

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-oriented¹.

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) Guidelines³ 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.

¹ *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

The WHO, in its report on *Health and Safety Component of Environmental Impact Assessment*⁶, 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*¹, 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').

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*⁶. 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 NHMRC⁶ 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

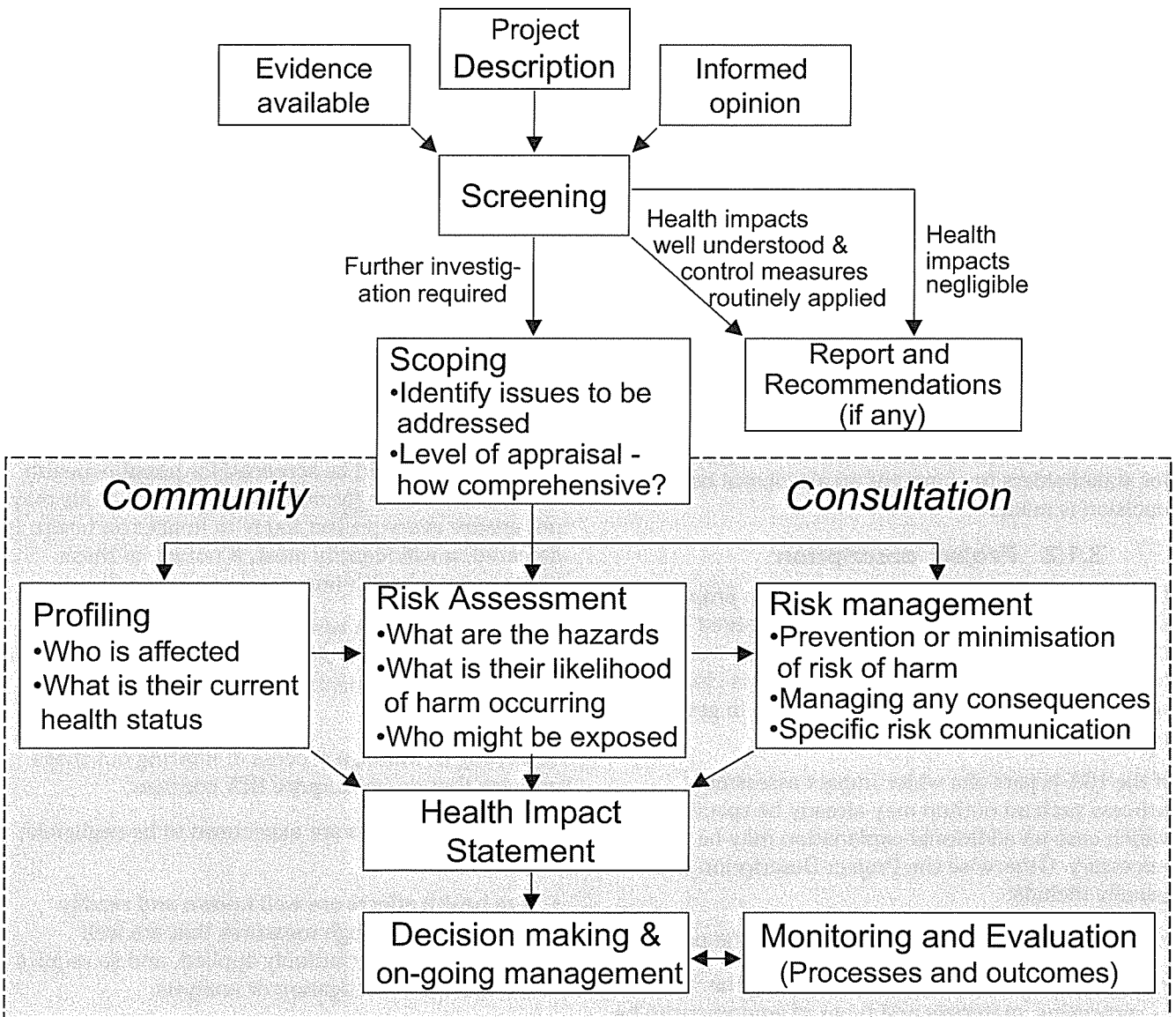
- Does the assessment provide sufficient, valid and reliable information for decision-making?
- Is there a conflict to be resolved?
- How will conditions be enforced?
- How and by whom will impacts be monitored?
- How will post-project management be resourced?

