Strategies to increase the use of evidence from research in population health policy and programs: a rapid review

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Executive summary

The increased use of evidence from research in the development and evaluation of health policy has the potential to improve health outcomes and increase the efficiency of resource allocation. This review was commissioned by NSW Health to inform decisions about strategies that the Division of Population Health could use to foster the use of research evidence in population health policy and programs.

We conducted a broad search across health and other relevant databases. We located 115 studies relevant to the review questions; of these, 16 described conceptual frameworks or models; 93 were commentaries, surveys of opinion or case studies; and only 6 tested the impact of strategies to increase the use of evidence in policy or programs.

The conceptual frameworks, commentaries and surveys of opinions suggested that evidence from research is more likely to be used in policy and program development when the following are in place:

- Mechanisms to ensure **ready access to research findings and summaries** of research;
- **Frequent interaction** between researchers and policy makers;
- **Organisational readiness** to use evidence from research;
- Supportive **resources and tools;** and
- Mechanisms for the generation of **new evidence from research** that is highly relevant to the priorities of the agency and applicable to local circumstances.

We identified *only six studies* that had set out to evaluate the extent to which various strategies increased the use of evidence; together they provide only small indications of effect. In summary, these showed that:

- Tailored targeted messages that bring to the attention of policy makers new evidence from research in their own area may increase the use of evidence in policy and program development.

- Strategies designed to increase the use of evidence from research in policy and programs may be more likely to be effective in organisations that have a culture that supports the use of research.

- Training in the appraisal of research and its use appears to increase participants' skills in critical appraisal and possibly their attitudes towards the value of research. There is as yet no evidence that it impacts the use of evidence.

This review

This review was commissioned by NSW Health to inform decisions about strategies that the Division of Population Health could use to foster the use of research evidence in population health policy and programs.

The review is designed to:
(i)   Identify conceptual frameworks about increasing the impact of research on population health policy and programs that are commonly used and widely respected.

(ii) From these frameworks and any other relevant research, identify the factors that may potentially increase the use of evidence in population health policy and programs by an organisation like NSW Health.

(iii) Describe the strategies that have been used to increase the use of existing research and analyse:
   - the evidence about the impact of these strategies;
   - the circumstances in which they are likely to be effective;
   - where are the gaps; and
   - relevance for NSW Health.

(iv) Describe the strategies that have been used to increase the likelihood that agencies like NSW Health are involved in generating new research that is useful in informing their work, including both commissioned research and partnership approaches, and analyse:
   - the evidence about the impact of these strategies;
   - the circumstances in which they are likely to be effective;
   - where are the gaps; and
   - relevance for NSW Health.

Introduction

The development of health policy and programs are complex processes, influenced by a host of factors that include lobbyists and pressure groups, ministerial priorities and political ideology, the media, available resources including budgets, habits and tradition, pragmatic considerations and contingencies, and evidence (Banks, 2009; Bowen et al., 2005; Davies, 2004).

The increased use of evidence from research in the development and evaluation of health policy has the potential to increase health outcomes and improve resource allocation (Banks, 2009). Prime Minister Kevin Rudd made clear his support for the increased use of evidence in policy in a speech to senior public servants last year (Rudd, 2008). This support is consistent with similar statements made a decade ago by the Blair administration in the UK (Cabinet Office 1999a, 1999b), and more recently by President Barack Obama in the United States (Mecklin, 2009). Evidence can impact health policy at several points in the development process, from the outset when an issue or problem is identified for policy attention, to the development of the most appropriate response, and to subsequent evaluation of its effectiveness (Banks, 2009; Ogilvie et al., 2009). Evidence can also impact policy in different ways, for example, to inform debate, to stimulate better or different research, or to guide or support recommendations (Ogilvie et al., 2009).

The challenge is to identify strategies that support the use of evidence in the development of health policy and programs.

Methods

Our search strategy was designed to capture as many studies as possible for later refinement. We developed and ran the search strategy in August and September 2009. Our search strategy had two arms: (i) published literature in peer-reviewed journals, and (ii) targeted searching of websites of key government departments and other government agencies.

(i)   Published literature

To identify relevant published peer-reviewed literature, we initially searched health databases only but because of the paucity of studies testing strategies, we extended the search to include other potentially relevant areas such as the social sciences, education, transport, housing, and justice. We searched six databases: Medline, CINAHL, ProQuest, PsycInfo, PubMed and Informit Online (which captures Australian publications).

We searched the literature published in English for a ten-year period from 1999-2009. The search was conducted using combinations of the following key words: capacity, evidence, evidence-based, health policy, framework, knowledge, knowledge brokering, knowledge transfer, knowledge translation, methods, model, policy, public policy, receptivity, and research. We did not include 'evidence-based medicine' or 'nursing' as search terms as these were outside the focus of the proposal, i.e. the population and public health domains.

Our initial search yielded 5540 articles. Because we found no articles relating to strategies to generate new research, we expanded our search terms to include research collaboration, partnership research and commissioned research. This brought our total yield to 7227 articles. After excluding duplicates (n=3074), 4153 articles remained. We agreed exclusion criteria which included articles focusing predominantly on individual clinical practice, clinical guidelines, clinical policies and procedures, health technology assessments, initiatives in developing countries, methodological papers, and community-academic partnerships. Studies focusing solely on strategies used within research organisations were excluded. We also excluded studies that focused on encouraging the use of evidence-based programs or policies in practice as we understood the purpose of the review to be focused on the use of research in the development of policies and programs. This is a complex literature that is often conceptually broad; we included papers that covered elements relevant to the review, even if the main focus was outside of the review questions.

Having excluded 4038 articles, we reviewed all remaining papers (n=115).

Sixteen papers described frameworks or models. We assessed the remaining 99 studies against the designations of levels of evidence published by the NHMRC (June 2009), see Appendix 1. Very few papers met the NHMRC criteria designated in levels I – IV. We developed an additional level V: surveys, interviews, and document analysis; case studies; and professional opinion.

Based on the above search process, and our assignment of levels of evidence, we sorted the 115 papers into: conceptual frameworks or models (n=16); studies that tested the impact of strategies to increase the use of evidence in policy or programs (n=6); surveys, interviews, and document analysis (n=30); case studies (n=35); and professional opinion (n=28). Tabulated summaries of the papers are provided in Appendix 2 (for models and frameworks) and Appendix 3 (for other published papers excluding case studies and professional opinion).

(ii) Papers by government and government agencies

We also searched for relevant papers published by government departments or government agencies. Online searching was conducted using Google and we also targeted specific government and government agency web sites in Australia (e.g., Department of Health and Ageing, National Health and Medical Research Council), the UK (e.g., National Health Service, Government Social Research Unit, National Health Service (NHS) Centre for Reviews and Dissemination, the Cochrane Collaboration, Centre for Evidence-Informed Policy and Practice, Social Care Institute of Excellence, Evidence Network, Scottish Executive, Welsh Assembly Government), USA (e.g., Institute for Healthcare Improvement (IHI), the Campbell Collaboration, the Community Guide), and Canada (e.g., Canadian Institutes of Health Research (CIHR), Canadian Health Services Research Foundation (CHSRF), Effective Public Health Practice Program, Canadian Population Health Initiative, Canadian Health Services Research Foundation (CIHI). Combinations of the following key words were used: capacity, criminal, education, effectiveness, evidence, evidence-based, government, health, knowledge, policy, receptivity, research, social services, strategy, uptake. We found 17 relevant reports by government or government agencies: 11 were surveys, interviews and/or documentary analyses; 1 was a case study; 2 were professional opinion; and 3 were other

types of documents (strategic frameworks, recommendations from an inquiry). Appendix 4 provides a summary of these papers.

The combined yield from all sources is 132 papers: 16 conceptual frameworks; 6 empirical studies; 41 surveys, interviews and document analyses; 36 case studies; 30 professional opinion papers; and 3 others (see Figure 1).
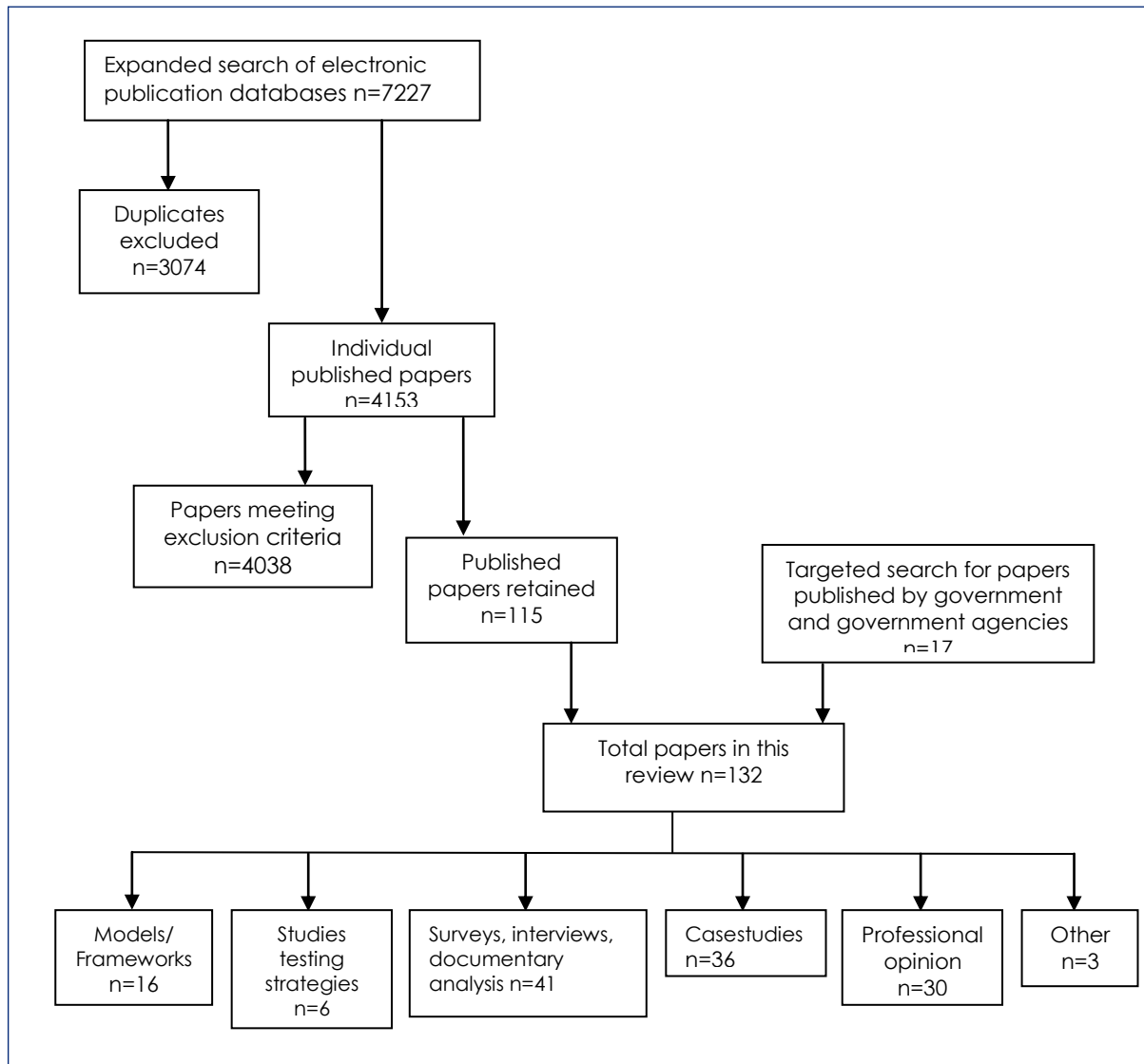

