined by many factors including genes, age, a person's social and economic circumstances, lifestyle and access to services, as well as environmental health factors such as air and water quality, housing, etc. HIA seeks to ensure both the positive and negative impacts on health (as viewed from a wider perspective than just physical illness or injury) are effectively considered during impact assessment.

The HIA process shares the general framework commonly used for impact assessment, as shown in the diagram below:





The proponent's role is to prepare a Health Impact Statement (generally as part of a broader impact assessment) that addresses the issues identified during scoping, and which includes assessment of the likely risks and benefits to health from the development, as well as management of the risks.

The health authority should provide its view on the health risks requiring attention (at the scoping stage) and ensure that the level of amelioration recommended is in proportion to the level of risk to health. The health authority may also advise on data requirements and data availability and provide input into assessment of the Health Impact Statement.

The decision-making agency (Environment or Planning) should ensure that human health is included in the issues to be addressed in the statement of requirements issued to proponents, it should refer assessments to the health authority for consideration and forward monitoring and evaluation data provided by the proponent or their agent.

A HIA will require much of the same data as needed for a general impact assessment, but there will often be additional data requirements. These include:

- demographic and health status data for local and other affected populations (eg. adjacent to transport routes), and details of any special populations, eg. children, the elderly;

- environmental health data – potential impacts on air quality, soil, water and waste-water will be of particular relevance in health assessment; as are any potential impacts on the quality, availability or price of food or impacts on food producing land;
- additional demands on community infrastructure – such as sewerage, water supplies, waste management services, schools, health and social services;
- transport issues, including the risk of injury, pollution and amenity. Both the positive and negative aspects of transport changes may need to be considered; and,
- social and economic impacts, where these may have an effect on health.

Assembly of these data into the Health Impact Statement is usually the responsibility of the proponent, but advice can be sought from the health authority. The health authority also has the role of providing the decision-making agency with advice and recommendations on the proposal.

These Guidelines and the related advice from the health authority should ensure a smooth, effective process that will more thoroughly address the potential human health impacts of a development.

# 1 Introduction

## 1.1 What is health impact assessment?

Health Impact Assessment (HIA) is defined by different agencies in different ways, but there is a general consensus around a broad definition, published in 1999 as the 'Gothenburg Consensus Paper' by the WHO Regional Office for Europe<sup>2</sup>. That definition is:

*“a combination of procedures or methods by which a policy, program or project may be judged as to the effects it may have on the health of a population.”*

HIA may thus include assessment of high level policy and programs as well as individual developments, and encompass the vast array of assessment techniques used for each.

In its broadest form, HIA seeks to predict the health impact of a policy, program or project (including a development) usually before implementation, and ideally early in the planning stage. It aims to facilitate the reduction or avoidance of negative impacts on human health and enhancement of the positive impacts, and in so doing promoting sustainable development (SD) – human health being central to the concept of SD.

Internationally, HIA has become a key component of informed decision making and is being undertaken by governments world wide in a variety of circumstances and situations<sup>3,4,7</sup>.

## 1.2 Aim of the Guidelines

The Guidelines are intended to provide an introduction to HIA and general guidance on the assessment of proposed developments.

More specifically the Guidelines aim to:

- improve consideration of the health impacts associated with development by promoting and facilitating the incorporation of HIA into environmental and planning impact assessment,

within the legislative framework that already exists in each jurisdiction; and,

- assist agencies, communities and individuals who are involved in the preparation of impact assessments with guidance on each of the key steps of a HIA.

The Guidelines seek to strengthen and improve the consideration of health issues within the context of the impact assessment processes currently in operation across Australia. They do not call for an additional evaluation process, nor to widen the scope of the development assessment laws in any jurisdiction.

HIA can be applied to the assessment of impacts in the wider field of policies and programs, but that is not the focus of these Guidelines.

These Guidelines do not address issues of occupational health and safety, as separate agencies are specifically charged with this responsibility in most jurisdictions. There are occasions where public and occupational health issues overlap to such an extent that they are inseparable, eg. *Legionella* control. In that case the Health Impact Statement will need to address the issue.

## 1.3 Scope of health impact assessment

The UK Department of Health guidelines<sup>3</sup> refer to HIAs as being 'broad' or 'tight' depending upon the scope of the activity under scrutiny and the approaches used to assess the health impacts. Table 1 describes the differences between these approaches. Notwithstanding the differences there is a common purpose – to optimise health impacts of a particular policy, program or project (minimise the negative and maximise the positive).

**Table 1**

**Characteristics of broad and tight perspective Health Impact Assessment**

	<b>BROAD PERSPECTIVE</b>	<b>TIGHT PERSPECTIVE</b>
<b>View of health</b>	Holistic	Emphasis on defined and observable aspects
<b>Disciplinary roots</b>	Sociology	Epidemiology; toxicology
<b>Ethos</b>	Democratic	Technocratic
<b>Quantification</b>	In general terms	Towards measurement
<b>Types of evidence</b>	Key informants; popular concern	Measurement
<b>Precision</b>	Low	High

*Source: UK DOH 2000. (3) Inset 6A*

Guidelines developed by the National Health and Medical Research Council (NHMRC)<sup>6</sup>, New Zealand<sup>7</sup> and (to a lesser extent) Canada<sup>4</sup> focus on health impact assessment of individual projects or developments, not at the policy or program level. Nevertheless, this set of Guidelines, as well as those mentioned above, take a broad view of what constitutes health. In that respect they cannot be regarded as tight in their focus.

**1.4 Why undertake health impact assessment?**

HIA is undertaken to ensure explicit and balanced consideration of the human health impacts of policies, programs and (in relation to these Guidelines) developments.

The importance of human health being more explicitly considered in relation to promoting sustainable development has already been discussed.

The costs of failure to protect and promote health fall on governments, the community generally and individual members of the public. These costs are unlikely to be borne by a proponent. Ensuring that such costs are not incurred by non-beneficiaries is both equitable and good economics.

Environmental Impact Assessment (EIA) has been practised in Australia and elsewhere since the early 1970s. While aspects of the physical and natural environment are central to EIA, the consideration given to human health has been generally unstructured and confined only to the most direct, negative impacts.

The need for HIA to be conducted explicitly in any environmental or economic decision-making process was strongly endorsed by the NHMRC in 1992.

In 1996, Tasmania became the first state to legislate for HIA to be a formal requirement of the EIA process. Appendix 1 sets out some of the Tasmanian experiences in the conduct of health impact assessment.

Traditional EIA often does not identify the positive effect on health that development may have. For example, as identified in Table 2, one of the key determinants of health is financial status. There is ample evidence that poorer communities experience poorer health and that improving economic circumstances can improve health status. HIA should explicitly identify the positive effects on health that development may have through, say, job creation, as well as any negative effects.

Furthermore, traditional EIA has not always managed identification and reporting of likely human health effects in an optimum manner. For instance:

- the reporting of health effects may be unstructured, as most impact assessment guidelines may not call for an explicit section on human health (even though relevant data may appear throughout the document);
- the consideration of health issues may be too narrow. As outlined in section 1.5, health is influenced by many factors and the lack of a specific requirement to consider and report on human health impacts has sometimes seen significant health issues overlooked; and/or
- regional environmental health considerations are often not characterised in a way that enables assessment of the incremental contribution a development or activity may have upon them (eg. the contribution of pollutants to a regional airshed or to dietary intake via the food chain).

A sharper focus on health need not involve a great deal more work by the proponent or others, and can prevent significant adverse health outcomes. It may also prevent the need for costly late changes to a development, or avoid adverse publicity for developers, managers and others, at some later stage.

HIA is occurring at present – formally in one jurisdiction but also informally or on a discretionary basis in others. It is not a whole new layer of bureaucratic activity that needs to be added on to what is currently occurring. Incorporation of these Guidelines should ensure better consideration of health issues, so that important health concerns are addressed explicitly and comprehensively early on, preventing later adverse health events with attendant cost to individuals, industry and the community, and at the same time maximising any health benefits.

The Guidelines rely on, and assume, intersectoral collaboration between health, planning and environmental agencies at all levels of Government – Commonwealth, State, Territory and Local.

## 1.5 What is meant by ‘health’ and what are its determinants?

It is useful when examining the scope of HIA in general, and of these Guidelines in particular, to consider what health is and what are its determinants.

The WHO definition of health is:

*‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’.*

This definition is very broad. While it helps to identify what might be included as ‘health’ it is less helpful in setting boundaries around what should be considered and what may be ignored. A more specific approach is to examine the key determinants of health and consider which are susceptible to change and by what means (Table 2).

As outlined above, the approach described in these Guidelines is sometimes referred to as *environmental* health impact assessment as it focusses mainly on the environment (natural and built) in attempting to improve and maintain health.

Nevertheless, HIA may also need to address other issues, such as lifestyle, an important determinant of health, which may be readily impacted upon by developmental change.

Overall, it is important to note that health is influenced by a very broad range of factors.

**Table 2**

### Examples of key factors that determine health

Fixed	Social and economic	Lifestyle & Behaviours	Access to services	Environment
<ul style="list-style-type: none"> <li>• Genes</li> <li>• Sex</li> <li>• Ageing</li> </ul>	<ul style="list-style-type: none"> <li>• Poverty</li> <li>• Employment</li> <li>• Social exclusion</li> <li>• Community structure and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Diet</li> <li>• Physical activity</li> <li>• Smoking</li> <li>• Alcohol</li> <li>• Sexual behaviour</li> <li>• Drugs</li> <li>• Coping skills</li> </ul>	<ul style="list-style-type: none"> <li>• Education</li> <li>• Health services</li> <li>• Social services</li> <li>• Transport</li> <li>• Leisure</li> </ul>	<ul style="list-style-type: none"> <li>• Air quality</li> <li>• Noise</li> <li>• Housing</li> <li>• Water quality</li> <li>• Social environment</li> <li>• Risk of injury</li> <li>• Sun exposure</li> <li>• Disease vectors eg. mosquitoes</li> </ul>

Source: Adapted from UK DOH (3) Inset 1A

### **What constitutes a health impact?**

Anything which alters a determinant of health, such as those listed in Table 2, may, as a consequence, have an impact on health.

A list of some possible health impacts, which may assist in identifying likely positive or negative impacts, is provided in Box 1, below. Sensitivity of individuals is likely to be affected by age, sex, nutritional and pregnancy status, or a combination of these factors<sup>3</sup>.

## **Box 1**

### **Examples of potential health impacts that may need to be considered during HIA**

#### **General environmental aspects that may impact on health:**

- Increased demand and/or improvements to public infrastructure (water supply, sewerage, waste management, health, education, other government services).
- Altered risk from acute hazards, eg. fires, spills during transport or handling of materials.
- Altered motor vehicle traffic leading to changed risk of injury or air pollution.
- Damage to vulnerable ecosystems that are of importance to human health.
- Impact on health or amenity through changes to odour, noise, dust, insects, shade, vibration, light spill, etc (including what are historically referred to as environmental health nuisances).
- Encourage/discourage healthy forms of physical activity eg. walking or cycling.

#### **Potential impacts on physical health:**

- Communicable/infectious diseases (eg. spread of STDs, mosquito-borne disease).
- Non-communicable diseases – cardiovascular disease, cancer, asthma, etc.
- Exacerbation of existing conditions.
- Injury, eg. from trauma.

#### **Social impacts which have a health effect:**

- Employment opportunities created/lost.
- Effect on local government revenues.
- 'Spin-off' effects on local industry.
- Changes in social conditions (way of life) or demographic changes leading to health consequences eg. the likelihood of changes to alcohol consumption in an area.
- Mental and emotional wellbeing of a community (eg. is the development likely to cause or allay stress, anxiety, nuisance, discomfort).
- Altered (improved or decreased) opportunity for recreation or socialisation.
- Increased or decreased isolation of individuals.
- Shifts of population into or out of the affected area and the health impacts of such shifts.

#### **Special populations that may need to be considered include:**

- the elderly;
- the disabled;
- persons of low socio-economic status;
- children – born and unborn;
- Persons with a non-English speaking background;
- Indigenous Australians;

Specific examination of the demography of the area under consideration may reveal other groups to be considered.

In the past, potential health impacts would frequently and perhaps automatically be thought of as negative. A more balanced approach is needed – it is important that the likely positive health aspects of developments be properly recognised and captured through the HIA process. Positive impacts can arise from increased employment, greater recreational opportunities, new products and services that reduce disease, or a decreased health risk by, for example, improved road design.

