Increasing research evidence translation and utilisation to improve population health outcomes

A POLICY EVIDENCE BRIEF
2022

Bojana Klepac, Michelle Krahe, Ramon Spaaij, Rosemary Calder & Melinda Craike

mitchell INSTITUTE

VICTORIA UNIVERSITY

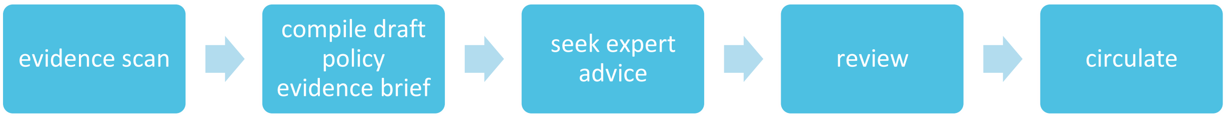
About us

The Mitchell Institute for Education and Health Policy at Victoria University is one of the country's leading education and health policy think tanks and trusted thought leaders. Our focus is on improving our education and health systems so more Australians can engage with and benefit from these services, supporting a healthier, fairer and more productive society.

The Australian Health Policy Collaboration is led by the Mitchell Institute at Victoria University and brings together leading health organisations and chronic disease experts to translate rigorous research into good policy. The national collaboration has developed health targets and indicators for preventable chronic diseases designed to contribute to reducing the health impacts of chronic conditions on the Australian population.

Process

The Mitchell Institute's policy evidence briefs are short monographs highlighting the key evidence for emerging policy issues. We work with our partners in the Australian Health Policy Collaboration to seek expert advice on topics, content and context.



Acknowledgements

The Mitchell institute wishes to acknowledge the contributions of the expert reviewers who offered helpful advice and feedback during the development of this document. The group of expert reviewers comprised:

- Associate Professor Lauren Ball, Griffith University
- Dr Fiona Druitt, Research Fellow, Institute for Sustainable Industries and Liveable Cities, Victoria University
- Bree Nicholas, Acting Director, Research Services, Victoria University
- Ms Ingrid Penberthy, National Disability Insurance Scheme Governance Branch, Department of Social Services
- Dr Yael Perry, Telethon Kids Institute, University of Western Australia

This project has been partially funded by the Australian Government Department of Health. The opinions expressed in this publication are those of the authors. They do not purport to reflect the opinions or policies of the Australian Government Department of Health or of the expert reviewers.

Suggested citation

Klepac, B., Krahe, M., Spaaij, R., Calder, R. & Craike, M. Increasing research evidence translation and utilisation to improve population health outcomes. Policy evidence brief 2022-02. Mitchell Institute, Victoria University. Melbourne. DOI: 10.26196/0bck-q209

ISBN: 978-0-6452000-1-0
Available from: www.mitchellinstitute.org.au

Table of Contents

Abbreviations

AHPC	Australian Health Policy Collaboration
ANROWS	Australia’s National Research Organisation for Women’s Safety
ARACY	Australian Research Alliance for Children and Youth
ERA	Excellence in Research for Australia
NHMRC	National Health and Medical Research Council
OECD	Organisation for Economic Co-operation and Development
RCT	Randomised Control Trial
TAPPC	The Australian Prevention Partnership Centre
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

Definitions

Capacity building for evidence-informed public health is defined as the strengthening and development of skills, knowledge, abilities, processes, and resources of an individual, an organisation, a community or a system [1] for evidence-informed public health. This includes activities like training, workshops, internships, etc.

Evidence-informed public health includes "the development, implementation, and evaluation of effective programs and policies in public health through the application of principles of scientific reasoning including the systematic use of data and information systems and appropriate use of program planning models".[2] This brief is focused on the use of research evidence in the development and implementation phases of programs and policies in public health.

Health promotion is, according to the World Health Organization (WHO) Ottawa Charter of 1986, "the process of enabling people to increase control over, and to improve, their health". [3] The concept of health promotion goes beyond the health sector and includes lifestyle, societal and personal resources.

Implementation research can be conceptualised as a "sub-domain of implementation science" [4] and defined as "the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and care".[5]

Knowledge translation is defined by the Canadian Institutes of Health Research as a "dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically sound application of knowledge to improve population health, provide more effective health services and products, and strengthen the healthcare system".[6]

Public health is "the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society".[7] It refers to activities focused on "prevention, promotion and protection rather than on treatment, on populations rather than on individuals, and on the factors and behaviours that cause illness and injury rather than the injury itself".[8]

Public health workforce are "people whose primary function is the protection [promotion and/or restoration] of the collective health of whole or specific populations (as distinct from activities directed to the care of individuals)".[9]

Public health organisation is "an organisational unit that provides public health services with the aim to protect, restore, promote, and improve the health of populations. The term ‘public’ is important not only because it refers to the function associated with the notion of public health. It also indicates the role of the public sector in shaping, designing, and providing the organisational infrastructure for public health services".[10] In this policy evidence brief, we primarily focus on organisations from the public sector, i.e. government actors and do not focus on other organisations that can also be considered ‘public health organisations’ such as some not-for-profit organisations, universities, and research institutes.

