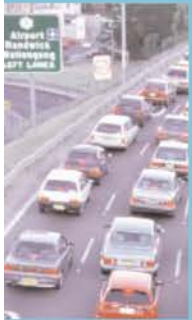


Health Impact Assessment Guidelines

July 2017



enHEALTH

Table of Contents

Audience	5
Acknowledgements	5
Abbreviations	5
Glossary	6
Executive Summary	8
1 Introduction	10
1.1 What is meant by health and determinants of health?	10
1.2 What is health impact assessment?	11
1.3 Aim and scope of the guidelines	12
1.4 Why undertake Health Impact Assessment for development projects?	12
1.5 Principles of HIA	13
1.6 The Precautionary Approach	14
1.7 Examples of modifiable determinants of health	15
1.7.1 Air quality	16
1.7.2 Noise and vibration	16
1.7.3 Food	16
1.7.4 Water (excluding wastewater)	16
1.7.5 Wastewater	17
1.7.6 Storage, handling and disposal of hazardous materials	17
1.7.7 Built environment	17
1.7.8 Infrastructure and services	18
1.7.9 Transport	18
1.7.10 Socio-economic determinants of health	19
2 The HIA process	22
2.1 The main steps in the HIA process	22
2.2 Roles and responsibilities	22
2.2.1 The proponent	23
2.2.2 The Public Health Authority	23
2.2.3 The decision-making agency (environment or planning)	23
2.2.4 Other stakeholders	24
2.3 Community and stakeholder engagement	24
2.4 Screening	26
2.5 Scoping	30
2.6 Profiling	32

2.6.1	Vulnerable populations	33
2.7	Assessing the health impacts (benefits and hazards)	35
2.7.1	Assessment of risks to health	37
2.7.2	Assessment of benefits to health	39
2.8	Managing the identified health impacts	39
2.9	Decision-making	40
2.10	Monitoring	42
2.10.1	Administrative considerations.....	42
2.10.2	General guidelines for monitoring	43
2.10.3	Monitoring health effects	43
2.10.4	Monitoring health indicators	44
2.11	Evaluation	44
3	Health Impact Assessment Report	47
3.1	Content of a Health Impact Assessment Report	48
3.1.1	Executive Summary	48
3.1.2	Introduction.....	48
3.1.3	Details of the proponent and the development	48
3.1.4	Community and stakeholder engagement	48
3.1.5	Scoping	48
3.1.6	Profiling	49
3.1.7	Assessment.....	49
3.1.8	Management.....	50
3.2	Next stages	51
3.2.1	Evaluation and decision-making	51
3.2.2	Monitoring and evaluation	52
4	Addendum – Question Guide.....	53
4.1	Air quality	54
4.2	Biological hazards.....	55
4.3	Built environment	56
4.4	Chemicals and hazardous substances.....	57
4.5	Land and soil.....	58
4.6	Light.....	59
4.7	Noise and vibration	60
4.8	Socio-economic and cultural considerations.....	61
4.9	Water quality.....	62
4.10	Other topics.....	63
5	Appendices.....	64
	Appendix 1 - Examples of determinants of well-being and health and related planning activities ..	65

Appendix 2 – Jurisdictional Resources.....	67
Appendix 3 – HIA Tools.....	69
6 Bibliography	70

Audience

The target audience for the Guidelines is the proponents, government agencies in health and non-health sectors, health professionals, consultants and members of the community and others who have an interest in Health Impact Assessment and development activities.

Acknowledgements

This enHealth document is an update of the original enHealth guidance document 'Health Impact Assessment Guidelines' first published in 2001 and has been funded by the enHealth committee. The draft was prepared by the following staff from the World Health Organisation Collaborating Centre for Environmental Health Impact Assessment and the School of Public Health at Curtin University; Helen Brown, Dianne Katscherian, Jeffery Spickett, Bruce Maycock and Delia Hendrie.

Staff from the Department of Health and Human Services, Tasmania, prepared the original 2001 version of the enHealth guidelines. The assistance of other contributors to the 2001 edition was acknowledged in that edition.

The review and contributions from enHealth members from each jurisdiction are acknowledged.

Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
EIA	Environmental Impact Assessment
HIA	Health Impact Assessment
HRA	Health Risk Assessment
IGAE	Inter-Governmental Agreement on the Environment
UNCED	United Nations Conference on Environment and Development
WHO	World Health Organisation

Glossary

Acute health effects - those health effects requiring medical attention with a maximum of one month's incapacity/time lost and no significant disability.

Chronic health effects - those health effects resulting in a severe health crisis and/or injuries, prolonged or permanent disability or absence for over one month.

Community - individuals or groups residing in a locality where an assessment is to be undertaken and who may be affected by the assessment physically (e.g. through risks to health or the environment, loss of amenity) or non-physically such as via concern about possible impacts.

Cumulative risk - implies that the risk associated with substances sharing a common mode of action or toxicity outcome, are aggregated across the exposure estimates for all such substances.

Development – the process in which an economy grows or changes and aims to improve the economic and social conditions for a community. Development proposals cut across all sectors and include projects in infrastructure, natural resources and mining, industry, urban development and agricultural projects.

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.

Environmental monitoring - monitoring of the concentration of substances in the physical environment of air, water, soil and food.

Exposed population - the people who may be exposed to a health impact associated with a development.

Exposure assessment - the estimation (qualitative or quantitative) of the magnitude, frequency, duration, route and extent of exposure to health impacts for the general population, for different sub-groups of the population, or for individuals.

Hazard - is the capacity of that agent to produce a particular type of adverse health or environmental effect.

Health consequences - are the outcomes of the impact of an event and their effects on health and includes the magnitude of the impact on health and well-being

Health issues – matters that may have an impact on health that arise from a development as a result of effects on the environmental, social, cultural and/or economic determinants of health

Health risk assessment – is 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 time frame.

Likelihood - relates to how likely it is, or the chance that something will occur and have an impact and also can consider the probability of an impact occurring. This can include the frequency with which an impact is likely to occur.

Management of risk - processes developed and implemented to reduce adverse impacts and enhance positive impacts.

Management criteria – are health risk management strategies to reduce negative impacts to an acceptable level and enhance positive impacts.

Proponent – those responsible for the development and management of the proposal being assessed.

Uncertainty – the level of confidence or reliability in the health risk level determined.

Note: some of the terminology in this glossary has been derived from the enHealth document *Environmental Health Risk Assessment, 2012: Guidelines for assessing human health risks from environmental hazards* and the Department of Health WA 2010 document *Health Risk Assessment (Scoping) Guidelines*, for consistency.

Executive Summary

Human health and development are inextricably linked through an array of environmental, social, cultural and economic determinants of health. In order for development to capitalise on opportunities to improve health as well as effectively manage any risks to health, it is critical that these links are identified and understood. This requires knowledge about both the type of health impacts that may occur and the distribution of those impacts in the affected community. While understanding these links is a relatively straightforward principle, in practice the task of achieving this is a challenge.

This challenge can be assisted by the application of Health Impact Assessment (HIA). HIA is an internationally recognised process that provides a systematic approach to address the potential health costs and benefits of projects, plans or policies.

These Health Impact Assessment Guidelines focus primarily on the application of HIA to new development projects or upgrades to existing developments, in sectors such as transport, environment, mining and resources, agriculture, energy, waste, housing and planning.

The process can be applied within an existing assessment framework such as Environmental Impact Assessment (EIA), Strategic Environment Assessments or Planning Assessments, or as a stand-alone application. The details of the application of HIA will be influenced by jurisdictional differences in legislation, policies and process, as well as changes over time. For these reasons, the Guidelines are broad-based and general in nature rather than prescriptive.

These Guidelines outline the key principles that underpin HIA as well as each of the steps in the process as shown in Figure 1. The importance of collaboration, including community and stakeholder engagement is highlighted.

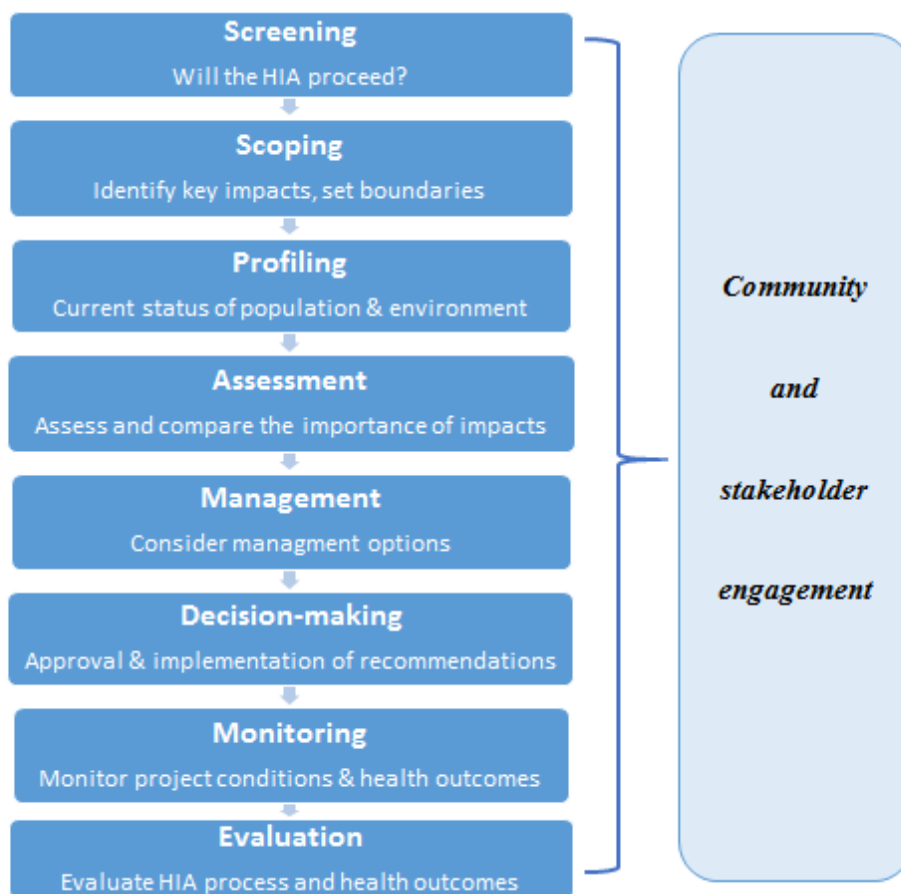


Figure 1 - The HIA Process

Examples of evidence that demonstrate the links between development and the environmental, social, cultural and economic determinants of health and ultimately health outcomes are provided.

The Guidelines have been developed to assist a wide range of stakeholders including:

- Proponents or consultants who undertake an HIA
- Health professionals who may be required to provide advice on health impacts of a proposal or evaluate a completed HIA, EIA or other assessment that addresses potential health consequences from a range of activities
- Professionals across a wide range of sectors who can provide relevant expertise to the HIA
- Members of the community who have an interest or may be affected by development proposals.

A well-conducted and robust HIA represents an opportunity for proponents, government and the community to work collaboratively to improve health and other outcomes of development projects and to mitigate any potential negative impacts.

The objective of these Guidelines is to provide guidance in the conduct of HIA and encourage health impacts to be incorporated as fundamental elements of decision-making in the planning stages of relevant development projects. It also provides suggestions for the preparation of HIA reports and a range of additional resources including an Addendum of guiding questions and links to HIA resources.

1 Introduction

1.1 What is meant by health and determinants of health?

Good health and well-being is universally considered as one of the most important assets in society. It is a fundamental indicator of sustainable development and an undeniable human right. The protection and promotion of health is central to HIA and as such, a shared understanding of health and the determinants of health is a critical starting point. The World Health Organisation (WHO) definition of health is often used in HIA and is:

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

Health is seen as a resource for everyday life and as a positive concept that emphasises social and personal resources as well as physical capabilities. Many cultures view health in this holistic way. For example from an Aboriginal and Torres Strait Islander peoples’ viewpoint ‘health’ as ‘not just the physical well-being of the individual but the social, emotional and cultural well-being of the whole community’ (National Aboriginal Health Strategy Working Party 1989). An ongoing and active relationship with ‘country’ (a place of ancestry, identity, language, livelihood and community connection) means that the health of community land plays an important role in determining the health of Indigenous people themselves.

The factors that keep us well often lie outside the direct influence of the health sector and are determined by a range of influences, often called determinants of health. These determinants are varied and include environmental factors such as housing conditions, urban design, soil, transport, ecosystems, biodiversity, historic heritage, ambient air and water quality.

Another way of expressing the concept of the determinants of health is to think about the context in which people live, for example their house, transport, work, education, cultural interests, natural environment, neighbourhood, worldview and their model of health. Figure 2 shows these relationships in diagrammatic form. It highlights that health and well-being is influenced by factors extending from the individual to factors at the local, societal and global level - many of which lie beyond the reach of health sector.

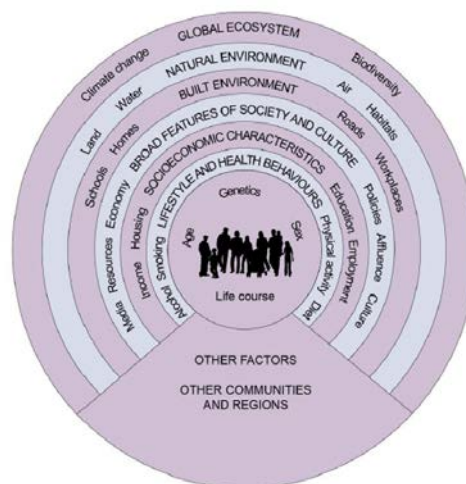


Figure 2 Determinants of Health

Source: Australian Institute of Health and Welfare, 2011

Examining these connections to establish health impact pathways is a critical component of HIA that provides invaluable information regarding potential solutions to promote and protect health. Figure 3 demonstrates how an understanding of such pathways can inform decision-making for effective management strategies as well as considering where existing vulnerabilities may occur. Management options higher up the health impact pathway should be considered wherever possible as these are generally targeted at a population rather than a localised or individual level.

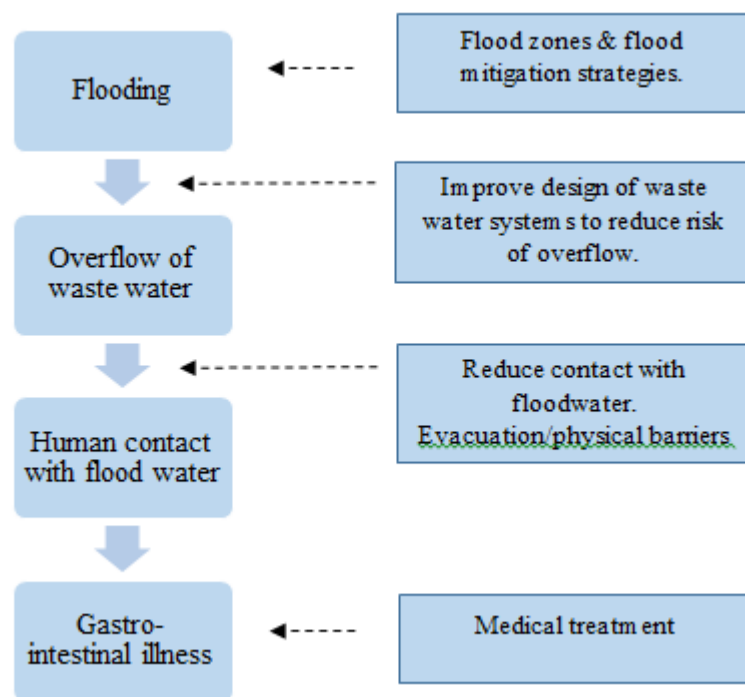


Figure 3 - Example of a health impact pathway and management opportunities

Many of these pathways cut across personal, social, economic, cultural and environmental factors. For example, lower socio-economic status groups are more likely to live in areas with higher levels of air pollutants and be more susceptible to their adverse health effects. Likewise, interactions have been shown between socio-economic factors and access to health promoting factors such as public open space, walkable communities and crime and safety. There is substantial evidence linking development with a wide range of these determinants. This evidence can be drawn from various sources including experience from similar developments, the literature, government agencies and the community.