During scoping the proponent can decide which likely impacts will be considered, usually after discussion with the relevant health authority.

### **Health impacts that may continue to be inadequately addressed**

There are developments which have impacts on public health while having no environmental impact, such as locating a large liquor outlet in a community that may already have many of them and/or signs of existing problems from excessive alcohol access/consumption. The focus of this document, however, is on health impact in the context of traditional environmental impact assessment.

Separate identification steps are required for developments with a public health impact that are not environmentally-oriented<sup>i</sup>.

Global health impacts are rarely if ever able to be addressed effectively by a process that considers impacts on a development-by-development basis. This is not to say that HIA does not have a place in assessing global health impacts – it can, when applied at the strategic and government policy level (this is outside the scope of these Guidelines). The UK Department of Health (DOH) Guidelines<sup>3</sup> are an example of guidelines that are focussed more at this level.

HIA of individual developments often fails to identify impacts that arise from numerous small activities, each of which are, in themselves, too small to warrant assessment. For example, the installation of wood-burning room heaters may, collectively, give rise to a high level of air pollution when installed in large numbers, particularly in non-windy areas. Each heater alone clearly falls outside the limits of what might be considered under HIA. Non-point source pollution from farming activity is another example.

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<sup>i</sup> *Tasmanian legislation includes the power to require health impact assessment be conducted on development proposals that are not subject to the normal impact assessment processes.*

## 2 Principles

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The WHO, in its report on *Health and Safety Component of Environmental Impact Assessment*<sup>8</sup>, established four basic principles to help fulfil the potential for environmental impact assessment (EIA) to protect human health. They are:

- One of the fundamental considerations in the approval of projects, policies and plans should be the health of communities affected by them;
- Greater consideration should be given to the consequences of development policies and programs for human health;
- Environmental impact assessment should provide the best available factual information on the consequences for health of projects, policies and plans; and
- Information on health impact should be available to the public.

These principles have been developed into the guiding principles listed in Box 2– they expand on and clarify the application of the WHO Principles.

Attention is also drawn to the *Charter of Entitlements and Responsibilities for Individuals, Communities, Business and Government* (the Charter) which, as part of the *National Environmental Health Strategy 1999*<sup>1</sup>, has been endorsed by the Australian Health Ministers' Conference on behalf of the Governments of Australia. The Charter sets boundaries for activities, in order to ensure the entitlements and responsibilities of each sector are fulfilled and maintained. A copy of the Charter is given in Appendix 2.

## Box 2

### Principles to be addressed when undertaking Health Impact Assessment

#### Overall

- The Charter of (Environmental Health) Entitlements and Responsibilities for Individuals, Communities, Business and Government will be observed throughout the HIA process (NEHS 1999<sup>1</sup>).

#### The Community

- Community consultation is a critical and integral part of the HIA process. People and communities are part of the “environment” and rely on the quality of the environment for their survival and maintenance of good health and wellbeing.
- The public has a right to know the actual or potential effects of a proposed activity on their health and their environment, and should be consulted on the management of risks.
- The community is also a rich source of local information that can only be tapped through its involvement.
- The protection and, where possible, the improvement of public health should be fundamental to HIA.

#### Scope, relevance and timeliness of the Health Impact Assessment

- The scope and detail of the HIA should be in proportion to the scale of the potential health impacts of a proposed development. Scoping should identify only those impacts which have significant potential to occur. The level of risk assessment should be in accord with the nature, scale and significance of the actual or potential effects of the proposed activity. Where there is insufficient information or uncertainty about the risks to health, this should be clearly stated.
- Both positive and negative health impacts should be considered.
- Human health should be safeguarded ie. likely health problems should be remedied before they can occur (once they have been identified as a possible concern). The additional financial cost is likely to be less for both industry and governments if action is taken at the design stage.

#### Integration of Health Impact Assessment and Environmental Impact Assessment

- HIA should be explicitly integrated into the assessment of effects on the environment (ie. into EIA) to ensure that any actual or potential impacts or risks to public health are adequately addressed in the development approval process.

#### Monitoring and review

- Where appropriate, monitoring should be carried out to assess whether modification to the proposal has actually been implemented, evaluate the HIA process, and assess the outcomes, ie. whether anticipated or unanticipated health impacts have occurred.
- Environmental and health controls, as conditions in approvals, should be reviewed regularly.



# 3 *The HIA process and roles of those involved*

## 3.1 The health impact assessment process

The HIA process described in these Guidelines is based on that outlined in the *National Framework for Environmental and Health Impact Assessment*<sup>6</sup>. The general process is outlined in Box 3.

This process is shown in flow chart format in Figure 1.

### Box 3

#### Summary of a proposed framework for HIA (adapted from NHMRC<sup>6</sup> p.xxii)

##### Step 1 Screening

- Should the project be subject to Health Impact Assessment?

##### Step 2 Scoping

- What issues must be addressed in the Health Impact Assessment?

##### Step 3 Profiling

- What is the current status of the affected population and the local environment?

##### Step 4 Risk assessment

- What are the risks and benefits?
- Who will be affected?

##### Step 5 Risk management

- Can risk be avoided or minimised?
- Are better alternatives available?
- How can benefits and risks be evaluated and compared?
- How can differing perceptions of cost and benefit, nature and magnitude be mediated?
- Will predictions of future health risk be robust enough to withstand legal and public scrutiny?

##### Step 6 Implementation and decision-making

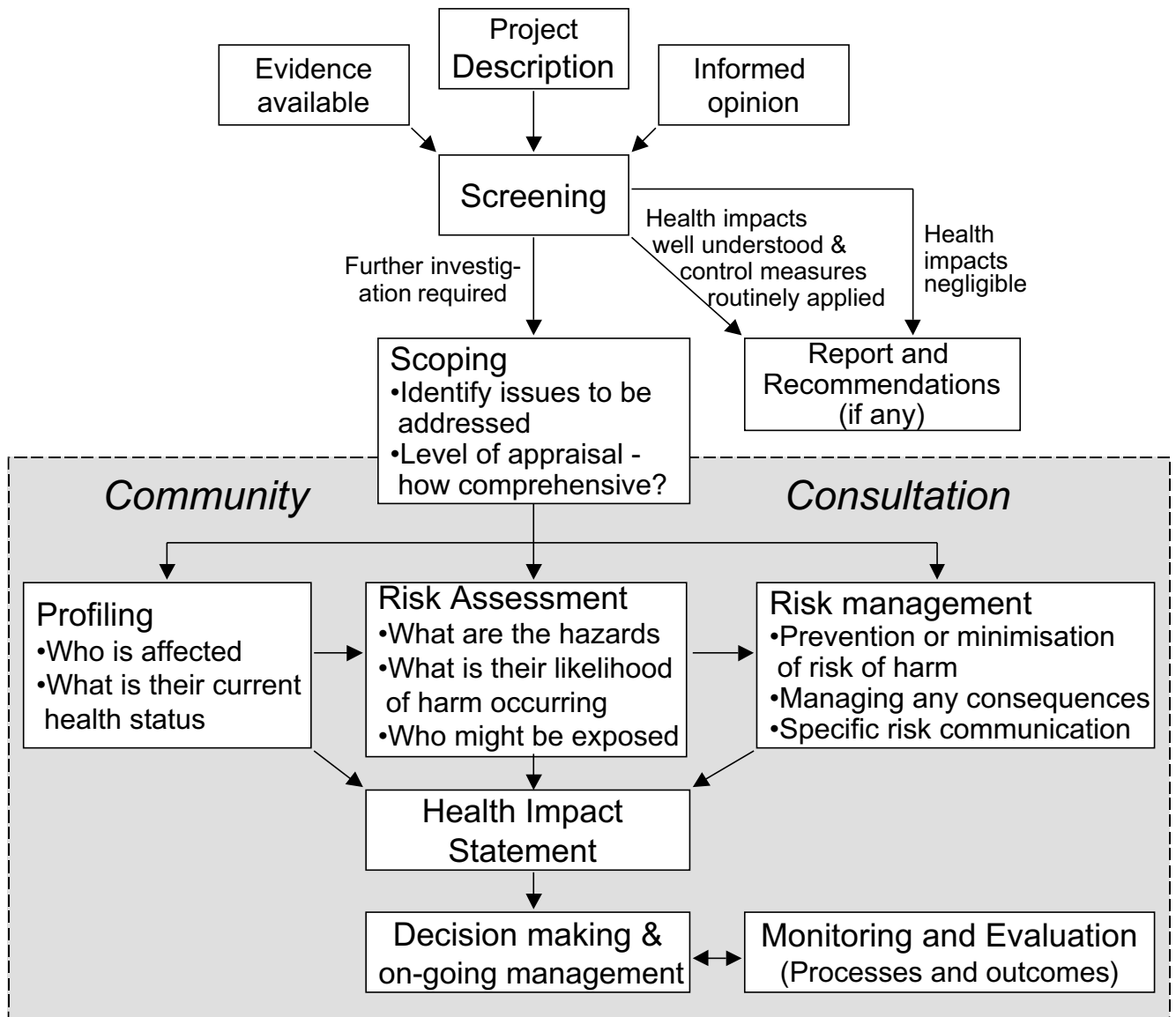
- Does the assessment provide sufficient, valid and reliable information for decision-making?
- Is there a conflict to be resolved?
- How will conditions be enforced?
- How and by whom will impacts be monitored?
- How will post-project management be resourced?

##### Step 7 Monitoring, environmental and health auditing, post-project evaluation

- Is the project complying with its conditions?
- How well is the E&HIA process as a whole achieving its aims of protecting the environment and health?

**Figure 1**

**Flow chart of the health impact assessment process**



*(Adapted from UK DOH (3), Insets 2A and 2C)*

### 3.1.1 Community consultation and communication

The NHMRC framework<sup>6</sup> does not include a specific consultation step, in the expectation that consultation will occur throughout the conduct of the HIA, as appropriate. Ideally consultation would occur at every stage, at least for large projects.

What is appropriate depends on the size and type of project, as well as the legislative requirements for consultation. These vary between jurisdictions. This document does not set out a particular consultation process, but assumes that jurisdictions will require consultation steps in accordance with their relevant legislation and as appropriate for the project. Some proponents may wish to do more than the required minimum.

In general, one would expect public input to the scoping and subsequent steps, as shown in the above diagram. In particular, there must be an opportunity for stakeholders to comment on a proposal before a decision is made.

### 3.1.2 Project description

One additional preliminary step to those proposed in the earlier NHMRC framework<sup>6</sup> is highlighted – the need for a comprehensive Project Description at the beginning of the HIA, so that the reader is clear what the intention of the project is and what, in general terms, the impacts might be.

If the HIA is part of a wider impact assessment process such an outline may already be specified, in which case no additional explanation may be necessary. Otherwise the Project Description will usually include:

- the rationale, objectives and goals of the project;
- a description of the project including the processes, materials and types of equipment to be used and the building layout;
- sufficient detail of the planning, designing, construction, operating, maintenance and decommissioning phases;
- types and quantities of inputs (energy, water and chemicals used in the industrial process) and outputs (products and waste materials) and a brief discussion of their treatment and disposal;
- expected infrastructure, local facilities and services (eg., electricity, water, sewerage, roads);

- advantages and drawbacks associated with the project;
- perceived impacts on health, positive or negative; and
- emergency procedures and response plans for incidents that have the potential to impact on the surrounding population.

### 3.1.3 Screening

Screening is the process of determining whether or not a proposed development warrants impact assessment. It is commonly governed by statute.

Screening for health issues is carried out as an integral part of the overall screening process. It is usually, if not invariably, undertaken by the agency responsible for determining whether a development needs to be assessed, and if so, to what extent.

All proposed developments that are required to undergo EIA should be screened for possible health impacts, as well as for other impacts. While this may not ensure every project likely to impact on health is detected, it will identify most, if not all, of those likely to have health impacts that are significant.

If health authorities wish to apply HIA more broadly they would need to make other arrangements outside this framework to identify the projects or issues of significance.

Screening is, firstly, a process of filtering out those projects that do not require HIA because:

- the health effects are expected to be negligible; or
- the health effects are well known and readily controllable through measures that are well understood and routinely applied, and so require no specific investigation or analysis.

Identifying these early in the HIA process allows scarce resources to be applied to assessment of those projects with the most significant likely health impacts.

In considering health issues, the UK Department of Health<sup>3</sup> has developed a screening tool to provide objectivity, transparency and consistency in its processes. This tool may be of use to health and non-health authorities when considering human health issues, and details of it are given in Appendix 3 for ease of reference.

