

## **A review of health impact assessment frameworks**

*NB This version has Table 1 inserted in the relevant place within the text so that the logic behind the reference numbering is obvious.  
The Supplementary data (Word file and Excel file for the web) have also been sent as separate files.*

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## **Abstract**

*Background:* Consideration of health impacts of non-health sector policies has been encouraged in many countries, with health impact assessment (HIA) increasingly used worldwide for this purpose. HIA aims to assess the potential impacts of a proposal and make recommendations to improve the potential health outcomes and minimize inequalities. Although many of the same techniques can be used, such as community consultation, engagement, or profiling, HIA differs from other community health approaches in its starting point, purpose, and relationship to interventions. Many frameworks have been produced to aid practitioners in conducting HIA.

*Objective:* To review in a systematic and comparative way the many HIA frameworks.

*Study design:* Systematic review

*Method:* The literature was searched to identify published frameworks giving sufficient guidance for those with the necessary skills to be able to undertake an HIA.

*Results:* Approaches to HIA reflect their origins, particularly those derived from environmental impact assessment. Early HIA resources tended to use a biomedical model of health and examine projects. Later developments were designed for use with policy proposals and tended to use a socio-economic or environmental model of health. There are more similarities than differences in approaches to HIA, with convergence over time, such as the distinction between 'narrow' and 'broad' focus HIA disappearing. Consideration of health disparities is integral to most HIA frameworks but not universal. A few

resources focus solely on inequalities. The extent of community participation advocated varies considerably.

*Conclusion:* It is important to select an HIA framework designed for a comparable context, level of proposal, and available resources.

### **Keywords**

Health impact assessment (HIA); Review; Frameworks; Guidelines; Policy

## **Introduction**

The Jakarta declaration of 1997 recommended that public and private sector policy development should incorporate equity-focused health impact assessment (HIA).(1) Almost a decade later, the 2006 Bangkok Charter on Health Promotion in a Globalized World highlighted the role of HIA as a key tool to aid decision-making.(2)

This paper reviews the published frameworks available for HIA. It is intended neither as an introduction to HIA nor as a detailed guide, as these exist elsewhere.(3-6) This review aims to compare the different HIA frameworks and how they have evolved with use by the public health community. By 'framework', we mean a 'how-to' guide to conducting HIA.

HIA, which has been encouraged in most areas of the world, (1;3;7) is a process which has as its primary aim predicting positive and negative effects of a proposal, including otherwise unanticipated effects. Its primary outcome is a set of evidence-based recommendations to modify a project or policy to minimize potential negative outcomes, maximize positive effects, and reduce any impacts on health inequalities. Such proposals may have health as their driver (eg air quality management) or it may be incidental or not considered (eg town or transport planning) because of different understanding of roles and responsibilities. Secondary aims of HIA include awareness-raising among decision-makers of their influence on their citizens' health through actions on determinants; the importance of the environment (physical, social and economic) in which individuals make decisions that affect their risk of disease (eg smoking); and involving the local community.(8) HIA has been found to be cost-effective.(9) Potential benefits of HIA include extending the

protection of human health; reducing ill health; enhancing cross-sectoral coordination; promoting greater equity in health; eliminating health sector costs of treating health consequences of non-health policies overlooked during planning; and potential for reallocation of saved resources.(10;11) A number of well-accepted definitions are provided in a web appendix (Box w1).(11-15)

Despite these, the term HIA is used to describe a range of activities: some would not be termed HIA by HIA practitioners, while the term HIA is not used by other professionals despite conducting similar appraisals.(16) While acknowledging the potential benefits of HIA, the need for credibility of the process and suggestions for improvements have been reported.(3;17) Concern has been expressed about the availability and/or quality of evidence used in HIA.(3;18;19) There has also been confusion about what HIA entails and the similarities and differences between the various approaches that have been employed. We therefore reviewed the available frameworks.