Figure 1: Summary of search process for literature included in this review

Conceptual frameworks about increasing the use of research in policy and programs

We identified 16 models and frameworks relevant to increasing the impact of research on health policy and/or programs (summarised in Appendix 2). Some of the frameworks were specific to health, two of which focused on public health (Ogilvie et al., 2009; Satterfield et al., 2009), and one on health promotion (Scott et al., 2008); others were set in the broader context of increasing knowledge transfer to policy and programs. There was no framework specific to the use of research in population health policy or programs. Many of the frameworks were concerned with a broad concept of evidence, of which research knowledge is one type.

Of the 16 models, we selected the following eight frameworks for more detailed discussion because they provide a good cross-section of existing conceptual models on the influence of evidence on policy and practice. These frameworks include models most frequently cited in the literature, and models that contribute unique perspectives of relevance to NSW Health.

The eight frameworks are:

1.	The Sax Institute Model	Redman, Jorm and Haines, 2008
2.	Framework for consideration of evidence and context in development of health policy recommendations	Dobrow et al., 2006
3.	Knowledge to Action (KTA)	Graham and Tetroe, 2009
4.	Evidence-based decision making framework	Lomas, 2003
5.	Translational framework for public health research	Ogilvie et al., 2009
6.	Model of categories and organisational attributes	French et al., 2009
7.	Promoting Action on Research Implementation in Health Services (PARiHS)	Kitson et al., 2008
8.	Participatory Action Knowledge Transfer (PAKT)	McWilliam et al., 2009

1.   THE SAX INSTITUTE MODEL (REDMAN, JORM AND HAINES, 2008)

Context: The Sax Institute Model is one of only three frameworks we identified that focus exclusively on the use of evidence in policy (for the others see Bowen & Zwi, 2005, and Shaxson, 2009). The model was developed to underpin the programs developed by the Sax Institute to increase the use of evidence from research in policy.

Purpose: The model is designed to identify factors that might be amenable to intervention and change. The model describes the attributes of the 'actors' that promote the use of research in policy, and mechanisms that might enable actors to generate and use more policy-relevant research.

Conceptualisation: The Sax Institute model views the process of research use in health policy as a complex system of interactions between policy makers, researchers, universities, research funders, government and the wider community (including the media). The model describes attributes and mechanisms (tools and enablers) that support these actors to generate and use more policy-relevant research. Enablers and tools include appropriate research infrastructure (research capacity and resources); brokerage services that can help policy makers formulate researchable questions, and access and use existing research evidence; research summaries that help policy makers answer key questions; and the development of partnerships between policy makers, service providers and researchers to promote new research that is relevant to policy and program priorities (see Figure 2).
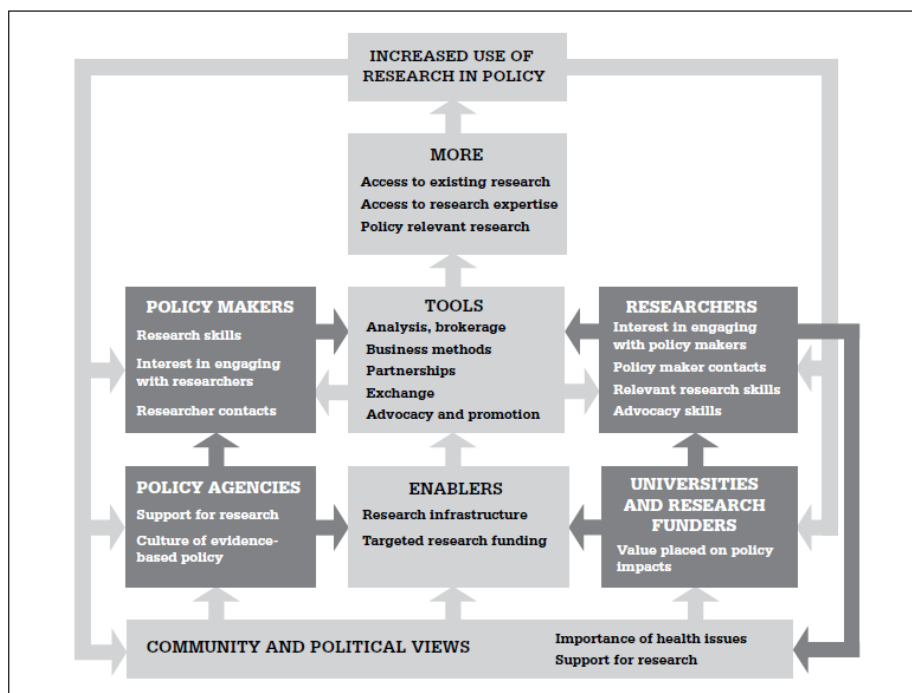

Figure 2: Actors and enables of increased use of research in policy (Redman et al., 2008)

Factors perceived as influencing the use of research:

- Attributes of individuals such as skills, interest in partnership and collaboration;
- Contextual factors for policy makers and researchers, and the value placed on the generation and use of policy-relevant research in health in these different contexts; and
- Tools and enablers that can be made available to policy makers, researchers and the wider community to increase access to, and uptake of, policy-relevant research.

2.   FRAMEWORK FOR CONSIDERATION OF EVIDENCE AND CONTEXT IN THE DEVELOPMENT OF HEALTH POLICY RECOMMENDATIONS (DOBROW et al., 2006)

Context: The framework emerged from a review of four expert groups formulating policy recommendations for different types of cancer screening. The authors caution that the framework has not been tested in other health contexts. However, the framework draws attention to the importance of understanding how the context in which policy is developed affects the use of evidence.

Purpose: The framework seeks to emphasise the importance of contextual factors in determining what constitutes evidence and how that evidence is used in different types of policy-making.

Conceptualisation: The use of evidence is conceptualised as a three-stage process: identifying evidence (including decisions about what types of evidence to include); interpreting evidence (the quality and generalisability of the evidence); and applying evidence (how evidence is weighted, prioritised, and transformed to justify decisions). The authors argue that contextual factors both internal and external to decision-making processes influence the type and use of evidence at each stage. Internal contextual factors (an organisation's people and processes) are open to change, while external factors (such as political interests and resource constraints) tend to act as barriers or limitations. The most relevant types of evidence at each stage will also depend on the policy objective. For example, as policy objectives shift from effectiveness (will it work?) to appropriateness (should we do it?) and implementation (how do we do it here?), the nature of the evidence shifts from largely experimental to largely non-experimental, requiring different skills and abilities to interpret and use. Decision support tools, such as agreed decision principles and evidence hierarchies, may assist in using evidence in the decision-making process (see Figure 3).