### 3.1.4 Scoping

Scoping is the process of identifying the particular issues that should be addressed in preparing a Health Impact Statement.

Scoping is the link between identifying the need for HIA, for one or more reasons, (ie. screening) and the actual assessment of the risks and the consequent development of management, monitoring and evaluation strategies. Scoping therefore needs to set the framework for the Profiling, Risk Assessment, Risk Management, Decision Making and Monitoring and Evaluation steps shown in Figure 1 above. It is a key step, if not the most important step, in the HIA process.

Scoping includes:

1. Identifying the potential health impacts that need to be addressed by:
  - identifying all the potential health impacts; and
  - assessing which impacts are likely to be important and thus need to be addressed in the HIA and which are not important.
2. Setting boundaries eg:
  - timescale;
  - geographical boundaries; and
  - population covered, including demarcation of any populations of special concern because of risk factors such as age, pregnancy, etc.
3. Identifying stakeholders that need to be involved, particularly those that will not already be involved in the routine impact assessment process.
4. Agreeing on details of the risk assessment between the proponent, the health authority and other stakeholders.

Responsibility for these steps typically rests with the proponent but the health authority will generally work with the proponent to identify the level of detail and effort required. This must be in proportion to the likely level of health risk, based on objective criteria.

Where the project is such that an actual risk appears to be low but the community's perception of the risk is high, the risk management strategy should address this aspect.

Within the limits of the local legislative requirements, proponents may choose the precise details of the scoping process they believe to be the most appropriate. There are, however, some steps that are strongly recommended.

Where there is a high level of community interest, proponents should involve the community early, in particular at the scoping stage. Also, an early meeting with the health authority may avoid unnecessary work, identify relevant data sources, and apprise the proponent of the health authority's view of the significant and less significant likely impacts on health.

A suitable process usually involves:

- an early meeting between the proponent and the health authority to discuss issues that may be of concern to the health authority;
- the health authority providing advice on issues (including parts of these Guidelines and other reference material) that the proponent should consider addressing and the level of detail required;
- discussion between the health authority and the proponent on models and methods that can be used to address the identified issues, assumptions that will need to be made, the contributions that the health authority can make, and where expert opinion may be required;
- the opportunity or necessity for periodic consultation with the health authority;
- identifying sources of health and demographic data (which may be provided by the health authority, on a cost recovery basis if necessary).
- identifying significant health stakeholders who should be consulted in addition to those routinely involved in the impact assessment process;
- discussion on the need for monitoring that may be required on health grounds during any phase of the development, or after completion; and
- identifying relevant standards that will provide some benchmarks for planning, consultation and HIA.

Public and stakeholder consultation may form part of the scoping exercise but will also take place during or following the preparation of the proponent's final

proposal, depending upon the precise arrangements for impact assessment in each jurisdiction.

Figure 1 shows consultation as an all-encompassing background to indicate that it should occur formally at some key points (this may vary between jurisdictions and between projects), rather than as a strict requirement at every step.

Informal consultation with interested parties and the wider public, throughout the process, may also be beneficial. Thus consultation is a wide-ranging process that should occur continuously throughout a project, not just at those points formally required by legislation.

Scoping should identify any special stakeholders that need to be consulted outside of those included in the usual impact assessment process.

Scoping may also identify health concerns for which public input should be especially sought, to more clearly establish the community's values and attitudes.

Approaches to community consultation are outlined in Appendix 4, and the bibliography (Appendix 5) provides links to relevant material.

### 3.1.5 Profiling

Profiling describes key aspects of the health status and general make-up of the population, particularly in relation to factors that are believed to be susceptible to change or that may act as indicators of anticipated health impact(s). It enables the identification of, and characterisation of, the potential health effects on the community, by providing a baseline against which possible health impacts can be assessed.

Information that may be collected includes:

- Characteristics of the population covered, for example:
  - size;
  - density;
  - distribution;
  - age and sex;
  - birth rate;
  - ethnicity;
  - socio-economic status; and
  - identification of at-risk groups, eg. at aged care facilities, schools.

- Health status of the population, particularly of at-risk groups, eg. from mortality, disability and morbidity data;
- Levels of employment/unemployment;
- Health behaviour indicators, if relevant eg. rates of alcohol use and alcohol-related harms;
- Environmental conditions of the population covered, eg.:
  - air/water/soil quality and ability to increase capacity eg. of a water supply or effluent disposal;
  - transport issues if relevant; and
  - quality and quantity of affordable housing.
- Locations where at-risk groups may be concentrated, eg. particular streets/areas, schools, nursing homes, etc.

Many of these data are routinely available from local government or the relevant health authority or other government agency, eg. the Australian Bureau of Statistics (ABS).

### 3.1.6 Assessing the health impacts (risk assessment)

The risk assessment process should identify the impacts that a proposed development is likely to have on health. These effects could be negative, resulting from exposure to a hazard, or positive such as improved recreational opportunities or job opportunities. This is an aspect overlooked by the typical assessment that does not fully consider human health, and is one reason to include a broader view of health in the impact assessment process.

Assessment of risk may be done by assessment against health-based guidelines, it may be a quantitative assessment, or use qualitative techniques, or it may use a mix of these approaches.

#### 3.1.6.1 Risk assessment using health-based guidelines and objectives

Health-based guidelines and objectives assist in consistently and reliably assessing health risks, ensuring safety in the situation to which they are relevant. Guidelines and objectives have been developed for environmental and occupational hazards, including noise, pollutants, radiation and microbiological agents.

Guidelines are prepared by national and State/Territory agencies as well as international bodies such as the WHO. They provide a straightforward means of predicting impacts, but they do not exist for every possible environmental health hazard. Ideally, predicted levels should have insignificant or little effect if they fall below the levels as specified by the guidelines or objectives. Guidelines should, however, be used critically. Reasons for caution include:

- most guidelines are developed to protect against specific types of health effects. They do not necessarily guarantee protection from all types of adverse effects, and reflect the science at the time of publication;
- they do not necessarily address the social, community or psychological dimensions of health and well-being effectively;
- they may apply to occupational exposure and are not directly applicable to public health;
- they may not identify positive effects on health; and
- they may not fully account for factors such as the age and sex of a person. For instance, children, the elderly and pregnant women may be more susceptible to some environmental health hazards.

If no regulatory standards or objective criteria are available, other modes of evaluation are used. Other approaches that can be used to assess a project's potential effects on health include risk-based analyses that may be quantitative or qualitative.

Whatever method is used will also need to address the concerns expressed by stakeholders and the public, as well as any other risks that are identified.

### 3.1.6.2 Quantitative risk assessment

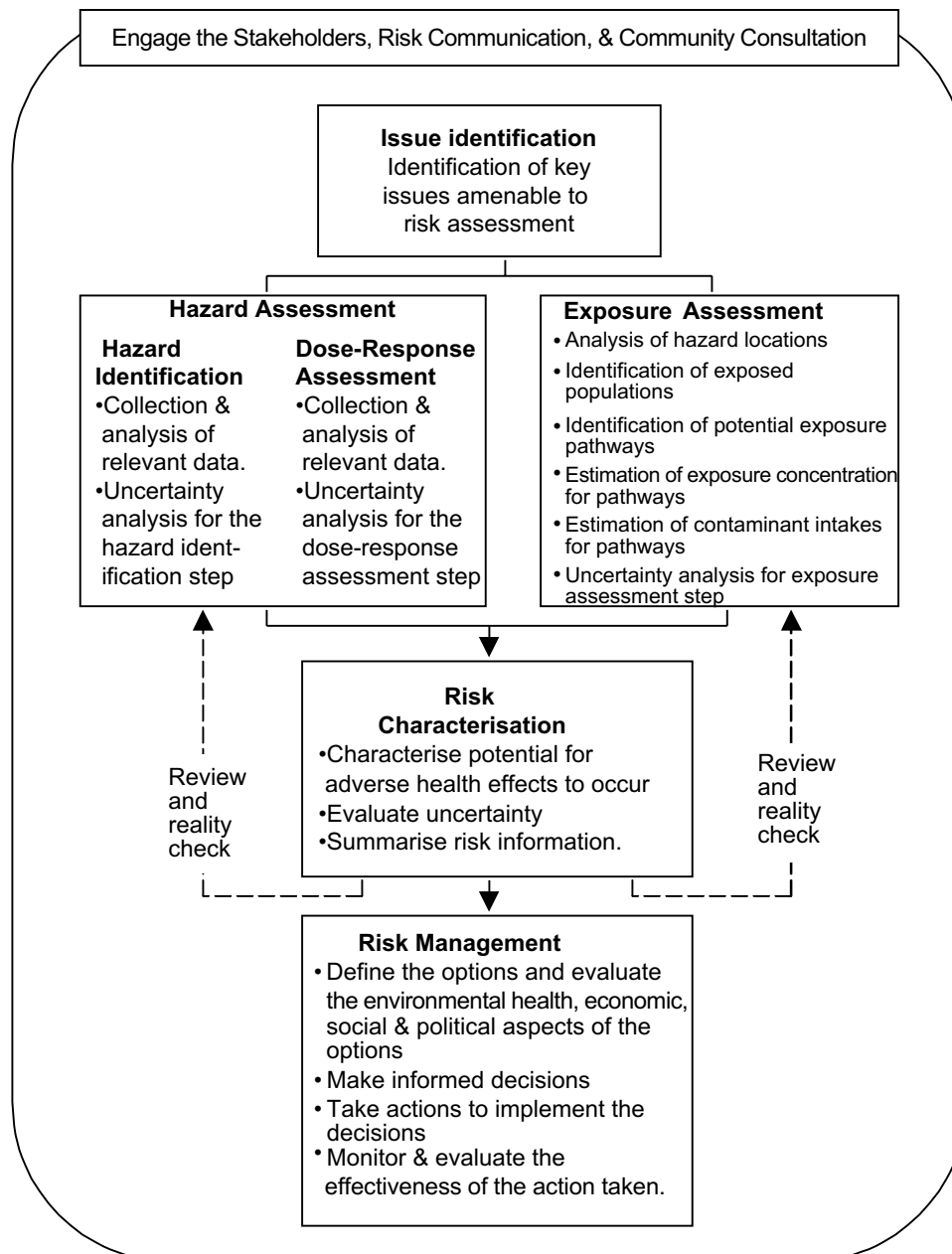
The basic risk assessment process is set out in Figure 2, which was taken from a draft of *Environmental Health Risk Assessment – Guidelines for Assessing Human Health Risks from Environmental Hazards*<sup>9</sup>.

Given that positive effects are also to be included, risk assessment may not be the ideal term but it is used for the sake of uniformity with the 1994 NHMRC publication<sup>6</sup> and similar risk assessment frameworks.

*Environmental Health Risk Assessment*<sup>9</sup> provides a methodology for assessing risk from chemical hazards in considerable detail; reference to this document is recommended for those undertaking such assessments.

Figure 2

Risk assessment model (adapted from enHealth Council<sup>9</sup>, p.5).



### 3.1.6.3 Other methods of risk assessment

Often sufficient data are not available to allow quantitative risk assessment (QRA) to be undertaken, and alternative methods will need to be used. In some instances the alternative methods may be used as an adjunct to QRA. Techniques used include:

- expert opinion, such as a Delphi study or workshop on the risks;

- views and perceptions of the community and other stakeholders; and
- other published material on analogous situations.

The *Canadian Handbook on Health Impact Assessment*<sup>4</sup> includes a table (see Table 3) for assessing impact significance which is a useful guide to non-quantitative risk assessment.