These examples, as well as the broad definition of health, highlight that whilst categorisation of health determinants is useful, care must be taken to avoid management based primarily on separate categories. Instead, a collaborative approach that promotes better awareness of the connections between health and development across a range of health determinants, is more likely to lead to a better understanding of the situation, which can in turn deliver more effective management of development activities.

1.2 What is health impact assessment?

A widely accepted definition of Health Impact Assessment (HIA) is that published in the Gothenburg Consensus Paper of 1999 (WHO European Centre for Health Policy, 1999).

“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 is a predictive tool that considers both positive and negative impacts on health of new developments or upgrades to existing developments. It identifies population groups more likely to suffer from health disparity or inequity. This typically involves a consideration of existing inequities and specific groups who may be more vulnerable to a particular health outcome(s) than the general population. HIA is primarily concerned with determinants of health at the population rather than the individual level. For this reason, HIA focuses on the environmental, social, cultural and economic determinants of health rather than personal characteristics or behaviours. In addition, HIA aims to support sustainable development and therefore considers health in the context of current and future generations.

Although the primary focus of HIA is human health, the vast majority of health determinants are managed by sectors outside the health sector and for this reason an effective HIA requires strong cross-sectoral collaboration. HIA also calls for consultation between key stakeholders such as the proponent, relevant experts, decision-making authorities and the community.

While HIA is based on a set of key principles and follows a typical process, the vast range of projects, policies or plans to which HIA is applied, requires a flexible framework where the choice of procedures or methods used should reflect the characteristics of the situation and the objectives of the HIA. Regardless of the specific application or methods used, a key objective of HIA is to influence decision-making with respect to health.

1.3 Aim and scope of the guidelines

These Guidelines are a revision and update of the previous enHealth *Health Impact Assessment Guidelines* (September 2001). The Guidelines focus predominantly on the application of HIA during the planning stages of a wide range of development projects that have the potential to influence the determinants of health. It is important that these influences are given due consideration as early as possible.

As an enHealth Guideline, this document primarily targets the application of HIA within other assessment processes such as Environmental Impact Assessment, Strategic Environment Assessments or Planning Assessments. This maximises the opportunity to consider and implement changes to a development proposal which may subsequently improve health outcomes for affected communities by increasing health promoting activities and/or mitigating the negative impacts.

The Guidelines are not intended to be prescriptive – different jurisdictions are influenced by different legislation, policies and government processes, all of which can change over time. The Guidelines do not address occupational health and safety issues, as separate agencies are specifically charged with this responsibility in most jurisdictions.

The Guidelines aim to:

- Provide an introduction and a rationale for the practical application of HIA
- Highlight the need for collaborative approaches to conduct HIA
- Improve consideration of health impacts (positive and negative; direct and indirect) of development projects by promoting and facilitating the integration of HIA into environmental and planning impact assessment, within the legislative framework that already exists in each jurisdiction
- Provide an outline of the key steps required to complete an HIA and the role of key stakeholders
- Assist key stakeholders in preparing and/or evaluating HIA Reports

1.4 Why undertake Health Impact Assessment for development projects?

Development usually provides society, community and individuals with goods and services that can result in significant health benefits. Many of these benefits occur via economic and social determinants of health such as better employment opportunities and increases in services that improve the overall standard of living and health outcomes of communities. However development can also result in negative health impacts through increasing exposure to a range of environmental or socio-economic risk factors. Management of all of these impacts is critical in the drive toward sustainable development. In most instances, development projects are associated with non-health sector activities and although health is affected by these projects it is rarely their central purpose. Without a clear

determination to include health as part of project planning there is a risk that health outcomes will occur in an ad-hoc way that are difficult to manage and unlikely to deliver the optimum outcomes.

One of the primary objectives of an HIA is therefore to ensure that health considerations are factored into the early stages of planning and decision-making processes of relevant developments. The intent of this should be to highlight both the potential harm and benefit to the current and future health of the community and provide suggestions for better health outcomes. The failure to identify, assess and manage these impacts can result in poorer health outcomes, missed opportunities to improve health, greater inequities and fractured communities. Many of the costs associated with these failings fall on governments, the community and individuals, however they can also have flow-on effects that undermine the success of the development and therefore impose a cost on the proponent. Avoiding or reducing such costs is an advantage to all stakeholders in terms of equity, health and well-being and economics.

An understanding of the distribution of health impacts of a particular development is a cornerstone of HIA. Projects that result in a sense of ‘winners and losers’ in the community are likely to lead to greater conflict and worse outcomes overall. HIA recognises that equity is strongly influenced by socio-economic and cultural determinants of health and aims to avoid the creation of new inequities or the exacerbation of existing ones.

As most development projects are likely to impact on a range of health determinants, it is unlikely that any one sector or stakeholder will have the necessary skills, knowledge and perspective to enable a thorough assessment and understanding of the potential health impacts. HIA addresses this challenge by promoting a collaborative approach that provides the health sector with an opportunity to ensure that other sectors have a better understanding of the importance of their developments on the health and well-being of the community. In addition, a better awareness in the health sector of others’ perspectives will enhance understanding not only of how health is impacted but also of other factors in the development that will influence decision-makers.

In summary the key reasons to do HIA are to:

- Assist proponents to consider all dimensions of sustainability
- Assist proponents to incorporate evidence into proposals
- Promote cross-sectoral activities with other sectors
- Promote a participatory and consultative approach to proposal development
- Improve health and reduce health inequalities
- Promote a balanced approach to decision-making by ensuring the inclusion of health

1.5 Principles of HIA

A range of guiding principles underpins Health Impact Assessment and these are listed in Box 1. These principles should be reflected throughout the HIA process.

Box 1: Guiding Principles for Health Impact Assessment

Democracy

People have the right to participate in the formulation and decisions of proposals that affect their life, both directly and through elected decision makers. In adhering to this value, the HIA method should involve and engage the public, and inform and influence decision makers. A distinction should be made between those who take risks voluntarily and those who are exposed to risks involuntarily.

Equity

The desire to reduce inequities that result from avoidable differences in health determinants and/or health status within and between different population groups. Particular attention should be paid to the distribution of health impacts and groups that may be more vulnerable to adverse impacts and consideration of ways to improve the proposed development for affected groups.

Sustainable Development

This principle emphasises that development should meet the needs of the current generation without compromising the ability of future generations to meet their needs. This requires a short- and long-term consideration of the potential health impacts and subsequent management of a proposal. Good health is the basis of resilience in the human communities that support development.

Ethical use of evidence

Transparent and rigorous processes are used to synthesize and interpret evidence, best available evidence from different disciplines and methodologies is utilised, all evidence is valued, and recommendations are developed impartially. In adhering to this value, the HIA method should use evidence to judge impacts and inform recommendations; it should not set out to support or refute any proposal, and should be rigorous and transparent.

Comprehensive approach to health

Physical, mental and social well-being is determined by a broad range of factors from all sectors of society (known as the wider determinants of health). In adhering to this value, the HIA method should be guided by the wider determinants of health.

Source: Adapted from Quigley et al, 2006.

1.6 The Precautionary Approach

In addition to the guiding principles, the precautionary approach is also central to HIA. The inclusion of the precautionary approach in the 1992 Rio Declaration on Sustainable Development (UNCED, 1992) led to broad international recognition and subsequent inclusion in many multilateral agreements, international laws, and domestic laws and policies.

In Australia, the approach was included in the 1992 Inter-Governmental Agreement on the Environment (IGAE):

“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.” (para 3.5.1)*

Subsequent inclusion of the precautionary approach has occurred in the *Environment Protection and Biodiversity Conservation Act 1999* and a range of State and Territory environmental legislation. These applications impact on a wide range of environmental determinants of health and are therefore crucial to considerations of health and well-being.

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 and nature of uncertainty. Further the precautionary principle has the potential to require the proponent to demonstrate there is no harm or risk to health associated with a development. This reverse onus of proof was accepted in Australia in 2006 in the NSW Land and Environment Court.

1.7 Examples of modifiable determinants of health

HIA focuses on those determinants of health that can be modified and result in protection or promotion of health at the population level. While individual characteristics such as age, gender and genetics may be considered as part of discussions on equity and vulnerability, they are not considered as modifiable. Figure 4 provides examples of different types of modifiable determinants of health. As HIA can be applied to a wide range of projects with vastly different characteristics this list is not exhaustive, but provides the reader with additional guidance on the types of determinants of health that need to be considered.

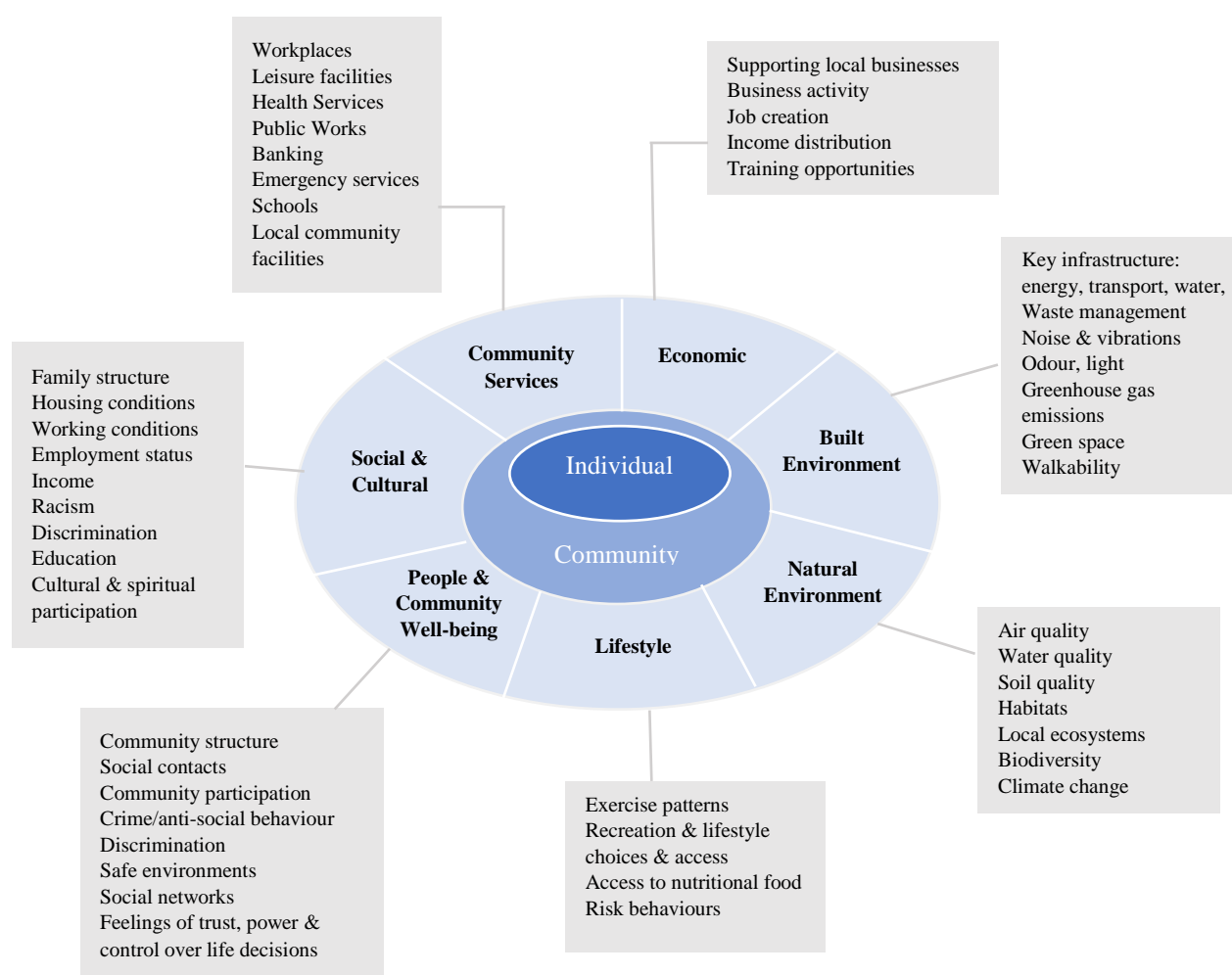


Figure 4 - Examples of modifiable determinants of health

Source: Adapted from Department of Health WA 2006

Further discussion of selected determinants is included below. Other information is provided in the Addendum in the form of guiding questions and Appendix 1 provides examples of planning activities at a local government level that are related to determinants of health and well-being.

1.7.1 Air quality

A key area of health concern is indoor and outdoor air quality. If a development is likely to have any influence on either, then potential health impacts must be assessed. Changes in indoor air quality may arise from a wide range of factors in the built environment, such as from construction materials or equipment used in a building, outdoor dust creation, 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 such as particulates or dioxins, and vehicle emissions. It can also be impacted during construction phases and from the movement of materials to and from sites during all stages of developments.

Whatever the source or type of emission that may have health effects, 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. Measurement of baseline data of existing air quality levels can also enable comparison with future levels as well as identify opportunities for improvements to air quality health outcomes. Modelling of the dispersion of airborne materials is a specialist task, as is the estimation of health effects once the dispersion model is developed. The [*Environmental Health Risk Assessment, 2012: Guidelines for assessing human health risks from environmental hazards*](#) provides direction on the requirements for undertaking risk assessments for air quality.

1.7.2 Noise and vibration

Noise and vibration during operation of development projects can be a significant issue. These issues may be restricted to a particular phase of the project (such as the construction phase) or be present for the entire life of the project. Examples include transport infrastructure such as major highways or railways, developments requiring extensive construction work, transport corridors to and from industrial or resource projects and changes to land-use planning that may impact on existing or surrounding neighbourhoods. Noise and vibration are often considered as part of other assessment procedures, which typically refer to key national, state and territories legislation.

1.7.3 Food

If there is the possibility of a development having an impact on the production, quality, quantity or the price of food this should be considered. Impacts on food production or on food producing land or water may be addressed by an EIA but these data would be of interest to the HIA as well. Consideration should be given to the long-term implications of the change of use from agricultural land to other purposes. Access to healthy food is also a consideration and can be influenced by aspects of the built environment.

1.7.4 Water (excluding wastewater)

The use of local water by a proposed development and the likely impact on the surface, ground water, recreational 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 could 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 of the water for humans. The state or territory agency responsible for

water provision or the water provider(s) can usually provide this information. The health authority should be able to direct the proponent to the appropriate source(s) of information.

Particular attention should be paid to any impacts on potable water supplies. Impacts might be from additional consumption that depletes reserves or reduces access, chemical contaminants (e.g. nutrients or metals), microbial contaminants, loss of amenity of lakes or other surface water for recreational purposes or other, and impact on fish used for food.

1.7.5 Wastewater

The disposal of wastewater can have health impacts, whether or not the wastewater contains sewage. Disposal of wastes to wastewater schemes in the most part, are controlled by regulation in all states and territories. Variations exist in some jurisdictions as to the size of the system regulated.

Improper disposal of storm-water 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 other sensitive land uses, and most other forms of development, and improper disposal quickly becomes a health hazard. Proponents are required to gain approval for all private waste water systems from the local health authority.

Industrial wastes pose differing hazards, depending upon their constituents. They often require further specialised treatment before discharge to sewer or to a local effluent disposal system. Information about treatment and other management of industrial liquid wastes should be clarified within the health assessment. If wastewater is to be produced in any quantity and is not simply discharged to sewer, full information on the details is expected. Many of these details, such as the volume, content and method of disposal are likely to be included in existing impact assessment procedures.

1.7.6 Storage, handling and disposal of hazardous materials

The storage, handling and disposal of hazardous materials, including solid waste, on and offsite are usually well addressed in current impact assessment processes and it is unlikely that further basic data would need to be provided for an HIA. The links to potential health effects associated with management of these materials should be identified and acknowledged.

