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## The impact and effectiveness of health impact assessment: A conceptual framework

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## ABSTRACT

The use of health impact assessment (HIA) has expanded rapidly and there are increasing demands for it to demonstrate its effectiveness. This paper presents a conceptual framework for evaluating HIA and describes its development through (i) a review of the literature, (ii) a review of work undertaken as part of a major HIA capacity building project and (iii) an in-depth study of seven completed HIAs. The framework emphasises context, process and impacts as key domains in understanding and evaluating the effectiveness of an HIA. This new framework builds upon the existing approaches to evaluating HIA and extends them to reflect the broad range of factors that comprise and influence the effectiveness of HIAs. It may be of use in evaluating completed HIAs and in planning HIAs that are yet to be undertaken.

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## 1. Introduction

The use of health impact assessment (HIA) has expanded rapidly in the past twenty years. It is now used in both developed and developing countries and many multilateral institutions promote its use (APHA, 2011; Dannenberg et al., 2006; Harris and Spickett, 2011; Harris-Roxas and Harris, 2011; IFC, 2009; Scott Samuel, 2005; Vohra, 2007; WHO, 2008a,b). We have a growing number of case studies that demonstrate HIA's utility across a range of settings (Dannenberg et al., 2008; Harris-Roxas and Harris, 2007; Mathias and Harris-Roxas, 2009; Ward, 2006; Wismar et al., 2007) but the conditions and prerequisites for HIA's effectiveness remain unclear. If HIA's use is to continue to expand and be recognised it is important that it demonstrates effectiveness in influencing planning and implementation, in relation not only to specific but also to more general decisions. This is particularly important if HIA's use is to continue to be supported by increasingly resource-constrained health systems (Edward, 2011) that demand evidence of the comparative effectiveness of interventions (Sackett and Rosenberg, 1995).

Little was published on evaluating HIA prior to 2005, despite significant HIA activity for at least a decade earlier (Birley, 1995; Birley and Peralta, 1992; Laws and Sagar, 1994; Martin, 1986; NHMRC, 1994; PHC, 1995). Much of the activity prior to 2005 was focused on "proof of concept" and illustrates HIA's evolution as a practical response to concerns about environmental health, the social determinants of health, and health inequalities (Harris-Roxas and Harris, 2011). The small amount that had been written emphasised

that HIA needed to show its impact on decision-making processes if it was to demonstrate its effectiveness:

We suggest that typical HIA evaluations should focus on the process of the HIA and the impact that it has on the decision-making process, rather than attempting to evaluate long-term health outcomes or whether predicted impacts actually occurred. (Quigley and Taylor, 2004)

This is understandable given that in 2004 only a handful of formal evaluations of the impacts of HIAs on decision-making and implementation had been completed (Abdel Aziz, 2000, 2003; Abdel Aziz et al., 2004; Close, 2001).

Since then a number of detailed case studies have demonstrated HIA's utility (Harris-Roxas et al., 2011a; Mathias and Harris-Roxas, 2009; Ward, 2006; Wismar et al., 2007), however a higher standard of evidence of effectiveness is being increasingly demanded if HIA is to be routinely used in regulatory or policy development processes, more often by those from public health than other sectors it must be noted (Staff, 2005; Thompson, 2008). Health systems worldwide are facing increasing resource constraints (Edward, 2011) and population health activities, including HIA, usually only make up a small subset of overall health expenditure. Within this smaller subset, interventions such as HIA are increasingly required to demonstrate their effectiveness, not only in their own right but also in comparison to other interventions (comparative effectiveness, e.g. Weinstein and Skinner, 2010).

Depending on the perspective of those involved in HIAs there may be many indicators of effectiveness, including ability to change or influence decisions, building strong and enduring relationships with other sectors, and developing an understanding of the priorities and perspectives of partner organisations (Elliott and Francis, 2005). This highlights the varied and "relativist" nature of what different groups may see as the effectiveness of HIA. Seeing HIA only as an

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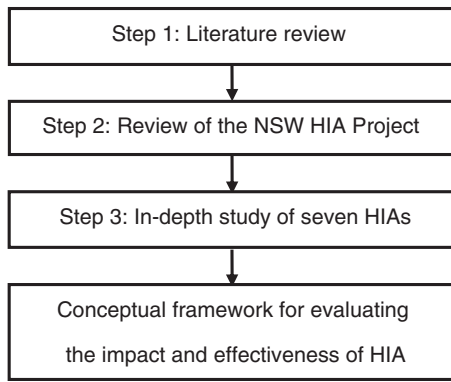


Fig. 1. The process for developing the conceptual framework.

opportunity to change or influence decisions may limit an understanding of its value in providing new and contextual information, raising awareness about the relationship between diverse public policy areas and health (National Research Council, 2011).