Factors perceived as influencing the use of research:
- Evidence that is relevant and applicable to the policy objective;
- Contextual factors that may influence/modify how evidence is used by decision-makers; and
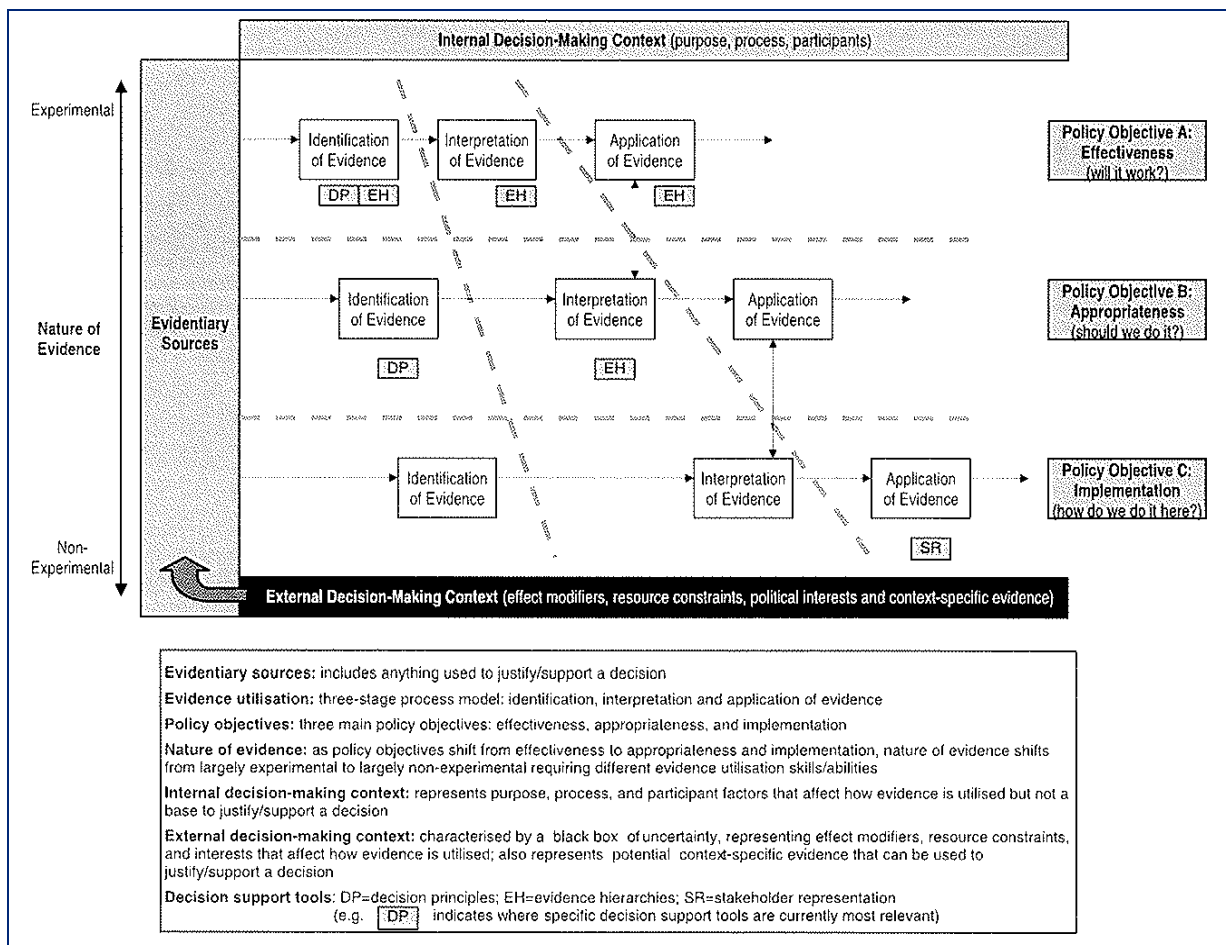- Tools to facilitate the use of evidence in decision-making processes.

Figure 3: Framework for consideration of evidence and context in development of health policy recommendations (Dobrow et al., 2006)

3. KNOWLEDGE TO ACTION (KTA; GRAHAM AND TETROE, 2009)

Context: The framework was developed by members of a national health research funding agency (the Canadian Institutes for Health Research, CIHR). It focuses on researchers leading the process of knowledge translation, and moving research evidence into health policy and practice. It includes the full spectrum of health research, that is, biomedical, clinical, health services and population health research.

Purpose: The framework aims to provide a theoretical basis for a range of initiatives being implemented by CIHR to increase the awareness and use of research knowledge to improve health outcomes and health care systems.

Conceptualisation: The framework views knowledge translation as a process that takes what we know from research and translates and applies it into what we do. Similar to the PARiHS model (see below), the Knowledge To Action (KTA) framework includes the key elements of evidence, context, and facilitation, that is, this translation process requires adapting knowledge to the local context, considering potential barriers, determining appropriate actions or interventions, monitoring and evaluating those actions, and sustaining those changes (see Figure 4). The KTA framework is underpinned by 'sustained interactivity' between researchers, policy makers and practitioners, to support ongoing exchange, to

provide opportunities for personal two-way communication, and to facilitate partnership approaches to research-policy initiatives. The degree of engagement between researchers and policy makers or practitioners depends on the strength of the evidence, the potential impact of the evidence on policy, and what is practical and feasible in a particular context. For example, at the end of a research project ('end of grant KT') researchers may consider activities such as publications and presentations to peers, policy makers or practitioners, ensuring these are brief, relevant and tailored to their audience. At the beginning of a research project, researchers might work together with policy makers in planning, designing, and interpreting policy-relevant research ('integrated KT').

Factors perceived as influencing the use of research:
- Evidence that is relevant and applicable to the needs of research users;
- Evidence that is tailored for use in local policy and practice contexts;
- Interactions and partnerships between researchers and research users; and
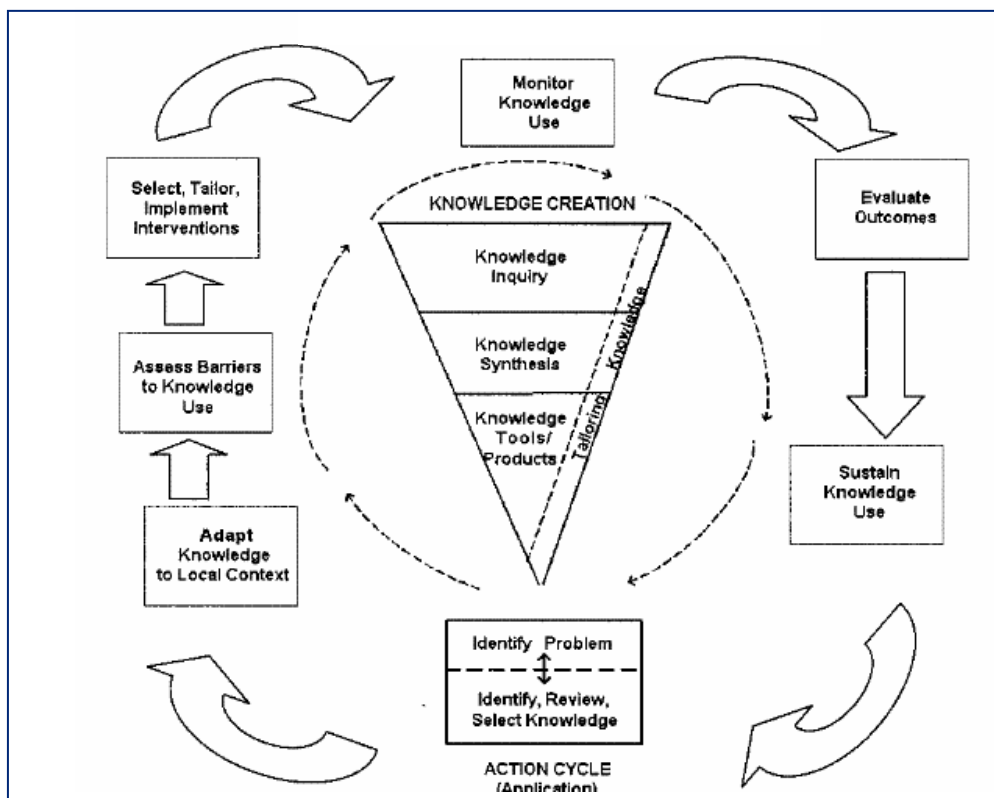- Strategies and tools that help address barriers to research use.

Figure 4: Knowledge to Action framework (Graham and Tetroe, 2009)

4. EVIDENCE-BASED DECISION MAKING FRAMEWORK (LOMAS, 2003)

Context: The framework was cited in a large report of the review of Australia's health and medical research sector (Grant, 2004)

Purpose: The framework aims to demonstrate the role of research in relation to other factors that contribute to evidence-based decision-making, and to identify how to best support the use of research in this process.

Conceptualisation: The framework sees evidence-based decision-making as a highly-interactive process involving four key groups of actors: decision-makers; research funders; researchers; and knowledge purveyors (public relations, media, etc). The author argues that there are at least six areas where mechanisms can be used to enhance the conduct and use of research in decision-making: priority-setting structures (to help decision-makers get the research they need); funding and training (to help researchers deliver the needed research); research synthesis and influence (to facilitate the sharing of research evidence and its use in advocacy); critical evaluation (to help determine the relevance and usefulness of research); receptor capacity (the ability of decision-makers to understand and use research); and linkage and exchange (to facilitate dialogue and partnership between decision-makers and researchers) (see Figure 5).

Factors perceived as influencing the use of research:
* Evidence syntheses to help communicate research findings;
* Organisational capacity building, including resources/processes that support priority setting for health issues;
* Skills development and capacity building to conduct and use priority-driven research; and
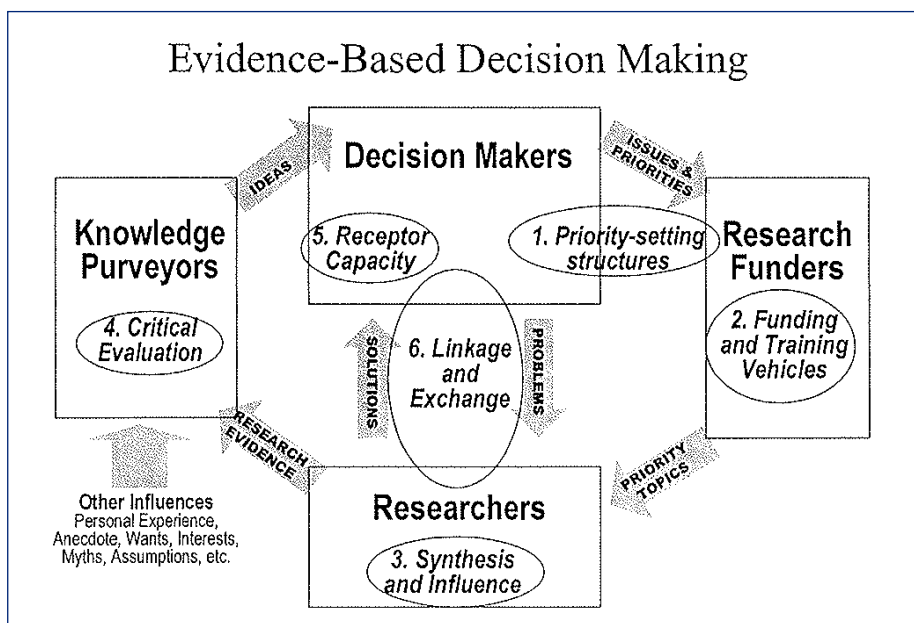* Interactions between researchers and decision-makers to facilitate communication and partnerships.