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 framework⁶ 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 framework⁶ 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 Health³ 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

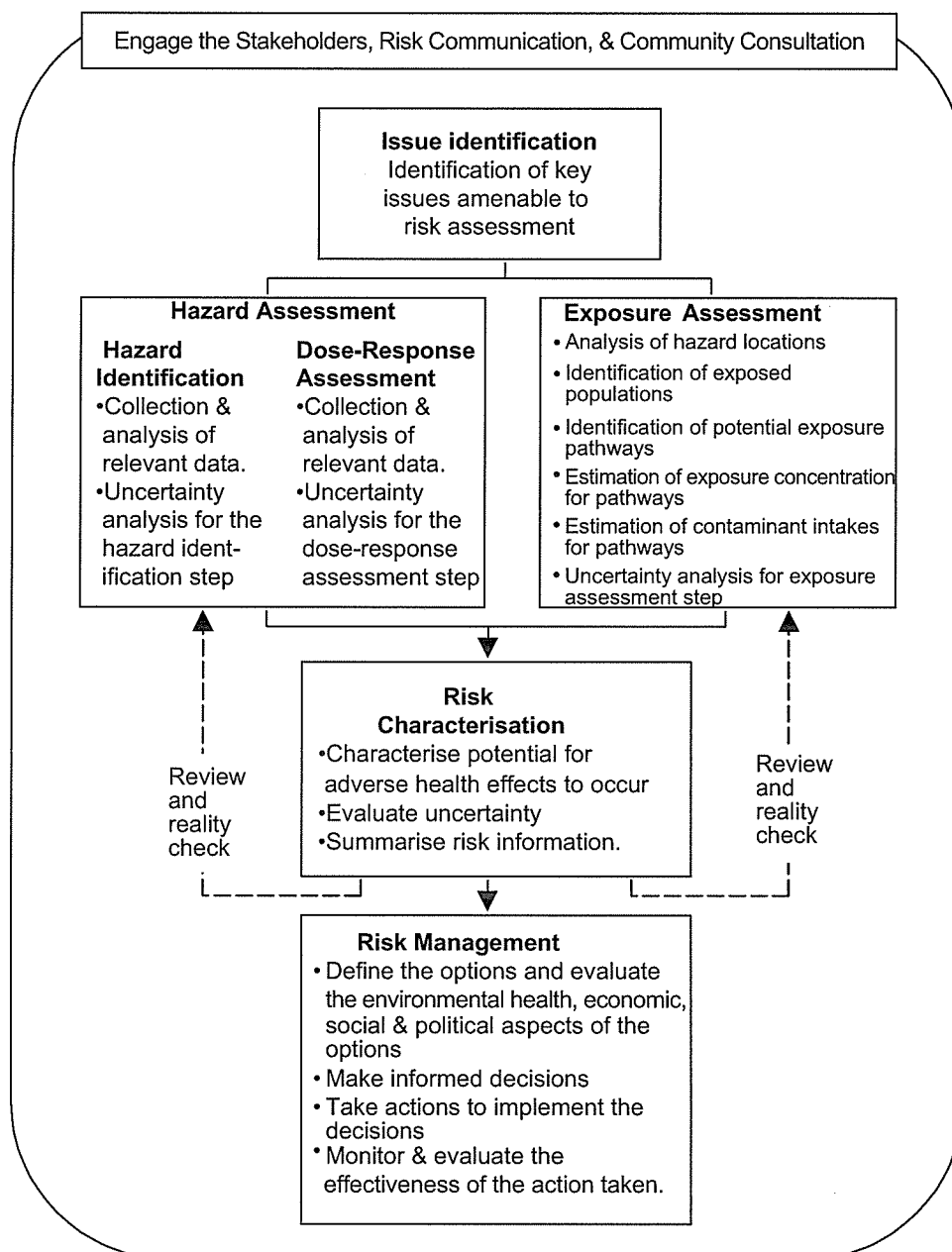
The basic risk assessment process is set out in Figure 2, which was taken from a draft of *Environmental Health Risk Assessment - Guidelines for Assessing Human Health Risks from Environmental Hazards*⁹.

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 publication⁶ and similar risk assessment frameworks.

*Environmental Health Risk Assessment*⁹ 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 Council⁹, 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*⁴ 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 agenciesⁱⁱ 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.

ⁱⁱ 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 risk¹⁰. 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 document⁶ 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)¹¹. 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 includeⁱⁱⁱ:

- 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;

ⁱⁱⁱ 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^{iv};
- 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.

^{iv} 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

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.