Effectiveness has been looked at in relation to other forms of impact assessment (IA) for several decades (Sadler, 1996 – this study is currently undergoing a major revision and update under the auspices of the International Association for Impact Assessment). The widely-used UNEP EIA Training Manual (2002) sets out the following grouping concepts for EIA evaluation:

*Effectiveness* – the extent to which the EIA process has achieved its purpose(s). Depending on how these are defined, an effectiveness review can be conducted against the terms of reference, the information provided to decision makers or principles and criteria of EIA good practice.

*Performance* – the success of the EIA process as measured by its outcomes and results, e.g. the environmental benefits achieved or the effectiveness of mitigation in avoiding or reducing impacts. (UNEP, 2002).

These reflect not only as a general focus in the EIA literature on its utility as a decision-making aid but also as a regulatory or governmental response to environmental issues. Similar to HIA the issues of perceived purpose and epistemological orientation play significant roles in determining what are the perceived aspects of IA effectiveness (Cashmore,

2004; Cashmore et al., 2004), and, like HIA, these are often simultaneously contested and poorly articulated.

In some ways the issue of effectiveness may have less currency in relation to other forms of IA. Impact assessment, in particular environmental impact assessment, is used in some form in almost every country. Its use is common, accepted, well understood and not usually actively compared to other interventions or activities. This is not necessarily true for health impact assessment though (Dannenberg et al., 2008) because of the resource constraints and associated health disciplinary and epistemological concerns highlighted above (Fielding and Briss, 2006; Sackett and Rosenberg, 1995).

This need for a more comprehensive examination of HIA's effectiveness led us to undertake a project to develop a conceptual framework for evaluating the effectiveness of HIA. The project was conceived in response to the obvious complexities inherent in evaluating HIA based on our work on the New South Wales HIA Project, which involved supporting more than 25 HIAs (Harris, 2006; Harris and Simpson, 2003; Harris et al., 2007a,b; Harris-Roxas and Simpson, 2005; Hughes and Kemp, 2007; Quigley and Watts, 2008).

2. Methods

The conceptual framework was developed through a linear sequential process as outlined in Fig. 1. This involved a literature review, a review of the New South Wales HIA Project and an in-depth study of seven completed HIAs.

Each step identified new elements of the framework or confirmed existing elements. This is described in greater detail below. Table 1 provides an overview of the contribution of each step to the elements of the final framework. The Table uses the final conceptual framework's over-arching domains of context, process and impacts to group and describe which new elements were identified (see the framework at Fig. 2 for more details). It also describes which existing framework elements were confirmed.

3. Findings

3.1. Step 1: literature review

Seventy-four relevant articles and reports were identified through Medline, Scopus and Web of Science searches. The search terms used were:

Table 1 Contributions of each of the project steps to the development of the conceptual framework.

	Step 1: literature review	Step 2: review of the NSW HIA Project	Step 3: in-depth study of seven HIAs
Conceptual framework elements identified	<p><i>Context</i> Broader context, goals, decision-making processes, type of HIA</p> <p><i>Process</i> Capacity and experience, resources, time, fidelity, review</p> <p><i>Impacts</i> Informing decisions, changing decisions and implementation, changes in health determinants, predictive efficacy, achieving goals, influencing other activities</p>	<p><i>Context</i> Purpose, values, decision-makers</p> <p><i>Process</i> Proposal, organisational arrangements, involvement of decision-makers and stakeholders</p> <p><i>Impacts</i> Understanding, perception of HIA</p>	<p><i>Context</i> (No new context elements were identified in this step)</p> <p><i>Process</i> Transparency, trade-offs</p> <p><i>Impacts</i> Learning, engagement</p>
Existing conceptual framework elements confirmed	<p>(This field is empty because it was the first step – there were no existing framework elements to confirm.)</p>	<p><i>Context</i> Broader context, decision-making processes</p> <p><i>Process</i> Capacity and experience, resources, time</p> <p><i>Impacts</i> Informing decisions, changing decisions and implementation, influencing other activities</p>	<p><i>Context</i> Broader context purpose, values, decision-makers, decision-making processes, type of HIA</p> <p><i>Process</i> Proposal, capacity and experience, resources, time, organisational arrangements, involvement of decision-makers and stakeholders</p> <p><i>Impacts</i> Informing decisions, changing decisions and implementation, influencing other activities, understanding</p>