Figure 5: Evidence-based decision making framework (Lomas, 2003)

5.   TRANSLATIONAL FRAMEWORK FOR PUBLIC HEALTH RESEARCH (OGILVIE et al., 2009)

Context: The framework was developed to demonstrate the complexity of the knowledge translation process in public health, and to show how this differs from the more linear medical model of knowledge translation referred to in the Cooksey report into the UK's health research funding (http://www.hmtreasury.gov.uk/cooksey_review_index.htm).

Purpose: This framework shows the pathways by which different types of evidence can influence public health policy and practice, and how feedback loops can then influence future research.

Conceptualisation: The framework views knowledge translation as a multifaceted process which transforms policy or practice by a 'gradual sedimentation of ideas' rather than by a single translational event. It recognises that research evidence is one of several factors that may influence health policy and practice, including political imperatives, resistance to change, and the media. This framework includes research at individual and collective levels, across the research spectrum from biomedical to applied, and from multiple disciplines (including health, psychology, sociology, anthropology and economics). The process of evidence synthesis is therefore pivotal to presenting research evidence in a way that can inform policy and practice (see Figure 6). The desired endpoint, population health improvement, includes changes in health-related behaviour as well as changes in mortality, morbidity and quality of life. Epidemiological surveillance of these end points provides feedback data to inform new research and policy. The authors also advocate the need for 'credible intermediaries', such as knowledge brokers, to facilitate knowledge translation processes at various points in the framework.
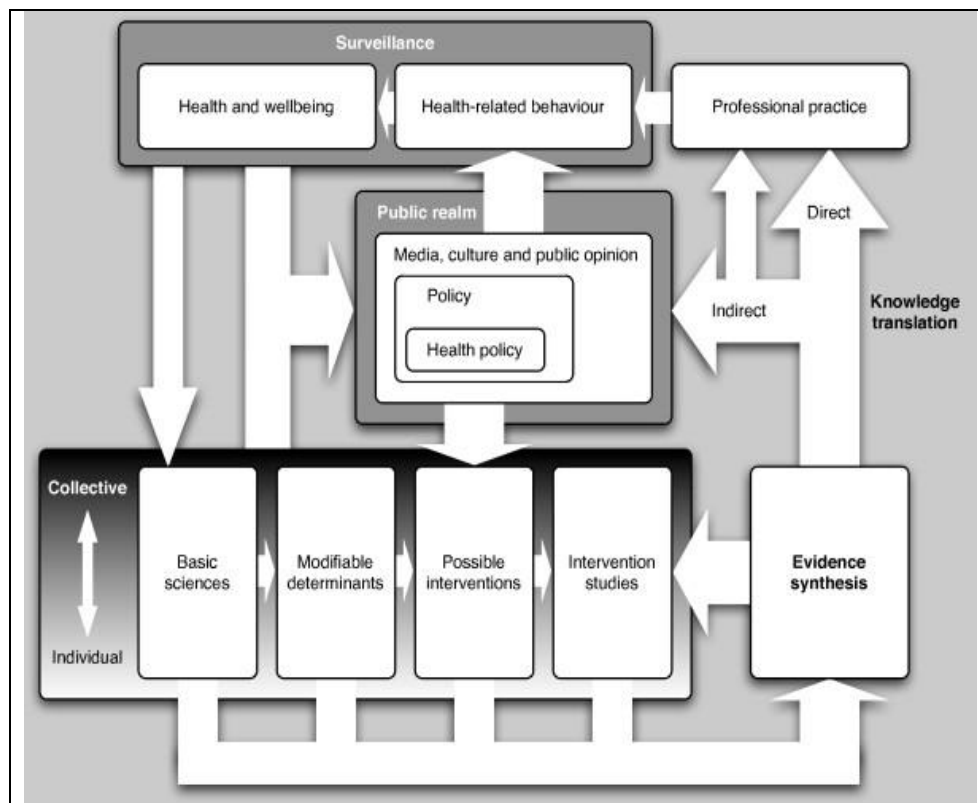

Figure 6: Translational framework for public health research (Ogilvie et al., 2009)

Factors perceived as influencing the use of research:

- Expanded evidence syntheses which integrate multiple sources and types of evidence
- Interactions between researchers, policy makers and practitioners to facilitate communication and exchange
- Facilitators who can assist with the knowledge translation process

6. *MODEL OF CATEGORIES AND ORGANISATIONAL ATTRIBUTES (FRENCH et al., 2009)*

Context: The model rests on the premise that organisational enablers can facilitate evidence-based practice, and that evidence from management theories may provide insights into the specific types of organisational factors involved.

Purpose: The model helps organisations seeking to build capacity for evidence-based practice by identifying a range of factors that can be acted upon to enhance this process.

Conceptualisation: The model is somewhat unique in its focus on building organisational capacity for research-informed decision-making. It is based on a structured literature review searching for measurement tools in four areas: research use, research activity, knowledge management, and organisational learning. Thirty tools that included measures of organisational factors were identified, and based on item extraction and analysis, 15 factors that might support the use of evidence in policy and practice are proposed (see Figure 7, outer circle). The factors include concrete tools and resources (e.g., access to research databases, research expertise) as well as less tangible factors (e.g., a supportive culture that values skills and knowledge). The factors are grouped into one of two types of organisational capacity: 'absorptive capacity' - an organisation's ability to recognise the value of new knowledge and assimilate it; and 'receptive capacity' - the ability to facilitate the transfer of new knowledge into local practices. The factors are also linked to seven broader categories: three 'core' common categories of vision, leadership and a learning culture; and four categories of activity – knowledge need, acquisition of new knowledge, knowledge sharing, and knowledge use.

Factors perceived as influencing the use of research:

- Organisational enablers that support research acquisition and use;
- Tools and resources that support research access and use; and
- Systems and processes to support internal and external collaborations (including networks).
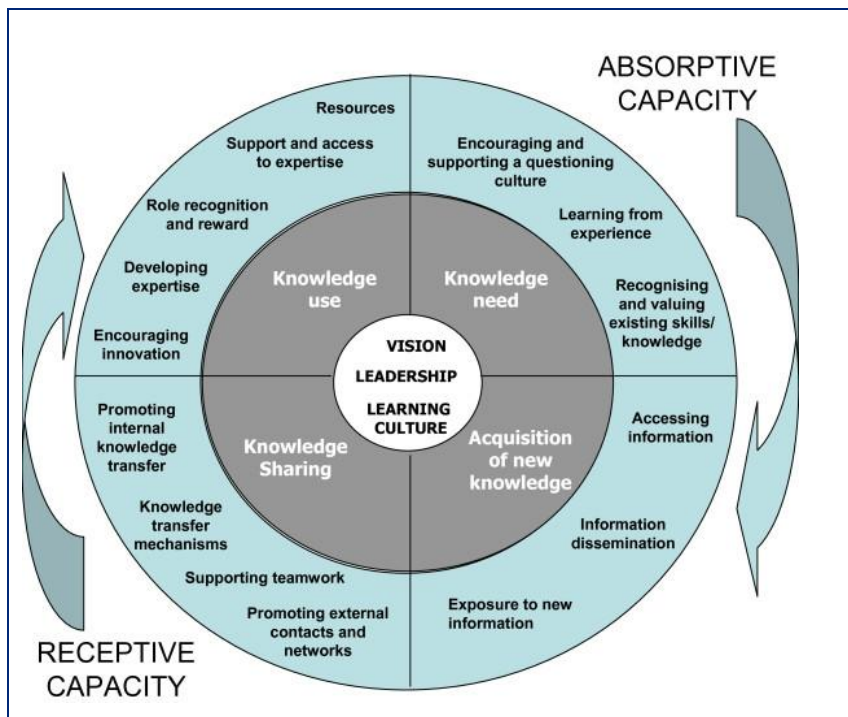
Figure 7: Model of categories and organisational attributes (French et al., 2009)

7. PROMOTING ACTION ON RESEARCH IMPLEMENTATION IN HEALTH SERVICES (PARiHS; KITSON et al., 2008)

Context: This model focuses on the process of implementing research into health practice. The authors published an earlier framework (1998), and as a result of ongoing testing and refinement, have proposed the PARiHS model. Although it focuses more on the dissemination of research into practice, we have included this model because it places evidence from research in a broad context with other kinds of evidence. (Note that the model by Dobrow and colleagues (2006), described above, also considers the wider context of evidence but within the sphere of health policy.)

Purpose: The model provides a theoretical and practical tool to guide researchers, decision-makers and practitioners in understanding and testing the process of implementing research into practice.