**Table 3**

### Criteria for Assessing Impact Significance (adapted from Canter, 1986 cited in ref. 4)

Nature of the Impact	Definition
Magnitude	The probable severity of each potential adverse impact, in the sense of degree, extensiveness or scale. How serious is the impact? Does it cause a large change over baseline conditions? Does it cause a rapid rate of change – large changes over a short time? Will these changes exceed local capacity to address or incorporate change? Does it create a change which is unacceptable? Does it exceed a recognized threshold value?
Geographical limits	This is the extent to which the potential impact may eventually extend (e.g., local, regional, national, global), as well as to geographical location (e.g., far North, reserve, etc.)
Duration & frequency	Length of time (day, year, decade) for which an impact may be discernible, & the nature of that impact over time (is it intermittent and/or repetitive?) If repetitive, then how often?
Cumulative impact	The potential impact that is achieved when the particular project's impact(s) are added to impacts of other projects or activities that have been or will be carried out. The purpose being to predict whether or not a threshold level is surpassed.
Risk	The probability of an impact occurring. For many socio-economic impacts, qualitative assessments would be appropriate (high, medium, low).
Socio-economic Importance	The degree to which the potential effects may (or may be perceived to) impact on local economies or social structure.
People affected	How pervasive will the impact be across the population? This criterion addresses the portion of the population affected and the extent to which it will affect different demographic groups, particularly at-risk groups (eg. children, elderly, pregnant women, etc.).
Local sensitivity	To what extent is the local population aware of the impact? Is it perceived to be significant? Has it been a source of previous concern in the community? Are there any organized interest groups likely to be mobilized by the impact?
Reversibility	How long will it take to mitigate the impact by natural or human means? Is it reversible, and, if so, can it be reversed in the short or long-term?
Economic costs	How much will it cost to mitigate this impact? Who will pay? How soon will finances be needed to address this impact?
Institutional capacity	What is the current institutional capacity for addressing the impact? Is there an existing legal, regulatory, or service structure? Is there excess capacity, or is the capacity already overloaded? Can the primary level of government (e.g., local government) deal with the impact or does it require other levels or the private sector?



### 3.1.7 Managing the health impacts identified as being of significant risk

Risk management is the process of evaluating alternative actions, selecting options and implementing them in response to risk assessments. The decision making will incorporate scientific, technological, social, economic and political information. The process requires value judgements, eg. on the tolerability and reasonableness of costs.

Alternative actions may be identified by the proponent or through a community consultation process.

Once possible health impacts have been identified and assessed, desirable and undesirable impacts can be sorted into those of significance and those that are not.

Actions to maximise potential health benefits and minimise or prevent the potential risks to health are identified.

Recommendations to the decision-making authority may be made by the health authority or by others, in accordance with the regulatory or administrative arrangements in the particular jurisdiction. Recommendations may be to modify the proposal, consider alternatives where available, or impose conditions on its implementation. One alternative, where the risks have not been, or cannot be, adequately addressed, may be not to proceed.

This stage may also involve a substantial public consultation element, including:

- how impacts identified during screening and scoping have been addressed; and
- demonstrating that impacts identified by the community as being important to them have been adequately considered and what action has been taken.

### 3.1.8 Decision making

The decision making process incorporates scientific, technological, social and economic information and must take into account the community concerns identified during consultation processes.

The decision-making capacity for an impact assessment does not lie within the health authority. This does not matter so long as the health authority is well linked in to the process and communication between health and the decision-maker is adequate. The important issue is to have health impact assessment as part of the overall impact assessment process.

Negotiation may occur between the environment, planning and health agencies<sup>ii</sup> to ensure a comprehensive, coherent and workable set of changes or conditions are applied to any proposal.

Recommendations and decisions, and the reasons for them, should be publicly available.

### 3.1.9 Monitoring and evaluation

There are two types of monitoring and two types of evaluation that may need to be undertaken.

#### Monitoring

- monitoring of the conditions applied to a development.

Routinely undertaken for many developments, both during construction and after operation of the development commences.

- monitoring of the health impacts during and/or after the development, as required.

This is an added requirement if, in fact, any monitoring of health impacts is needed. Adverse health impacts are often 'designed out' to the point of presenting negligible additional risk, in which case monitoring is not required (beyond monitoring that the controls are actually implemented – see previous point).

If a particular risk to health cannot economically be controlled to an extent that ensures no significant additional public health risk, then monitoring of health status, or indicators of the risk thereof (such as noise or dust levels, rather than deafness or asthma) may be necessary.

Health monitoring is discussed in detail in Appendix 6.

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<sup>ii</sup> Within a local government these three aspects may all be considered within the one agency if it has decision-making powers for that development.

## Evaluation

- evaluation of the efficiency of the HIA process.

The intent when dealing with risk should not be to reduce it at all costs or to reduce it to a negligible level, but rather to balance the benefits and costs to the community of reducing the risk<sup>10</sup>. There is economic cost to the proponent (money and time) and to the health authority (the opportunity cost of the assessment activity) and these should be offset by the health or economic gains that result from the project's improved consideration of health issues.

- evaluation of the health outcomes – is the HIA process effective and are health outcomes improved as a result of it?

This requires assessment of the actual health outcomes achieved (positive and negative) as a result of undertaking HIA, with a view to evaluating whether the process is effective in maintaining or improving the health status of the community.

Both of the evaluations mentioned above should ideally be undertaken across a series of HIAs, some time after they have been implemented (ie. once the outcomes can reasonably be determined).

## 3.2 The precautionary approach

The NHMRC framework document<sup>6</sup> suggests that when the scientific basis for a risk assessment is still in the early stages of development, decisions should err on the side of caution. This is often referred to as a precautionary approach.

### What is meant by the precautionary approach?

Definitions of the precautionary approach vary, but the most widely internationally accepted is that described in Principle 15 of the Rio Declaration on Sustainable Development (UNCED, 1992)<sup>11</sup>. This states:

*“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to*

*prevent environmental degradation.”*

In Australia, some jurisdictions have included this concept, variously referred to as the 'precautionary approach' or 'precautionary principle', in agreements and legislation. In February 1992, the Inter-governmental Agreement on the Environment included the following as part of a commitment to sustainable development:

*“Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and (ii) an assessment of risk-weighted consequences of various options.”*

Whilst the Inter-governmental Agreement on the Environment is aimed at environmental protection, the Rio Declaration, within the context of sustainable development and Agenda 21, makes it clear that the concept is equally applicable to human health and wellbeing.

The precautionary approach is not intended to be a device to inhibit development. However, proponents may need to consider and discuss health risks that are uncertain as well as those that are well defined, including an indication of the degree of uncertainty and where the uncertainty is thought to lie.

A precautionary approach is limited in its utility by the uncertainty as to its meaning and application. Caveats that apply to its use include<sup>iii</sup>:

- Implementation of a precautionary approach should start with an objective risk assessment, identifying at each stage the degree of scientific uncertainty;
- All the stakeholders should be involved in the study of the various management options that may be envisaged once the results of the risk assessment are available;
- Regulatory measures taken should be proportionate to the risk which is to be limited or eliminated;

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<sup>iii</sup> Adopted from Health Canada. 2000. Therapeutic Products Programme Strategic Framework for 1999-2002.

- measures based on a precautionary approach should be able to establish responsibility as to who should furnish the scientific proof needed for a full risk assessment; and
- measures based on a precautionary approach should always be of a provisional nature, pending the results of scientific research performed to furnish the missing data and performance of a more objective risk assessment.

### 3.3 Roles and responsibilities

#### 3.3.1 Responsibilities of the proponent

The proponent should satisfy the requirements of the impact assessment process set out in the relevant jurisdiction.

This process should include the need to explicitly address potential impacts on human health. These Guidelines are intended to assist proponents to do this.

If proponents are in any doubt as to what to do they should contact the relevant health authority. Proponents are also encouraged to contact the health authority as soon as they identify a potentially detrimental human health impact, to discuss acceptable means of preventing or ameliorating the impact.

#### 3.3.2 Responsibilities of the Public Health Authority

The health authority will facilitate development of the health impact statement (HIS) by the proponent through:

- discussing the HIA process, methodology, specific health concerns, sources of data, resources and cost recovery (if applicable) as required – a key focus being to ensure that the overall level of effort is in proportion to the level of risk;
- providing or identifying potential sources of relevant health and demographic data, where available;
- participating in the screening and scoping processes, including visiting the site of the development if practicable;
- reviewing the health components of the draft impact assessment report;
- providing advice to the proponent when they address the concerns raised during public consultation. The HIS may need to be modified, extended or otherwise changed and monitoring conditions imposed to address the community concerns (depending upon the process used to manage public comments in the jurisdiction);
- making recommendations to the approving authority concerning the potential health impacts of a development<sup>iv</sup>;
- participating in the health monitoring and evaluation, as appropriate; and
- liaising with the decision-making agency.

#### 3.3.3 Responsibilities of the decision-making agency (environment or planning)

The managing agency should:

- include human health as an issue to be addressed in the guidelines and standards that prescribe and describe the impact assessment process;
- encourage proponents to make contact with the public health authority early in the process;
- refer development applications requiring assessment to the health authority for consideration in a timely fashion;
- provide the health authority with the results of monitoring and evaluation related to public health, when they are provided by the proponent or other agency;
- provide feedback to the health authority on HIA procedures as they impact on the overall impact assessment processes; and
- liaise with the health authority as required.

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<sup>iv</sup> Most jurisdictions tend to have one decision-making authority, which may be a Minister, a Board or the Chief Executive of the relevant planning or environment agency. The precise relationship between the health authority and the decision maker needs to be considered. The purpose of this paper is not to say what they should be – that will depend upon the laws and administrative arrangements in each jurisdiction.

# 4 *Preparing a Health Impact Statement*

This section provides supplementary and additional information and ideas on how to undertake a successful HIA (and in so doing, prepare a satisfactory Health Impact Statement).

While the basic steps have been described and the essential content of each outlined, actually undertaking a HIA will still involve a great deal of learning. Successfully undertaking a HIA will require practice and may be difficult at first for both proponents and health authorities.

## 4.1 Content of a Health Impact Statement

In preparing a Health Impact Statement it is necessary for the proponent to consider what data need to be included. The level of detail and the range of issues canvassed will depend upon the health impacts identified during the scoping stage.

This section attempts to provide guidance on issues that might be considered. It is not expected that every issue outlined here should be covered, nor is it necessary that there be an explanation of why issues listed here are not covered.

### 4.1.1 Details of the proponent and the development

Certain details will be required under the statutory impact assessment framework in each jurisdiction and it is unlikely that this will need to be added to for health purposes. If only a HIA is necessary, these same requirements are likely to provide sufficient information and may be used as a guide by proponents.

Details of the development, its site(s), site history, and site climate should be covered in the standard detail provided.

### 4.1.2 Details of the affected or interested communities

The size of the local population, particularly that living close to the site, and details of that community are essential to the HIA.

Profiling is the first step of the appraisal and influences the risk assessment and resulting risk management and communication strategies.

The local population that is relevant may be defined in many ways. If the community is small it may simply be the whole community, or it may be a community not near the site but on a transport route to it, or it may be some other community that self-defines itself as having an interest. In the latter case while communication must be maintained, health profiling may not be necessary. The basis of choice of the boundaries should be explained by the proponent.

#### 4.1.2.1 Demographic data

Demographic data should correspond as closely as possible to the defined community, however such data may be difficult to obtain for small areas except by direct survey. The cost of a survey would only be justified in exceptional circumstances. An alternative may be to discuss with key informants any differences between the data for the larger area covered by the demographic (usually ABS) data and the area itself. For example, an industrial area may have very few residents, and therefore few ABS survey respondents, while having a large population in workplaces during the day. Furthermore, any data involving small populations, however obtained, may lack epidemiological power, ie. lack ability to reliably detect significant health effects.

#### 4.1.2.2 Health data

Health (or illness) data may be similarly difficult to obtain. Morbidity data collections usually cover wide areas (eg. to postcode level) and usually reflect illness rather than health. The health of the relevant

population may, therefore, also require inference of health status from data available on the regional population. Very local health data, if available, may be subject to confidentiality requirements as it may be identifying. There will be ethical and confidentiality constraints on the use of any such data and it may only be accessible to the State/Territory health authority.

Health data collected might include crude and standardised mortality data, morbidity data for diseases related to potential health impacts, eg. mosquito-borne disease notification rates, or data measuring the prevalence of chronic diseases of concern.

#### 4.1.2.3 Special populations

The data collection may need to identify special populations who may be at greater risk of adverse health effects. For example a 'top end' Indigenous population may have substantial outdoor exposure and would therefore be more at risk of an increase in mosquito-borne disease, such as Murray Valley encephalitis, from a new dam. Other groups that may need to be considered include the young, the elderly, and the poor.

Some facilities may be significant in terms of risk exposure. These include child care centres, schools, aged care facilities (domiciliary or day care). The proponent needs to consider the existence of any such facilities and the health impacts that may be more significant for such groups (which may be as simple as road-crossing being more/less dangerous due to altered traffic flows).

Notwithstanding the difficulties, profiling should be possible with sufficient accuracy to obtain representative data on the age structure, socio-economic status and health status of a population. Provided special local factors such as child care or aged care centres are taken into account, a reasonably clear picture of the population should be possible. Should this not prove to be the case the proponent should discuss with the health authority the level of detail required for the profiling step.