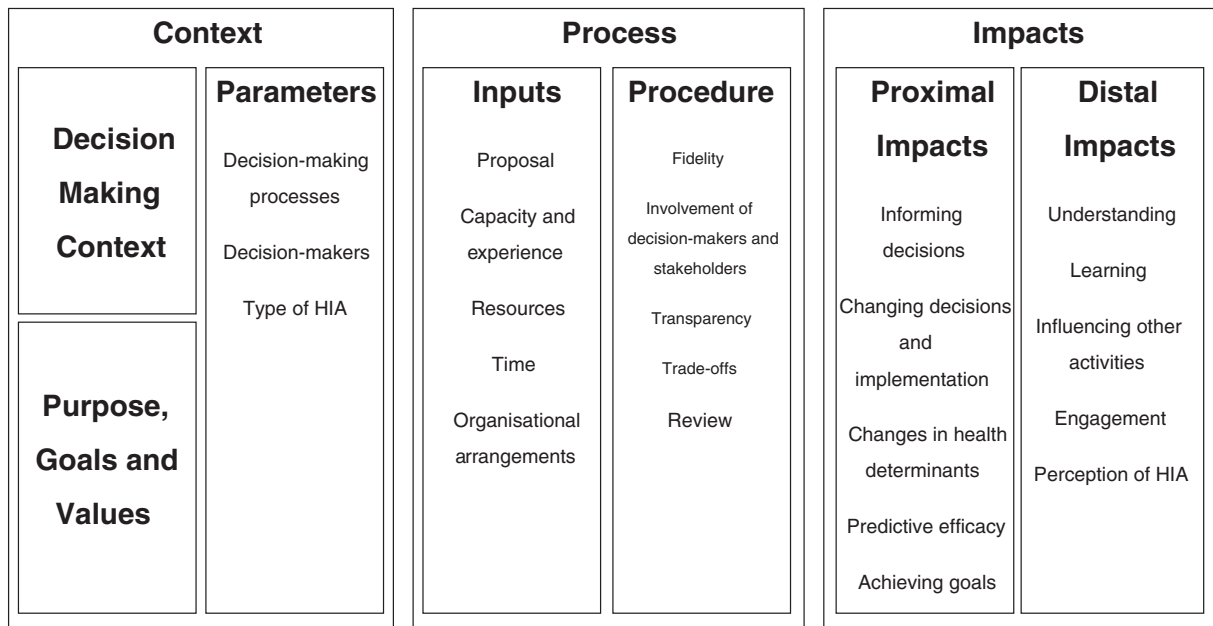


Fig. 2. Conceptual framework for evaluating the impact and effectiveness of health impact assessment.

1. (HIA\* OR “impact assessment”) AND (impact\* OR effective\* OR efficac\* OR evaluat\* OR outcom\*)
2. (HIA OR “impact assessment”) AND ((impact\* OR outcome\*) AND (direct\* OR indirect\*))

( ) indicates that the enclosed search is performed first  
 “ ” indicates that the retrieved records must contain the enclosed phrase  
 AND indicates that the retrieved records must contain both terms  
 \* indicates unlimited truncation, e.g. evaluat\* would return evaluate, evaluating or evaluations

- the time available or devoted to conducting the HIA,
- fidelity to procedural guidance,
- peer review of the HIA,
- whether the HIA informed decision-making and implementation,
- whether the HIA influenced health and played as determinants of health (though the literature noted that health itself was unlikely to clearly be affected in a way that could be attributed solely to an HIA),
- whether potential health impacts predicted through the HIA came to pass,
- whether the goals of the HIA were achieved, and
- whether the HIA influenced other activities.

These were reviewed to identify factors that contribute to, or make up, an effective HIA. A number of factors were identified (see Table 1) through free coding (Richards, 2005). These included:

- the broader context for the HIA,
- the goals of the HIA,
- the nature of the decision-making processes the HIA sought to influence,
- the type of HIA,
- capacity and experience of the assessors,
- resources devoted to conducting the HIA,

These factors were subsequently sorted and broadly grouped into context, process and impacts domains (see Fig. 2 – the conceptual framework).

Two significant existing conceptual frameworks for evaluating HIA were identified through the literature review and are worth describing in detail. Parry and Kemm (2005) developed the first framework for evaluating HIA (see Table 2). It proposes three domains to look at when evaluating an HIA – prediction, participation (involving stakeholders) and informing the decision-makers. Each of these domains have both process and outcome criteria. This framework has informed subsequent evaluations, which have noted the difficulties

Table 2  
 Three domains for evaluating HIAs (Parry and Kemm, 2005).

	Process criteria	Outcome criteria
Prediction	<ul style="list-style-type: none"> <li>• Methods used for predictions</li> <li>• Methods for scoping</li> <li>• Baseline data collection</li> <li>• Use of checklists</li> <li>• Identification of differential impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Accuracy of predicted impacts</li> </ul>
Participation	<ul style="list-style-type: none"> <li>• Voice in decision-making and access to information</li> <li>• Knowledge gathering</li> <li>• Involvement of professional and/or community stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Degree to which stakeholders felt involved in the decision-making process and felt ownership of the HIA's recommendations</li> </ul>
Informing the decision-makers	<ul style="list-style-type: none"> <li>• Decision-makers engagement in the HIA</li> <li>• Timing of the HIA</li> <li>• Communication of the HIA's recommendations</li> </ul>	<ul style="list-style-type: none"> <li>• Informing decision-making</li> </ul>

in evaluating the full range of impacts of an HIA and the extent to which benefits may be realised (Ali et al., 2007, 2008, 2009).