## **Method**

A systematic literature search was conducted using both PubMed and Google to identify HIA frameworks published in peer-reviewed or grey literature, respectively, that gave sufficiently detailed advice for someone with (access to) the necessary skills to conduct (or organize) a health impact assessment on a proposal in any field. Details of the search strategy and inclusion and exclusion criteria are provided in a web appendix (Box w2).(16;20-26) Topic-

specific resources and those aimed at increasing the consideration of health in other impact assessments were excluded.

For the generic HIA frameworks found, the basis, focus, and approaches to community participation, quantification, uncertainty around quantification, and inequalities were compared as the key features that differed between the various approaches. One of us (IF), a local public health practitioner, evaluated the strengths and weaknesses of each framework from the point of view of practical usefulness or clarity in explaining HIA concepts to an inexperienced practitioner.

## **Results**

When reviewing the many frameworks found, most fell easily into one of a small number of models of HIA (Table 1). More detailed analysis of the different frameworks are provided in a web appendix in an Excel spreadsheet.

*Insert Table 1 Models of HIA around here*

<b>Model of HIA</b>	<b>Policy analysis</b>	<b>Based on Environmental Impact Assessment (EIA)</b>	<b>Economic appraisal</b>	<b>Elements of EIA / British Columbia / HIA model / Democracy / Health promotion</b>	<b>More recent HIA models, based on earlier frameworks and 'good practice' HIA</b>
<b>Examples</b>	British Columbia 1994 (27)	Australia 1994 (29) New Zealand 1995 (30) Liverpool Health Impact Programme 1995 (31;32) EHIA 1997 (33) Prospective HIA (Manchester) 1997 (28) Merseyside 1997 (34) Merseyside 1998 (35) British Medical Association 1998 (13) Bielefeld EHIA 1999 (23;24;36) Lerer 1999 (21) Australia 2001 (37) Canada 2001 (22)	English Department of Health 1995 (38)	Swedish County Councils 1998 (39) Scotland – local government 1999 (40) Kirklees 1998 (41;42)	London 2000 (42) West Midlands 2001 (43) UK – local government 2002 (44) England (HDAi) 2002 (45) b Queensland 2003 (46) Ireland 2003 (47) HIARUc, Birmingham 2003 (48) New Zealand 2004 (49) Wales 2004 (50) Europe 2004 (51) Australia Health Equity Impact Assessment, 2004 (52) West Midlands PHO 2007 (53) CHETRE, 2007 (54) Whanau Ora HIA, New Zealand, 2007 (55)



<b>Main areas for HIA</b>	Public policy	Projects	Public policy	Policy proposals	Non-health policies, programs and projects
<b>Model of health</b>	Socio-environmental	Earlier HIA models used biomedical model of health. More recent focus on socio-environmental model	Biomedical	Socio-ecological / Holistic	Socio-environmental / Holistic
<b>Focus of the HIA</b>	Possible impacts of public policy on determinants of health	Protecting & improving public health by anticipating adverse health effects to incorporate mitigation at the planning stage  Quantitative assessment of environmental factors	Monetary values	Determinants of health	Better (healthy) policy making - informing and influencing decision-makers

<p><b>Categories of potential impacts on health considered</b></p>	<p>Economic Employment / education Healthy beginnings for children Control Physical &amp; mental health Equitable access to services Environment Physical safety/security</p>	<p>Varies. All include: Environment &amp; hazardous agents (chemicals, radiological, biological, noise); Injury; Nutrition. Some include: social, psychological, economic or ecological factors; lifestyle; or health services</p>	<p>Psychosocial environment Housing / living conditions Pollution Lifestyle Injury Occupation Geophysical factors</p>	<p>Physical environment Living habits Democracy / influence / equality Financial security Work / education Social network Access to services Belief in the future /life goals /meaning</p>	<p>Determinants of health and of inequalities: Socio-economic, cultural, environmental, and economic factors. Living &amp; working conditions Lifestyle Biological factors Services</p>
<p><b>Identification of health impacts</b></p>	<p>Checklist, simplified in 1996 (28)</p>	<p>Checklist + local concerns + risk assessment</p>	<p>Experts from a range of disciplines</p>	<p>Swedish: assumes an extensive understanding of impacts on influences on health. Scottish: systematic comprehensive framework to identify all relevant</p>	<p>Appraisal may be rapid, intermediate, or comprehensive, using a range of assessment tools. Use of qualitative and quantitative evidence eg London: multi-disciplinary, multi-agency steering group; brief literature</p>