1.7.7 Built environment

The built environment refers to more than just the structures people have built, it also relates to how those structures enable human interaction to occur. It is well recognized that the built environment can positively or negatively influence human activities. The design of our communities, and workplaces, as well as the key infrastructure and services that are required to support them, all impact upon health. In addition to more traditional factors such as environmental noise and housing conditions, opportunities to engage with health promoting infrastructure for physical activity, access to healthy food options and a range of social and community interactions, are recognised as central elements of healthy communities, particularly with respect to chronic diseases. The availability of passive/active recreation venues, access to public open space and green space, traffic control, safe and connected routes (accessible, walkable), and active travel to school or work (end of trip facilities) all contribute to health outcomes in the community. Well-designed and activated spaces can also reduce crime and increase community engagement. There is recognition that poorly designed communities can contribute to obesogenic environments. The National Heart Foundation via their Healthy Active by Design identifies that it is easier to be physically active if a local area:

- is close to shops, services, school, and jobs, so you can walk or cycle instead of driving
- has supportive infrastructure such as footpaths, road crossings, cycling paths and public transport
- provides quality spaces that can improve well-being such as green areas, open space, plazas

and recreational facilities.

It is appropriate to ensure that health considerations are included in the master plans for new land use developments and that these are adhered to in the implementation. It is important that the planning for these developments should consider if they have the potential to either enhance or detract from the intended outcomes of the built environment/master plan and public amenity of the affected area.

It should be noted that successful built environments require more than just good design; they need engagement from the community in which the design will reside. There are tools to assist in this process and numerous websites that have case studies highlighting positive and negative examples of built environments. Resources that highlight the importance of the built environment for good health outcomes, especially in relation to urban development plans and proposals, may be available from local health agencies.

Box 2 – Urbanisation

The Australian population is highly urbanised. As of the 2011 census, 88.9% of the population lived in urban Australia (Australian Bureau of Statistics, 2017). Planning and urban design are a mechanism of environmental control and can influence well-being and health in systematic ways, for example through cleanliness of air and water in the natural environment; availability of safe and attractive pedestrian and cycling facilities, parks, public pools and playing fields in the built environment; access to food outlets and supportive social networks (Barton et al 2009). The social, economic, cultural and environmental make-up of the built environment therefore poses a major opportunity by which to improve urban health and health equity.

1.7.8 Infrastructure and services

Introduction of or changes to the capacity of utilities (gas, electricity, water) or public facilities (education, public housing, transport, energy, health and social services) which lead to reduced or increased access or cost would be likely to result in health impacts. If large enough or if they have the potential to exacerbate existing requirements, such potential impacts would warrant inclusion in the HIA Report. Transport is included below as a more detailed example related to infrastructure.

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

1.7.9 Transport

Transport infrastructure supports public and private modes of motorised transport as well as non-motorised methods such as walking and cycling. Transport provides significant benefits to society by enabling access to a wide range of goods and services as well as economic and social opportunities. In addition to injuries and deaths from accidents, motorised transport also results in air and noise pollution and reduced physical activity opportunities. Car dependence has been identified as a contributor to sedentary lifestyles and growing rates of overweight and obesity in Australia, both well-known risk factors for cardio-vascular disease and several cancers.

Careful consideration is needed within HIA for developments that directly or indirectly affect transport systems such as industry haulage or new residential developments. The HIA 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.

People-sensitive design of road systems can reduce noise, air pollutants, and the rate of injury to motorists and pedestrians. Opportunities to increase physical activity through the provision or support of a less car-dependent workforce and community and increased options for active transport should be incorporated.

Improved public transport may have the effect of improving equity through better access to public facilities and workplaces, reducing isolation and increasing opportunities for work and social activity for all members of the community. Use of public transport can increase exercise through walking to the bus or train stop. Improvements to cycling infrastructure and facilities can also provide significant environmental and health benefits.

Areas of loading or unloading can be problematic due to noise or handling of hazardous materials. Transport of materials from source to end use such as from a mine to a port, is often not considered in project approvals, except for ingress and egress from sites and impacts on local traffic movements. It is important that the potential health and safety impacts to all communities along transport routes are considered.

1.7.10 Socio-economic determinants of health

Box 3 - Examples of associations between social and economic status and health

- Tangible inequalities continue to exist between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians, particularly in relation to chronic and communicable diseases, infant health, mental health and life expectancy; between one third and one half of the life expectancy gap can be explained by differences in the social determinants of health (Calma, 2007, Booth, 2005).
- After accounting for differing age structures, the rate of burden of disease (fatal and non-fatal) in Australia was 1.5 times higher in the bottom socio-economic quintile of the population compared with the top quintile (AIHW, 2016).
- Australians aged 15 years and over who were long-term unemployed were four times as likely as employed people to say that their health was only fair or poor (34% compared with 9%), twice as likely to be a current smoker (44% compared with 22%), and almost three times as likely to have mental or behavioural problems (27% compared with 11%) (ABS, 2011).

There has been considerable progress in understanding the relationship between social, cultural and economic issues and their impact upon health. Box 3 provides some examples of these impacts.

Developments have the potential to intentionally or unintentionally impact upon health through changes to the social, cultural or economic environment. Socio-economic issues being considered within a new proposal will vary significantly between different types of development. Any social or economic impact needs to be considered in the context of the local social and cultural conditions.

Issues that may be relevant include:

- The current industries and populations and any potential for land use conflicts. For example conflicts that might develop between mining, agriculture and tourism. If a mutual co-existence cannot be established then adverse impacts including loss of employment, reduced diversity of employment or reduced liveability could result.
- Large projects have the capacity to transform land use, impact existing infrastructure, and service provision and to transform the labour force. For example increased pressure on social infrastructure (e.g. health and recreational services) to accommodate the increased population, or shortages of labour in local industries unable to compete with salary packages offered by new projects.

- Changes to the scale of operations due to commodity cycles or post-development phases of the project. Consideration of the scale shifts will enable people to plan for changing employment opportunities. The ‘boom-bust’ cycle can create labour shortages, inequity and sudden changes in income levels and fluctuating housing prices which can have flow-on effects to mental health and well-being.
- Impacts of fly-in fly-out (FIFO) or drive-in drive-out (DIDO) work practices on workers. Social isolation from living in camp accommodation, compressed work schedules, shift work and separation from family need to be effectively managed particular in relation to mental health and behavioural risk factors.
- Pressure on supporting infrastructure and levels of service provision. During the life cycle of any project the impact upon local infrastructure and services will change. Consideration needs to be given to the impact of all of the environmental factors, for example the impact of additional traffic on local inhabitants and on walkability, the impact of a large influx of individuals on local health services and the impact upon local airports.
- Social inequality can be enhanced or reduced by the decisions made in relation to use of local labour, use of local businesses and the provision of training and housing. Existing inequities such as lower employment rates for Aboriginal and Torres Strait Islanders or women should be considered. The impact of significant fluctuations on housing affordability, especially for the local community, should be taken into account.

Box 4 provides more examples of potential health impacts to consider.

Box 4 - Examples of potential links to health and well-being to consider during HIA

General environmental aspects that may impact on health:

- Increased demand and/or improvements to public infrastructure (e.g. water supply, sewerage, waste management, health, education, other government services)
- Impacts on health or amenity through changes to quality of air, food and water, as well as odour, noise, dust, insects, shade, temperature, vibration and light spills
- Altered risk from acute hazards (e.g. 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
- Encourage/discourage healthy forms of physical activity such as walking or cycling
- Alter access to healthy food options

Potential impacts on physical health:

- Communicable/infectious diseases (e.g. spread of sexually transmitted infections, mosquito-borne disease)
- Non-communicable diseases (e.g. cardiovascular and respiratory disease, cancer)
- Exacerbation of existing conditions
- Injuries

Socio-economic impacts which may have a health effect:

- Employment opportunities created/lost and impact on income inequalities
- 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 (e.g. the likelihood of changes to alcohol consumption in an area or the risk of sexually transmitted infections, feelings of safety or security)
- Changes in cost of living (e.g. cost of housing, food and services)

- Mental and emotional well-being of a community (e.g. stress, anxiety, nuisance, discomfort)
- Impacts on culturally or spiritually important sites, practices or beliefs
- Increase in health inequities
- Increased or decreased opportunity for social and community interactions
- Shifts of population into or out of the affected area and the health impacts of such shifts.

2 The HIA process

2.1 The main steps in the HIA process

HIA is a tool for considering impacts on health determinants identified for proposal development (including planning, implementation, operation and decommissioning). This formalised process provides opportunities for proponents and other stakeholders to act proactively to share possible community benefits as well as minimize potential future adverse impacts on health.

The HIA process may vary slightly depending on the type of proposal to be addressed such as for policies or projects. The format, as described in these Guidelines, is similar to international and national best practice in HIA and to that used for Environmental Impact Assessment (EIA). The general process is outlined in Figure 5. While Figure 5 depicts a general sequence of steps there is often overlap between the steps and some may require revisiting as new evidence is gathered.

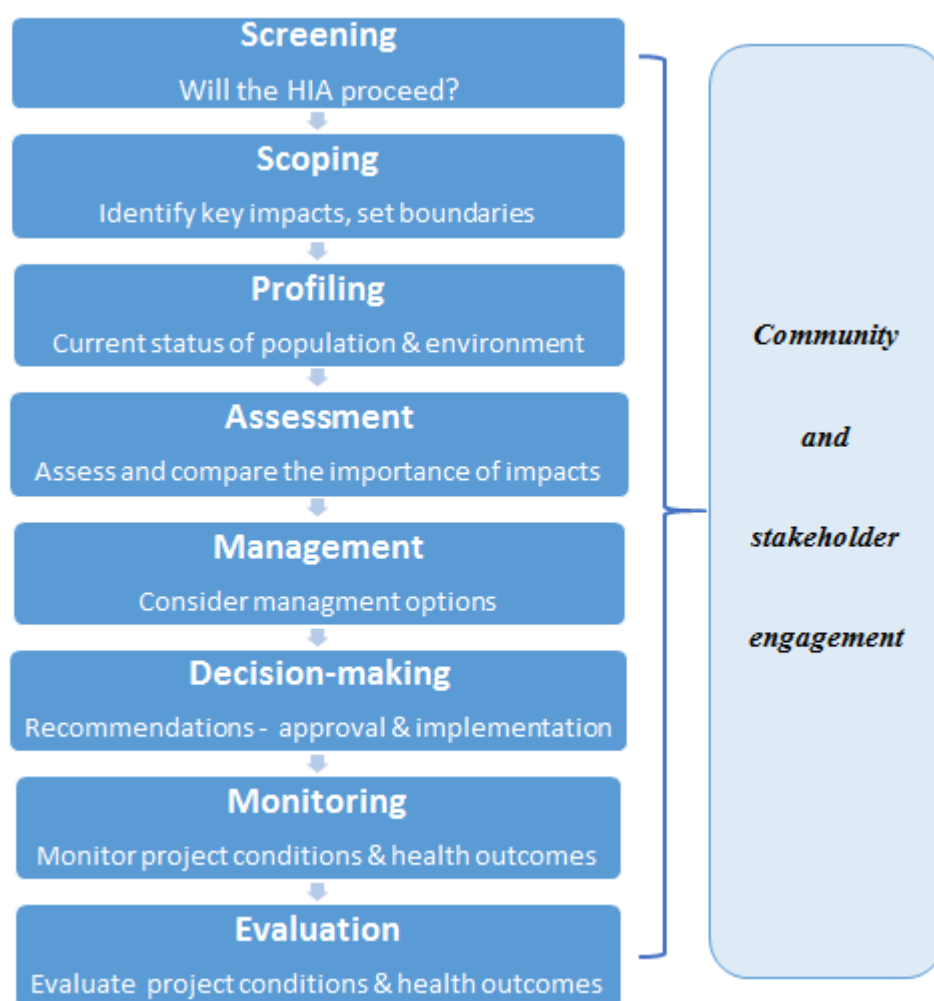


Figure 5 - The HIA Process

2.2 Roles and responsibilities

HIA is a consultative and collaborative process however there is value in identifying some general responsibilities of the various participants in the HIA process; the proponent, health authority,

decision-making agencies, other stakeholders and the community that will potentially be affected by the implementation of the proposal. It is important that general roles and responsibilities of the main groups are established early in the process. An indication of these is provided below but they are by no means prescriptive or limiting.

2.2.1 The proponent

The proponent is the person, group or organisation that proposes a development for approval. The proponent has responsibility for ensuring that statutory requirements for the impact assessment process as set out in the relevant jurisdiction are met. These requirements include:

- Determining what referrals are required
- Provision of all required details, including additional information when necessary
- Meeting specified timeframes for submission of documentation
- Ensuring qualified and experienced HIA expertise is used for these assessments
- Assuming the costs and responsibilities associated with requirements
- Providing publically accessible information about the proposal
- Early identification and engagement with communities and other stakeholders (see section 2.3)

The proponent should also ensure that impact assessment processes include the requirement to explicitly address potential impacts on human health. This guide outlines the main requirements for assessment of human health however the proponent is encouraged to contact the local planning authority/local health authority for further process advice if required.

Proponents are also encouraged to contact the health authority and other stakeholders or relevant authorities for advice on the scope of health impacts to consider, methods for assessing risks and benefits and potential management options.

2.2.2 The Public Health Authority

The public health authority will facilitate development of the health impact assessment by the proponent through:

- Checking the adequacy of the health impact assessment process undertaken, methodology (including screening), health concerns addressed in the health impact assessment, additional data required, and overall feedback on the health impact assessment
- Assist in identifying potential sources of relevant health and demographic data, where available
- Reviewing the community communication and engagement strategy where appropriate
- Participating in the screening and scoping processes, including visiting the site of the development if practicable
- Reviewing the health components of the draft scoping document and the draft impact assessment report
- Providing advice to the proponent and the community about issues raised during public consultation
- Liaising with the decision-making agency
- Making recommendations to the approving authority concerning the potential health impacts of a development
- Taking part in collaboration/consultation with all stakeholders
- Participating in the health monitoring and evaluation post approval, as appropriate

2.2.3 The decision-making agency (environment or planning)

The agency responsible for making decisions or providing recommendations to Government 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 at appropriate stages in the process
- Refer development applications requiring assessment to the health authority and other documentation 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
- Liaise with the health authority and other stakeholders as required.
- Consider the potential for providing assistance to the community to access relevant expertise and information

2.2.4 Other stakeholders

Other stakeholders are people, groups or organisations with an interest in the proposal but not directly involved in the HIA. They may provide information relevant to the proposal or the community and may include community groups. They may have roles including:

- Understanding the rationale for inclusion of health in the proposal and reviewing the project in relation to their own activities
- Providing details to the proponent, the health authority, the decision-making agency and the community of their interest in the proposal and their requirements
- Engaging with communities to consider queries and concerns
- Working with these groups to resolve any issues that may arise
- Committing the necessary resources to collaborate in the proposal assessment
- Remaining informed of the assessment progress and forwarding information to others where necessary.

2.3 Community and stakeholder engagement

Active public participation in open and transparent decision-making processes is important so that people can participate in the consultation for proposals that may impact on their lives. Community and stakeholder engagement is essential to meet the key HIA principle of democracy. Current understanding is required of the links between environmental factors and social, cultural and economic impacts as well as emphasis on the importance of proponents to have meaningful consultation with affected communities.

As shown in Figure 5, community and stakeholder engagement can occur across the entire process. Opportunities and mechanisms for community engagement and collaboration in the process bring benefits to proponents and communities as they can:

- Identify local important environmental, social, economic and cultural issues as well as current health concerns
- Build relationships with the community
- Identify and access resources and expertise
- Identify and address public concerns before they become significant issues in the review process
- Enable people to reach agreement with proponents about possible outcomes
- Prepare local communities and residents for a collaborative approach to managing the social, economic and land-use impacts of a project

Additionally, understanding local community issues can bring:

- Identification of local employment and business opportunities related to the project
- Improved relations among diverse stakeholders
- Identification of opportunities to prepare and train workers and suppliers to be involved in the development project

Ideally engagement should 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, which vary between jurisdictions. Engagement and collaboration may occur formally at some key points rather than as a strict requirement at every step and would be an agreed process with the stakeholders.