The other significant framework for evaluating HIA's effectiveness was developed by Wismar et al. (2007, see Table 3) and came out of a major European community-funded review of HIA activity across Europe. Though the Wismar et al. framework has been criticised for presuming a top-down, bureaucracy-oriented approach to HIA and for focusing overly on administrative functions (Aldred, 2009) it has face validity as it recognises that an HIA may have multiple types of effectiveness and an HIA's impact is not restricted to straightforward, clearly attributable changes to decision-making and implementation. Anyone who has been involved in several HIAs will recognise aspects of those HIAs in the categories outlined in the framework. Wismar et al.'s framework has also been used to guide two of the largest evaluations of the impacts of HIAs on decision-making in Europe and the USA (Blau et al., 2007; Dannenberg et al., 2008).

The difficulty in using Wismar et al.'s framework is that a given HIA may appear to belong to several categories simultaneously. Different people involved in the HIA may have radically different perspectives on whether an HIA was effective or not. An HIA may also appear to have had differing levels of effectiveness at different points in time, for example an HIA may appear to have not had many impacts immediately upon completion but this may be different one year afterwards. There is also not necessarily a clear hierarchy between the categories, though clearly direct effectiveness is the most desirable type.

Both the Parry and Kemm and Wismar et al. frameworks are useful for understanding some of the impacts of HIAs on decision-making and implementation. Moreover they've been critical in developing the field's understanding of how to evaluate HIAs, an issue that has been gaining increased attention across all forms of impact assessment (Cashmore et al., 2004; ESCWA, 2001; Polonen, 2006; Sadler, 1996). Despite this they may not fully explain the full range of factors that influence whether an HIA changes decisions or not, nor do they provide us with a sense of which factors may be most important in determining the effectiveness of an HIA (see Box 1). A broader conceptual framework is required that incorporates these factors but includes others, such as the context in which the HIA is undertaken and the full range of impacts it may have.

Other approaches to evaluating HIA have been put forward (Birley, 2007; Fredsgaard et al., 2009), though to date the two outlined above are the only ones whose use has been described in the literature (Gunther, 2011).

### 3.2. Step 2: review of the New South Wales HIA Project

In order to ensure that a broad range of contextual and decision-making factors were included in the framework, a review of documents about the New South Wales HIA Project was undertaken. The New South Wales HIA Project was a five year capacity building project undertaken by the University of New South Wales and funded by NSW Health. It led to 25 HIAs being undertaken and more than 300 people being supported to undertake HIAs.

The review was conducted by reading and free coding (Richards, 2005) the eight major project documents that were produced as part of the NSW HIA Project (Harris, 2006; Harris and Simpson, 2003; Harris et al., 2007a; Harris-Roxas and Harris, 2007; Harris-Roxas and Simpson, 2005; Menzies, 2007; Quigley and Watts, 2008). Though they were written within a specific context and timeframe and related to a single overall capacity building project, these documents all sought to consolidate learning from several HIAs. Through this review a number of additional framework elements were identified, and many of those identified in the literature review were confirmed (see Table 1). The review highlighted that apart from the credibility and rigour of the HIA as a technical process, factors such as the broader decision-making context and the manner in which the HIA was conducted

#### Box 1

An example of the limitations of existing frameworks for evaluating HIA.

An evaluation of an HIA undertaken in New Zealand may illustrate some of the limitations with existing frameworks for evaluating HIAs (Parry and Kemm, 2005; Wismar et al., 2007). An HIA was conducted on the Christchurch Urban Development Strategy, which sought to guide regional growth for the next 40 years (Stevenson et al., 2006, 2007). The HIA made 33 recommendations, 24 of which were included in the revised strategy, though clearly attributable evidence of impacts on implementation were hard to identify (Mathias and Harris-Roxas, 2009). The HIA led to increased cooperation between the agencies involved, with a jointly-funded public health physician position created in Christchurch City Council. The evaluation emphasised the need for HIAs to address the concerns and timeframes of decision-makers.