#### 4.1.3 Environmental health data

A range of environmental factors affect health, notably food, water and air quality, and waste disposal (solid, liquid and hazardous wastes if any). It is easier, more sensitive and usually more useful to measure the hazard directly, rather than measure ill health.

Indicators must be chosen that reasonably reflect both the health impacts that were identified as being of importance during the risk assessment and management steps (see Box 3, steps 4 and 5), and the effectiveness of their amelioration (or not).

Indicators of health need to be:

- available at reasonable cost;
- valid and reliable reflections of the actual situation;
- closely linked to actual health outcome;
- timely – ie. rapidly reflect change when a health impact occurs;
- able to be acted upon directly, without further delay or further data collection; and
- readily understood by non-technical people.

##### 4.1.3.1 Air quality

One key area of health concern is indoor and outdoor air quality. If a development is likely to have any influence on either indoor or outdoor air quality then likely health impacts should be assessed.

Changes in indoor air quality may arise from a wide range of factors, eg. construction materials or equipment used in a building, from outdoor dust creation, from environmental tobacco smoke, or through the entrapment of other pollutants due to inadequate ventilation.

Outdoor air may be affected by the handling of dusty materials, such as ores or grains, by the emission of gases such as sulfur dioxide or other smokestack emissions, including particulates or dioxins, and vehicle emissions.

Whatever the source of pollution, it requires careful estimation of the area likely to be affected, the intensity and duration of the effect and the level of health impact (actual health effects) on the at risk population. Modelling of the dispersion of airborne materials is a specialist task, as is the estimation of health effects once the dispersion model is developed.

##### 4.1.3.2 Food

If there is the possibility of a development having an impact on the quality, quantity or the price of food this should be noted and discussed in the HIS.

Impact on food production or on food producing land or water would almost certainly be addressed by an EIA but these data would be of interest to the HIA as well.

#### 4.1.3.3 Water (not including wastewater)

The use of local water by a proposed development and the likely impact on the surface, ground water and drinking water is a fundamental health concern. It is also an environmental concern and so will be addressed to a significant extent, if not fully, by the EIA process. However, there may be some aspects that require specific attention from a health perspective.

The proponent should provide a detailed description of the local water supplies, including non-potable water, and any beneficial uses which the water is, or could be, put to. Particular attention should be paid to any impacts on the potable water supply.

Impacts might be from additional consumption that depletes reserves or reduces access, chemical contaminants (nutrients, heavy metals, etc) microbial contaminants, loss of amenity of lakes or other surface water, impact on fish used for food, etc.

#### 4.1.3.4 Wastewater

The disposal of wastewater can have health impacts, whether or not the wastewater contains sewage. Improper disposal of stormwater can lead to loss of amenity and may be hazardous. Disposal of sewage may be a problem in that control of nutrients and microbes can be difficult or expensive; it typically requires a considerable area of land well away from housing and most other forms of development, and improper disposal quickly becomes a health hazard.

Industrial wastes pose differing hazards, depending upon their constituents. They often require further specialised treatment before discharge to sewer or to the local effluent disposal system. These details will be required for any health assessment.

If wastewater is to be produced in any quantity and is not simply discharged to sewer, full information on its expected volume, content and method of disposal is likely to be required (note that this information may be included in existing impact assessment procedures now). These details could include:

- the biological oxygen demand;
- heavy metal content;
- pH;

- concentration of nutrients – nitrogen, phosphorus compounds;
- pathogens of special significance, eg. *Giardia* which produces hard-to-kill cysts; and
- odour, colour, etc.

#### 4.1.3.5 Government-controlled infrastructure

Changes to the capacity of utilities (gas, electricity, water) or public facilities (education, public housing, health and social services) which lead to reduced or increased access or cost would be likely to result in a health impact. If large enough such possible impacts would warrant inclusion in the Health Impact Statement.

Some developments may enhance community infrastructure through directly funding the provision or upgrading of services or through the payment of rates which enable improved community services. These have the capacity to improve health directly or indirectly and should be included in the HIA process.

#### 4.1.3.6 Transport

One issue that may have significant health impact but which is not usually considered in a health context (except in relation to injury) is transport, both public and private.

Improved public transport may have the effect of improving equity, improving access, reducing isolation and increasing opportunities for work and social activity. Use of public transport can even increase exercise through walking to the bus or train stop. Cycleways provide an environmentally friendly, healthy way to travel. Improving road systems can reduce (or increase) noise, pollution, and the rate of injury to motorists and pedestrians. Areas of loading or unloading can be problematic because of noise and because of materials that may be hazardous being handled there.

HIA for a development that directly or indirectly affects means of transport or traffic levels to a significant extent, needs careful consideration. It should entail description of existing services and traffic levels related to either movement of people or materials (particularly hazardous materials), the anticipated or planned changes to those services and assessment of their positive or negative effects on health and amenity. Links to examples of HIAs of major public transport schemes overseas are given in

the bibliography (Appendix 5). The UK has undertaken a number of such HIAs.

#### 4.1.3.7 Storage, handling and disposal of hazardous materials

Hazardous materials storage and handling is a good example of a health issue that is typically well addressed by current impact assessment processes and it is unlikely that further basic data would need to be provided for a HIA. The organisation of the material might need to be more focussed on human health, however, which may only require better cross referencing within the proponent's impact assessment.

#### 4.1.4 Social impacts

Social impact assessment is important to HIA in that the health and social impacts are inextricably intertwined. While these can overlap, health impact and social impact require different analytical skills and need to be assessed separately.

Where social impacts are of importance to health they should be addressed by the HIA. As discussed above, the level of intervention needs to be proportional to the degree of risk and potential impact of that risk.

#### 4.1.5 Economic impacts

As for social impacts, the HIA process should not become an economic assessment process. Economic impacts need only be mentioned where they are also important health impacts; their analysis should be independent from the HIA.

#### 4.1.6 Actual assessment of the health impact

The list of health impacts developed by Canter (given in Table 3, p.18) provides a useful set of criteria against which to evaluate a proposal. It gives the proponent a guide as to the types of impact that may be required to be addressed by a health authority.

From these criteria a set of weightings might be given to the positive and negative health effects and where there are substantial negative effects that are capable of amelioration or mitigation, a health authority can consider recommending conditions be applied to the approval. A list of possible mitigating actions is given in Box 4 below.

If negative impacts are substantial but *not* capable of amelioration, the fate of the proposed development needs to be seriously considered against the health and other benefits identified for it.

## Box 4

### Possible means of mitigating the unacceptable health impacts of a development

- Alter processes or the design or choice of structures, equipment or other details to reduce the risk, or adverse health impact, experienced by the population. This could include changing the process/chemicals used, installation of pollution control equipment, safety equipment, altering speed limits, providing training, providing remote siting for a hazardous facility, etc.
- Enhance operational safety by requiring that staff be provided with appropriate training.
- Monitor to reduce the likelihood of adverse health impacts during and after site operations.
- Establishment of public health surveillance systems to monitor health effects of the development during and after implementation.
- Ensure that potential problems are detected early and that contingency measures are in place to facilitate early response.
- Ensure that emergency procedures and response plans are in place in the event of an acute exposure or major incident.
- Modify land use planning to ensure that the development is not placed near nor becomes close to sensitive areas.
- Modifications to infrastructure to reduce the adverse health impact.
- Remove the risk and restore the environment at any stage of the development but especially at the close of operations (eg site remediation).
- That procedures, structures or other aspects of the development can be altered in the future in response to monitoring results (includes any monitoring of health, biological or environmental indicators that reveals an increased or unexpected risk to health due to the development).
- Ensure that services are available to deal with any potential adverse health events including training of health personnel where required.
- Consider the special needs of workers and any at-risk groups in the affected populations.
- Undertake measures aimed at building public confidence and trust in the approach taken by project management.
- Compensation payments to affected populations (financial or other contributions to groups or individuals). Any compensation should be paid in a way that optimises the mitigating effects of the compensation.



# 5 *Conclusion*

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In seeking to improve consideration of health issues associated with development activity these Guidelines have outlined the importance of Health Impact Assessment as part of the overall examination of a proposal and described the main steps involved in the drafting of a Health Impact Statement.

In particular, HIA at the planning level can be a very useful tool, as it can:

- facilitate maximisation of positive health impacts;
- facilitate minimisation of negative health impacts before they occur; and
- strengthen the likelihood of sustainable development.

The likely general roles of the proponent and government agencies, and some of the key health concerns that may need to be considered when undertaking a HIA, have also been discussed.

Importantly, the Guidelines call for HIA to be better integrated into the assessment processes already in place across the country; they do not advocate the creation of new evaluation processes. Neither have the Guidelines tried to be too prescriptive about how to conduct a HIA, this being largely precluded by the extent of variation across jurisdictions. Any important additional details will need to be factored-in by the key agencies in each jurisdiction when involved in a HIA.

Health and wellbeing are intimately linked to the state of our surroundings, better understanding these links can lead to benefits for all.

# ***Appendix 1: The Australian Experience with Health Impact Assessment – HIA in Tasmania***

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The need for HIA was strongly endorsed by the NHMRC in 1992. Although other Australian states require some form of HIA, to date Tasmania is the only Australian jurisdiction to have introduced legislation requiring formal HIA. The incorporation of HIA in the resource management and planning system in Tasmania was a major initiative resulting from the review of public health legislation in Tasmania.

The *Environmental Management and Pollution Control Act, 1994* (EMPCA), was proclaimed in January 1996, and empowers the Director of Public Health to require that an Environmental Impact Assessment include an assessment of the impact of an activity on public health. The power of the Director of Public Health to require HIA applies to all activities which by law require Environmental Impact Assessment (EIA). HIA is fully integrated with EIA processes, in accordance with the principles identified in the *National Framework for Environmental and Health Impact Assessment*<sup>6</sup>. In practice, all activities requiring an EIA now also must have a HIA.

Since 1996, HIA in Tasmania has been based on draft *Guidelines for Health Impact Assessment* prepared by the then Tasmanian Public and Environmental Health Branch, in accordance with the broad principles identified in the *National Framework for Environmental and Health Impact Assessment*.

## **Legislative background**

Subsection 74(5) of the EMPCA provides for the Director of Public Health to direct that an EIA include a HIA. HIAs are required to be conducted in accordance with the EIA Principles contained in the EMPCA Section 74.

It is intended that HIA be fully integrated with the overall EIA process. Applicants, in preparing Environmental Impact and Health Impact Statements, are not required to repeat general

material or address shared issues separately, unless addressing such issues or material independently is the most effective way to represent them accurately. The Tasmanian draft HIA guidelines are used in conjunction with the Environmental Impact Assessment Manual produced by the Tasmanian Department of Environment and Land Management.

EMPCA establishes 3 categories of proposed developments or activities, based on their potential to cause environmental harm, which is defined very broadly in the legislation. The categories are:

- Level 1 activities, which are likely to cause minor environmental harm;
- Level 2 activities, which are more significant (examples are outlined in a schedule); and
- Level 3 activities, which are of “statewide significance”.

The Environmental Assessment Manual distinguishes EIA as carried out by the Board of Environmental Management (the Board) for Level 1 referred activities and Level 2 activities, from environmental assessment as carried out by planning authorities for Level 1 activities. In a similar manner, HIA is carried out by the Director of Public Health for Level 1 referred activities and Level 2 activities and, where relevant, health assessment should be carried out by a planning authority for Level 1 activities.

When assessing health impacts it is important to consider the immediate effects of foreseeable events upon the health of the community and to also consider the effects of events and increased demands upon existing and planned community, health and emergency services.

## Criteria for activities likely to require HIA or health assessment

Assessment (either HIA or health assessment) should be required for activities which exhibit any of the following characteristics:

- the possibility of substantial change to the demographic or geographic structure of a community;
- potential exposure of individuals to hazardous products and processes, including substances that are clinical or infectious;
- changes to the environment that may impact on disease vectors or parasites;
- the potential to render recreational facilities or water resources unsafe;
- potential impact on land productivity for horticultural and/or pastoral activities;
- impact on the microbiological or chemical safety of food chains and food supplies;
- substantial increase in the demands on public utilities;
- increased traffic flow with increased risk of injury or significant increase in the release of pollutants;
- generation of a high level of public interest in and/or concern about public health issues;
- identified ecosystems which are vulnerable, and damage to which may cause health effects;
- potential exposure of the public to contaminants;
- potential impacts on the incidence of illness or infection in the community, especially in relation to populations such as children and the aged.