This document does not set out a particular engagement process, but assumes that jurisdictions will require consultation in accordance with their relevant legislation and as appropriate for the project. Some proponents may wish to do more than the required minimum. Readers are referred to the [International Association for Public Participation](#) or others for best practice in community engagement.

The methods used for community engagement will vary according to the type and nature of the project, availability of resources, the statutory requirements for some project types, and the preferences and experience of the proponent. However, as a minimum it is recommended that a consultation and engagement strategy is developed before commencement of the HIA and includes approaches to:

- Inform the community of the proposed development details and discuss the potential health impacts
- Address concerns and possible misunderstandings and how follow-up will be communicated to the community
- Provide appropriate opportunities to comment on issues of relevance and ensuring that the comments are taken into account in the development of the proposal, including modification if necessary.
- Facilitate continued engagement as appropriate

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

- The development of a collaborative approach to advise communities and other stakeholders about the reasons for consultation
- The development of mechanisms to identify opportunities to explore:
 - Potential benefits and risks to health associated with a proposed development that 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
 - Strategies to decrease health inequities.
- The perception of community members about the severity and characteristics of risks to health

Information about risk perception and risk communication that may be useful is available in the enHealth publication: [Environmental Health Risk Assessment, 2012: Guidelines for assessing human health risks from environmental hazards.](#)

In general, one would expect public input to the scoping and subsequent steps. In particular, there must be opportunities for the community and key stakeholders to comment on a proposal before decisions are made. Box 5 outlines case studies that highlight some of the benefits of effective stakeholder consultation in HIA.

Box 5 – Advantages of stakeholder consultation

Three case studies were undertaken of stakeholder consultation in HIAs in Australia and the USA between 2004 and 2008. The HIAs included leasing plans for oil exploration in Alaska, a foreshore management plan in NSW and a rezoning initiative in San Francisco. The study highlighted a range of benefits that were enhanced by the consultation process including:

- Improved relations between diverse stakeholders
- Development of working relationships among unlikely partners potentially resulting in future collaborations
- Improved inclusion of community impacts and visions in the HIA and subsequent plans
- Greater acceptance of recommendations by the proponents; and
- Empowerment of community residents to become involved in political decisions that impact their lives and livelihoods.

The authors concluded that many of these benefits have the potential to influence future projects or considerations of health that extend beyond the original proposal considered by the HIAs.

Source: Tamburrini, Gilhuly and Harris-Roxas, 2011

The HIA Steps



2.4 Screening

Screening is the process of determining whether or not a proposed development has the potential to result in changes to the health of communities if it were to be implemented, the significance of these changes and whether the outcomes of an HIA would add value to the decision-making process. Screening ensures that resources (funding, staff and organisational time) are targeted appropriately to maximum effect, by making sure that HIAs are only conducted on the proposals with the most

significance for health, well-being and health inequalities.

Not every proposal will require an HIA. Assessment of proposals is usually not required if the health effects are:

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

The evaluating authority normally responsible for determining whether a development needs to be assessed and if so, to what extent, carries out screening of new proposals. This is usually governed by statute. Some jurisdictions may have specific requirements for certain issues such as air quality, to be subject to Health Risk Assessments. Screening for health issues is carried out as an integral part of the overall screening process and most health agencies in Australia have some input to the early screening of proposals. It is important that health agencies within both state/territory and local governments have strong working relationships with other sectors, especially environment, planning and transport, to ensure that there is an awareness of the links with health of their activities.

Many jurisdictions both within Australia and internationally have developed screening tools to assist evaluating authorities or proponents determine if a health assessment is required. Links to examples of these and other tools for HIA can be found in Appendix 3.

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.

The benefits of undertaking HIA are where significant effects on public health that could result from a project's implementation can be identified and addressed or where population health could be promoted or protected. There is also value to the proponents if they are engaged in the HIA process as they can use the results to assist relations with communities.

Screening will normally consider the:

- parameters of the proposal
- potential impacts
- level of assessment required
- capacity of the proponent to conduct the HIA.

The parameters of the proposal should be described in a comprehensive Project Description which should be provided to potential stakeholders 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 as EIA, an outline may already be specified, in which case no additional explanation may be necessary. Otherwise the Project Description will usually incorporate the key features as described in Box 6.

Box 6 – Key Features of Project Description

- The rationale, objectives and goals of the project
- The location and physical aspects of the site and surrounding area
- Planning, construction, operation and decommissioning arrangements, including time frames for each component
- Sufficient detail on the various phases of the project including:
 - Planning
 - Design and construction
 - Operation and maintenance
 - Decommissioning
- The processes, materials and types of equipment to be used and the building layout
- Quantities and nature of inputs and outputs of the process:
 - Inputs can include energy, water and chemicals used in industrial processes
 - Outputs such as products and waste materials and discussion of their treatment and disposal
- Current use of the site and surrounding area and the relationship to other proposals or projects in the area/region
- Demands of the project on local infrastructure and services:
 - Infrastructure can include electricity, water, sewerage, roads
 - Public services such as health care facilities, police, fire and emergency
- Description and location of the communities likely to be affected by the proposed development – any data on environment and health links
- Advantages and drawbacks associated with the project including:
 - 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

The level of detail in the HIA will depend on the location and the type of proposal: especially in relation to the scale and significance of the potential to impact on the health of surrounding communities. The following provides a description of the different levels of HIA that can be undertaken.

- **Rapid health impact assessments**

Rapid health impact assessments are often used as a means of screening proposals to identify potential health impacts from the activity or for proposals that may be small or less complex or where time and resources may be limited. It is usually a “desk top” literature review that assesses potential health impacts using publically available information and evidence. Community engagement is usually limited to a single meeting with stakeholders.

- **Intermediate health impact assessments**

Occasionally there may be justification for assessment beyond a basic literature review for certain types of proposals where additional data may be required but may not require a comprehensive analysis of health impacts. Procedures and assessments that will confirm potential health outcomes may be undertaken in consultation with stakeholders to establish appropriate management outcomes. This type of assessment may apply where potential health impacts may not be significant but where little data is available or where concern has expressed by communities or government.

- **Comprehensive health impact assessments**

A comprehensive HIA requires extensive literature searches, analysis of existing data as well as

collection and quantification of new data from numerous sources and proposal specific analysis of sensitivity. Appropriate methodologies for all activities must be developed and agreed upon. Community engagement is often extensive.

Box 7 – Case studies comparing rapid and comprehensive HIA

Two HIAs are outlined below, one conducted by a Public Health Authority on a proposal for a crematorium and one overseen by a requiring authority reference group for a state highway development proposal. While both proposals may require the development of an environmental impact assessment, each has different contextual issues surrounding it, resulting in each being scoped as a different level.

	Case 1	Case 2
Issue	Crematorium proposal	State highway proposal
Scale of proposal	Minimal size and potential to do harm (depending on the location i.e. zoned industrial) and a relatively small investment as it is one activity in one location.	A large investment with the potential for large potential positive and negative health effects. Has potential for a dual purpose in serving the local community as well as a strategic state highway moving people (including tourists) and freight through the region.
The significance of the impacts	Large scope for impacts but on a small area and there is some certainty about the types of likely impacts as identified by existing HIA evidence. However there may be little information regarding possible health impacts from a mental health dimension.	Considerable scope for both negative impacts (e.g. traffic pollution, noise vibration and traffic related injuries) and positive impacts (e.g. access to services, improved infrastructure).
External interest	Small amount of local political and public interest.	Large amount of political and public interest.
Timing	Number of working days to provide recommendations to fit with the Council's current plans.	Nine months for a hearing to report back on a draft decision (including proposed conditions).
Window of opportunity	Very small because of minimum statutory requirements.	Likely to stay on the political agenda until approval and construction which is more than two years away.
Organisational capacity	Limited staff availability in the Public Health Authority but there is ready access to the HIA literature and expert advice.	Capacity for a consultancy firm who can sub-contract an HIA expert in the context of the relevant legislation and specific aspects of the environmental assessment process.
Resources	Limited resources but good access to the literature and expertise.	Large resources available to support the HIA and a large amount of data and expertise is available and accessible.
Level scoped	<i>Desk-based – small number of impacts to be assessed.</i>	<i>In-depth – large number of impacts to be assessed</i>

Case studies provided by the Department of Health and Human Services, Victoria

2.5 Scoping

Scoping establishes the foundation under which the HIA is conducted and is the process of determining which issues should be addressed as part of the HIA. A well-planned scoping step is the key to an effective HIA. The first component is identification of the potential effects the proposal may have on the biophysical, social, cultural and economic environments. From these potential changes the flow-on effects to health need to be identified and understood. An important component will be consultation with stakeholders and the community to identify any concerns about the proposal.

The level of assessment should be in accord with the nature, scale and significance of the actual or potential effects of the proposed activity and the scope and detail should be in proportion to the scale of the potential health impacts of the proposed development. Scoping should identify only those impacts that have significant potential to occur. A preliminary risk assessment could be undertaken on the full range of determinants identified, to prioritise health impacts to be assessed (the [Health Risk Assessment: \(Scoping\) Guidelines](#) provide direction on how this can be undertaken).

Responsibility for scoping typically rests with the proponent who should demonstrate that an appropriate level of professional health expertise will be employed to undertake the assessments and that the requirements of the health authority are to be met.

Generally the health authority will work with the proponent to identify the level of detail and effort required; in proportion to the likely level of health impact and based on objective criteria determined by the health sector. Some jurisdictions have developed specific requirements that must be addressed. Further coverage of these criteria is included in the assessment step.

Where there is insufficient information or uncertainty about the risks to health, this should be clearly stated.

The objectives of scoping are to:

- Determine the health and environmental factors to be considered
- Consider any alternatives that might be required
- Prioritise the issues to be addressed
- Establish the boundaries for the assessment
- Determine the appropriate level of effort

It is recommended that a team be established with a dedicated coordinator to be responsible for coordination of activities associated with the HIA. This team can then identify:

- Key issues that should be considered
- The potentially affected population(s)
- The methods to be used in the assessment
- The range of technical experts and stakeholders for consultation and collaboration

Thus, scoping includes:

- Identifying the potential health impacts that need to be addressed by:
 - Developing a community profile which takes into account vulnerable and/or disadvantaged groups to ensure equity is appropriately considered
 - Determining whether the individual environmental, social, cultural or economic impacts have positive or negative effects on health.
 - Considering existing and future developments and how these contribute to cumulative impacts
 - Assessing which impacts are likely to be of significance and thus need to be addressed in the HIA and which are not important. A preliminary risk assessment can be undertaken at this stage using processes based on the likelihood and consequence of identified health impacts. An example is provided in the Health Risk Assessment: (Scoping) Guidelines (Department of Health, Western Australia, 2006).

- Setting boundaries such as the:
 - Timescale
 - Geographical boundaries
 - Population potentially affected including groups of special concern because they are at higher risk due to factors such as age, pregnancy, occupational activities, leisure activities, low socio-economic status and/or marginalised groups.
- Identifying stakeholders that need to be involved, particularly those that will not already be involved in the routine impact assessment process.
- Agreeing on details and processes for the issues to be assessed between the proponent, the health authority and other stakeholders.

Box 8 provides some information about consideration of off-site issues.

Box 8 – Consideration of offsite issues

Comprehensive planning for the establishment of a new major industrial estate in the south-west of WA considered most health issues related to existing communities as part of the current Strategic Impact Assessment procedures.

Activities allocated to a dedicated buffer ensured no sensitive land uses would be allowed. However, some of these activities had the potential to effect health.

Discussion with the local government identified future residential planning in close proximity to these activities, so the plans were revised. The advantages of a collaborative approach during the scoping stages for this proposal were clearly demonstrated.

Situations may arise where the perception by the community about risks to health is high even though the evidence supports that risks are low. It is important that the communication strategy has identified approaches and suitable expertise able to address and, if possible, resolve this aspect.

Within the limits of the local legislative requirements, proponents, preferably in collaboration with other stakeholders may choose the precise details of the scoping process they believe to be the most appropriate. However, the following are strongly recommended:

- Where there is a high level of community interest, proponents should involve the community early, in particular at the scoping stage
- Early consultation with the health authority and community is critical and 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.

Where no specifically defined process has been established to determine the adequacy of the scoping and subsequent assessment processes, the following can be used as a guide to assist proponents and others on procedures for scoping:

- Referral of the proposal to the health authority for internal review
- Review of examples of other similar projects and the lessons learned in relation to potential impacts on communities
- Consultation between the proponent, the health authority and other stakeholders to identify and consider issues that may be of concern to the health authority including:
 - The level of detail and expertise required
 - 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 and other stakeholders can make, and where expert opinion may be required;
 - The opportunity or necessity for periodic consultation with the health authority and other stakeholders

- Identifying sources of health and demographic data including vulnerable/disadvantaged groups and existing environmental health concerns (which may be provided by the health authority, on a cost recovery basis if necessary).
- Identifying significant health and other stakeholders who should be consulted in addition to those routinely involved in the impact assessment process
- The need for monitoring that may be required on health grounds during any phase of the development, or after completion
- Identifying relevant standards and guidelines that will provide some benchmarks for planning, consultation and HIA
- Some jurisdictions in Australia have online publications to provide advice, technical and other data, methodologies, and management options to developers and the community on high priority health issues.
- Establish and agree on a community and stakeholder engagement program

Box 9 – Scoping for HIA: Central Plains Water Scheme (CPWS) Resource Consents

This proposal was to irrigate the central plains of Canterbury, New Zealand using water diverted from the Waimakariri and Rakaia rivers stored in a dam in the Waianiwhi valley. Health did not feature strongly in the CPWS Assessment of Environment Effects and where it did the health implications were not clearly identified or evaluated *‘in a way that members of the public would be able to consider the health consequences for themselves, their family, or their community’*. Because of the limited time available to submit a report prior to the Council hearing a rapid assessment approach was conducted. As a result the study focused on three determinants of health – water quality, employment/wealth and social connectedness. This was in respect to three particular and vulnerable groups: infants and toddlers, low income people and Māori (Morgan 2011).

2.6 Profiling

Profiling should provide a reasonably clear picture of the population and their environment, with a focus on aspects that are relevant to the issues identified during scoping. It should provide sufficient accuracy on representative data on the demographic structure, socio-economic and health status of a population as well as an indication of groups that may require special consideration. A profile of relevant aspects of the built and natural environment is also required. As well as informing the assessment step, profiling provides a baseline against which future conditions can be compared and assessed. The proponent should discuss the level of detail required and potential sources of data with the health authority and other relevant sources. If the health assessment is being conducted as part of other processes it is likely that some of the relevant data will already be available.

Information that may be collected includes:

- Characteristics of the population covered, for example:
 - Size, age and gender
 - Density and distribution
 - Ethnicity
 - Cultural identity and practices
 - Socio-economic status
 - Projected population changes during the life of the project
- Vulnerable or disadvantaged groups or locations in proximity to the development such as groups in aged care facilities, schools, child care centres, hospitals and other sensitive activities
- Health status of potentially affected populations including groups linked to the proposal (FIFO,

workers' camps and others more likely to be exposed to hazards associated with the proposal when not working): available from health authorities, clinics or other data sources and including morbidity and mortality data;

- Economic factors including sources, types and rates of employment, cost of living indicators, housing issues
- Cultural factors
- Health behavior indicators such as physical activity, nutrition, use of harmful substances (alcohol, tobacco, drugs)
- Environmental conditions of the population(s):
 - Air, water, soil quality and implications of changes to use of services
 - Infrastructure such as roads, power, water, transport
 - Quality, quantity and cost of housing
 - Capacity of health services such as hospitals or clinics
 - Community services such as police ambulance, fire and other emergency services, recreational services, public open space
 - Changes due to climate change

The data for most of these can usually be obtained from the relevant local governments, the health authority or other government agencies such as the [Australian Bureau of Statistics](#) (ABS) or the [Australian Institute of Health and Welfare](#) (AIHW). Many Local Government Areas have data on existing community profiles, which include health and well-being and socio-economic factors. Health Departments are often a rich source of data on health outcomes and population health survey results. Data may include crude and standardised mortality data and morbidity data for diseases related to potential health impacts, such as mosquito-borne or infectious disease notification rates. Data may also be available for the prevalence of chronic diseases of concern or risk factors of a range of health outcomes. Additional information may also be obtained directly from the community during consultation.