Looking at Christchurch UDS HIA using Parry and Kemm's framework we can see that the prediction domain, i.e. whether reliable predictions were made, played only a limited role in determining perceptions of whether the HIA was effective or not (Mathias and Harris-Roxas, 2009). In contrast the process for involving stakeholders and informing decision-makers was seen as important. Important impacts that are indirectly related to the HIA, such as the creation of the joint public health role and the timeliness of the HIA, aren't necessarily identified using the three domains in Parry and Kemm's framework. All three domains constitute important considerations but may not be sufficient to understand why an HIA results in changes. It is important to note that the relevance of some domains, such as prediction, may vary markedly depending on the decision-making context in which the HIA is conducted and the importance that is placed on methodological and predictive rigour. Looking at The Christchurch UDS HIA using Wismar et al.'s framework we can see that it is also hard to categorise the effectiveness of the HIA. Whilst 24 of the HIA's recommendations were reported to have been adopted, which might suggest the HIA had *direct effectiveness*, it was not possible to attribute any changes to the implementation of the plan solely to the HIA, suggesting that the HIA might have had only *opportunistic effectiveness*. The HIA seems to have changed the nature of the relationship between Council and the District Health Board, suggesting awareness raising that characterises *general effectiveness*. On a positive note, given that the HIA wasn't ignored it seems unlikely that it had *no effectiveness*. As such we can see that an HIA can be effective in more than just one way, highlighting a major challenge of using Wismar et al.'s framework to categorise the effectiveness of HIAs.

have an important impact on whether HIAs result in changes to planning, decision-making and implementation. A shared understanding of the purpose of the HIA and the values underpinning its use were also important.

The review also showed that indirect changes were also significant in determining if an HIA was seen as being both effective and worthwhile. This included factors such as shared understandings of the nature of health impacts and the purpose of the HIA, improved communication and collaboration, and the involvement of decision-makers. This confirms what has been found in relation to impact assessments in other settings (Farhang et al., 2008; Harris-Roxas and Harris, 2011;

**Table 3**

Four types of HIA effectiveness (Wismar et al., 2007).

		Modification of pending decisions	
		Yes	No
Health adequately acknowledged	Yes	<b>Direct Effectiveness</b> <ul style="list-style-type: none"> <li>· HIA-related changes in the decision</li> <li>· Due to the HIA the project was dropped</li> <li>· Decision was postponed</li> </ul>	<b>General Effectiveness</b> <ul style="list-style-type: none"> <li>· Reasons provided for not following HIA recommendations</li> <li>· Health consequences are negligible or positive</li> <li>· HIA has raised awareness among policy-makers</li> </ul>
	No	<b>Opportunistic Effectiveness</b> <ul style="list-style-type: none"> <li>· The decision would have been made anyway</li> </ul>	<b>No effectiveness</b> <ul style="list-style-type: none"> <li>· The HIA was ignored</li> <li>· The HIA was dismissed</li> </ul>

Harris-Roxas et al., 2011b; Lilien and Anwar, 2008; Mannheimer et al., 2007; Mathias and Harris-Roxas, 2009; Sadler, 1996).

### 3.3. Step 3: in-depth study of seven HIAs

An in-depth study of seven completed HIAs was undertaken to identify any additional factors that should be included in the conceptual framework based on a group of HIAs. The HIAs included in the review were:

1. HIA of Population and Land Use Planning for Bungendore (Gow and Dubois, 2007);
2. HIA of the Greater Granville Regeneration Strategy (Tennant and Newman, 2007);
3. HIA of the Lower Hunter Regional Strategy (Wells et al., 2007);
4. HIA of the “Blue Mile” Wollongong City Foreshore Project (Furber et al., 2007, in press);
5. Greater Western Sydney Urban Development HIA (WSROC, 2007);
6. Indigenous Environmental Health Workers in North Coast Area Health Service Proposal (NCAHS, 2006);
7. Health Home Visiting Program in Northern Sydney Central Coast Area Health Service (NSCCAHS, 2006).

Data was collected through 18 semi-structured interviews with people involved in the HIAs and document reviews of the seven HIA reports. The interviews varied in length and scope but all participants were asked:

- How did you do the HIA?
- What changed as a result of doing the HIA?
- What influenced the extent to which the HIA made changes?
- Was the HIA a success? Why?
- Knowing what you know now what would you have done differently?

The interviews were coded using the existing conceptual framework domains and to identify new ones (see Table 1). Table 4 provides summary of the context, process and impacts of each of the seven HIAs and illustrates in more detail what the HIAs found and what their impacts were.

## 4. The conceptual framework

Each of the three steps undertaken identified new conceptual framework factors. These factors were grouped, and the groupings were refined. It became clear through doing this that it is not possible to discuss the impacts of HIAs independent of the context in which they're conducted and the process which they follow. The elements of the conceptual framework are presented in Fig. 2 and described below.

A conceptual framework for evaluation is important for HIA as a field because it sets out the conceptual domains and conditions under which HIAs are done and what they seek to influence. Whilst this conceptual framework will require further discussion, testing and revision in different settings represents an important attempt to systematically identify the factors that influence how HIAs are conducted and the factors that are influenced by HIAs in turn.