				<p>impacts, including reviewing the literature, 'expert' informants, focus group discussion, interviews, &amp; routine data.</p> <p>Kirklees: checklist</p>	<p>review by 'expert' informants; stakeholder workshop.</p>
<p><b>Quantification of health impacts</b></p>	No	<p>Risk assessment</p> <p>Not all health impacts are calculable</p>	<p>Lives lost</p> <p>YOLLd</p> <p>QALYse</p>	<p>No (most frameworks):</p> <p>Local authority frameworks emphasise number of people affected to aid prioritisation of impacts</p>	<p>No (most frameworks):</p> <p>Local authority frameworks emphasise number of people affected to aid prioritisation of impacts</p>
<p><b>Specific advice about uncertainty</b></p>	None	<p>Most give clear advice eg</p> <p>Explicit statement of assumptions and uncertainties</p>	<p>Identify main source of uncertainties in estimating costs and benefits</p>	None	<p>None, except for West Midlands &amp; Birmingham</p>

<b>Equity focus</b>	Distribution of effects as well as aggregate effects	Consideration of vulnerable groups	None	Effects on prioritised groups as well as on whole population	Commitment to reduce inequalities. A role of HIA in making explicit the impact on inequalities
<b>Community involvement</b>	None	Yes	None	Yes (Swedish model: categories of health impacts determined by focus groups but HIAs conducted by officials)	Important. HIA as a way to engage and empower communities

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a HDA: English Health Development Agency (since April 2005 part of National Institute of Health and Clinical Excellence, NICE)

b Adapted from London Health Commission 2000 (25)

c HIARU HIA Research Unit

d YOLL: Years of life lost

e QALY: Quality-adjusted life year

Table w1 summarizes the main features of:

- many earlier approaches to HIA that envisaged it as a component of environmental impact assessment (EIA), often associated with a “chemical hazard or risk assessment” approach and a medical model of health;
- other earlier approaches to HIA; and
- more recent HIA frameworks. The frameworks reviewed vary in their level of detail but are all deemed sufficiently detailed to enable one to conduct HIA (see note in first worksheet of web tables).

The descriptions ‘*brief*’, ‘*intermediate*’ and ‘*comprehensive*’ in Table w1 relate to the level of detail of information given, and practical examples included, in the framework document. This is to indicate the extent to which the document paints a sufficiently descriptive picture for the user to understand what actions are required. These terms

refer neither to the length of the publication (although the depth of information and length of document are often similar), nor to the duration or extent of the actual HIA process planned. [The level of resource required to use each framework depends primarily on the extent of the actual HIA to be undertaken: for example the time available, the resources available, and the level of detailed analysis required. These may determine which framework is used, rather than the other way round.](#)

Most frameworks were developed to assess potential health impacts either of public policy (27;38;39;41-43;45-55) or of environmental or development projects. (13;23;24;28;33;34;36;37;56) Two were for use for both policies and projects (35;44); others were intended for health promotion and health development, environmental planning and management (21) or service delivery. (40) The Australian 2001 framework was intended to encourage greater consideration of health issues within current impact assessment processes in Australia, not to be an additional process.(37)

Frameworks fall into three main groups (Tables 1 and w1): those based on EIA, (13;21;24;28-31;33-35;37;56) which mainly focus on project-level HIAs; those based on principles of democracy and civic engagement (39-41); and those developed from these concepts but adapted to assess health impacts of policies (42-55). The exception is the first English Department of Health guide to policy appraisal, which focused solely on economic appraisal (38). In most countries, earlier resources focused on project-level HIA, as part of or evolving from EIA, but more recent resources have been directed towards influencing policies.