The local population that is relevant may be defined in many ways. If the community is small it may simply be the whole community, it may be a community not near the site but on a transport route to it or potentially close enough to be exposed to emissions from the proposal, or it may be some other community that self- defines itself as having an interest in the proposal. In this last case while communication must be maintained, health profiling may not be necessary or may include the health data of the general community in the region, or if this is not available, for the state/territory. The proponent should explain the boundaries chosen to delineate the population and the reasons for these choices.

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 or local authority) data and the area itself. For example, an industrial area may have very few residents and therefore few ABS survey respondents but have a large working population during the day. Similarly, a remote resource development may have a worker's camp, where employees, when not working, should be regarded as a local residential population. An understanding of the workforce numbers and timeframes should be demonstrated. Information about workforce numbers may be obtained from local businesses or the Local Government.

An important consideration related to the data for small populations, however obtained, is that it may lack epidemiological power, that is, lack the ability to reliably detect significant health effects.

2.6.1 Vulnerable populations

Data collection should consider groups who may be more vulnerable than the general population to adverse health effects. Figure 5 provides a useful guide to consider vulnerability.

Exposure to a particular hazard or situation is the first consideration. For example a northern Aboriginal and Torres Strait Islander 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 proposed water storage facility. Likewise outdoor workers and people who exercise regularly may be more exposed to localised sources of air pollutants.

Sensitivity considers whether there are groups that are more sensitive to adverse health effects of a given exposure. The young, the elderly and those with pre-existing medical conditions are often sensitive to a range of hazards. For example, asthmatics may be more sensitive to exposure to air pollutants. Some facilities may also be significant in terms of their use by sensitive groups. These include childcare centres, schools, aged care facilities (domiciliary or day care) and recreation facilities. The proponent needs to consider the existence of any such facilities and the health impacts that may be more significant for such groups. Consideration also needs to be given to populations who may be more sensitive to the social changes likely to occur as a result of the development. For example, shifts in gender ratio may occur as a result of an influx of male workers and this can have flow-on effects to feelings of safety and the mental health of women in such communities.

The two elements of exposure and sensitivity contribute to the potential impact that may be experienced. The final element of vulnerability is adaptive capacity which acknowledges that not all people or communities will have the same capacity to manage or adapt to a particular exposure or issue. For example, low-income groups may not be able to afford access to goods and services that can reduce the risk associated with particular hazards. Similar issues can also exist for small or remote communities where existing services and resources may be limited. Other groups, such as those from a non-English speaking background may be at a disadvantage due to a lack of understanding or awareness regarding some hazards.

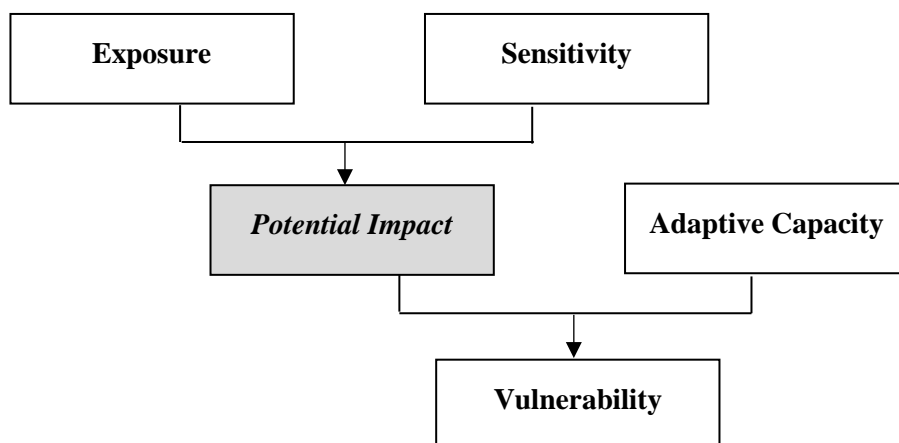


Figure 6 - Elements contributing to vulnerability

2.7 Assessing the health impacts (benefits and hazards)

The assessment step aims to determine the relative importance of the positive or negative health impacts identified during the scoping step. The outcomes of the assessment provide a means of:

- Evaluating the level of risk or benefit of factors that influence health
- Identifying and prioritising response requirements
- Establishing benchmarks against which the proposal can be measured
- Providing the basis for changes to the proposal if required
- Establishing information on management actions for health for decision makers

The critical information required for this determination is an understanding of:

- Direction of the impact (positive or negative)
- Magnitude of the impact (including proportion of population affected and severity)
- Likelihood of the impact occurring (including frequency of impacts)
- Groups likely to be most affected
- Cumulative affects
- Quality of evidence, uncertainties and how these are addressed

The direction of the impact should have been determined during the scoping phase and can be expressed simply as positive (health benefit) or negative (adverse health effect).

The magnitude of the impact is a combination of the number of people likely to be affected and the scale of the impact. These should be assessed according to a pre-determined scale that considers both acute and chronic consequences. The scale can vary from a very simple comparative scale ranging from low to high, to a more detailed scale such as a risk scale that applies specific health measures for both acute and chronic health effects such as:

- Number of fatalities
- Number of permanent disabilities
- % of population at risk from non-permanent injuries requiring hospitalisation
- % of population requiring hospitalisation for acute health effects
- % of population requiring medical treatment for chronic health effects (Department of Health WA, 2010)

While there are a variety of health consequence scales that can be used, these differ in terms of population size & characteristics considered, the nature of potential health effects and perceptions

of risk. It is important that an HIA provides a clearly defined scale and a rationale for its content and use.

The likelihood of the impact occurring is also assessed using a sliding scale of usually between three and five categories. The scale can range from a simple; unlikely, likely and probable to more detailed scales that include estimates of the frequency of non-chronic health effects or the percentage chance of chronic health effects occurring the life of the project.

Figure 7 provides a flow chart of the process for undertaking assessments.

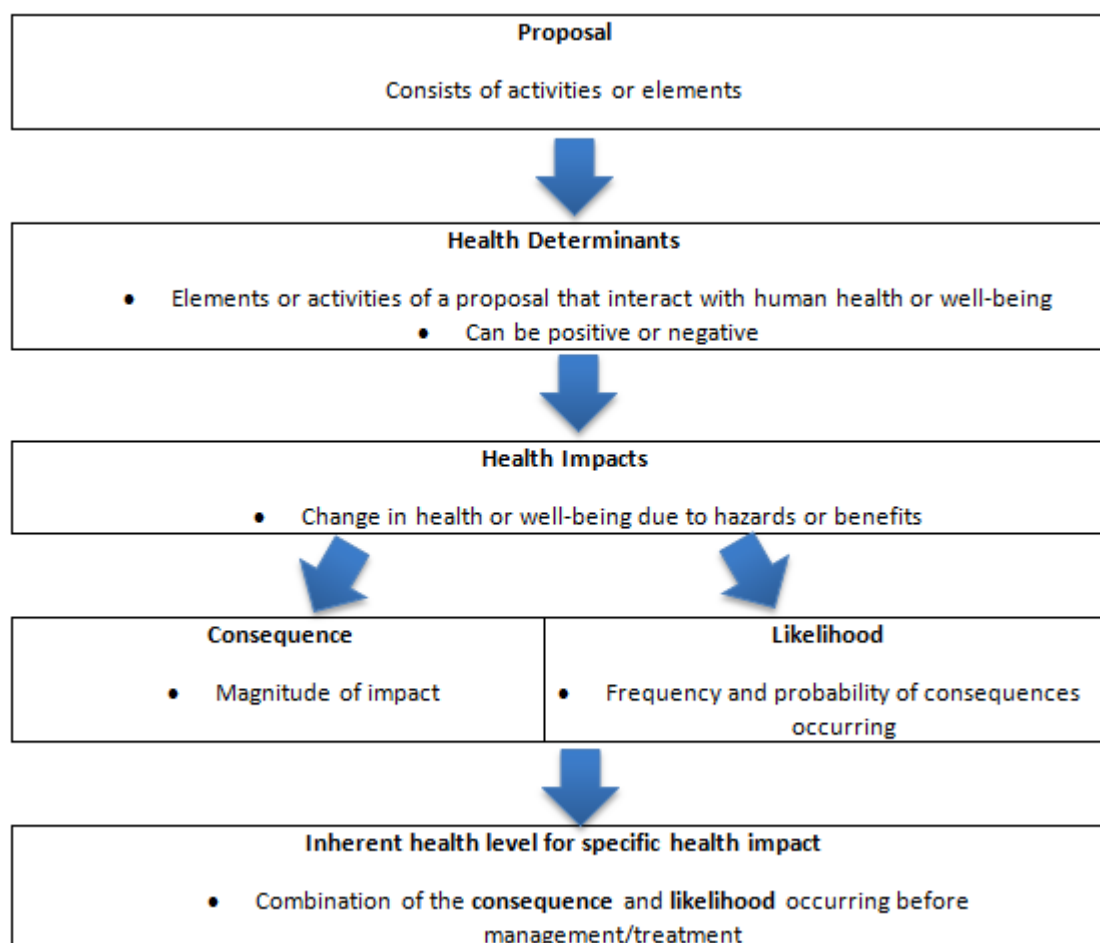


Figure 7 Flow chart of the health assessment process
Source: Adapted from Department of Health WA 2010

The combination of health consequence and likelihood levels is typically combined in a simple matrix as shown in Figure 8 to provide an estimate of the relative significance of different impacts. Although this type of matrix is most often associated with an assessment of health risks, it can also be applied to health benefits.

Likelihood	Consequences				
	Low	Medium	High	Very High	Critical
Very Unlikely	Very Low	Very Low	Low	Low	Medium
Unlikely	Very Low	Low	Low	Medium	High
Possible	Low	Low	Medium	High	Very High
Likely	Low	Medium	High	Very High	Extreme
Very Likely	Medium	High	Very High	Extreme	Extreme

Figure 8 - Example of Assessment Matrix
Source: Adapted from Spickett et al, 2015

When the proposal may place demands on health services, it is important that the proponent considers the ability of the health system to provide health care services for identified health outcomes. This is particularly important for regional areas where health services may be limited. The information from the profiling step can help inform this. The cost to health services should be identified and can be considered in terms of financial cost per event or the extent by which demand on health services exceeds capacity.

A consideration of the distribution of the positive and negative impacts should then be undertaken, with a particular focus on those vulnerable groups identified during the earlier stages. For example, the distribution of potential benefits such as employment or increases in the demand for goods and services should be considered. The potential for the exacerbation or reduction of existing inequities or the introduction of new inequities should also be identified.

Uncertainties in the evidence or its applicability to the specific proposal should be stated, with special mention made of any significant gaps in the data. In addition, if there are other local sources of possible exposure to similar hazards, the potential for cumulative exposures should be taken into account.

The assessment will typically include a mix of qualitative and quantitative methods and data that is largely influenced by the type of impact being assessed. Quantitative methods are more likely when a dose-response (or exposure-response) relationship is established as well as an indication of current and future exposure and where standards relating exposure to health outcomes are established. Examples of quantitative assessments that have been used in HIA cover a broad range of applications including ambient air, noise and chemical pollution, wage changes and traffic-related health impacts.

A wide range of qualitative methods is available to inform assessments of potential impacts. Assessment of many health outcomes, especially those with a complex set of contributing factors such as mental health and chronic health conditions, often require qualitative methods or a mixed methods approach. These methods are also well-suited to the community and stakeholder consultation and engagement throughout the HIA process. Data collection methods available include the following examples:

- Expert opinion, such as a Delphi study or workshop on the risks;
- Stakeholder analysis to elicit views and perceptions of the community and other stakeholders through questionnaires, surveys, focus groups, workshops, interviews;
- Modelling approaches including input-output analysis and econometric techniques; and
- Review of the relevant literature, especially any material on similar developments.

The assessment step requires the appropriate level of expert judgment to interpret the evidence in the context of the proposal. A statement about the expertise involved in this step should therefore be made.

2.7.1 Assessment of risks to health

Risk assessment is 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 time frame (enHealth 2012).

The assessment may be a quantitative assessment, or use qualitative techniques, or it may use a mix of these approaches. Some hazards such as chemicals and noise can be subject to dose-response assessments if the data and evidence is clear. Other hazards may have more indirect or complex pathways to health outcomes that preclude the establishment of dose-response relationships. In these cases, a consideration of the relationship between the exposure and the health response or outcome can be considered.

The [*Environmental Health Risk Assessment, 2012: Guidelines for assessing human health risks from environmental hazards*](#) provides a comprehensive methodology to consistently and reliably assess

health risks associated with environmental hazards. This guide has become the primer for Health Risk Assessment (HRA) in Australia and its intention is use by a range of stakeholders including those involved in the preparation or review of risk assessments. The main focus of the guide is on chemical hazards in the environment although the principle methodology can be applied to other types of hazards as shown in Figure 9, which has been adapted from these guidelines.

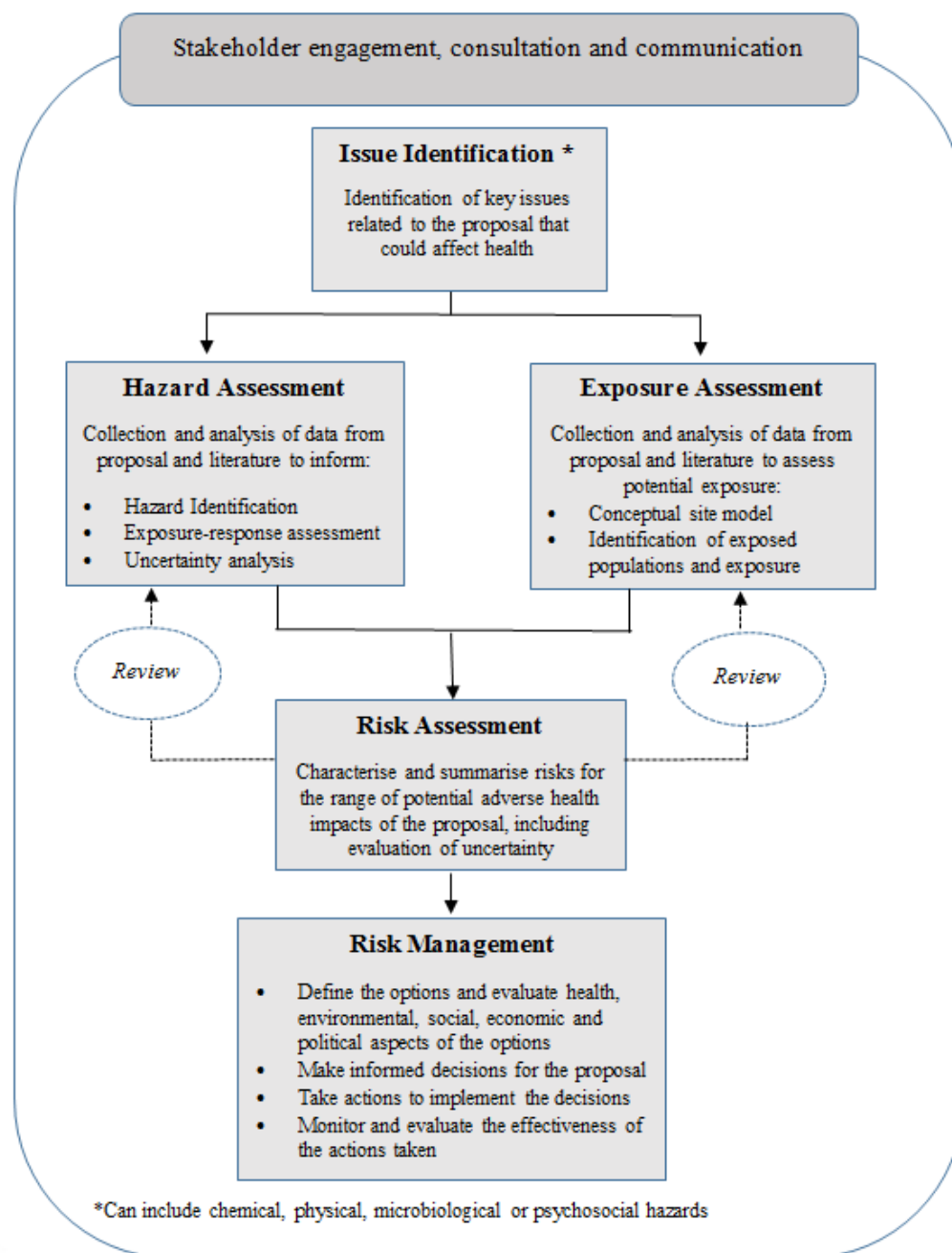


Figure 9 Health Risk Assessment model Source: Adapted from enHealth Council 2012

Other guidelines have been developed by national and State/ Territory agencies as well as international bodies such as the World Health Organisation for environmental and occupational hazards, including noise, pollutants, radiation and microbiological agents. T

Where these provide an accepted standard or guideline, a comparison of estimated levels with that guideline can form the basis of the assessment. However, many hazards do not have such

guidelines, in which case basic risk assessment processes are employed. Other enHealth publications such as *'The health effects of environmental noise – other than hearing loss'* (2004) may provide additional guidance.