The elements within the conceptual framework have been grouped based on a modified version of the conceptual framework developed by Donabedian (1988), which has been widely adopted and is based on robust theory underpinning program evaluation more widely (Sipthorpe and Garner, 2007). The Donabedian framework is based on three components: organisational structures, process and outcomes. In our framework we have renamed organisational structures and processes as context, and outcomes have been changed to impacts. This reflects the more episodic, one-off nature of HIA as a decision support tool, rather than being a routine and system-wide approach to service development and delivery.

Within our framework, context includes the broader decision-making context, the values, purpose and goals of the HIA, and the parameters for the HIA, which includes the triggers for an HIA and decision-making processes an HIA informs. Process includes not only the actions required to undertake the HIA but also the structures and resources that are required to support it. The impacts can include both proximal and distal – or direct and indirect. Impacts can be understood not only as the impact of an HIA on decision-making and implementation but also as part of a logic pathway to achieving longer term goal, against which effectiveness can be judged, though this will be influenced by many more factors than a single HIA. As such it is important to recognise that there will be a significant lag between any HIA being conducted and any changes in health outcomes, and that these changes will never be solely attributable to an HIA. It may be more appropriate to understand HIA as a tool to influence decision-making, implementation and related activities rather than directly influencing health outcomes per se. Evaluations of its effectiveness should focus on those impacts, both directly and indirectly, rather than health outcomes.

This framework provides:

- a structured conceptual basis for evaluating completed HIAs, moving beyond instrumental analysis of the direct effects of HIAs on decision-making and implementation to a more comprehensive understanding of the factors that enhance or reduce the effectiveness of an HIA;
- a basis for the development of future tools that may be used to plan future HIAs to enhance their impact and effectiveness; and
- an initial overview of the sort of decision-making contexts and processes that may link with impacts.

No HIA will address all elements of this framework, nor should they. The framework provides an overview of the broad range of factors that can determine whether an HIA is successful or not, across a range of decision-making and impact assessment contexts. Not every factor needs to be addressed in every HIA. The elements of the framework are described in more detail below.

### 4.1. Framework domain 1: context

HIAs are conducted across a range of contexts. There are three main aspects to the context to consider when evaluating HIAs – the broader decision-making context, the values, purpose and goals of the HIA, and the parameters for the HIA. An evaluation of an HIA should include a description of the decision-making context in terms of the general governance, political context and social context. Relevant recent and historical events should be described and considered in the evaluation because these may play a significant role in determining whether an HIA is effective or not, independent of factors relating to how the HIA itself was conducted. These considerations