Research evidence, in this brief, includes evidence from peer-reviewed, published research articles and papers, also sometimes called academic evidence.

Research evidence translation in this brief is defined as a "dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically sound application of" research evidence to "improve population health, provide more effective health services and products, and strengthen the healthcare system".[6] For the purpose of this brief, we modified the definition of 'knowledge translation' by the Canadian Institutes of Health Research to define 'research evidence translation'.

Research evidence utilisation in public health can be described as the adoption or application of research evidence to make an impact on or change public health practice and policy.

Introduction

To achieve national objectives for improved population health, more widespread adoption of evidence-informed public health has been recommended.[9, 10, 13] Evidence-informed public health requires effective translation and utilisation of research evidence into public health practice and policy. Research evidence is only one type of evidence but has the advantages of greater rigour, relevance, and independence compared to some other types of evidence (e.g. surveillance data, community reports, government reports).[14] The conduct and publication of research evidence involves detailed documentation of methods, peer review and external scrutiny, resulting in rigour and openness. These processes contribute to its systematic nature, help provide a means to judge the trustworthiness of findings and offer the potential to assess the validity and/or credibility of one claim compared to another.[15] Although evidence-informed public health policy should utilise a range of forms of evidence, in this policy evidence brief, we explicitly focus on the utilisation of research evidence.

Research that informs public health is conducted with the expectation that it advances knowledge and eventually translates into improved population health.[16] Indeed, governments invest in health research in the hope of benefits, not only in terms of academic excellence but also in societal impacts on health and wellbeing.[17] Despite this, the translation of research evidence into practice and policy remains relatively limited.[18] The magnitude of the research to practice and policy gap has stimulated governments and research funders worldwide to focus more on the translation of research into practice and policy and to increase the efficiency of resource allocation.[16, 19]

Responding to calls for increased evidence-informed public health [9, 10, 13] and increased impacts from research [9-10, 13], the aims of this policy evidence brief are to:

1. Present the main barriers to research evidence translation and utilisation in public health;
2. Explore strategies that can address these barriers; and
3. Suggest policy options that might lead to more effective research evidence translation and increased utilisation of research evidence in practice and policy, to improve population health outcomes.

In this policy evidence brief, we focus on policy options for consideration by the Australian Government Department of Health. However, we acknowledge that improving research evidence translation and utilisation also requires action from the whole system, including other federal government departments, state and local governments, and sectors (e.g., training of researchers in how to effectively synthesise and disseminate their work to a range of audiences). Additionally, the policy options presented in this brief cannot address the identified barriers in isolation. These options need to be implemented as a part of a system-wide approach that is necessary to tackle the overarching problem of poor translation and underutilisation of research evidence in public health.

The problem

Poor translation and underutilisation of research evidence in public health

The evidence created through research is essential for improving population health. Evidence-informed public health[1] is an approach that recognises that research evidence and other forms of evidence, including community preferences and values, practitioner experience and judgment, should be integrated into the decision-making process in public health practice and policy.[6] Evidence-informed public health also recognises that evidence needs to be contextualised and is influenced by the broader political and funding constraints and by organisational environments.[20] Benefits to using evidence-informed public health include the utilisation of higher-quality information on what works; greater productivity in the workforce; more efficient use of public health resources, higher likelihood of evidence-informed programs being implementable; and an overall improvement in public health.[11, 21]

Every year, the outcomes of millions of dollars in health research funding are, if not “lost in translation”, at least significantly delayed in being integrated into practice and policy. [22-26] Translating research evidence and utilising it in practice and policy is a significant challenge that has long been noted in the public health literature.[16, 27-29] Concerns about 'research to practice gaps' have been widespread in Australia, Canada, the Netherlands, United Kingdom (UK) and the United States of America (USA), where evidence-informed movements have been most active.[30] Despite strong advocacy in high-income countries for evidence-informed public health (Box 1), assessments of public health policy development continue to conclude that they are often not based on the best available research evidence.[30, 31].

The magnitude of the 'research to practice gap' has stimulated governments and research funders worldwide to recognise the importance of the active translation of research into practice and policy.[32] An additional stimulus to closing the ‘gap’ was the COVID-19 pandemic that forced governments around the world to react promptly and follow medical and science-based advice. Australia’s response, especially in the early phase of the pandemic, has been assessed as “exemplary” [33]. Consequently, there is increasing interest in 'knowledge translation' [34] and ‘implementation science’.[23] Both implementation science and knowledge translation focus on applying research evidence in practice and policy so that scientific discoveries are fully utilised and result in improved population health.

Many barriers contribute to the research to practice and policy gap, such as the natural attrition of research projects which may lead to discontinued studies that may prevent research utilisation. In this brief, we focus on three key barriers that we consider the most relevant from a research/academic perspective in their contribution to poor translation and underutilisation of research evidence in public health practice and policy:

1. Research evidence generally does not address the needs of practitioners and decision-makers;

---

[1] In the literature, there are several similar terms related to ‘evidence-informed public health’ that are often used interchangeably such as ‘evidence-based public health’, ‘evidence-based decision-making in public health’, ‘evidence-informed policy making in public health’, ‘evidence-based practice’ or ‘evidence-informed practice’. For the purpose of this brief, we use evidence-informed public health as a synonym with these terms.