The approaches to HIA have more in common than separates them.(57) The various frameworks share a staged approach, although their terminology is not always the same: this paper uses the most frequently utilized terms.(4) *Screening* is applied to a wide range of proposals to identify those which are likely to affect health. *Scoping* is the stage at which the issues to be addressed by the HIA are

decided and the key stakeholders (those with an interest in or affected by the proposal) and those involved in conducting the HIA identified. *Profiling* describes the collation of baseline demographics and health status of the affected population(s). *Risk assessment* is similar to the procedures described above but a wider range of factors that can affect health are considered in some approaches. *Risk communication* asks whether there has been adequate consultation on the risks and whether public concerns have been considered. *Risk management* entails options for avoiding, reducing or treating the risks, consideration of their costs and benefits, and the adequacy of contingency plans. It also includes discussion of how differing perceptions of risk can be mediated and whether future health risks can be predicted. (30) *Risk assessment, risk communication and risk management* are terms predominantly used in EIA and therefore EHIA, rather than policy-focused HIA. They can all be part of a stage more commonly (or collectively) known as *appraisal* of potential health impacts.

In some frameworks (30), *monitoring* refers to a process performed to ensure compliance of a project with the conditions attached to the consent but most guidance refers to monitoring of health outcomes or indicators. *Evaluation and monitoring* refers equally to evaluating the process of conducting HIA; the impact the HIA recommendations have had on altering proposals; and monitoring changes in awareness of factors impacting upon health and of management strategies for these.

The Merseyside Guidelines (35) distinguish between *procedures*, frameworks for commissioning and implementing HIAs, and *methods*, the systems for carrying them out. Most frameworks, however, use these terms in less precise ways.

### ***Quantification and uncertainty***

Most of the earlier EIA-based approaches focused on quantified risk assessment for exposure to toxic substances (13;24;29;30;33;40;45), considering HIA a health protection tool.(58) Most of these also mention dealing with uncertainty, although half mention it only briefly. In contrast, most HIA frameworks designed for policy use discuss neither quantification nor uncertainties around such estimation. In a departure from most approaches, the 1995 English Department of Health guide focused on economic appraisal, using years of life lost and quality-adjusted life-years as the metrics for quantification.(38)

### ***Community participation***

There is considerable variation in the extent of community participation in HIA. This is due both to practical difficulties and to differences in ideology. Some believe that local people potentially affected by a proposal should participate in HIA through, for example, focus groups or stakeholders' workshops.(59) To others, participatory HIA means the community should lead the process(60) or at least be involved in each of the many stages.(61) A few models consider community involvement to be paramount, with the community as experts (62;63):



the Community HIA Tool (CHIAT) was designed specifically for that purpose, as a mechanism for incorporating "the health concerns of the Antigonish community" into public policy development.(63) (This tool has not been included in the tables as it refers only to screening and scoping.) However, not all HIA frameworks advocate community involvement,(27;56) particularly when intended for assessment of high-level policies.

### ***Distribution of potential impacts***

Equity is a value within HIA but is also a determinant of health.(64) All but five frameworks(21;27;28;30;38) mention consideration of unequal burden of potential health impacts. Consideration of specific vulnerable groups is the approach recommended in most cases. There is disagreement about whether disadvantaged groups should be identified at the start or during the course of the process of the HIA.(65)

A few frameworks have been devised to focus on health disparities. The Bro Taf Health Authority rapid appraisal tool, now the National Public Health Service for Wales HIIA tool, was the first to focus specifically on inequalities. It provides a very brief overview and a series of worksheets, designed to be completed during three half-day meetings, interspersed with evidence collection.(66;67) More recently, several frameworks have been developed which devote particular attention to unequal burdens of exposure and / or susceptibility of

effects,(51;52;54;55) with the Australasian frameworks containing an especially strong focus.