The intent when dealing specifically 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. There is an economic cost to the proponent (financial and human resources) and to the health authority (the 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. However, any residual risks need to be noted.

Where guidelines are available, the assessment of impacts aims to find a predicted level that should have insignificant or little effect on health if the resulting outcome (may be a target objective or number) falls below the level as specified by the guidelines or objectives. Guidelines should, however, be used critically. Reasons for caution are that:

- 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 exposures
- They may not identify positive effects on health
- They probably do not consider synergistic effects
- 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.

To address these weaknesses, it is recommended that assessors consider and review the range of guidelines developed by national and state/territory agencies for consideration of the determinants health relevant to the specific proposal.

2.7.2 Assessment of benefits to health

Benefits from proposals often occur as a result of changes to a range of socio-economic determinants of health. Although these can be assessed with a combination of quantitative and qualitative methods, the complex nature of the relationship between these determinants and health generally require more qualitative approaches. Benefits can also occur through improvements in environmental determinants of health such as increased quality and reliability of water supplies or new or improved infrastructure.

Benefits for particular groups may be increased training and employment opportunities which may target particular groups such as young people, people from older age groups, women, and people from different ethnic backgrounds. Contributions to local activities through the use of local businesses or services or other activities that enhance and support the local region should be assessed. The range of methods discussed in 2.7 can be employed to give a qualitative assessment of the extent and distribution of benefits in the affected community.

2.8 Managing the identified health impacts

Management is the process of evaluating alternative actions, selecting options and implementing them in response to assessments to maximise potential health benefits and minimize or prevent potential risks to health. The following flow chart (Figure 10) demonstrates the process for

management of identified health impacts.

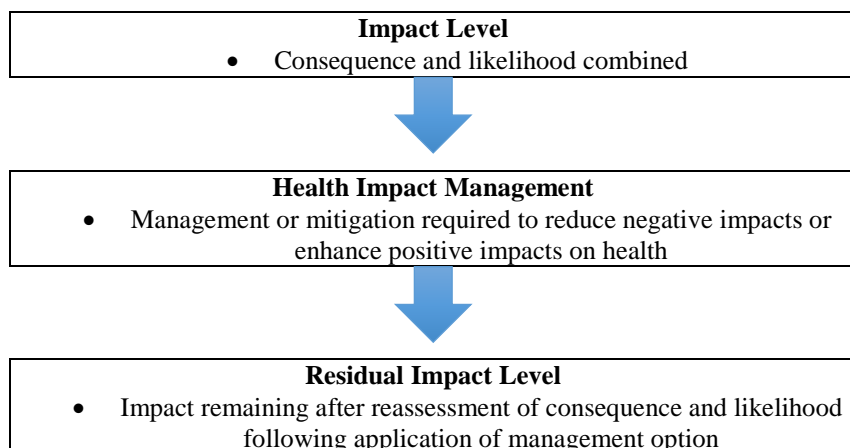


Figure 10 Flow chart of health impact management Source: Adapted from Department of Health WA 2010

Communication with stakeholders is an integral component of the management process and stakeholders should be informed and given opportunities for input during the process. Collaboration with key stakeholders such as local government or community groups can identify management options that may complement or improve existing programs. Any limitations associated with risk management and maximising benefits should be identified and explained. Similarly, any impacts identified by the community as being important to them should have been adequately considered and feedback provided on the actions taken.

Once possible health impacts have been identified and assessed, desirable and undesirable impacts can be prioritized. The risk associated with the health impacts should be managed according to a set of criteria similar to that in Table 1 and appropriate management measures applied according to the level of risk. The risks then need to be re-evaluated to ensure they are reduced to an acceptable level. Any residual risks will need explanations. Table 1 can also be adapted to suit prioritisation of potential health benefits.

Risk Rating	Risk mitigation/management criteria
Extreme	Potentially unacceptable: modification of proposal required
High	Major mitigation/management may be required Apply management options and re-assess the level of risk
Medium	Substantial mitigation/management required Apply management options and re-assess the level of risk
Low	Some mitigation/management may be required No detailed re-assessment of health hazards required Apply routine controls
Very Low	No further assessment required

Table 1 - Risk Management Criteria

Source: Adapted from Department of Health WA 2006

2.9 Decision-making

The decisions on whether a state-based proposal is to go ahead are usually made by a Minister of Government after consultation with other Ministers.

Recommendations and advice from the assessments are provided by the relevant agencies or specific bodies established for that purpose. The health authority or others may make recommendations to the decision-making authority in accordance with the regulatory or administrative arrangements in the particular jurisdiction. Recommendations may be to:

- Modify the proposal
- Consider alternatives where available
- Impose conditions on its implementation, or
- Not proceed in the situation where risks have not been, or cannot be, adequately addressed.

Local Government Councils make decisions for their localities based on information provided by Council officers using internal protocols. A range of issues such as government or council policy, scientific, technological, social, economic and political information are included in the deliberations and can include value judgements and the tolerability and reasonableness of costs. Decision-making must also take into account the community concerns identified during consultation processes. Alternative actions may be identified by the proponent or through the community consultation process.

Box 10 – Examples of HIA-related recommendations

- The health assessment of a proposed new coal mine identified its potential to cause adverse environmental health impacts, particularly in relation to surface water discharge, air quality and noise emissions. A formal HIA was requested to consider management of surface water discharges to prevent downstream contamination, prediction of air quality impacts both onsite and offsite (including residences), and identification of noise emissions and their projection to nearby residences. Following the results of the HIA, the proposed development did not progress.
- The State health authority requested a noise report for a proposed expansion of a quarry in a semi-rural residential area. The noise report resulted in the proponents having to notify nearby residents one week prior to blasting activities taking place.
- Residents of a mining community expressed concerns regarding the health effects of seepage water in low lying areas. Investigations included extensive environmental sampling, bio-monitoring and independent medical investigations. The results indicated no link between the environmental contamination and the health concerns of a number of residents. Despite evidence of elevated levels of metals in the soil, HIA demonstrated that this hazard was manageable and did not translate into a health risk.

Source: Department Health and Human Services, Tasmania

The decision-making capacity for an impact assessment usually does not lie with the health authority. It is important however, that the health authority is well linked in to the process and communication between health and the decision-maker is adequate. The fundamental objective is to ensure that an assessment of health impacts is included as part of the overall impact assessment process and appropriately considered in the decision-making process.

The final judgement by decision-makers will often include comprehensive, coherent and workable changes or conditions, negotiated between the environmental, planning and health agencies, or internally in the case of Local Governments. These must be met by the proponent and will address issues raised during the consultation and assessment phases. Proponents will be required to demonstrate how they intend complying with these conditions and to provide the decision maker with details on ongoing monitoring and reporting programs if required.

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

2.10 Monitoring

Monitoring provides information on the progress of assessed activities and whether the aims and objectives of these are being achieved. For any project to be able to demonstrate success it is important that appropriate monitoring and processes are set out in conditions for approval and carried out when in operation. Both positive and negative health impacts can be monitored.

There are two types of monitoring that may need to be carried out.

- Monitoring of the conditions applied to a development. This is routinely undertaken for many developments, both during construction and during the operational stages of the development.
- Monitoring of the health impacts during and/or after the development, as required. Monitoring of health impacts may not be needed. Adverse health impacts are often ‘designed out’ to the point of presenting negligible additional risk, in which case monitoring is not required.

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 causes (such as noise or dust levels, rather than deafness or asthma) may be necessary.

The indicators that require monitoring need to be outlined at or before the time of approval and include what action will be taken if the activity being monitored reaches a certain pre-defined point

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
- Reviewing monitoring procedures and the need to continue monitoring.

2.10.1 Administrative considerations

Monitoring should be:

- Undertaken or paid for by the proponent
- Performed transparently and reliably
- Reported to relevant government agencies and available 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
- Conducted efficiently. It is important that monitoring costs be in proportion to the scale of a proposed development.

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 may wish to be directly involved in overseeing the monitoring (e.g. as a member of a monitoring committee). 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 public health authority should review and assess the results of monitoring on a regular basis (e.g. yearly). Should the results suggest the potential for an adverse health impact in excess of that described in the Health Impact Report it should alert the decision-making authority and initiate actions to reduce the risk. Such action should involve consultation with stakeholders, particularly

the proponent and decision-making authority. If the proposal included actions to increase benefits to the local community such as training, employment and business opportunities, these should also be monitored.

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

2.10.2 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
- 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.

2.10.3 Monitoring health effects

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

Monitoring the health of small populations can be a complex task. 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 recognizing trends. Ideally, monitoring would commence before a development proceeds, thus providing a baseline against which to compare results obtained during and after the development activities
- It may be practical for only a small number of parameters to be monitored. Parameters can be health conditions (e.g. diseases) or bio-indicators (e.g. blood lead concentrations or antibodies) or environmental parameters (e.g. 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
- Monitoring of health impacts with long latency periods may not be effective in preventing adverse health outcomes
- The collection and analysis of human biological samples (e.g. blood, urine or hair) 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 (e.g. 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 (e.g. water, soil and air) 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
- Indicators of social, economic and cultural change as well as commitments made such as compensation, local employment or training opportunities, local community programs or activities, modifying the development or continuing community consultation, should be monitored.

Monitoring that relies on the provision of data without financial reward may fail unless those providing 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.

2.10.4 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
- 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. 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 (e.g. 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.

The enHealth publication: [*Environmental Health Risk Assessment, 2012: Guidelines for assessing human health risks from environmental hazards*](#), has further details on monitoring processes.

2.11 Evaluation

Evaluation of HIAs requires assessment of the process used to undertake the HIA, including the community engagement processes as well as consideration of the health outcomes and how well the process has achieved the aims of protecting public health. Mechanisms need to be developed to demonstrate the outcomes of assessments to government and the community.

There are two types of evaluation:

- Evaluation of the efficiency of the HIA process. This requires assessment of the processes used in the HIA to ensure that health has been appropriately considered in the overall assessment process for the proposal. A series of HIAs could be reviewed some time after they have been implemented to consider the effectiveness of processes used.
- Evaluation of the health outcomes and the effectiveness of the HIA process in improving health outcomes. This requires assessment of the actual health impacts (positive and negative) based on the monitoring results, with a view to evaluating whether the process is effective in maintaining or improving the health status of the community.

Box 11 – Summary of the HIA Process
<p>Proposal description</p> <p>Key features of the proposal to provide sufficient information about the proposed development to anyone not familiar with it. This can include:</p> <ul style="list-style-type: none"> • The location and its relationship to communities in the area • The physical and process attributes of the proposal • Links with other activities and services in the area
<p>Community and stakeholder engagement</p> <p>Consultation and collaboration with key stakeholders and potentially affected communities is an essential component of HIA. It should commence as early as possible and be maintained throughout and include:</p> <ul style="list-style-type: none"> • Establishment of a community and stakeholder engagement plan • Identification of key community and other stakeholders • Establishment of collaborative mechanisms for the inclusion of relevant health sector representatives
<p>Step 1: Screening</p> <ul style="list-style-type: none"> • Should the proposal be subject to an HIA?
<p>Step 2: Scoping</p> <ul style="list-style-type: none"> • What is the plan and timeline for the HIA? • What are the key health determinants and other issues to be considered? • What are the attributes of the potentially affected populations? • What methods and evidence should be used? • Who needs to be involved?
<p>Step 3: Profiling</p> <ul style="list-style-type: none"> • What is the current status of the affected population and the local environment? • What are the demographic attributes and health status of potentially affected populations? • How are disadvantaged or vulnerable groups to be identified? • What environmental conditions and services may have an influence on health outcomes?
<p>Step 4: Assessment</p> <ul style="list-style-type: none"> • What is the relative importance of the potential health risks and benefits? • What evidence is available for the health determinants identified during scoping? • What are the exposure pathways? • How will benefits to health be considered? • What methodologies are to be used to assess risks? • Who could be affected? • What is the distribution and significance of health impacts on specific groups within populations? • Is there the potential for unintended consequences?
<p>Step 5: Management</p> <ul style="list-style-type: none"> • Can risk be avoided or minimised? • Are better alternatives available? • How have benefits been addressed? • How can differing perceptions of cost and benefit, nature and magnitude be mediated? • Have community concerns been identified and addressed? • Will predictions of future health risks be robust enough to withstand legal and public scrutiny?
<p>Step 6: Decision-making</p> <ul style="list-style-type: none"> • Does the assessment provide sufficient, valid and reliable information for decision-making? • What information needs to go to decision-makers? • Are there conflicts that need to be resolved? • Do conditions need to be established and how will they be enforced? • What monitoring processes need to be established and who will be responsible for these? • Has the relevant health authority evaluated the HIA report for the particular development?
<p>Step 7: Monitoring</p> <ul style="list-style-type: none"> • Is the project complying with its conditions? • Are there health impacts that need to be monitored during/after implementation of the proposal?
<p>Step 8: Evaluation</p> <ul style="list-style-type: none"> • Was the HIA process appropriate? • How will did the HIA process achieve its aims of protecting the environment and health?

3 Health Impact Assessment Report

This section provides information on decision-making processes and how to prepare a Health Impact Assessment Report.

For a new proposal to appropriately inform the decision-making process and to be given approval to proceed with the development, proponents need to develop an HIA report for appraisal by national, state/territory and/or local government decision makers. This report may be included within the documentation for EIA or similar assessments procedures or stand-alone. The purpose of the HIA report is to:

- Provide information about the proposal to stakeholders and the community about the proposal and its implications
- Demonstrate the assessment outcomes of the proposal's likely adverse and beneficial impacts on the health of the potentially affected population(s)
- Document the process(es) undertaken
- Identify all stakeholder and community participants and their contributions
- Provide clear management strategies and other relevant comments to assist decision makers make informed decisions about the proposal
- Determine performance requirements for health aspects that should apply to the proposal

Most new major projects or planning proposals in Australia are required to be assessed under a statutory impact assessment framework authorised through statutory authorities such as environment or planning. However, there may be different procedural arrangements and requirements for the development of the report for these proposals. In some jurisdictions, the government determines the Terms of Reference according to their regulatory requirements. In others, the proponent is required to prepare a summary document, which is referred to the approving agency for review and feedback on the scope of the issues to be covered in the assessment. The final report must then address the issues required through either process.