**Table 4**  
Summary of the in-depth study of seven HIAs.

	Conceptual framework domains		
	Context	Process	Impacts
HIA of Population and Land Use Planning for Bungendore	<ul style="list-style-type: none"> <li>There was already a familiarity with related assessment processes within local government, such as social impact assessment</li> <li>The HIA was voluntarily conducted and agreed to by the agencies involved, there was no legal requirement for it to be done (applies to all these HIAs)</li> </ul>	<ul style="list-style-type: none"> <li>Helped to identify some trade-offs between water security and population growth</li> <li>The direct involvement of local government elected representatives helped the HIA to be conducted and to formulate recommendations</li> </ul>	<ul style="list-style-type: none"> <li>HIA's recommendations incorporated into plan</li> <li>Improved ongoing relationship between the Area Health Service and local government</li> <li>Led to related activities, e.g. local health service initiatives and collaboration in ongoing planning</li> </ul>
HIA of the Greater Granville Regeneration Strategy	<ul style="list-style-type: none"> <li>A well developed and detailed proposal existed</li> <li>There was agreement between Housing NSW, the local government and the Area Health Service that an HIA would be a beneficial process</li> </ul>	<ul style="list-style-type: none"> <li>Relationships already existed between a number of the agencies involved</li> <li>Good engagement with a range of agencies and stakeholders through the HIA</li> <li>A number of community-members were consulted about potential health impacts</li> </ul>	<ul style="list-style-type: none"> <li>HIA enabled a shared learning and understanding about the links between the proposal and health, described as a "Eureka moment" by Housing NSW staff involved</li> <li>Led to a number of memoranda of understanding between the agencies involved</li> <li>Led to ongoing collaboration</li> <li>One proposed site didn't proceed</li> <li>Asked by the Department of Planning to assess potential impacts of three alternate sites</li> </ul>
HIA of the Lower Hunter Regional Strategy	<ul style="list-style-type: none"> <li>There was an explicit focus on vulnerability and equity in the assessment</li> <li>HIA had to be submitted through normal public submission and commenting processes</li> <li>Agreement between agencies that potential impacts were significant enough to warrant an HIA</li> </ul>	<ul style="list-style-type: none"> <li>Improved the transparency of decision-making processes</li> <li>Very short timeframe to influence decision-making</li> <li>HIA was auspiced by regional government interagency group</li> <li>Sharing of confidential service data between agencies</li> </ul>	<ul style="list-style-type: none"> <li>HIA informed decision-making</li> <li>Improved understanding of potential health impacts of land use planning in local government</li> </ul>
HIA of the "Blue Mile" Wollongong City Foreshore Project	<ul style="list-style-type: none"> <li>Being able to point to local "successful" HIAs gave the HIA process legitimacy</li> <li>Detailed site planning had already been undertaken</li> <li>Potential to use the HIA's recommendations to argue for additional funding</li> </ul>	<ul style="list-style-type: none"> <li>A previous HIA on a related proposal in another local government area facilitated the HIA</li> <li>People experienced in HIA involved and conducting the HIA</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensive assessment provided an evidence base that was used in subsequent related HIAs</li> <li>Enabled "spin-off" work with other agencies</li> <li>Limited evidence of recommendations being adopted</li> <li>Learning focused on technical options of strategy rather than proposing alternatives</li> </ul>
Greater Western Sydney Urban Development HIA	<ul style="list-style-type: none"> <li>Initial disagreement about the purpose of the HIA, was it to change decision-making and implementation or to model potential impacts</li> <li>Broader decision-making process about the Sydney Metropolitan Strategy was already advanced and there was limited scope to change it, though there was scope to influence implementation and sub-regional planning</li> </ul>	<ul style="list-style-type: none"> <li>Limited involvement of decision-makers in the HIA process itself</li> <li>Shared organisational arrangements through shared oversight on the steering committee but also joint funding of the HIA by three agencies involved</li> <li>Good engagement of broad range of stakeholders</li> <li>Well resourced</li> </ul>	<ul style="list-style-type: none"> <li>Limited evidence of influencing decision-making</li> <li>HIA identified some alternate approaches that may have worked better</li> </ul>
Indigenous Environmental Health Workers in North Coast Area Health Service Proposal	<ul style="list-style-type: none"> <li>There was some disagreement about the purpose of the HIA</li> <li>The proposal existed but was unlikely to have been implemented.</li> </ul>	<ul style="list-style-type: none"> <li>The HIA may not have been screened appropriately, i.e. there was disagreement about whether it should have been done</li> <li>A range of regional agencies were involved in the HIA</li> </ul>	<ul style="list-style-type: none"> <li>Shared learning about the proposal and determinants of health and health equity</li> <li>Improvements in working relationships within the organisation</li> </ul>
Health Home Visiting Program in Northern Sydney Central Coast Area Health Service	<ul style="list-style-type: none"> <li>Decisions were being made about the program quickly</li> <li>Many of the decisions had already been made, such as what the nature of the service was going to be</li> </ul>	<ul style="list-style-type: none"> <li>Lack of a clear proposal made the HIA difficult to undertake</li> <li>Key personnel were not directly involved in the HIA</li> <li>The HIA may not have been scoped appropriately</li> </ul>	

are particularly relevant in situations where HIAs are conducted or evaluated by external consultants, who often start out with only a limited understanding of the broader context for the HIA.

The values, purpose and goals of the HIA should be evaluated, for example were the goals of the HIA described and were these met? Additionally a description of the values that have informed an HIA is important as these determine the way the HIA is conducted and the nature and weighting of the evidence used for the assessment. The purpose of the HIA should also be evaluated, as this is often poorly articulated and may vary between parties involved in the HIA (Harris-Roxas and Harris, 2011). For example, some of those involved in the HIA may believe that the purpose is technical learning about likely health impacts in order to make minor alterations to what's planned, whilst others may see its purpose as identifying different activities that could be undertaken to achieve the same goals (Harris-Roxas and Harris, 2011).

The parameters for an HIA are those factors that determine how an HIA is conducted but which lie outside the HIA itself. This includes the nature of the decision-making processes that the HIA is informing,

for example is the HIA part of a regulated assessment process or is it being done voluntarily. The parameters also include the nature of the decision-makers, not only organisationally but also individually, and any existing organisational arrangements such as memoranda of understanding.

#### 4.2. Framework domain 2: process

The process for undertaking the HIA needs to be transparent and to reflect the generally understood steps for undertaking an HIA (Harris et al., 2007b; Harris-Roxas and Harris, 2011). The process domain focuses on the inputs and procedures followed. Inputs may include: a clear description of the project, plan or proposal and the rationale for undertaking the HIA; an assessment of the capacity and experience of those involved to undertake the HIA; the adequacy of the resources and time available; and the extent to which organisational arrangements support or work against an HIA being undertaken or its recommendations accepted.

Understanding the procedures that were followed in an HIA is important because it allows for an appraisal of the HIA's fidelity against prescribed processes and standards of best practice (Fredsgaard et al., 2009; Quigley et al., 2006). The nature and extent of stakeholder and decision-maker engagement is an important factor to understand as it may modify the level of personal and organisational commitment to an HIA and its recommendations. Review by external parties can be an important factor in ensuring the rigour of an HIA.