Conceptualisation: The model suggests that successful implementation of research into practice is dependent on three core elements – the level and nature of the evidence; the context or environment into which the research is applied; and the ways in which the process is facilitated (see Figure 8). Research is one of four types of evidence; the others being clinical experience, patient preferences and routinely collected information. In order to influence practice, research evidence must be integrated with the other types of evidence, through social interaction processes that may involve researchers, research users, and facilitators. The PARiHS model is structured in two phases: a preliminary examination of the evidence and context (see Figure 8); and a determination based on this, of the most appropriate facilitation method(s).
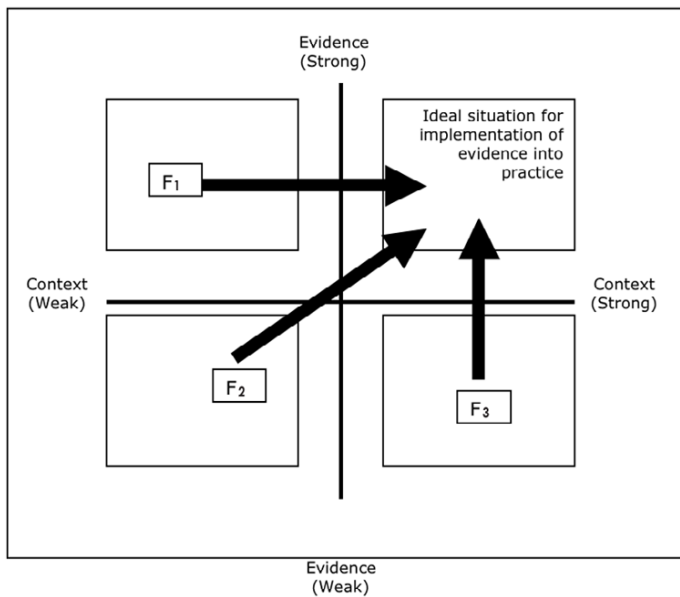
Figure 8: PARiHS Diagnostic and Evaluative Grid (Kitson et al., 2008)

Factors perceived as influencing the use of research:
- Research evidence integrated with existing knowledge and practices;
- Organisational factors that support research use;
- Relationships between researchers, decision makers and practitioners to foster trust and mutual cooperation;
- Facilitation strategies matched to the 'readiness' of individuals, team and context.

8.   PARTICIPATORY ACTION KNOWLEDGE TRANSFER (PAKT; MCWILLIAM et al., 2009)

Context: PAKT is the most participatory model and explores the process of implementing knowledge transfer through social interaction, that is, how the players involved shape and influence the knowledge received, through their interaction, their individual characteristics and broader organisational factors. This model is focused on dissemination of evidence but we have included it because it considers the interpretation of evidence from research and emphasises the role of local context.

Purpose: The model aims to provide guidance on how to proactively construct a 'fit' between the the type of evidence to be transferred, the context and facilitation tools and resources.

Conceptualisation: The model proposes that the uptake and transfer of evidence into practice rests in the interaction between practitioners, evidence and a facilitator. Evidence-based practice is therefore not an individual cognitive process, but rather is *learned* through interactive processes which allow participants to co-construct a new 'knowledge' that integrates their interpretation of the original evidence, their views on how the evidence fits within the local context, what barriers need to be overcome, what strategies may address them, and what people, tools and resources might facilitate the process (e.g., internal

facilitators, facilitation guides, group process evaluation forms, mentoring). The model also integrates individual, team and organisational factors that may impact these interactive processes (see Figure 9). The authors argue that strategies and solutions for knowledge transfer should be determined by the research content, the context and the people involved.
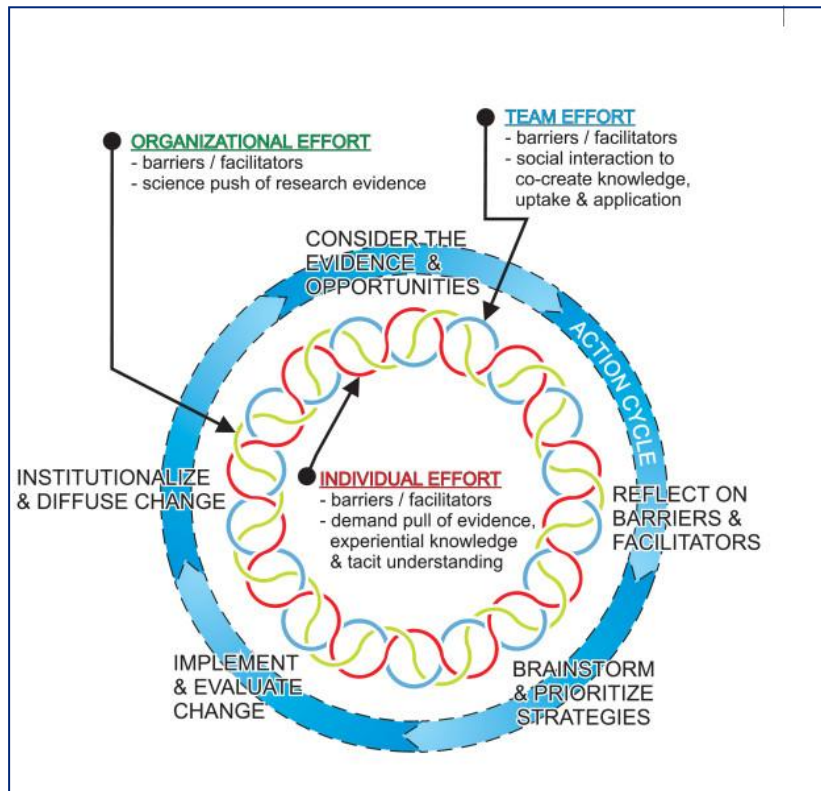

Figure 9: PAKT (McWilliam et al., 2009)

Factors perceived as **influencing the use of research:**
- Research evidence integrated with existing knowledge and practices;
- Organisational factors that support research use;
- Relationships between researchers and research users; and
- Facilitation tools and resources.

Factors that may potentially increase the use of evidence in population health policy and programs

Many factors have been identified as potentially important in increasing the use of evidence from research in health policy and programs. In identifying factors likely to be important to NSW Health and population health policies and programs, we drew on the models described earlier in this report, and a large number of surveys and commentaries. There was considerable agreement between factors nominated through these sources, and one or two differences. As outlined in the next section, the value of only a few of these strategies has been tested.

The review questions included strategies to increase the use of *existing research* and strategies to *generate new research*. The focus of most of the papers was on the use of existing research; however, it is likely that factors that promote the use of existing research will also encourage the generation of new research. As described above, we undertook a targeted search about the generation of new research and the results of this search are considered separately below (pp 11-12).

FACTORS EMERGING FROM THE FRAMEWORKS AND MODELS

Based on our analysis of the eight frameworks and models, as well as the remaining frameworks listed in Appendix 2, the following five factors appear to be commonly identified as influencing the use of research; all are of relevance to an organisation like NSW Health seeking to increase the use of research in population health policy and programs. Most of these factors relate both to the use of existing research and to the generation of new research.

- **The nature and relevance of the evidence**, that is, research is more likely to influence policy and practice if it is targeted at its intended audience(s), relates to the priorities and work of the people involved, is timely, and synthesised and presented in a format that is easily understood (Bowen & Zwi, 2005; Dobbins et al., 2002; Dobrow et al., 2004; Graham & Tetroe, 2009; Kitson et al., 2008; Lomas, 2003; Ogilvie et al., 2009; Redman et al., 2008; Scott et al., 2008; Shaxson, 2009b; Swinburn et al., 2005; Wandersman et al., 2008).

- **The context in which the evidence is to be used,** that is, research is more likely to influence policy and practice if it is presented in a way that demonstrates its relevance and applicability to local circumstances, and if local users develop a shared understanding of the research and its applicability in their context (Dobbins et al., 2002; Dobrow et al., 2004; French et al., 2009; Graham & Tetroe, 2009; Kitson et al., 2008; McWilliam et al., 2009; Scott et al., 2008; Swinburn et al., 2005; Wandersman et al., 2008).

- **Interactions between researchers, research users and other stakeholders**, that is, research is more likely to influence policy and practice if trusting relationships have been established between researchers and research users, researchers understand the priorities and needs of research users, users are engaged as partners with researchers in defining the purpose and design of research, and research results are presented in a

way that answers key questions of users and other stakeholders (Graham & Tetroe, 2009; Lomas, 2003; McWilliam et al., 2009; Ogilvie et al., 2009; Redman et al., 2008; Shaxson, 2009b; Swinburn et al., 2005; Wandersman et al., 2008).

- **The organisation's readiness to receive and use evidence**, that is, research is more likely to influence policy and practice in organisations that have leaders who value the use of research, promote a learning and questioning culture, provide opportunities for skills development and training in research and research use (Bowen & Zwi, 2005; Dobbins et al., 2002; Dobrow et al., 2004; French et al., 2009; Kitson et al., 2008; Kontos & Poland, 2009; Lomas, 2003; McWilliam et al., 2009; Redman et al., 2008; Satterfield et al., 2009; Swinburn et al., 2005; Wandersman et al., 2008).

- **The availability of, and access to, supportive resources and tools,** that is, research is more likely to influence policy and practice in organisations that provide access to databases or libraries of research summaries, people with technical research skills and expertise who can help explain and interpret research, and people who can facilitate the identification and use of research such as knowledge brokers and knowledge networks (French et al., 2009; Graham & Tetroe, 2009; Kitson et al., 2008; Kontos & Poland, 2009; Lomas, 2003; McWilliam et al., 2009; Ogilvie et al., 2009; Redman et al., 2008; Shaxson, 2009a; Swinburn et al., 2005; Wandersman et al., 2008).

FACTORS EMERGING FROM SURVEYS, INTERVIEWS AND OPINIONS

We identified 110 papers summarising surveys, interviews and other opinions about factors that may be important in increasing the use of evidence from research in policy and programs (see Appendix 3 and Appendix 4 for further details). For the most part these strategies are likely to be relevant to the generation of new relevant research. One of these papers is a review of 24 surveys of opinion makers; it suggested that the factors that were most likely to increase the use of evidence in practice are personal contact with researchers, timely relevance of research, and the inclusion of summaries of policy recommendations (Innvaer et al., 2002).

Overall, the 110 papers identified four kinds of factors that are potentially important:
- Relevant, useful, accessible research;
- Frequent interaction between researchers and policy makers;
- Organisational readiness to use evidence from research; and
- Supportive resources and tools.

These factors are detailed below. We also include discussion of the limited number of opinion pieces that referred specifically to strategies to increase the generation of new evidence from research.

Relevant, useful, accessible research

Eighteen studies explored views about how to increase access to evidence from research that is useful to policy makers. Indeed, most of the studies included in this review identified access to research as very important in determining use. The studies identified a number of different types of access issues that are likely to be important including: the use of data of

high relevance to the agency, including local data; the format of the review or research including summaries; and ease of access to this information. In summary:

Relevance

- There were some views that involving policy makers and health managers in defining key questions and methods for the production of reviews would make the review or research more relevant and therefore increase its use (Anderson et al., 2008; Lavis et al., 2005; Lavis et al., 2006; Lomas et al., 2003).