### ***Other reviews of HIA frameworks***

A number of reviews have been published, but none in peer-reviewed journals.(68) All are either incomplete, focusing only on the best-known approaches, or are considerably older and therefore miss the considerable change in approach over recent years we have shown. Table w2 gives details of the HIA resources compared in different reviews and of the main similarities and differences observed.

### **Discussion**

For historical and developmental reasons, information about HIA, both theory and practical examples, has tended to be published as grey literature. Older resources have been included in this review not only to investigate changes over time but also because some people are likely to continue to use instruments with which they are familiar.

This paper comments on resources that enable a reader to conduct an entire HIA, given suitable skills. In addition, useful toolkits exist to aid particular aspects of conducting an HIA. A planning and report-writing toolkit provides a series of questions to guide the process and the decisions about the HIA process at each

stage.(76) The templates assist organization of an HIA, and of the thinking behind it, but the resource does not explain what HIA is, how to do it, nor that consideration of inequalities is central to HIA: it was therefore not included in our review. Similarly, the Community Health Impact Assessment Tool provides a structured and comprehensive screening tool using 79 prompts under 16 different categories of determinants and possible impacts but omits the appraisal stage that is paramount in other frameworks (63). An English rapid appraisal toolkit gives very detailed instructions for each task in the two stages of scoping and appraisal but not for the other stages of HIA.(59)

Most resources were piloted as part of their development. The Scottish Needs Assessment Programme conducted two pilots but their guidance was advice on how to conduct HIAs better, rather than a series of steps to follow (77;78). Reports of completed HIAs are also helpful, both as examples of what HIA is and can entail and also as a source of relevant evidence for other HIAs on related topics. They are best found through internet searches. Useful websites for HIA have been listed(5); the most comprehensive website is undergoing redevelopment and the contents are being updated and extended.(79)

Kemm distinguished between '*broad focus*' HIA, in which a holistic model of health is used, democratic values and community participation are paramount, and quantification is rarely attempted, and '*tight focus*' HIA, which is based on epidemiology and toxicology and tends towards measurement and

quantification.(71;80) In practice, there has been an increasing tendency for HIA practitioners to borrow from both models, with most approaches occupying a position somewhere between these extremes. Although HIA developed from a variety of backgrounds, there has been a shift in emphasis for the more recent approaches. Mahoney and Morgan have traced the evolution of HIA guidance in Australia and New Zealand.(58) Their findings are consistent with those of the wider set of resources examined in this paper. The main changes have been gradual moves from a biomedical to a socio-economic or environmental model of health; from consideration of toxic, infectious and other hazards to wider determinants of health, such as employment, transport and housing; and considering the health impacts not just of specific projects but also of broader programs and policies. More recent resources are based on other HIA approaches, rather than being a direct development from EIA or policy appraisal.

The Gothenburg consensus (15), participants at an international seminar to discuss health inequalities impact assessment (HIIA) (81), and those at a workshop at the WHO Regional Networks for Health annual conference (82) (both in 2000) concluded that considering inequalities should be an integral part of any HIA rather than a separate process. Each HIA should therefore consider both the aggregate and distributional aspects of health impacts. A recent study found that almost all the HIAs examined did include consideration of inequalities, although to varying extents and identifying vulnerable groups with different degrees of specificity.(83) The Australian 2004 framework for equity-focused HIA to examine

policy or practice proposals (52) resembles most of the later frameworks described in Table w1 but provides a structured way in which to examine potential impacts on equity, which occurs with the Queensland (46), Ireland (47), Birmingham (48), Europe (51), and New Zealand (55) frameworks but not explicitly in others. The CHETRE framework (54) states that in some cases an 'Equity Focused HIA' should be undertaken, but does not explain what this would consist of.