The extent to which an HIA is procedurally transparent and well documented is important because it provides an explicit account of: what procedures were followed; how evidence was collected; the relative weighting given to different forms of evidence; the processes through which conflict and disagreement were managed; the principles that informed the assessment; and how trade-offs were decided within the HIA.

#### 4.3. Framework domain 3: impacts

One of the challenges to assessing the effectiveness of HIA is that the impact can be both proximal and distal in nature, i.e. directly or indirectly linked to the HIA itself. Proximal impacts may include informing decisions, changing decisions and implementation, changing how the determinants of health were considered in the proposal assessment, and whether the impacts predicted in the HIA came about. A related important function of HIA can also be to inform those affected by a decision about its potential impacts and benefits, alternatives, and proposed mitigation measures.

The distal impacts of an HIA are often longer term in nature and may include: the development and strengthening of partnerships and engagement within the health sector and also with other government sectors, the private sector and the community sector; whether the HIA leads to other activities; improved understanding of the factors that influence health and determine health outcomes; technical skills in gathering and assessing evidence; and an improved understanding of the potential role of HIAs and related health appraisals (Harris and Harris-Roxas, 2010).

An important and often overlooked distal impact of HIA is learning. All HIAs are undertaken to learn something, though the nature, scope and purposes of this learning are not usually recognised as an issue. Glasbergen (1999) describes three types of learning that can result from using decision-support tools, namely:

- technical learning, which involves searching for technical solutions to fixed objectives;
- conceptual learning, which involves redefining goals, problem definitions and strategies; and
- social learning, which emphasises dialogue and increased interaction between stakeholders (this is distinct from the concept of social learning used in psychology).

In evaluating the impact of an HIA it is important to attempt to describe and categorise the learning that has taken place, and to recognise that this may take more than one form (Harris-Roxas and Harris, 2011). Different context and process factors such as the purpose of the HIA, the nature of the decision-making process it is informing, and the way the HIA was conducted will influence the nature and extent of learning arising from the HIA.

Table 4 presents the ways in which the three conceptual framework domains were expressed in the seven HIAs included in the in-depth study we undertook in Step 3, providing more information on the empirical basis for these domains and how they can be observed in practice.

#### 4.4. Strengths and limitations

This conceptual framework is the first attempt that the authors are aware of to develop a comprehensive, empirically-based framework

for evaluating HIAs. It enables better conceptualisation of the broad range of factors that can influence HIAs and are influenced by HIAs in turn. It also identifies a number of factors that may be of use in planning HIAs, in terms of the ways they should be conducted and the desired impacts.

The conceptual framework was also developed in a specific Australian context. Even though the project sought to draw on the international literature, the HIAs studied were conducted voluntarily and were done within a specific broader organisational, disciplinary and cultural context. As such further work is required to establish to what extent this framework applies in different contexts, and whether it allows us to understand different forms of HIA such as equity focused health impact assessment (EFHIA, Simpson et al., 2005) and mental wellbeing impact assessment (MWIA, Coggins et al., 2007) or health within more integrated assessments such as environmental, social and health impact assessments (ESHIA, McHugh et al., 2006).

It will be necessary to consider what needs to be added to the framework and what elements may need to be removed or assigned a lower priority in other settings. The framework aims to be comprehensive but in doing so still involves a measure of subjectivity. For example what constitutes "influencing other activities" under the distal impacts domain requires subjective appraisal. Further research is required to develop standardised definitions of elements of the framework, e.g. what would a high level of learning look like in an HIA or what would a low level look like, or standardised instruments so that the framework elements may be more objectively appraised.

Additionally the conceptual framework is largely focused on structural and process factors. The extent to which individual agency and opinions influence the overall effectiveness of HIAs warrants further study, and may need to be reflected in revisions to the framework.

## 5. Conclusion

This conceptual framework provides an approach for evaluating completed HIAs, and may also be of use in planning and reporting on HIAs and in assessing the quality of HIA reports. It was developed through a review of the literature, a review of work undertaken as part of a major HIA capacity building project and an in-depth study of seven completed HIAs. We have conceptualised HIA and its impacts using a modified version of Donabedian's evaluation framework (1988) that emphasises context, process and impacts as key domains in understanding and evaluating the effectiveness of an HIA. It may have relevance outside HIA in other areas of impact assessment and also for evaluating other forms or mechanisms of decision-support.

As HIA continues to be more routinely incorporated into public health practice the demand for it to demonstrate its effectiveness will only increase. This framework builds upon the existing models for evaluating HIA and extends them to more comprehensively reflect the range of factors that comprise and influence the effectiveness of HIAs.

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