While some Australian jurisdictions have no statutory requirements for HIA, there is an expectation that health issues are considered within existing statutory impact assessment frameworks and the health sector can request an HIA be undertaken. Therefore, most HIAs will be linked to these approvals processes or to address public health policy. Readers are referred to the health, environment or planning agency in respective states/territories for information on regulatory requirements. The format for inclusion of the health components of these combined assessments should follow the published requirements. The following outlines the content of the health components.

For an HIA Report it is important that the proponent produces a clear logical synthesis of the consultation, methods and evidence used in the HIA to support the recommendations for approval. The report should be written in a clear and concise style that can be readily understood by any general reader. Normally, after the assessment is completed, a draft HIA report would be peer reviewed by technical experts. Community consideration of the draft report should have been included in the communication strategy. The community feedback, the draft and the peer review outcomes are then submitted to relevant agencies for review and evaluation.

To encourage public transparency and accountability it is recommended that the final report is made widely available.

3.1 Content of a Health Impact Assessment Report

In preparing an HIA Report it is necessary for the proponent to present the potential health impacts identified during planning and community and stakeholder engagement, the methods and evidence used to assess these with discussion of assumptions, as well as the management options proposed to maximize the benefits and minimize risks. The report should also provide the level of detail, the data and evidence and their sources, methodologies to be used and the mechanisms for working with communities other stakeholders.

It is not expected that every determinant of health should be covered although some jurisdictions may require some accountability for determinants that may not be included. There should be sufficient detail for the reader to discern the key elements for assessment and their justification.

3.1.1 Executive Summary

- Brief overview of the proposal and links to EIA
- Background to the HIA and its requirements
- Summary of community and stakeholder engagement
- Health determinants considered during the assessment
- Key findings from the assessment
- Management strategies to maximize benefits and minimize risks to health
- Potential supporting arguments including links to EIA, for the proposal to proceed

3.1.2 Introduction

- Objectives of the proposal and the HIA
- Background to proposal and its implications (significance, contributions, links to other proposals, regulatory requirements, key approval and stakeholder groups, other as appropriate)

3.1.3 Details of the proponent and the development

- Specific details of the proposal and the proponent. These will be required under the statutory impact assessment framework in each jurisdiction and these should suffice for an HIA to be integrated into other assessment procedures. If the HIA is stand alone, proponents may use these same requirements as a guide.
- Details to be provided of surrounding (offsite) sensitive land uses; current and during all stages of the proposal.
- Details of the population areas and boundaries
- Details of the development during its various stages (construction, operation and decommissioning), location(s) and its attributes, site history, workforce and linkages with other activities.

3.1.4 Community and stakeholder engagement

- The strategies and timeframes used to consult and engage with key stakeholders and members of the community as per the communication strategy should be presented and clarified.
- The communication strategy should include and describe the roles and contributions of all people or groups engaged in the process as well as any stakeholder, technical advisory or steering committees established.

3.1.5 Scoping

This section should provide information on the issues to be considered and methodologies to be used during the appraisal of the proposed activity and include:

- Information on the significant environmental, social or economic factors of the location and the proposal if implemented (baseline information), that could influence the health of the defined population(s)
- The health factors identified to be assessed including those arising from consultation with stakeholders and the community
 - Where appropriate include determinants of health considered but not included and the reasons for their exclusion
 - Include the health related evidence, data and their sources and any limitations for each health factor
- The potential health impacts (direct, indirect and cumulative where possible) including pathways, associated with each health factor and any differential health impacts on different groups within the population(s)
- Agreed methodologies
- Any preliminary risk assessments undertaken to prioritise health factors
- Consultation methodologies to engage with general, vulnerable and disadvantaged groups

3.1.6 Profiling

The proponent should discuss with the health authority the level of detail required for profiling. The report should include:

- Demonstration of an understanding of the population potentially affected by the proposal and the environmental, social, cultural and economic factors that could influence the health and well-being of the population by the proposal's implementation.
- Details about the local population developed during profiling that provide a reasonably clear picture of the population, particularly that living or involved in activities close to the site.
- Sufficient accuracy on representative data on the demographic structure, socio-economic status and health status of a population as well as an indication of groups that may require special consideration.
- Identification of special local areas where people may congregate
- Provision of data (baseline information) and clarification of each of the following data groups about the potentially affected population(s)
 - Demographic data: Demographic data should correspond as closely as possible to the defined community
 - Health data: Data that is relevant for the health impacts identified during scoping
 - Vulnerable populations: The data collection may need to identify special populations or facilities that may be at greater risk of adverse health effects.

3.1.7 Assessment

The assessment section should outline the procedures and outcomes and include:

- Evaluations of the significance of the potential impacts (direct, indirect and cumulative) against baseline conditions identified during profiling and scoping including:
 - Exposure levels and pathways and comparison against relevant standards (for risks) or conditions (for socio-economic factors)
 - Application of weightings of positive and negative effects of the health outcome or determinant as per Table 2.
- Analytical methods used, their justification and results
- Predicted health impacts and their significance
- Identification of any significant gaps in evidence or data
- Consideration of health services requirements
- Comments on links to EIA process

The following table provides a guide to presentation of assessment outcomes for each health impact. The terms for magnitude and likelihood should follow those agreed to in the assessment phase of the HIA.

Health Determinants	Health Impact	Direction	Magnitude	Likelihood	Distribution	Quality of Evidence
		Positive Negative Uncertain No effect	Low Medium High (Relative to population size)	Likely Possible Unlikely Uncertain	Effects on specific populations	+ ++ +++

Table 2 - Guide to presenting the assessment outcomes

3.1.8 Management

This section should provide information on management options for the assessed positive and negative health outcomes, which should include:

- Mitigation measures for risks to health
 - Consideration of potential residual risks
 - Reassessment of risks after consideration of management options
- Strategies for improving/optimising potential health outcomes
- Strategies for working with communities as component of implementation of management options
- Strategies for monitoring the health outcomes over all stages of the development
- Strategies for responding to changes in proposal or environmental conditions and their potential impacts on the health of the population(s)

The final report should include a summary table of proposed management actions to address each of the assessed health impacts.

Health Impact	Management Actions
• •	• •

Table 3 - Summary of proposed management actions

A range of potential strategies to minimize or enhance health outcomes has been provided in Box 12.

Box 12 Possible means of minimising the health impacts and enhancing positive health outcomes of a development

- Effective community and stakeholder engagement
- 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.
- Modify land use planning to ensure that the development is not placed near or becomes close to sensitive areas.
- Consider and respond to the special needs of any at-risk groups in the affected populations.
- Consider incorporating features to the project that increase healthy choices for the broader community such as health promotion programs, providing access to green space or promoting physical activity.
- Establish public health surveillance systems to monitor health effects of the development during its construction, operation and potential decommissioning including measurement of benefits adopted.
- Establish procedures, structures or other aspects of the development that can be altered in the future in response to monitoring results (includes any monitoring of health, biological or environmental indicators that reveal an increased or unexpected risk to health arising from the development's activities).
- Establish plans to ensure that opportunities for use of local services and employment are optimised. Examples include commitment to local supply chains and quotas for local training and employment opportunities.
- Ensure that emergency procedures and response plans are in place in the event of an acute exposure or major incident.
- Ensure that services are available to deal with any potential adverse health events including training of health personnel where required.

3.2 Next stages

The next stages of the assessment process are to review and make recommendations on whether the proposal should proceed.

3.2.1 Evaluation and decision-making

The health authority will review all documentation and processes, including the HIA report, and make recommendations to either the statutory authority responsible for the overall impact assessment or directly to the proponent for stand-alone HIAs. The document [*A Guide for the Evaluation of Health Impact Assessments carried out within the EIA process*](#) may assist with this review process.

During the review the health authority will consider:

- If the assessment provides sufficient, valid and reliable information for decision- making
- If there is conflict to be resolved
- If there is the need for conditions to be applied to the proposal, how will these be enforced and by whom?
- How and by whom will effects be monitored?
- How will post-project management be resourced?

The recommendation will be one of:

- Approving the HIA and that the proposal could proceed given the management options provided by the proponent

- Approving the proposal but applying conditions to its implementation
- Rejection of the proposal if negative impacts to health are substantial and are not capable of amelioration, even if considered against the health and other benefits identified for it.
- Rejection or request for further information on the basis that the HIA has not provided sufficient, valid and reliable information for decision- making

3.2.2 Monitoring and evaluation

Once approval is granted, the proponent will be expected to monitor and evaluate the management procedures and conditions outlined in the HIA Report. Reporting on management to the statutory authority and/or the health authority (depending on the jurisdictional requirements) and should include:

- Information on compliance with plans and conditions
- Information on the health outcomes during all stages of the development
- Outcomes of evaluation of monitoring and responses to changes if necessary
- Whether the HIA process is achieving its aims of protecting and enhancing health

4 Addendum – Question Guide

This addendum includes guiding questions for topics that are often considered as part of HIA of development proposals. Given the vastly different characteristics of projects and the communities in which they are set, a simple checklist approach is neither practical nor effective. For this reason, the list of topics and questions should not be considered exhaustive. The questions should be used in consultation with communities and other stakeholders to assist with the engagement process and identification of local issues – in many cases this process will raise more issues that are not necessarily covered by this addendum.

The answer to these questions will typically require input from relevant topic experts or sourcing information from reputable sources which are likely to include: state or territory departments including health, environment and planning, local government, community organisations and health or environmental standards. Stakeholders can check with their state or territory health and environment agencies regarding relevant jurisdictional requirements. In some cases, answers to these questions may have already been addressed by other assessment procedures.

The questions may be useful throughout the HIA process including the evaluation of completed HIAs.

4.1 Air quality

Indoor and outdoor air quality are important parameters when evaluating potential impacts on human health and well-being. If the development is likely to result in any changes in air quality then these need to be evaluated. Air pollution can come from many industrial and commercial developments from dust, gases, vapours fumes, odours among others.

- Are there any process inputs, processing, outputs, storage or transportation involved in the industrial process which could result in changes to air quality?
- Will there be a significant decrease in the levels of air quality?
- Are there any aspects of the process that could generate biological, physical or chemical on and offsite emissions?
- Are there existing baseline data of existing air quality parameters including substances to be generated by the proposal?
- Will there be hazards to human health from decreased air quality?
- Will any temperature inversions result in a decrease in air quality?
- Will there be any synergistic effects with existing pollutants?
- Will wind direction result in changed levels of pollution in local areas?
- Will particulate matter or odours be released from the development?
- Are there any sensitive communities (e.g. children, elderly) in the area likely to be affected by the development?
- How do the predicted air quality levels compare with accepted standards e.g. WHO
- How is the validity of the predicted of the predicted air quality parameters determined?
- Are levels of uncertainty in the predicted air quality explained clearly?
- Will there be any increase in respiratory health disease (e.g. asthma) from any changes in air quality?
- Will the development result in any increase in prescribed burning activities?
- Any other key questions?

4.2 Biological hazards

Biological hazards can come from a variety of sources and include bacteria, viruses, insects, plants, birds, animals, and humans. These sources can be associated with a range of health effects ranging from skin irritation and allergies to infections.

- Will the development require or be involved with any vector management and if so is it likely that this could affect the community?
- Will the development be likely to increase the risk of communicable diseases to the community?
- Will any food processing be involved in the development and if so is it possible that any products or waste material could result in hazards to the health of the community?
- Are any residents in the area likely to be exposed to waterways leading to increasing exposure to mosquitoes and hence mosquito-borne disease risks?

4.3 Built environment

The built environment is increasingly recognised as having both positive and negative impacts on the health of its occupants and users. The location and access of service and recreation facilities form an important component of the daily life activities and can affect the communities' health and well-being through transport access, physical activities and so on.

- Is the community represented on the stakeholder group?
- Is there a partnership and activation plan for new recreation and green space developments?
- Will the development enhance / detract from existing green spaces?
- Will the development enhance / detract from community access to fresh food?
- Will the development enhance / detract from community access to schools (connections/safety)?
- Will the development enhance / detract from active living opportunities? For example, creating or modifying the built-in environment to allow free movement and physical activity is key to physical and mental well-being. Relatively small changes can make a big difference to the quality of life of people with disabilities. A wide hanging bridge, for example, allows a wheelchair user to move freely and enjoy the experience
- Will the development enhance / detract from social connection? For example, having public spaces that invite people to be active, to be outside and to be social.
- Will the development damage vulnerable ecosystems that are of importance to human health?
- Will the development encourage/discourage healthy forms of physical activity such as walking or cycling?
- Will the development alter access to healthy food options?

4.4 Chemicals and hazardous substances

Exposure to chemicals or hazardous substances or material can result in acute or chronic illness or injury and need to be considered in the identification, assessment, evaluation and management in any development project. This category includes radioactive materials, cytotoxic substances sharps and sanitary waste. Much of the control and management of these materials will be covered by occupational health and safety, transportation of dangerous goods and other relevant legislative requirements.

- Are there any chemical substances transported, stored, used in the process and if so are they adequately managed to avoid any release into the environment and affect human health and safety?
- Are any dangerous goods used in the process that could be released, either deliberately or accidentally, into the environment and pose a health and safety risk to human health?
- Will any demolition or construction activity be likely to disturb or release any hazardous material such as asbestos?
- Will any contaminated sites be involved in the development process?
- Are there any sections of the community that may be more exposed or more sensitive to the above releases?
- Are there plans/strategies to manage any releases to the environment that could affect human health directly or indirectly?
- Are all waste materials adequately managed to avoid exposures likely to affect human health?
- Are the mechanisms in place to ensure compliance with all relevant legislative requirements, standards and codes of practice?

4.5 Land and soil

Cases have been recorded of land and soil pollution resulting in serious adverse health effects. The pollution can be as a result of inadequate disposal of contaminated waste, household and commercial waste. Contaminated material can find its way into water sources, vegetables that have been grown in contaminated soil or from exposure to poor air quality surrounding the site. Land and soil pollution can result in offensive odours, provide breeding sites for disease vectors and air pollution from burning.

- Are there any inputs or processing activities that could result in solid or liquid waste that would be discharged onto the project land or in onsite landfill.
- Will there be any soil erosion or degradation from activities involving chemical, biological or physical materials?
- Will solid or liquid wastes generated in the process be treated onsite and their disposal properly managed?
- Will there be any treated or untreated sewage disposal on the land?
- Will there be any synergistic interactions between solid or liquid effluents with soil components?
- Are there any radioactive or asbestos wastes that need to be managed?
- Are there any gardening/horticultural activities that could result in human exposure to pesticides or fertilizers?
- Will there be any decomposition of disposed material onsite that could result in air or water pollution?
- Will any on- or off-site flora or fauna be affected which could result in adverse impacts on human health?
- Will any plastic waste be properly managed?
- Will any levels of contamination of land from construction, process and decommissioning comply with national and international standards?
- Will the sampling, analysis and evaluation comply with national and international standards?
- Is there the potential for the activity to compete with food production in the region?

4.6 Light

Light from industrial or commercial premises can result in excessive illumination, glare and a glow in the sky. Light used in this way covers multiple problems and can cause annoyance and disturbance and affect sleeping in premises outside the boundaries of a development.

- Will there be any external fixed light sources that could affect the community?
- Will any light sources be generated from mobile sources that could affect the community?
- Will there be any intermittent or flashing light sources that could extend to the affected community?

4.7 Noise and vibration

Noise is sound at such a level that is annoying, distracting or likely to cause physical harm mostly hearing loss or stress. Noise exposure is complex and in the environment, rather than the workplace, an acceptable level of noise for one person may be unacceptable to another person. The impact on people can depend on the time of the day and the nature and type of the noise or vibration.

- Are there any parts of the process likely to generate noise or vibration that would permeate outside the area of the development?
- Will any noise or vibration be generated during the evenings, night time or early mornings?
- Will any noise generated have particular noise characteristics such as high frequency or low frequencies?
- Will the noise or vibration be of an intermittent or impact nature?
- Will there be any noise or vibration generated from outdoor activities such as building or ground maintenance?
- Will mobile sources be used that could generate noise outside the boundaries of the development?
- Will there be any livestock involved in the process that could give rise to noise outside the boundaries of the development?
- Will there be noise or vibration generated from construction or demolition activities?
- Will there be noise or vibration emanation from transportation activities associated with the development

4.8 Socio-economic and cultural considerations

Development projects will almost invariably impact on a range of socio-economic and cultural determinants of health. In addition, these determinants of health often play a critical role with respect to issues of equity and sustainable development.