### Process for HIA

Level 1 activities can be “called in” to the EIA/HIA process, if the Director of Public Health is concerned about potential health impacts.

All level 2 and 3 activities are subject to EIA and HIA (the EMPCA requires that all EIAs include explicit HIA).

HIA and EIA are undertaken in accordance with various principles detailed in the legislation:

- the level of assessment should be consistent with the health and environmental significance of the activity, and the likely public interest;
- the Director of Public Health can specify requirements for the contents of a proposal;
- the Director of Public Health should provide the proponent with guidance on potential health impacts/issues of concern, and the level of assessment required;
- there must be public consultation during the assessment; and
- information on health and environmental impacts should be publicly available.

In Tasmania, the sequence of events in undertaking health impact assessment is essentially the same as described in the body of these guidelines.

### Perspectives arising from HIA in Tasmania

1. HIA is not a separate discipline but a focussing of many existing disciplines on particular issues and projects.

HIA involves using a range of public health and related skills in new ways, rather than being a new discipline itself. It is also more of an exercise in lateral thinking involving health concepts than following checklists.

It is helpful if those carrying out HIA have a broad experience with health, environment, regulatory, and land use planning issues so that as many issues as possible are considered in the screening/scoping process. For some larger projects special expertise in a particular discipline may be sought.

2. HIA is a decision support tool and not a decision making tool.

Because HIA is part of the EIA process, health authorities reviewing the HIA will not usually have any statutory power of veto over a development. Health authorities will provide advice and recommendations to whatever statutory body is ultimately responsible. Other components of the EIA will need to be considered by the community and the decision-making authority, along with HIA, in deciding whether a development proceeds or has special conditions attached to it.

3. Consult widely before calculating deeply.

There are detailed tools available for numerical assessment of human health risks from contaminants in ground, water and air. The base data and resources to use such tools may not be available or appropriate for smaller projects which have a HIA component. Screening and scoping are always required to ensure that important health issues are not overlooked before carrying out such calculations.

In practice, it seems that the most useful information more often comes from the screening and scoping rather than from the calculations.

Appropriate local consultation is important. For example, most municipal council environmental health officers have a wealth of experience and knowledge about the history of particular areas, industries and local health problems and local attitudes. This form of consultation should be standard practice, even where it is not formally required by legislation.

4. Scoping is the essence of HIA.

The possible health consequences, direct and indirect, of a development may be numerous. In the preparation of HIAs it is usually preferable to scope the significant health issues and to have the bulk of the HIA related to assessment of these issues. If not, the HIA may be dominated by a long list of possible health issues which are of little consequence. It is important to show that other issues were considered however, and this might be done in association with any environmental checklists in the rest of the EIA, where there would be some overlap. Community involvement in scoping is also highly desirable.

5. Consult early with the proponent.

This will enable consideration of alternatives and modifications so that the likely impacts are minimised. In practice this has been found to be important by reducing time delays and extra costs, if changes are requested later in the assessment process. It is important that this sequence of consultation, be it with government or the public, together with any project modification, is described in the HIA.

In some cases consultation may involve the PHA assisting the proponent to undertake the HIA

component of the EIA. This assistance has generally been appreciated and to date there have been no major problems or objections to a requirement for HIA.

6. Consider positive impacts on health also.

Environmental impact assessments often focus on negative effects or risks. However, there may be significant positive health impacts and it is important that these be effectively assessed.

For example, a new sewage treatment plant would lead to better water quality downstream from the discharge point and this would affect health in relation to the suitability of the water for swimming or possibly drinking purposes. Increased employment and income in a community would also have beneficial health impacts.

7. HIA does not add greatly to the cost of developing EIA.

The experience so far has been that HIA does not increase greatly the size or cost of an EIA. Almost always the consultant preparing the EIA has been able to prepare the HIA component, with some assistance, and has not needed to engage additional consultants. However, as acceptance of HIA and further evolution of the methodology occurs, HIA may become more detailed and there may also be a greater role for specialist HIA practitioners.

# ***Appendix 2: The Australian Charter for Environmental Health***

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Australians are entitled to live in a safe and healthy environment. The Charter identifies the basic entitlements and responsibilities required to maintain and improve the quality of health for all Australians.

The *National Environmental Health Strategy* (1999)<sup>1</sup> emphasises that people share responsibility for securing good health with their government, and cannot merely depend on others for their own protection. No single organisation has the capacity to fulfil the Charter's objectives. Recognising environmental health as an entitlement helps encourage stakeholders to become involved in the cooperative management of problems.

Although not all of the entitlements can be met at this stage, it should be the aim of the Australian people that strategies are developed to ensure that all aspects of the charter are eventually met.

Environmental health entitlements cannot be absolute, as the total absence of risk is not possible. The entitlements spelt out in this charter only extend to what can be practically achieved. The principles that underpin this charter and guide actions arising from the Strategy are shown in Box 1 on the following page.

## Box 1

### The Australian Charter for Environmental Health's Guiding Principles (NEHS 1999)<sup>1</sup>

- **Protection of Human Health**  
Protect human health by identifying threats posed by environmental hazards as early as possible and by introducing appropriate safeguards. Ideally, these should be sustainable and cost-effective.
- **Interrelationship between Economics, Health and Environment**  
Economic development, human health and environmental protection are inextricably linked. Economic development should proceed hand-in-hand with measures to protect the environment and promote high standards of environmental health.
- **Sustainable Development**  
Future human health requires that development meets the needs of the present without compromising the ability of future generations to meet their own needs.
- **Local and Global Interface**  
Changes to local and global environments are interactive and have a significant ability to impact on human health. Environmental health programs need to take into account that global environment protection requires local action and that local actions impact globally.
- **Partnership**  
Planning, implementing and evaluating environmental health programs requires that all involved work together: the general public, Commonwealth, Local, State and Territory governments, industry and business, non-government agencies, and the health and scientific communities. This cooperation should extend to include policies and programs that are not environmental health specific, but which have an environmental health component or impact.
- **Risk-based management**  
Risk assessment and management are tools used to address existing or potential environmental threats to human health and the adverse effects on people, communities and economic interests. It includes assessing the likely impact of these threats and the development and implementation of strategies for their prevention, minimisation or removal.
- **Evidence-based decisions**  
Decisions and deliberations must be based on a careful analysis of available scientific evidence about potential environmental risks to human health. However, absence of conclusive evidence is not an excuse for inaction.
- **Efficiency**  
Improving the delivery of environmental health services, encouraging innovation, and careful examination of how environmental health services are provided – including the relative costs and benefits of each alternative – are important considerations for optimal environmental health outcomes.
- **Equity**  
Socioeconomic status and other social factors such as access to community networks, family support and education, are key determinants of health. Providing all Australians with access to appropriate environmental health services will help reduce the gaps in health status between different population groups.

## **Charter of Entitlements and Responsibilities for Individuals, Communities, Business and Government (NEHS, 1999)<sup>1</sup>**

### **1 Individuals and Communities**

Entitlements – Individuals and communities are entitled to live in a safe and healthy environment. This includes:

- safe and adequate supplies of water;
- safe and nutritious food;
- safe and adequate sanitation;
- clean air;
- safe and sustainable shelter;
- urban and housing designs that promote environmental health;
- environmental management systems that protect environmental health;
- safe occupational environments and work practices;
- safe and adequate recreational facilities, including water;
- information about environmental health issues; and
- being consulted on plans, decisions, and activities likely to affect both the environment and health, and to open and transparent decision making on these issues.

Responsibilities – Individuals and communities are responsible for:

- ensuring their own actions contribute to the protection of the environment in the interests of their own health and the health of others;
- participating in decision-making processes on matters likely to affect both the environment and health; and
- ensuring their environmental health services are delivered to a high standard.

### **2 Business and Industry**

Entitlements – Business and industry are entitled to:

- Management systems (legislative, regulatory and other) that:
  - promote health and the environment while recognising business interests;
  - recognise industry capacity for self-management in a co-regulatory environment;
  - provide access to appropriate support, advice and information on environmental health; and
  - provide information on environmental hazards.
- Consultation on environmental health decisions that affect business; and
- Guidelines and standards which:
  - place a reasonable regulatory burden on industry;
  - support industry capacity to manage environmental health;
  - are developed transparently; and
  - are consistently and fairly applied.

Responsibilities – Business and industry are responsible for ensuring that they:

- use opportunities and practices that minimise adverse impacts on human health;
- seek and use alternatives to hazardous agents and practices wherever possible;
- reduce levels of pollution and waste wherever possible;
- maintain a high level of occupational health and safety;
- ensure consumer and product safety;
- have a contemporary knowledge of the potential environmental health risks arising from their processes; and
- recognise that they are an integral part of the community and therefore have community obligations.

## 2.3 Government

### Responsibilities

While the charter recognises the responsibilities of individuals, communities and business, government has an obligation to make a major contribution to progressing this Charter. Government has been and remains responsible for most of the investment in the infrastructure that underpins the delivery of environmental health services.

Government at all levels is responsible for providing direction and leadership in environmental health policy and management through:

- setting clear management standards that are consistent across governments;
- ensuring effective mechanisms for linkages between agencies to achieve improved environmental health outcomes;
- ensuring appropriate environmental health infrastructure and services are available and effective;
- ensuring seamless transition between jurisdictions and agencies, especially in management of environment and environmental health issues;
- ensuring that planning and regulatory decisions recognise that the integrity and sustainability of the ecosystem must be maintained;
- transparent and consultative decision-making processes;
- development of consistent legislation, standards, and approaches to enforcement;
- planning, preparing and responding to environmental health challenges;
- aiding community involvement; and
- facilitating investment in strategic environmental health research.



# ***Appendix 3: The HIA Screening Tool developed by the UK Department of Health<sup>3</sup>***

The screening tool comprises four parts:

1. Examines the parameters of the proposal. It should be used to reach a provisional decision about whether a proposal has sufficient organisational/partnership significance (within the parameters outlined) to justify an appraisal.
2. Considers the potential health impacts. It should be used to qualify the provisional decision, to ensure that those proposals which seem to have insufficient organisational /partnership importance, but nevertheless have potential negative impacts of some import, are passed through screening to appraisal.
3. Should be used to qualify or confirm the provisional decision made about which type of appraisal to use (when applying the first part of the tool).
4. Focuses on the organisation/partnership capacity to conduct the HIA.

<b>Screening tool: Part 1</b>
<b>Investigating the parameters of the proposals</b>
<p>Important parameters to consider are listed below.</p> <p>For each parameter it is recommended that officers identify a set of levels or thresholds for the following situations:</p> <ol style="list-style-type: none"> <li>(1) do not conduct HIA;</li> <li>(2) conduct a rapid appraisal;</li> <li>(3) conduct an intermediate appraisal;</li> <li>(4) conduct a comprehensive appraisal.</li> </ol> <p>As HIA becomes a regular feature of decision-making, and processes and outcomes are monitored and evaluated, it will be possible to develop screening guidelines relevant to, and appropriate for, the type of proposals an organisation/partnership regularly implements.</p> <p><b>Parameters for all types of proposal (policies, programs or projects):</b></p> <ul style="list-style-type: none"> <li>• The relative importance of the proposal within the organisation's/partnership's priorities;</li> <li>• The extent of the population affected by the proposal;</li> <li>• The existence of at-risk groups within the population affected (because of age, nutritional status, etc);</li> <li>• Stage of development of proposal (i.e. the potential to make changes).</li> </ul> <p><b>Parameters for proposals about programs and projects:</b></p> <ul style="list-style-type: none"> <li>• The size of the proposal;</li> <li>• The cost of the proposal;</li> <li>• The nature and extent of the disruption to the population affected.</li> </ul>

## Screening tool: Part 2

### A checklist of questions about the nature of potential health impacts

Bias towards HIA	To your knowledge:	Bias against HIA
Yes/don't know	Are the potential negative health impacts likely to be serious?	No
Yes/don't know	Are the potential negative health impacts likely to be disproportionately greater for some groups in the population, eg. because of age?	No
Yes	Are there community concerns about potential health impacts?	No
No/don't know	Is there a robust evidence/experience base readily available to support: <ul style="list-style-type: none"> <li>• appraisal of the impacts?</li> <li>• the recommendations that could be made to ameliorate those impacts?</li> </ul>	Yes
No/don't know	• the recommendations that could be made to ameliorate those impacts?	Yes
Yes/don't know	Could any of the actions to ameliorate the potential negative health impacts of the proposal actually have a negative effect on health?	No
No/don't know	If allowed to occur, could the potential negative health impacts be easily reversed through current service provision?	Yes
Yes	Is there a need to increase social capital in the community or population affected?	No

## Screening tool: Part 3

### A checklist of questions about the circumstances in which the HIA must be conducted

Bias towards rapid appraisal	To your knowledge:	Bias towards intermediate or comprehensive appraisal
Yes	Is there only limited time in which to conduct a HIA?	No
Yes	Is there only limited opportunity to influence the decision?	No
Yes	Is the timeframe for the decision-making process set by external factors beyond your control?	No
Yes	Are there only very limited resources available to conduct a HIA?	No

## Screening tool: Part 4

### A short checklist of questions about the capacity within an organisation or partnership to conduct the HIA

Bias towards commissioning the assessor(s)	To your knowledge:	Bias towards appointing an internal assessor(s)
No	Do personnel in the organisation or partnership have the necessary skills and expertise to conduct the HIA?	Yes
No	Do personnel in the organisation or partnership have the time to conduct the HIA?	Yes

# Appendix 4: Community Consultation and Risk Communication

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Health can encompass many quality of life and well-being issues that cannot always be effectively captured in public health statistics and projections. It is essential to consult with the community to identify these factors (eg. social and cultural needs).