Factors promoting success of HIA include: partnership working; baseline data for population profiling; a well-developed community; overall strategy with shared aims; and capacity (both time and resources).(74) The Belfast Healthy Cities toolkit differs by examining the importance of, and providing assessment tools for, partnership working, community participation, and evaluation before explaining HIA (84).

Quantitative HIA remains rare (85). As Cole and colleagues found (10), advice on quantification is generally limited to EIA-based approaches, which tend to rely on technocratic risk assessments. This is an appropriate method where there are mandatory (E)HIA requirements at a project level, known toxins, and a strong epidemiological and toxicological evidence base. Community participation is seldom a feature of this approach. However, even in these circumstances, a project will often also impact on socioeconomic determinants of health and disparities, so a broader consideration of health and community participation in an HIA would have greater resonance with most public health professionals.

Approaches that concentrate on a single method produce an incomplete picture. For example, Dowie describes 'health impact estimation', called 'quantification' in this paper (86). It is analogous to a survey in health needs assessment. Both provide useful, quantified information if conducted according to scientific best practice but are insufficient for a full assessment. With current knowledge, quantification of most policy-level proposals is not possible. Methods that concentrate on finding the best evidence, from published research, previous HIAs, and stakeholders, including members of potentially affected communities, will therefore be preferable.

None of the frameworks found give guidance on how to identify the impacts on mental health. This gap has in part been filled by a new HIA screening tool, designed to assist project developers to understand how their work impacts on the mental health and well-being of individuals and communities accessing the projects (87).

A number of organizations are working to develop guidance on integrated impact assessment.(68;88) There is consensus that making HIA an integral part of the policy-making process is important not only to improve the health effects of a policy but also to raise awareness of potential health impacts among those working in other sectors.(9;89-92) However, integrating HIA within other impact assessments risks a tokenistic consideration of health. Major efforts have been

made to have HIA included as an integral part of Strategic Environmental Assessment (SEA) both across Europe(93) and in England.(94)

### ***Conclusion***

A plethora of resources now exist to provide guidance on conducting health impact assessment. Morgan commented in 2003: "The proliferation of suggested approaches to HIA ...seem to be used by practitioners almost as a menu of options from which to choose a model..."(68) According to the World Health Organization, these different approaches to conducting HIA are part of its strength, demonstrating a pragmatic ability to engage with other sectors to influence decision-making.(11) We have shown that the many HIA frameworks have more similarities than differences, with differences between 'wide-' and 'narrow-' focused HIA diminishing over time. There has been a trend from EIA-based biomedical approaches to more holistic attitudes to health and from a focus on projects to one on policies. Recent frameworks differ far less than earlier approaches: they share similar stages; a socio-economic or socio-environmental model of health; recognition of the need to integrate research evidence, local data, and the knowledge of stakeholders, particularly members of affected communities; and the need to consider the distribution of effects as well as the potential overall impacts. However, the emphasis on quantification, community involvement, and consideration of inequalities still varies between approaches.

Some may be disappointed this project compared various aspects of the 27 frameworks in Table w1 without picking a 'best buy'. Although we have identified some strengths and/or weaknesses of the frameworks reviewed in this paper, the relative strengths and weaknesses of the different approaches depend on the level of HIA to be conducted (policy or project), the extent (rapid or comprehensive), the definition of health used when conducting an HIA (biomedical or holistic), the resources available (including staff, time, expertise, and funding), and the values of those involved. This is particularly so for the degree to which community participation is sought, quantification is desired, or impacts on disparities are of concern. This review should enable those starting an HIA to identify and obtain a short-list of frameworks that meet their prioritised criteria. The precise choice of framework to be used will depend on the legal, cultural or other context of an HIA; the level of proposal (policy, programme or project) to which the HIA relates; and personal preference for style.



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