- Is there broad community representation on the steering committee and in the stakeholder groups?
- Is the consultation process culturally appropriate for the affected community?
- Will existing cultural and social norms be affected by the project?
- Will there be any impact of development on cultural heritage/spiritual health including Aboriginal and Torres Strait Islander Sacred Sites
- Will employment opportunities be created or lost?
- What will the impact of changed employment be in relation to income inequalities?
- Will the changes due to project employment result in demographic changes (ie changes to the gender ratio) and will contribute to adverse health consequences (e.g. the likelihood of changes to alcohol consumption in an area, risk of sexually transmitted infections)?
- Will the project result in changes in cost of living e.g. cost of housing, food and services?
- Will the project contribute or reduce mental and emotional well-being of a community (e.g. increase engagement and belonging or increase stress, anxiety, nuisance, discomfort)?
- Will the development increase / decrease health inequalities in the community
- Will the development enhance / detract from quality of life of local community?
- Will existing community businesses including primary producers be affected by the development?

4.9 Water quality

The inadequate disposal of wastewater can have serious impacts on human health and the environment. Water pollution can kill organisms that depend on these water bodies and result in adverse effects on fish, crustaceans, birds and many other animals.

- Will effluents, treated or untreated, be released to the environment (lakes, rivers, estuaries or other water bodies), which could affect human health directly or indirectly?
- Will effluents be able to find their way from surface water bodies to the water table and vice versa?
- Will there be any synergistic interactions between effluents with other water contaminants in water bodies?
- Will effluents be able to bio-concentrate in water bodies or result in any high levels of contamination?
- Will any activities in the process (transportation, operation, waste disposal) be likely to result in any water storage, including adventitious storage, which is likely to provide breeding areas for mosquitos, or any other insects likely to affect the local community?
- Will seasonal variations in water bodies result in changes to concentrations of contaminants, which could affect human health?
- Will gradients in salinity or other gradients from water movements result in significant local increases in concentration of contaminants or adversely affect dispersion processes.
- Will recreational or commercial water activities be affected by any effluent concentrations?
- Will there be any offensive odours, directly or indirectly, from effluent discharges?
- Will any flora or fauna be affected which could result in adverse impacts on human health?
- Is there data and information on baseline levels of water quality in water bodies likely to be affected by the development?
- Is the quality of the sampling, analysis and evaluation of the data consistent with best national and international practice and are limits and uncertainties adequately addressed?
- Are the predicted impacts on water quality from the development adequately determined with uncertainty clearly explained?
- Are the water quality standards used for evaluating the acceptability of predicted water quality well established nationally and internationally?
- Has the impact of predictions of natural disasters including storms and floods been assessed and considered?
- Are management mechanisms for spills to the environment, especially in proximity to communities, in place and have they been adequately described?

4.10 Other topics

- Are there likely to be any impacts related to the development that would be affected by climate change?
- Is the proposal likely to impact on the biodiversity of the area?

5 Appendices

Appendix 1 - Examples of determinants of well-being and health and related planning activities

Categories of determinants of health	Examples of specific health determinants	Local municipal council activities/functions
Social and cultural factors	<ul style="list-style-type: none"> • Social support, social connectedness • Equity • Social isolation • Participation in community and public affairs • Family connections • Cultural and spiritual participation • Expression of cultural values and practices • Links with cultural resources • Racism • Discrimination • Attitudes to disability • Fear of prejudice • Relationship with the land and water • Level and fear of crime • Reputation of community/area • Perceptions of safety 	<ul style="list-style-type: none"> • Cultural development • Recreational programs • Injury prevention • Community safety and crime prevention • Social connectedness
Economic factors	<ul style="list-style-type: none"> • Creation and distribution of wealth • Income level • Affordability of adequate housing • Availability and quality of employment/education/training • Skills development opportunities 	<ul style="list-style-type: none"> • Economic development and innovation
Environmental factors (including living and working conditions)	<ul style="list-style-type: none"> • Housing conditions and location • Working conditions • Quality of air, water and soil • Waste disposal • Energy • Land use • Climate change mitigation and adaptation • Biodiversity • Sites of cultural significance (e.g. sacred or historic sites) • A change in the emissions of greenhouse gases • Public transport and communication networks • Noise • Exposure to disease causing organisms (pathogens) 	<ul style="list-style-type: none"> • Housing (building applications, financial contributions) including affordable housing (territorial authorities) • Effects of land use and associated natural and physical resources • Effects of subdivision • Noise (territorial authorities) • Effects of climate change including adaptation • Urban design and planning • Natural and cultural heritage • Maintenance and enhancement of amenity values • Transport and road provision • Management of hazardous substances and contaminated sites • Waste management • Natural hazards and emergency

		<p>management</p> <ul style="list-style-type: none"> • Air quality • Water quality and quantity • Soil conservation • Recreational facilities • Biodiversity • Biosecurity
Access to, and quality of population-based services:	<ul style="list-style-type: none"> • Employment and education opportunities, • Workplaces, • Housing, • Public transport, • Health care, • Disability services, • Social services, • Childcare, • Leisure services, • Basic amenities, • Policing 	<p>Local councils can advocate for the provision and access of social and health services. This might include a proposed activity or modifications to an existing activity.</p> <p>Imposing conditions on a planning application i.e. setting conditions related to acute or chronic human health from preventive infectious diseases namely pathogens in the environment.</p>
Individual/behavioural factors	<ul style="list-style-type: none"> • Personal behaviours, such as: <ul style="list-style-type: none"> - Diet - Physical activity - Smoking - Alcohol intake • Life skills • Personal safety • People's belief in the future and sense of control over their own lives • Employment status • Educational attainment • Level of income and disposable income • Stress levels • Self-esteem and confidence 	<p>Local councils are not usually involved in acting directly on these determinants, however may promote healthy personal behaviours through a variety of community programs such as exercise programs or enforcement activities such as liquor bans and noise control.</p>
Biological factors	<ul style="list-style-type: none"> • Age, • Gender, • Genetics 	Beyond the control of local councils

Source: Adapted from the New Zealand Parliamentary Commissioner for the Environment 2006

Appendix 2 – Jurisdictional Resources

National Guidelines

[Australia's Physical Activity and Sedentary Behaviour Guidelines](#)

[Australian Dietary Guidelines](#)

[National Environment Protection Measures](#)

National Heart Foundation: [Healthy Active by Design](#)

[Risky business: A resource to help local governments manage environmental health risks \(PDF 617KB\)](#)

New South Wales

Built environment

NSW has developed a [Healthy Urban Development Checklist](#) to provide feedback to local councils, and other relevant organisations, on health issues in relation to urban development plans and proposals.

[Centre for Health Equity Training Research-and-Evaluation](#) (CHETRE) provides a range of HIA tools, case studies and publications.

Queensland

Built environment

The [Active Healthy Communities](#) is an online resource for Local Governments in Queensland to create environments that support active and healthy living.

Health in EIA

The [Health considerations - Environmental Impact Statement: Guidelines for Proponents](#) document highlights the potential health issues that should be considered in the development of an Environmental Impact Statement.

South Australia

Built environment

South Australia has developed [Healthy by design](#) website to guide planning, designing and developing healthy urban environments.

Western Australia

The Department of Health and the WHO Collaborating Centre for Environmental Health Impact Assessment at Curtin University have developed a range of documents that are useful for HIA documents including:

- [A Guide for the Evaluation of Health Impact Assessments carried out within the EIA process](#)
- [Health Risk Assessment in Western Australia](#)
- [Health Risk Assessment: \(Scoping\) Guidelines](#)
- [Public Health Consultation; A3 Table](#)
- [Public Health Consultation: A Guide for Developers](#)
- [Public Health Consultation: A3 Framework](#)
- **New Zealand**

- A guide to health impact assessment : a policy tool for New Zealand
- Whānau Ora Health Impact Assessment specific to indigenous population
- An idea whose time has come [electronic resource] : new opportunities for health impact assessment in New Zealand

Appendix 3 – HIA Tools

A wide range of HIA tools is available on the internet and a selection is provided below.

- [National Collaborating Centre for Healthy Public Policy, Canada](http://www.ncchpp.ca/54/Health_Impact_Assessment.ccnp) http://www.ncchpp.ca/54/Health_Impact_Assessment.ccnp
- [Centers for Disease Control and Prevention, USA](https://www.cdc.gov/healthyplaces/hia.htm) <https://www.cdc.gov/healthyplaces/hia.htm>
- [European Portal for Action on Health Inequalities](http://www.health-inequalities.eu/tools/health-impact-assessment/) <http://www.health-inequalities.eu/tools/health-impact-assessment/>
- [Human Impact Partners](http://www.humanimpact.org) <http://www.humanimpact.org>
- [International Council Mining and Minerals](https://www.icmm.com/en-gb/publications/health-and-safety/health-impact-assessment-summary-of-the-good-practice-guidance) <https://www.icmm.com/en-gb/publications/health-and-safety/health-impact-assessment-summary-of-the-good-practice-guidance>
- [IOWA Public Health Association](https://www.iowapha.org) <https://www.iowapha.org>
- [Mid-Michigan](http://hiatoolkit.weebly.com/) <http://hiatoolkit.weebly.com/>
- [UCLA](http://www.hiaguide.org/methods-resources/methods/phases-hia-1-screening) <http://www.hiaguide.org/methods-resources/methods/phases-hia-1-screening>
- [UNSW Research Centre for Primary Health Care and Equity \(CHETRE\)](http://hiaconnect.edu.au/) <http://hiaconnect.edu.au/>
- [US National Academy of Science](http://deis.nas.edu/Report/Improving-Health-United-States/13229?bname=) <http://deis.nas.edu/Report/Improving-Health-United-States/13229?bname=>
- [World Health Organization](http://www.who.int/hia/tools/en/) <http://www.who.int/hia/tools/en/>
- [International Association of Impact Assessment \(IAIA\)](http://www.iaia.org/) <http://www.iaia.org/>

6 Bibliography

- Australian Bureau of Statistics (ABS) (2011). Australian Social Trends, Cat no 4102.0.
- Australian Bureau of Statistics. (2017).
<http://www.abs.gov.au/websitedbs/censushome.nsf/home/dataquality?opendocument>
- Australian Government Department of the Environment and Energy. <http://www.environment.gov.au/>
- Australian Institute Health and Welfare (2011). Health and the environment: a compilation of evidence.
- Barton H, Grant M, Mitcham C and Tsourou C. 2009. Healthy urban planning in European cities. Health Promotion International 24 Suppl 1: i91-i99.
- Booth A and Carroll N (2005). The health status of Indigenous and non-Indigenous Australians. Institute for the Study of Labor (IZA), Discussion Paper 1534.
- Commission of Social Determinants of Health (2008). CSDH final report: closing the gap in a generation: a health equity through action on the social determinants of health. World Health Organisation, Geneva.
- Calma, T. (2007) Achieving Aboriginal and Torres Strait Islander health equality within a generation - A human rights based approach. Aboriginal and Torres Strait Islander Social Justice Commissioner Department of Health (2007). Health Impact Assessment in WA Summary Document.
- Department of Health Western Australia (2006). Public Health Consultation: A guide for developers.
- Department of Health Western Australia (2010). Health Risk Assessment (Scoping) Guidelines.
- enHealth (2001). Health Impact Assessment guidelines. enHealth, Canberra: Commonwealth of Australia.
- EnHealth (2004). The health effects of environmental noise – other than hearing loss. enHealth, Canberra: Commonwealth of Australia.
- enHealth (2012). Environmental health risk assessment guidelines- Guidelines for assessing human health risks from environmental hazards. enHealth, Canberra: Commonwealth of Australia.
- Green D. 2008. Climate impacts on the health of remote northern Australian Indigenous communities. Garnaut Climate Change Review
[http://www.garnautreview.org.au/CA25734E0016A131/WebObj/03-CIndigenous/\\$File/03-C%20Indigenous.pdf](http://www.garnautreview.org.au/CA25734E0016A131/WebObj/03-CIndigenous/$File/03-C%20Indigenous.pdf).
- Harris P, Harris-Roxas B, Harris E and Kemp L (2007). Health impact assessment: a practical guide. Sydney: UNSW Research Centre for Primary Health Care and Equity and NSW Health.
http://hiaconnect.edu.au/wp-content/uploads/2012/05/Health_Impact_Assessment_A_Practical_Guide.pdf
- Human Impact Partners (2011). A Health Impact Assessment Toolkit: A Handbook to Conducting HIA, 3rd Edition. Oakland, CA.
- Intergovernmental Agreement on the Environment 1992. <http://www.environment.gov.au/about-us/esd/publications/intergovernmental-agreement>
- International Association for Impact Assessment. <http://www.iaia.org/>
- International Association for Public Participation. <https://www.iap2.org.au/Home>
- International Council on Mining and Metals (2010). Good Practice Guidance on Health Impact Assessment.

Morgan RK (2011). An Evaluation of the Health Impact Assessment for the Central Plains Water Enhancement Scheme. Wellington: Ministry of Health.

National Aboriginal Health Strategy Working Party 1989. A National Aboriginal Health Strategy. Canberra: Department of Aboriginal Affairs.

National Heart Foundation via their Healthy Active by Design

New South Wales Department of Health (2009). Health Urban Development Checklist. A guide for health services when commenting on development policies, plans and proposals

New South Wales Department of Health (2010). Public Health Classifications Project – Determinants of Health. Phase Two: Final Report.

New South Wales Land and Environment Court (2006). Telstra Corporation Ltd v Hornsby Shire Council [2006] NSWLEC 133, paras 107-188

Office of Disease Prevention and Health Promotion: Determinants of Health.
<https://www.healthypeople.gov/>

Parliamentary Commissioner for the Environment. 2006. Healthy, wealthy and wise. A health impact assessment of Future currents: Electricity scenarios for New Zealand 2005–2050. Wellington: Parliamentary Commissioner for the Environment.

Peterson D (2006). Precaution: principles and practice in Australian environmental and natural resource management. Australian Journal of Agricultural and Resource Economics, 50, 469–489.

Quigley R, den Broeder L, Furu P, Bond A, Cave B and Bos R (2006). Health Impact Assessment International Best Practice Principles. Special Publication Series No. 5. Fargo, USA: International

Spickett, J, Brown H and Katscherian D (2011). Adaptation strategies for health impacts of climate change in Western Australia: Application of a Health Impact Assessment framework Environmental Impact Assessment Review, 31(3), 297-300.

Spickett, J, Brown H and Katscherian D (2015). Climate change, vulnerability and health: a guide to assessing and addressing the health impacts. <http://ehia.curtin.edu.au/local/docs/cc-guideline-10615.pdf>

Tamburrini A, Gilhuly K and Harris-Roxas B(2011). Enhancing benefits in health impact assessment through stakeholder consultation Impact Assessment and Project Appraisal, 29(3), 195–204.

UCLA Health Impact Assessment Clearinghouse: Learning and Information Center
<http://www.hiaguide.org/>

University of Queensland (2015). Boomtown Toolkit. <https://boomtown-toolkit.org/>

Urban Land Institute (2015). Building Healthy Places Toolkit: Strategies for Enhancing Health in the Built Environment. Washington DC: Urban Land Institute.

Urban Land Institute. <https://americas.uli.org/research/centers-initiatives/building-healthy-places-initiative/resources/>

Whitehead M and Dahlgren G (1991). What can we do about inequalities in health? *Lancet* 338: 1059–1063.

WHO European Centre for Health Policy (1999). Health Impact Assessment. Main concepts and suggested approach. Gothenburg Consensus Paper, December 1999. Copenhagen: WHO Regional Office for Europe.