- There was also a view that analyses of local information such as routinely collected health data and local evaluations, would be of particular value in increasing the use of research in policy (Armstrong et al., 2007; Jewell & Bero, 2008).

Format

- Most opinion was that research that has been synthesised and summarised is more likely to be used than single studies. There is general agreement that syntheses that bring together multiple sources of evidence are likely to be particularly valuable (Anderson et al., 2008; Armstrong et al., 2006a; Campbell et al., 2009; Cooke et al., 2008; Dobbins et al., 2004b; Dobbins et al., 2007a; Innvaer et al., 2002; LaPelle et al., 2006; Renfrew et al., 2008; Walter et al., 2003b).

- The Canadian Health Services Research Foundation (CHSRF) was among the first to consider the format of the review. They developed a standard format for reader-friendly writing called "1:3:25", comprising one page of main messages, followed by a three-page executive summary , and the research findings in no more than 25 pages, written in language that a person not trained in research would understand (CHSRF http://www.chsrf.ca/knowledge_transfer/pdf/cn-1325_e.pdf).

- There are divergent views about the extent to which summaries are more valuable if they focus just on reporting the findings of research or if they include commentaries on the evidence such as recommendations, policy implications, contextual information and economic evidence. The different views about the value of commentaries may depend on the position in the organisation and the proposed use of the review or research (Armstrong et al., 2006a; Cooke et al., 2008; Dobbins et al., 2001; Dobbins et al., 2004c; Innvaer et al., 2002; Jewell & Bero, 2008; Lavis et al., 2005; Poulos & Zwi, 2007; Weatherly et al., 2002).

Access

- Policy makers identified some preferences for how to receive research evidence, including through the use of websites, email notifications, conferences and workshops, and journal articles. They also felt that registries of reviews and promoting the use of databases such as the Cochrane Health Promotion and Public Health field and the Effective Practice and Organisation of Care group may increase use (Adily & Ward, 2004; Adily & Ward, 2005; Anderson et al., 2008; Cooke et al., 2008; Dobbins et al., 2007b; LaPelle et al., 2006).

Frequent interaction between researchers and policy makers

Six studies explored the role and impact of interaction between researchers and policy makers in increasing the use of existing evidence. In summary:

- Most opinion was that interaction between researchers, policy makers and practitioners is likely to increase the use of research (Cooke et al., 2008; Denis et al., 2003; Denis & Lomas, 2003; Ginsburg et al., 2007; Golden-Biddle et al., 2003; Innvaer et al., 2002; Jewell & Bero, 2008; Kitson et al., 2008; Lavis et al., 2002; Lomas, 2000; McWilliams et al., 2009; Mitton et al., 2007; Ross et al., 2003; Walter et al., 2003a).

- Several kinds of interaction were identified as potentially important including: consultation, sharing knowledge, building relationships, and collaborative research partnerships (Ginsburg et al., 2007; McWilliams et al., 2009; Walter et al., 2003a), and several types of participants, such as policy makers, practitioners, stakeholders, and peers (Cooke et al., 2008; Jewell & Bero, 2008; Ross et al., 2003).

- Some of the surveys and commentaries suggested that the use of intermediaries such as knowledge brokers and research experts might increase the use of evidence, by developing customised strategies that are responsive to context; by building policy-research relationships; and by increasing research users' capacity to use evidence (Armstrong et al., 2007; Greenhalgh et al., 2004; Kitson et al., 2008; Lomas, 2000; Scott et al., 2008).

- Some of the surveys and opinion pieces indicated that web-based and electronic tools could possibly be used to support interaction between researchers, policy makers and stakeholders, e.g., to conduct forums and consultations (Ginsburg et al., 2007; LaPelle et al., 2006; Renfrew et al., 2008).

Organisational readiness to use evidence from research

Twelve studies explored views about the impact of organisational readiness or receptivity to using research, or the broader concepts of evidence and knowledge. In summary:

- Health and other professionals claim that a supportive organisational culture characterised by attributes such as supportive leadership, a learning culture that values knowledge, and investment in skills development and capacity building, will contribute to increased research uptake (Adily & Ward, 2004; CHSRF, 2008; Cooke et al., 2008; Dobbins et al., 2001; Dobbins et al., 2004c; Dobbins et al., 2004b; Jewell & Bero, 2008; LaPelle et al., 2006; Pagoto et al., 2007; Walter et al., 2003b).

- Government reports from the UK, Canada and Australia also nominate these factors as important (Banks, 2009; Davies, 2004; Welsh Assembly Government, 2002; Willis, 2006).

Supportive resources and tools

Seven studies explored views about the use of systems, processes, resources and tools. In summary:
- Health professionals claimed that access to repositories of evidence (e.g., databases and registries) contributes to increased research uptake (Adily & Ward, 2005; Cooke et

al., 2008; Dobbins et al., 2007b; Scottish Executive, 2005). However, a substantial body of literature from evidence-based medicine has consistently demonstrated that such passive dissemination tools, when used in isolation, are ineffective in encouraging research use (Armstrong et al., 2006a; Brownson et al., 2007; NHS Centre for Reviews and Dissemination, 1999).

- There appears to be some interest in the use of facilitators (knowledge brokers and other intermediaries) who can work with research users to promote interaction, discussion and use of research (Armstrong et al., 2007; Dobbins et al., 2009a; McWilliam et al., 2009; Scottish Executive, 2005; Scottish Executive, 2006; Shaxson, 2009b).

Strategies to increase the generation of new relevant research

Many of the above strategies are relevant both to increasing the use of existing evidence and to generating new relevant research. However, we found 8 papers that provided specific comment focused on increasing the generation of new relevant research (Bell et al., 2002; Denis et al., 2003; Goering et al., 2003; Graham et al., 2004; Hanney et al., 2003; Lomas, 2000; Lomas, 2007; Ross et al., 2003). These papers suggested the following strategies as having the potential to generate new research of greater relevance to policy agencies:

- ***Gaining agreement about research priorities***: It has been argued that agreement about research needs can be used to stimulate researchers to consider addressing questions of relevance to policy agencies (Hanney et al., 2003; Harman, 2000). This approach has been used to agree a research agenda (e.g., CHSRF Listening for Direction; NHMRC's approach to strategic research, www.nhmrc.gov.au/guidelines/consult/index.htm). Priorities are often developed through policy/research workshops and forums – these may also function by improving collaboration and communication, and by identifying knowledge gaps, priorities and strategic opportunities for new initiatives (Bell et al., 2002; Denis et al., 2003; Goering et al., 2003; Graham et al., 2004; Hanney et al, 2003; Lomas 2007; Ross et al., 2003). However, we were unable to locate any evidence that priority setting resulted in research that was regarded as more relevant or was more used in developing policy (Grant, 2004; Lomas et al., 2003; see also http://www.chsrf.ca/other_documents/listening/documents/LfDIII-FINAL_ENG.pdf).

- ***Establishing partnership research programs:*** Opinion also suggests that research that is undertaken in partnership between researchers and policy makers where policy makers are involved in developing the research questions, undertaking the research, interpreting the findings and disseminating the results is likely to have a greater impact on policy (Anderson et al., 2008; Grant, 2004; Lomas, 1997). While policy makers and researchers view such partnerships positively, several authors commented that there may be a need for support in implementing them in practice, such as time to participate in collaborative activities and research generation; opportunities to use research skills; and participation in peer, scientific and policy/research forums (Antil et al., 2003; Denis et al., 2003). Opinion is also that long term partnerships in programmatic research are more likely to result in research that is relevant to policy. Based on the CHSRF experience, for example, Lomas reported that researchers were more likely to commit to partnerships of longer duration (up to 5 years) rather than shorter, as the longer timeframe made the

commitments of time and effort to establishing and maintaining relationships worthwhile (Lomas, 2000). There are also examples of highly effective long term partnerships that have resulted in research that has made a substantial contribution to policy development (e.g., Manitoba Centre for Health Policy, http://umanitoba.ca/medicine/units/mchp/).

- *Commissioning and co-funding research*: In co-funded research, the policy agency contributes to the cost of undertaking research, either alone or with a research funding agency. Lomas reported that co-sponsorship funding structures (where CHSRF and regional health services each funded half the costs of programs) promoted partnerships between policy makers and researchers, and increased motivation for linkage and exchange more generally (Lomas, 2007). ARC Linkage Grants and NHMRC Partnership Awards are based on this premise. More commonly an agency may decide to commission research around a particular question.

- *Encouraging research using local data:* Research using local data is thought to be more likely to increase the use of evidence in practice. Increased capacity to use routinely collected data (such as information about the use of hospital services, general practice and medications) and to link these together create considerable new opportunities for providing locally relevant data (Jewell & Bero, 2003; Redman et al., 2008). The Manitoba Centre for Health Policy also illustrates the ways in which local data can be used to provide information of relevance to policy makers in Canada. The Western Australian Data Linkage System has undertaken many analyses over a number of years, some of which have had a considerable impact on policy (http://www.datalinkage-wa.org/). In NSW, the establishment of CHeReL, the 45 and Up Study and the new Population Health Research Network create new opportunities for the rapid analysis of local information relevant to policy and programs.

- **Integrating research into the roll out of policies and programs:** The integration of research into the roll out of major policies and programs also has potential to generate research findings of use to policy makers. There has been development of these approaches in the United Kingdom (e.g., Government Social Research Service, http://www.civilservice.gov.uk/networks/professional/gsr/index.aspx) and in Canada (e.g., Population Health Intervention Research Centre, http://www.ucalgary.ca/PHIRC/). This is one of the few ways to ensure that research about the impact of programs that are large scale and potentially sustainable can be undertaken.