Consultation is not only important to allay community concerns but may also lead to improvements in the development proposal. It is essential that communication be just that, ie. a two way process with a willingness to listen to and act upon community views, not simply informing the community what decisions have been made or just going through the motions of meeting the minimum legislative requirements because one has to.

Health impact assessment is a part of impact assessment more generally and therefore the legislative requirements for HIA will be those of impact assessment in the particular jurisdiction. The proponent may have already consulted with the community, or have plans to consult with the community during the process, in addition to any statutory requirements. Proactive community consultation is encouraged irrespective of the minimum legislated requirements of environmental or health impact assessment.

Some of the key principles of effective risk communication<sup>9</sup> are:

- accepting and involving the public as a partner and stakeholder;
- carefully planning and evaluating the nature and content of the risk communication undertaken so that it is relevant and understandable;
- listening carefully to the public's concerns and acting on them. Trust, credibility, competence, fairness and empathy are often as important to the community as statistics and scientific details. Trust and credibility are very difficult to regain if lost (experts do not command automatic trust);

- being honest, realistic and open;
- appreciating that intentional communication is often only a minor part of the message actually conveyed. The manner of delivery and its tone may be more important than its content;
- ensuring that information is accurate, consistent between agencies, and not speculative;
- effectively communicating with the media;
- acknowledging the concerns of the public and the effects on the community; and
- focusing on issues and processes rather than people and behaviours.

The extent of community consultation will largely depend on the nature of a proposed development. Large developments that may generate considerable controversy will generally require a greater degree of community consultation than smaller developments.

Community and health authority input during scoping, if sought, may augment the proponent's own ideas about the degree and form of the health impact assessment.

Benefits of community consultation and public participation include:

- better decision-making, by obtaining input from the community as to its values, priorities and concerns, including matters known only to local residents;
- identifying and addressing public concerns before they become significant issues in the review process;
- providing useful local information and knowledge for completing the required impact assessment studies;
- identifying ways to avoid or mitigate adverse impacts (a key element of the review process);

- avoiding or minimising unnecessary delays in the project review and permitting processes;
- preparing local communities and residents for managing the social, economic and land-use impacts of a project;
- preparing workers and suppliers for training, employment and business opportunities related to the project; and
- developing overall community and public understanding of the project.
- non-negotiable aspects of the consultation process should be identified early in the process;
- communities are likely to lose faith in the consultation process if it appears that they have no power to affect unwelcome outcomes of a proposed development;
- using methods that encourage responses from right across the community; and
- targeting those who are most likely to be adversely affected.

### Community consultation methodology

The extent of community consultation should be consistent with the size and potential impact of a development.

The methods used for community consultation will vary according to the size of the project, with particular statutory requirements for some project types, and with the preferences and experience of the proponent. However, as a minimum it is recommended that consultation involve:

- informing the community of the proposed development details, the nature and likely magnitude of both potential and possible impacts and their associated risks and benefits;
- allaying concerns by correcting misunderstandings; and
- providing the opportunity to comment in a way that ensures the comments are taken into account when finalising the proposal, by modifying it if necessary.

When consulting with the community a number of particular issues may require consideration, including:

- benefits, risks and other adverse effects associated with a proposed development are unlikely to be evenly distributed across the community;
- the ability of individuals to voice concern or recognise issues may not be evenly distributed in the community;
- communities should be informed about the reasons for consultation;

Communication of complex issues such as risk can be difficult. The community's understanding of risk is likely to be affected not only by the actual magnitude of the risk but also by factors such as the nature of the danger and who will be subject to the risk. In communicating an appreciation of risk to the community care should be taken to use the most effective methods.

Proponents may have consulted with the community outside of the impact assessment process, especially where the development is likely to be controversial, in an effort to achieve the best possible outcome for both the community and the development. Early consultation has the benefit of:

- encouraging community trust;
- identifying problems earlier in the process; and
- assisting investigation of health issues associated with concerns raised by the community.

In addition to community consultation prior to a development proceeding, ongoing consultation is likely to be required; this could involve:

- periodic meetings between the proponent and community;
- information presented via the media; and/or
- visible acknowledgment of, and response to, comments and concerns from the public.

# ***Appendix 5: Bibliography of Sources of Key Impact Assessment Information***

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Lists mainly electronic sources of information and the key impact assessment websites for each Australian jurisdiction. Not all relevant sites are listed, but many sites give links or references to other sites (eg. the UK papers give numerous links to other UK work).

## **Australian Legislation**

Commonwealth legislation is at:  
<http://scaleplus.law.gov.au>

Legislation for most States and Territories is at:  
<http://www.austlii.edu.au>

## **Health Impact Assessment in comparable countries – key sites**

### **Canada**

<http://www.hc-sc.gc.ca/ehp/ehd/oeha/hia>

### **New Zealand**

General site at [www.moh.govt.nz](http://www.moh.govt.nz) and search for Health Impact Assessment or go to:

<http://www.moh.govt.nz/moh.nsf/wpgIndex/Publications-Online+Publications+Contents> (then to 1998 and go through the list).

### **United Kingdom**

<http://www.doh.gov.uk/london/healthia.htm>

(Section 7 of the Resources for Health Impact Assessment provides numerous other UK web addresses including the well known University of Liverpool site).

### **WHO (Gothenburg Consensus Paper)**

<http://www.who.dk/hs/ECHP/index.htm>

## **Impact Assessment in Australia – government sites**

### **Queensland**

<http://www.env.qld.gov.au> (search for impact assessment and/or integrated planning act).

### **New South Wales**

<http://www.duap.nsw.gov.au>

See also <http://www.epa.nsw.gov.au>

### **ACT**

[http://www.palm.act.gov.au/planning\\_and\\_development/environmental\\_planning/eia.htm](http://www.palm.act.gov.au/planning_and_development/environmental_planning/eia.htm)

### **Victoria**

<http://www.doi.vic.gov.au/doi/internet/planning.nsf>

(see Impact Assessment under Environment in the A-Z index).

and <http://www.epa.vic.gov.au>

### **Tasmania**

<http://www.dpiwe.tas.gov.au/env>

### **South Australia**

<http://www.planning.sa.gov.au>

See also <http://www.dehaa.sa.gov.au/epa>

### **Northern Territory**

<http://www.lpe.nt.gov.au/enviro/EIAinNT.htm>

### **Western Australia**

<http://www.environment.wa.gov.au>

### **Commonwealth**

<http://www.ea.gov.au/epbc/>

**Australian Environmental Impact  
Assessment network**

<http://www.ea.gov.au/assessments/eianet>

**International Impact Assessment  
websites**

The Environmental Impact Assessment Preliminary  
Index of Useful Internet Web Sites

<http://www.iaia.org/eialist.html>

**International Association for Impact  
Assessment**

<http://www.iaia.org/>

# *Community Consultation and Risk Communication*

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- Risk = Hazard + Outrage: A Formula for Effective Risk Communication (Video).
- Quantitative Risk Communication: Explaining the Data (Video).
- Implementing Risk Communication: Overcoming the Barriers (Video).

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# Appendix 6: Health monitoring

Generally, the potential health risks posed by a development will be controlled to the extent that health monitoring of the public is unnecessary. However, in a small number of instances such monitoring may be required.

It may, of course, be more necessary for workers as they may receive much higher exposure than a member of the public. Occupational health has not been explicitly considered in these Guidelines but there may be areas where the public and occupational health issues overlap. In such circumstances the issue needs to be addressed, possibly in collaboration with other agencies.

Monitoring health impact, and the difficulties it may present, is also extensively discussed in section 8 of the *Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards*<sup>9</sup>.

Monitoring programs are necessary only when developments are known to be, or likely to be, associated with ongoing health impacts of concern. It is essential to define in advance what action will be taken if the indicator being monitored reaches a certain pre-defined point. If no specific action is necessary or possible, then there is no point in monitoring. Similarly, monitoring is only of use if the regulatory authority has the power and will to act on the results in order to protect health.

The indicators that require monitoring need to be outlined at or before the time of approval.

Key steps in monitoring include:

- identifying parameters to be monitored and defining the correlation between those parameters and effects on health;
- developing monitoring protocols;
- ensuring monitoring is conducted;
- receiving and assessing results regularly;

- responding to results; and
- reviewing monitoring procedures and the need to continue monitoring.

## Administrative considerations

Monitoring should be:

- undertaken or paid for by the proponent;
- performed transparently and reliably (on time, using standardised equipment, trained operator, etc);
- reported publicly, including advice to local residents. Communities should be involved in as many aspects of the monitoring as possible, including planning, sampling, analysis and interpretation; and
- conducted efficiently. It is important that monitoring costs be in proportion to the scale of a proposed development (which includes minimising required monitoring) and that it be conducted as efficiently as possible.

Individuals and organisations overseeing monitoring should have adequate technical expertise and be (and be seen to be) independent.

It is assumed that monitoring will be overseen by the decision-making agency in most cases. Where a development could potentially have a significant impact on health, the public health authority (PHA) may wish to be directly involved in overseeing the monitoring (eg as a member of a monitoring committee).

The PHA should review and assess the results of monitoring on a regular basis (eg. yearly). Should the results suggest the potential for an adverse health impact in excess of that described in the Health Impact Statement, the PHA should alert the decision-making authority and initiate action to reduce the risk. Such action should involve



consultation with stakeholders, particularly the proponent and decision-making authority.

It may be appropriate that a committee of stakeholders (including community representation) oversee the monitoring of some developments, particularly those with a significant potential for adverse health impact or where the development is controversial.

### General guidelines for monitoring

Parameters to be included in a monitoring program should:

- be of reasonable cost;
- be technically reliable;
- be scientifically valid, with high sensitivity and specificity;
- be easily interpreted;
- provide reassurance to the population;
- assist with undertaking protective responses; and
- provide timely indication of a problem.

Periodic review may indicate that a more modest monitoring program would be adequate. If a monitoring program is to be scaled-down it is important that this be done in such a way as to preserve the comparability of the new and old monitoring data (if those data continue to be collected).

### Monitoring indicators of health effects or health effects themselves?

It is often much easier, more economic and effective to measure indicators of health effects rather than health effects themselves.

Health effects may be difficult to assess on a population-wide basis, incidence/prevalence may fluctuate independently of environmental changes, there can be time lags between event and outcome, and one does not want to wait until harm is done before taking action.

As the WHO Guideline *Evaluation and use of epidemiological evidence for environmental health risk assessment* (WHO, 2000.) states, “epidemiological studies that report associations

between measures of health of populations and the presence of hazardous factors in the environment are difficult to interpret”. Nevertheless, epidemiology does have a place in monitoring and in health risk assessment generally.

Measuring environmental or biological surrogates for health effects also has its difficulties. It may be difficult, for example, to demonstrate an actual correlation between the indicator and a specific health outcome, even when one is expected to closely follow the other in time, such as asthma from airborne dust or gases such as sulfur dioxide.