SUMMARY OF FINDINGS ABOUT FACTORS THAT MIGHT CONTRIBUTE TO THE USE OF RESEARCH IN POLICY AND PROGRAM DEVELOPMENT

Considering both the conceptual models and the commentaries and opinion surveys, it is possible to identify five factors that might potentially increase the use of evidence in policy and program development:
- Mechanisms to ensure **ready access to research findings and summaries** of research;
- **Frequent interaction** between researchers and policy makers;
- **Organisational readiness** to use evidence from research;
- Supportive **resources and tools;** and

- Mechanisms for the generation of **new evidence from research** that is highly relevant to the priorities of the agency and applicable to local circumstances.

Evaluation of the impact of strategies to increase the use of evidence in policy and programs

Despite the wealth of surveys and commentaries suggesting factors that might increase the use of evidence from research in policy, this review found almost no tests of the extent to which these strategies did in fact improve the use of evidence in policy or programs. We identified **only six studies** that had set out to evaluate the extent to which various strategies increased the use of evidence; together they provide only small indications of effect. We have linked these studies with the factors that have been suggested by the conceptual frameworks, opinion surveys and commentaries as likely to be important. It should be noted that all studies are relatively weak methodologically, due to design issues and/or small sample sizes.

We found **no studies** testing the effectiveness of strategies to increase the generation of new policy-relevant research.

Relevant, useful, accessible research

One study looked at **strategies to promote** increased access to, and use of, relevant research.

- Dobbins and colleagues (2009b) compared three types of interventions designed to increase the use of research evidence in health promotion policies and programs. The study involved program managers and program directors from 108 health departments across Canada, who were randomly assigned to one of three interventions of varying intensity for 12 months (n=36 per group): i) access to an online registry of systematic reviews of public health interventions – the most minimal intervention (HE) ; ii) access to the same online registry plus tailored, weekly targeted messages for seven weeks, advising of articles in the registry relevant to their program area (healthy weight promotion) (TM) – a middle intensity intervention; or iii) access to the same online registry plus tailored, targeted messages, plus a knowledge broker (KB) who worked one-on-one with the decision-makers in the public health departments – the greatest intensity intervention. The KB helped to develop plans for individual and organisational capacity building, identified new evidence, assisted in the interpretation of evidence, and conducted training sessions to help participants critically appraise different knowledge sources. Data on organisational, environmental, and individual characteristics were collected at baseline (August 2004) and following the intervention (February 2006). Two self report outcome measures were used: participants were asked to report on (a) the extent to which they considered research evidence when making a recent program-planning decision, referred to as global decision making by the authors and (b) the extent to which eleven policies or interventions with good evidence of effectiveness were being implemented by each of the health departments, referred to as policies and programs by the authors. There was no significant difference between the three intervention groups in the extent to which research evidence was considered when making a recent program-planning decision – that is, there was no benefit from the more intensive interventions (targeted messages and knowledge broker) over the more minimal intervention on global decision making. However, some between-group differences were observed in the extent to which participants reported the use of evidence-based programs in their health department (policy and programs); health

departments receiving the middle intensity intervention (TM) improved to a greater extent than the departments receiving either of the other two interventions. The authors suggest that the findings might indicate that organisations need 'just the right amount of information'.

Further analyses suggested that organisational measures may moderate these effects, specifically the extent to which an organisation has a research culture, an organisation's expectations around the use of research evidence, and how frequently participants hear the term research evidence in their organisation; however the number of organisations is small for these comparisons.

Summary: This study provides some evidence that tailored, targeted messages plus access to website information can improve the use of evidence in comparison to access to website information alone. It suggests that doing more (that is the intensive strategy) does not necessarily result in greater use of evidence. These strategies may be more effective in some organisations than others (for example, those with a high research culture). This study is important and is more rigorous than previous studies; however, the sample in each cell is relatively small and the outcome measures are self report.

Frequent interaction between researchers and policy makers

One study looked at the impact of interaction on the use of research.

- Kothari and colleagues (2005) conducted a matched case-control study to examine whether interaction between users and producers of research evidence was associated with a higher level of its use in the design and delivery of health care programs. Responses to the dissemination of a research report on breast cancer prevention were compared between two groups of public health units in Ontario: the first group comprised three public health teams that had interacted with the research organisation commissioned to produce the research report, and the second group comprised three teams that had not. The first group's interaction extended over a year and included providing feedback to the research organisation on draft versions of the report, and attending a meeting where members of the research organisation presented the report's findings. Data were collected through group interviews and document reviews approximately 6-8 months after the report was released, and included information on dissemination, the interaction, research utilisation, and organisational and environmental factors associated with each public health unit.

  Analysis of the teams' comments suggested that the interaction process helped to educate the interacting teams about the research process and its limitations for the breast health report. Interacting teams were more articulate about the value of the report, and had higher expectations about being able to use the report. However, there was no difference between the two groups in the use of the report: both groups reported using the document to confirm the appropriateness of current knowledge and practices, and to compare the breast health practices in their region with those in other regions.

  Summary: The study provides some evidence that interaction between public health units and researchers increases the understanding of the research but does not increase its use. The study is limited by the small number of teams in each group.

Training in research receptivity

Two studies examined the impact of training to increase the use of research.

- Taylor and colleagues (2004) used a prospective randomised controlled trial to assess the effectiveness and cost of the Critical Appraisal Skills Programme (CASP), one of the most widely used forms of critical appraisal skills training in the UK. The program is designed to help participants systematically examine research to assess study validity, the results, and their relevance to a particular clinical scenario. Participants practise these skills during the training session, by critically appraising a systematic review article, and then receive follow-up materials following the training session. Over a three-month period, 1305 practitioners were sent invitations to participate; 145 accepted. Seventy-three medical practitioners and healthcare managers/administrators were randomly assigned to receive training, and 72 were randomly assigned to a waiting list. Both the intervention and control groups completed a questionnaire six months after the training workshop, and critiqued a systematic review article. The questionnaire explored knowledge of the principles for appraising evidence, attitudes towards the use of evidence, perceived confidence in appraising evidence, and reading and evidence-seeking behaviour. The participants' appraisals of the review were independently assessed by two of the authors using a five-point visual analogue scale.

  The data were analysed on an intention-to-treat basis, however 21 of the 73 participants randomised to the training group did not attend, so secondary exploratory analyses were performed comparing those who actually received the training with those who did not. The primary analyses showed statistically significant ($p<0.05$) but small improvements in overall knowledge about research principles and in the ability to critically appraise research results in the training group compared with the control group. No differences were found in perceived confidence, attitude towards research, or evidence-seeking behaviour. The program cost was approximately 250 GBP per person, the majority of which was salary costs for the participants attending the training (around 140 GBP). Secondary analyses showed a bigger difference in research knowledge, but no other significant difference.

  Summary: The study suggests that a half-day training session for practitioners may elicit small improvements in research knowledge and critical appraisal skills, but no change in attitudes towards the use of evidence or evidence-seeking behaviour. One-off educational interventions may have limited effect on the use of research.

- Denis and colleagues (2008) evaluated the Executive Training for Research Application (EXTRA) program, led by the Canadian Health Services Research Foundation (CHSRF). This program aims to improve receptor capacity for research among senior health service executives and the organisations in which they work. The two-year program is structured around residency sessions, the development and implementation of an intervention project, an information management component, a mentoring system, and learning networks. To date, five cohorts have enrolled in the program comprising 128 senior professionals across 80 healthcare organisations in Canada. Each cohort has

ranged in size from 24 to 28 people. The program is evaluated annually, and relies largely on self-assessments by participants before, during and after the training program. This publication reports on the second graduating cohort (n=26) and compares self-assessment scores at entry and on graduation.

The results showed that the proportion of participants who rated themselves as excellent or very good on research literacy increased from 16% to 71%; knowledge of research-based evidence increased from 17% to 90%; skills for doing research increased from 0% to 24%; assessing the quality of research increased from 12% to 52%; knowledge of change management increased from 50% to 95%; and ability to promote the use of research evidence in their organisation increased from 16% to 86%. Participants had also identified more opportunities to use research in collaboration with other professionals (increase from 16% to 86%). Organisational changes (opportunities to learn more about research at work, opportunities to use research in collaboration with other professionals) showed more modest gains (0% to 24%, 0% to 9%).

Summary: The study suggests it is possible to increase self-reported research literacy and skills. However, this study uses only self reported outcomes and has small numbers. It is a highly intensive course for senior managers and its applicability to NSW Health is possibly limited.

Other organisational factors

Two studies examined organisational factors other than training that might influence the use of research. Neither of these tested the impact of strategies to increase the use of research in policy; we have included them in this section as they go beyond surveys or opinion and include other data as well.

- Dobbins and her colleagues (2001) examined the extent to which public health decision-makers used systematic reviews in policy development, program development and evaluation, and staff development. They also considered whether individual, organisational, or environmental factors predicted use. Five systematic reviews of the effectiveness of public health interventions had been disseminated to public health units. A cross sectional telephone survey was conducted two years later, involving 141 decision makers from 35 public health units, to assess perceptions of the extent to which the systematic reviews had influenced decision-making (using a five-point Likert scale ranging from one (no influence) to five (great influence). Individual demographic details were also collected from participants, as well as their perceptions of barriers to using research evidence in decision-making. A self-administered organisational demographic questionnaire was completed by an administrative assistant in each participating public health unit, providing information about the unit's size, perceived complexity, and culture of the organisation. Data were collected on environmental characteristics such as statutory regulations, and political and other relationships between the public health units, the health authorities and community organisations.

  In total, 89 participants (63%) reported using at least one systematic review in the past two years to make a decision. Of these, 40-50% reported that they perceived the review had a great influence on either program justification or program planning decisions. However, 37-44% indicated that the review had not influenced decisions relating to policy development, program evaluation, or staff development. Separate multiple linear

regressions were conducted to identify predictive factors for use of systematic reviews in i) policy development decisions; ii) program planning decisions; iii) program justification decisions; iv) program evaluation decisions; and v) staff development decisions. Together, these analyses suggested that the more value an organisation places on the use of research in decision-making, and whether an organisation provides ongoing critical appraisal skills training, may be predictors of the influence systematic reviews have on decision-making. These results should be interpreted cautiously given the number of analyses and the relatively small sample size.

Summary: Organisational factors, such as the value an organisation places on the use of research and the provision of ongoing critical appraisal skills training, may be associated with the use of systematic reviews in decision-making.

- Kothari and colleagues (2009) tested the usability of a tool for measuring the research capacity of organisations. The self-assessment tool was developed by the Canadian Health Services Research Foundation (CHSRF); scores are intended to differentiate organisations that are lower-end research users and higher-end research users. The tool is structured around three themes: the ability to access research; the ability to assess (critically appraise) research; and the ability to adapt and apply research. The study involved 142 key advisors from 32 health-related organisations (including government, non-government and community-based). The sample included organisations known to be higher and lower research users. The self-assessment tool was distributed to participants to be completed in advance and discussed at a focus group with other participants from the same organisation (thus 32 focus groups were held).

Seventy-seven participants returned the self-assessment tool; 66 forms were complete. All 142 participants attended the focus groups. The tool demonstrated good usability and strong response variability, and discriminated organisations that were higher research users from those that were lower research users. The focus groups discussed the tool scores and used the group process to arrive at a consensus view about each organisation's position with regards to accessing, assessing and applying research. The authors noted that the initial tool score acted as a valuable catalyst for the more important group discussion that followed, and suggested that group discussion itself could be used as an intervention to encourage processes and supports for increasing the use of research.

Summary: The study showed that the CHSRF tool was able to discriminate organisations that were higher research users from those that were lower research users. This may be a helpful tool in assessing organisational receptivity to research use, and to engage research users in relevant discussions. It also may provide a convenient mechanism for measuring change over time if one were implementing interventions to build organisational capacity.

SUMMARY OF FINDINGS FROM EVALUATIONS

We located six studies that examined the impact of strategies to increase the use of evidence in policies and programs. This is a new and developing area of inquiry and therefore many of the studies are not methodologically rigorous. The paucity of information

about effective strategies is the result of a very small number of studies; the impact of the strategies is *unknown*, they have not been demonstrated to be effective or ineffective.

Nonetheless it is possible to draw some tentative conclusions:

- Tailored targeted messages that bring to the attention of policy makers new evidence from research in their own area may increase the use of evidence in policy and program development.

- Strategies designed to increase the use of evidence from research in policy and programs may be more likely to be effective in organisations that have a culture that supports the use of research. That is, the organisational context in which people work influences their response to the provision of systematic reviews, training and other programs. There is some evidence that it is possible to reliably measure the extent to which an organisation has a culture that supports the use of evidence from research in decision-making.

- Training in the appraisal of research and its use appears to increase participants' skills in critical appraisal and possibly their attitudes towards the value of research. There is as yet no evidence that it impacts on the use of evidence.

- There is a little evidence that interaction between researchers and health managers in the development of policy and programs increases perceptions of the value of research but as yet there is no evidence that it impacts on the use of evidence.

Summary and conclusions against the review questions

(i) Identify conceptual frameworks about increasing the impact of research on population health policy and programs that are commonly used and widely respected.

The review identified 16 models and frameworks relevant to increasing the impact of research on health policy and/or programs (summarised in Appendix 2). We reviewed eight of these in detail, because they provide a good cross-section of existing conceptual models on the influence of evidence on policy and practice. These frameworks include models most frequently cited in the literature, and models that contribute unique perspectives of relevance to NSW Health.

(ii) From these frameworks and any other relevant research, identify the factors that may potentially increase the use of evidence in population health policy and programs by an organisation like NSW Health.

We located 16 conceptual models and 99 commentaries and opinion surveys that identified factors that might potentially increase the use of evidence in policy and program development:

- Mechanisms to ensure **ready access to research findings and summaries** of research;
- **Frequent interaction** between researchers and policy makers;
- **Organisational readiness** to use evidence from research;
- Supportive **resources and tools;** and
- Mechanisms for the generation of **new evidence from research** that is highly relevant to the priorities of the agency and applicable to local   circumstances.

(iii) Describe the strategies that have been used to increase the use of existing research and analyse:
- the evidence about the impact of these strategies;
- the circumstances in which they are likely to be effective;
- where are the gaps; and
- relevance for NSW Health.

We located six studies that examined the impact of strategies to increase the use of evidence in policies and programs. This is a new and developing area of inquiry and therefore many of the studies are not methodologically rigorous. The strategies below are relevant for NSW Health.

- Tailored targeted messages that bring to the attention of policy makers new evidence from research in their own area may increase the use of evidence in policy and program development.

- Strategies designed to increase the use of evidence from research in policy and programs may be more likely to be effective in organisations that have a culture that supports the use of research. That is, the organisational context in which people work influences their response to the provision of systematic reviews, training and other programs. There is some evidence that it is possible to reliably

measure the extent to which an organisation has a culture that supports the use of evidence from research in decision-making.

- Training in the appraisal of research and its use appears to increase participants' skills in critical appraisal and possibly their attitudes towards the value of research. There is as yet no evidence that it impacts on the use of evidence.

- There is a little evidence that interaction between researchers and health managers in the development of policy and programs increases perceptions of the value of research but as yet there is no evidence that it impacts on the use of evidence.

(iv) Describe the strategies that have been used to increase the likelihood that agencies like NSW Health are involved in generating new research that is useful in informing their work, including both commissioned research and partnership approaches, and analyse:
- **the evidence about the impact of these strategies;**
- **the circumstances in which they are likely to be effective;**
- **where are the gaps; and**
- **relevance for NSW Health.**

While many of the strategies outlined under (ii) have the potential to increase the generation of new research, we located only 8 papers that explicitly considered this question and these were all commentary pieces. These papers identified a number of strategies which are all potentially relevant to NSW Health, however there is no evidence of their impact. In summary, the generation of research that is more relevant to policy agencies might be increased by:
- Agreement about research priorities;
- The establishment of partnership research where policy makers and researchers work closely together, particularly in long term partnerships;
- Commissioning and co-funding research;
- Encouraging research using local data; and
- Integrating research into the roll out of policies and programs.

Best bets for NSW Health

As described, there are many opinions about the factors that may be useful in increasing the use of evidence from research by agencies like NSW Health. However, there is very little evidence about what actually works in practice.

Based on our reading of the literature, our *best bet* is that an integrated approach should be considered that includes one or more strategies that address each of the factors that are commonly identified as having the potential to increase the use of research in policy. Since there is such limited evidence about what works to increase the use of evidence in policy, NSW Health might consider supporting efforts to identify effective strategies. Although the supporting literature is very limited, *our best bets* about the strategies that are most likely to be effective are to:

1. **Provide mechanisms to ensure ready access to research findings and summaries of research**

   Opinion is that ready access to relevant research may increase its use in policy and programs. Specifically, the following strategies may be useful:

   - Commission and disseminate research syntheses on priority issues.

   - Ensure that staff are aware of the location of public and population health research resources, for example existing e-libraries, databases, or other access points.

   - Locate key summaries in a central repository to facilitate access and encourage use of such a repository by staff.

   - Establish systems for tailored messages about research that advise staff about new research or reviews in their area. There are some existing models such as *PulsE* and *HARC*.

2. **Increase interaction between researchers and policy makers**

   Opinion is that increased interaction between researchers and policy makers may increase the use of research in policy. Specifically, the following strategies may be useful:

   - Encourage staff to develop contacts with researchers and to attend relevant research forums. Informal engagement may result in shared programs and ongoing relationships.

   - Encourage the development of long term programmatic engagement between researchers and policy makers. As the different skills and perspectives become better understood over time, it is likely that the engagement will become more useful. Short term one-off encounters may be less likely to be useful.

- Encourage the development of collaborative research programs between researchers and policy makers. This may result in research that is more closely targeted to the information needs of policy makers and the greater ownership and use of findings by policy agencies.

3. **Increase organisational readiness to use evidence from research**

There appears to be a consensus that organisational factors are important in determining the use of research in policy and program development. Specifically, the following strategies may be useful:

- Train staff in critical appraisal skills and in using evidence. Training should be ongoing and include senior staff.

- Establish policies, protocols and communication strategies that establish the use of evidence as a core organisational value.

4. **Increase use of resources and tools**

Opinion is that use of resources and tools can increase the use of evidence in policy and programs. Specifically:

- Use knowledge brokers and other facilitators to assist policy makers in identifying, interpreting and using research evidence. There is already some use of knowledge brokers occurring through the Sax Institute.

- Survey staff using tools that measure the organisational capacity for using research such as the one developed by the Canadian Health Services Research Foundation (Kothari et al., 2009) to identify the extent to which evidence is currently used and opportunities for improvement.

5. **Establish mechanisms for the generation of new evidence from research that is highly relevant to the priorities of the agency and applicable to local circumstances**

Opinion is that the generation of research that is more relevant to policy might increase its use. Specifically:

- Support partnership research with policy makers, particularly long term programs such as the research centres funded by NSW Health in obesity and overweight and injury.

- Develop programs of sponsored (commissioned or co-funded) research. This will require (a) the establishment of research priorities for NSW Health; and (b) models for engagement with researchers in vehicles such as ARC linkage grants and NHMRC Partnership awards. Knowledge brokers may be useful in defining the questions of interest and in assisting with transparent mechanisms for developing research partnerships for sponsored research.

- Develop approaches to using local data more effectively. The establishment of CHeReL, the 45 and Up Study and the new Population Health Research Network create new opportunities for the rapid analysis of local information relevant to policy and programs. Strategies for making best use of this information could be developed.

- Consider approaches to integrating research into the roll out of policies and programs.

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