Monitoring the health of small populations can be a considerable task, involving significant technical difficulties. The following should be considered when developing a methodology:

- health monitoring using epidemiological tools may be possible where the affected population is large enough to yield reasonable confidence intervals and the geographic boundary of the population coincides with that of the statistical local area(s);
- monitoring should commence as early as possible so as to optimise the likelihood of recognising trends. Ideally, monitoring would commence before a development proceeds, thus providing a baseline against which to compare results obtained during (and possibly after) the development activities;
- it may be practical for only a small number of parameters to be monitored. Parameters can be health conditions (eg diseases) or bio-indicators (eg blood lead concentrations or antibodies) or environmental parameters (eg concentration of polychlorinated biphenyls in biota, concentration of phosphates or dissolved oxygen levels in water). An ideal parameter is one where easily measured changes in its value indicate small changes in health impact;
- the number of parameters to be monitored will depend upon the potential likelihood and magnitude of the health impacts and should be no more than is consistent with providing adequate protection of public health;
- every effort should be made to ensure comparability of results of sampling and analysis over the whole monitoring period (eg. by retaining the same method, or parallel running of

new methods of obtaining samples, sampling locations, analytical technique);

- monitoring of health impacts with long latency periods may not be effective in preventing adverse health outcomes eg. although cancer rate monitoring may be worthwhile in the future, monitoring of biological or environmental markers would be more effective in predicting increased risk and preventing higher cancer rates (although the emission of a known carcinogen is likely to be approved only in very special cases eg. extremely low levels of benzene or a polycyclic aromatic hydrocarbon);
- the collection and analysis of human biological samples (blood, urine, hair etc) can be used as a marker to detect concentrations of contaminants in people. While it may be ethically or socially unacceptable to routinely collect such samples, it may be possible to sample opportunistically from reasonably representative groups who are being otherwise tested. It may also be practical to test a sensitive sub-population (eg all pregnant mothers or school children, or perhaps to collect samples from sensitive animal populations). Collection and analysis of samples should be done with ethical approval, confidentially and with the least possible disruption and discomfort to those providing the samples;
- environmental samples (water, soil etc) and samples of animal or plant tissue may be used as effective markers of environmental contamination and as such can be used as predictors of some health impacts;
- while environmental parameters or biological markers may be the most efficient and timely means of assessing negative health impacts, whether actual or likely, the community may be more interested in whether health is being directly affected and therefore may be interested in periodically being advised about health indicators for the area; and
- indicators of social, economic and cultural change could also be monitored.

Monitoring that relies on the provision of data without financial reward (eg sentinel data collections) may fail unless those collecting the data are rewarded in some way, including being linked into the process and/or kept informed about the trends indicated by the data being collected.

## Monitoring health indicators

Monitoring of health indicators will usually be confined to large developments and should be considered if:

- the potential effects are likely to be significant and obvious;
- the potentially affected population is large enough to yield reasonable confidence intervals for rates;
- data pertinent to the area can easily be compiled, collected or obtained;
- there are few or no other means of indirectly monitoring an important potential health impact; and
- the community demands reassurance that their health will be unaffected by the development and the monitoring methods are adequate.

Identifying a change in community health status will require knowledge of the population being assessed, particularly the baseline health status. Identifying an increase in the number of cases of asthma for example, without an understanding of changes in the population, may lead to incorrect conclusions. A lack of baseline health status data diminishes the value of monitoring.

Disease rates which may be influenced by age or gender are best standardised against a reference population (eg. the Australian population), unless it is clear that the age and sex structure of the population in the area has remained largely unaltered (in which case crude rates may be acceptable).

Additionally, it should be borne in mind that many indicators are likely to relate only to specific diseases, so they will only give a narrow picture of the health status of a population.

## Some strategies for monitoring health

Monitoring of health can be achieved by:

- using standard data collections such as Australian Bureau of Statistics mortality data, midwives data collection, cancer registries and other data collections to track disease incidence over time. As mentioned above, one of the several disadvantages in using these data for health

monitoring is that the data are frequently old and impacts may only become apparent some time after exposures occur;

- establishing sentinel data collections involving local clinicians tracking particular diseases or their markers (confidentiality and continuity issues may be a problem);
- a series of surveys over time to track the indicators of health status and/or the prevalence of disease, conditions or markers. This method of monitoring will frequently require significant funding;
- routine health checks of sections of the population which may be accepted as indicators of community health (eg workers, school children etc). Alternatively, testing of high risk populations, such as pregnant women or the frail elderly;
- monitoring specific incidents, for example injuries involving vehicles or equipment associated with a large development. These data could be provided through workers' compensation data, hospital data, or police and/or transport authority data; and
- the public health authority notifiable disease database may be useful for monitoring infectious diseases. While this database may provide timely data, isolating the data for small areas is generally difficult and complicated by confidentiality issues.

### **Guidelines for monitoring biological indicators**

Often it will be impractical to monitor health. Monitoring of biological indicators may be a preferable alternative and can be more effective in protecting health, especially where an indicator reveals damage is occurring (eg blood lead concentrations) or the potential for damage (eg vaccination status), as opposed to damage actually done (eg impaired neurological function or cases of measles).

Measuring blood lead levels is an example of monitoring a biological indicator; the health impact of most interest being impaired neurological function. Monitoring of blood lead concentration is a more feasible approach and a much earlier indicator of people at risk, compared to assessing neurological

function – the results being more useful if concern arises that lead contamination may be a problem.

Biochemical and/or microbial assessment of blood, urine, hair, teeth and other tissue can provide useful indicators. Monitoring could include analysis of samples:

- collected during one-off surveys conducted at regular intervals (eg 5 yearly);
- collected for other tests eg. blood collected for other tests could, with consent, be analysed for contaminants of interest; and/or
- collected during routine screening of population subgroups (eg screening of school populations, workers or other populations which are periodically screened).

When designing a monitoring program using biological indicators consider:

- is funding adequate to ensure the program will continue for as long as necessary;
- is the indicator a good measure of the health impact of interest;
- are there possible biases in the selection of individuals providing samples, and if so, in what way will the bias operate and will the results still be useful;
- is the analysing laboratory accredited and does it have a good reputation for analysing the samples for the contaminant or material of interest;
- will relevant standards be followed in sample collection and analysis;
- has contamination been considered and prevented (eg. contamination of skin, collection equipment and sample storage equipment); and
- are the collection and analysis methodologies well-defined. Changing these methodologies can render comparisons over time invalid or difficult (thus possibly masking trends) and may render critical information useless, possibly to the community's disadvantage.

### **Guidelines for health indicators**

As discussed, it will often be unacceptable or difficult to monitor community health status and/or human biological samples. Consequently it will often be more appropriate to monitor aspects of the physical or social environment.

When (time of day, season and how often, etc) and where (geographical location, depth, altitude etc) samples are collected, the method of sampling and analysis and who is to collect and analyse the samples are issues that may require consideration by the community, the proponent, the health agency, the environmental agency and other key stakeholders.

Frequency of sampling and spatial distribution of sampling points can be critical for the success of a monitoring program. Measurement of contaminants associated with ill health may be undertaken in soil, water, air, dust or other organisms.

It may also be necessary to measure non-biological indicators of health to assess the impact of a large development on a community – the health impact may be positive and/or negative, and the justification for a development may have been dependent upon one or more of these health determinants improving.

Some measurable indicators of health include:

- proportion of people of working age who are in work;
- indicators of success in tackling poverty and social exclusion;
- people in employment working long hours;
- working days lost through illness, work fatalities and injury rates;
- index of Local Deprivation;
- long term unemployment;
- qualifications at, say, age 18;
- expected years of healthy life;
- people without qualifications;
- health inequalities;
- health indicators for heart disease, cancer, accidents, mental health;
- respiratory illness;
- hospital waiting lists;

- road traffic measures such as average journey length by purpose;
- homes judged unfit to live in;
- temporary accommodation; and
- household and population growth.

### **Monitoring employment and proponent commitments**

During an environmental impact assessment process a proponent may make commitments by way of mitigation, for example, of compensation, employment, modifying the development and continuing community consultation. It may be necessary to monitor the undertaking of these commitments.

# ***Appendix 7: enHealth Council Membership and Terms of Reference***

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The enHealth Council is the premier advisory body on environmental health in Australia. It provides national leadership on environmental health issues, sets priorities, coordinates national policies and programs and provides a pivotal link between international for a and environmental health stakeholders in Australia. It is also responsible for implementation of the National Environmental Health Strategy and is a sub-committee of the National Public Health Partnership.

## **Membership**

Chair – Professor Christine Ewan, Pro Vice-Chancellor (Education), University of Western Sydney.

## **Members**

State and Territory Health Department representatives:

Australian Capital Territory – Manager Health Protection Service

New South Wales – Director Environmental Health

Northern Territory – Program Director Environmental Health

Queensland – Manager Environmental Health

South Australia – Director Environmental Health

Tasmania – Director Environmental and Public Health

Victoria – Manager Environmental Health

Western Australia – Director Environmental Health service

New Zealand – New Zealand Health Ministry

Commonwealth Dept. of Health and Aged Care – Director of Environmental Health

Australian Institute of Environmental Health – National President

Environment Australia

Public Health Association of Australia

Australian Consumers' Association

National Indigenous Environmental Health Forum

## **Secretariat**

Services provided by the Environmental Health Section of the Commonwealth Department of Health and Aged Care.

## **Terms of Reference**

1. Provide national leadership on environmental health issues by:
  - i) coordinating and facilitating environmental health policies and programs;
  - ii) establishing strategic partnerships between environmental health stakeholders;
  - iii) setting priorities for national environmental health policies and programs;
  - iv) providing an open consultative system for policy development; and
  - v) facilitating cost effective use of environmental health resources.
2. Drive the implementation of National Environmental Health Strategy;
3. Advise the Commonwealth, States and Territories, Local government and other stakeholders on national environmental health issues;
4. Coordinate the development of environmental health action plans at local, state and national levels;
5. Promote and develop model environmental health legislation, standards, codes of practice, guidelines and publications;

6. Strengthen the national capacity to meet current and emerging environmental health challenges;
7. Provide a pivotal link between international fora and environmental health stakeholders in Australia and strengthening Australia's collaboration with countries in the Asia-Pacific region.

# Appendix 8: enHealth Council Publications

(N.B. Any monographs published before 1999 were produced by the National Environmental Health Forum which the enHealth Council has replaced)

## Foundation Documents

The National Environmental Health Strategy 1999

The National Environmental Health Strategy Implementation Plan 2000

## Human-Environment Interface

### Water Series

1. Guidance for the control of Legionella (1996)
2. Guidance on water quality for heated spas (1996)
3. Guidance on the use of rainwater tanks (1998)

### Soil Series

1. Health-based soil investigation levels, 3rd edition (2001)
2. Exposure scenarios and exposure settings, 3rd edition (2001)
3. Composite sampling (1996)

### Metal series

1. Aluminium, 2nd edition (1998)
2. Zinc (1997)
3. Copper (1997)

### Air series

1. Ozone (1997)
2. Benzene (1997)
3. Nitrogen Dioxide (1997)
4. Sulfur dioxide (1999)

## General series

1. Pesticide use in schools and school grounds (1997)
2. Paint film components (1998)
3. Guidelines for the control of public health pests – Lice, fleas, scabies, bird mites, bedbugs and ticks (1999)

## Exposure series

1. Child activity patterns for environmental exposure assessment in the home (1999)

## Counter Disaster Series

1. Floods: An environmental health practitioner's emergency management guide (1999)

## Environmental Health Justice

### Indigenous Environmental Health series

1. Indigenous Environmental Health No. 1 (1999)
2. Indigenous Environmental Health No. 2 (2000)

## Environmental Health Systems

1. National standard for licensing pest management technicians (1999)
2. Environmental Health Risk Perception in Australia (2000)

You can obtain copies of these publications from:  
phd.publications@health.gov.au

or ph. 1800 020 103.

OR VISIT THE ENHEALTH COUNCIL WEBSITE  
<http://enhealth.nphp.gov.au/council/pubs/ecpub.htm>

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- 7 Ministry of Health (1998) A Guide to Health Impact Assessment: Guidelines for public health services and resource management agencies and consent applications. Wellington, New Zealand.
- 8 World Health Organization (WHO). (1987). Health and Safety Component of Environmental Impact Assessment. Environmental Health Series No 15. Copenhagen: WHO, Regional Office for Europe.
- 9 EnHealth Council. (2001). Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards (in press). enHealth Council: Canberra. Once published will be available at: <http://enhealth.nphp.gov.au/council/pubs/ecpub.htm>
- 10 Office of Regulation Review. (1998). A guide to regulation. Second edition, p.E28. Canberra: AGPS.
- 11 United Nations Environment Programme. (1992). Rio Declaration on Environment and Development. UNEP Nairobi, Kenya.