2. Research findings are generally not communicated or disseminated in ways that reach decision-makers and practitioners; and
3. Practitioners, decision-makers, and organisations often do not have the capacity to adopt and apply research evidence.

It is important to note that these barriers are not static and isolated which means they cannot be addressed by a single strategy and/or policy action. Even though there have been fragmented attempts to support practitioners and decision-makers in evidence-informed public health, this effort has not been undertaken systematically and there are limited systems and infrastructure available.[35] The factors that contribute to the 'research to practice gap' are interconnected, as there are dynamic interrelations between various system components [36, 37], which means that only a whole-of-system approach can help address the research to practice and policy gap.

Research evidence generally does not address the needs of practitioners and decision-makers

Historically, the underutilisation of research evidence was considered simply a dissemination failure – that is, practitioners and decision-makers were unaware of research findings. It is now recognised that research evidence underutilisation, at least in part, is the result of ‘research production failure’, that is, researchers do not produce evidence that addresses the problems practitioners and decision-makers face or do not produce evidence in a format that is actionable.[16, 24, 30, 38] Producing relevant research evidence for public health practice and policy is more complex than, for example, research evidence that informs medical/clinical practice.[28] Researchers, who are often discipline-based, tend to focus on topics that are oriented to their very specific professional practice, which may be considered ‘narrow’ from a public health perspective and might not align with the complex issues faced by public health practitioners and decision-makers.[38-40] Additionally, research may not always be of high standard, in terms of quality [41, 42] and research findings are often not timely and actionable due to typical procedures for publishing in academic journals [30], which makes it difficult for decision-makers and practitioners to utilise them.

The research designs that are considered to be ‘gold standard’ can also act as a barrier to research to practice and policy translation and utilisation:

- Efficacy trials, using randomised controlled trial (RCT) designs, are dominant, but there are several issues as these: often measure impact on outcomes that are not central or meaningful for services (e.g. symptom reduction vs. functional outcomes); have inclusion criteria that are often very stringent (e.g. excluding individuals with co-morbidities or severe symptoms, when these are often the norm in real world services); and are designed to achieve evidence of impact but do not consider organisational and contextual/local factors integral for translation into practice.[14, 38, 43, 44]
- Implementation research is less common in research studies that inform public health. Implementation research seeks to understand and work within real-world conditions and is more focused on context.[45] Implementation research considers practice relevance and local context and therefore has the potential to be actionable in policy and practice, yet is often considered lower scientific quality by researchers.[38]
- Incentives within the academic research environment favour efficacy RCTs, whereas implementation research is often seen as inferior or resulting from less rigorous

methods.[39] Grants are scored and manuscripts critiqued based on their potential for impact in a highly controlled research setting rather than their feasibility and scalability.[46-48] This results in many academics conducting research that aims to have academic impact over impact on public health.

Research findings are generally not communicated or disseminated in ways that reach decision-makers and practitioners

One of the most significant barriers to translation and utilisation of research evidence is a disconnect between how researchers disseminate their findings (i.e. peer-reviewed publications/academic journals and conferences)[49] and how practitioners and decision-makers learn about the latest research evidence (e.g. webinars and workshops, individual communication, social media).[49-52] Research findings are often not easily accessible or understood, tailored, or effectively disseminated and shared with practitioners and decision-makers.[53-55] Often, they are presented in a way that does not demonstrate their relevance and applicability to local circumstances and that is not easily accessible to various audiences due to academic language and communication style focused on experts and discipline-based readership (e.g. practitioners may have limited understanding of statistical terms and jargon used in research [56]). Furthermore, researchers are often not incentivised to engage in knowledge translation activities.[30, 57] However, this is slowly changing and some academic institutions are exploring the ways in which to incentivise researchers' engagement with decision-makers.[58]

Practitioners, decision-makers, and organisations often do not have the capacity to adopt and apply research evidence

Although producing relevant research evidence and making findings accessible through both targeted and wide dissemination are essential, they are insufficient for the utilisation of research evidence as part of evidence-informed public health.[20, 59] Public health practitioners, decision-makers and organisations need to have the capacity to utilise research evidence. However, many public health practitioners, decision-makers and organisations have insufficient capacity to apply evidence-informed public health measures [60-63], and lack the resources, infrastructure, and leadership to support the utilisation of research evidence.[20, 35] Building capacity for research evidence utilisation requires consideration of the individual, organisational, and system-level factors.[1]

Many public health practitioners and decision-makers do not have the knowledge and skills to implement evidence-informed public health; most have not had formal training in any of the public health disciplines (e.g. epidemiology, health promotion).[35, 59, 64] Skills and knowledge related to searching, assessing, adapting, and applying research evidence within the organisational context are essential for evidence-informed public health [35]; however, many public health practitioners and decision-makers lack such skills and knowledge [35, 63]. Some of the specific barriers regarding knowledge and skills required for utilising research evidence as part of evidence-informed public health include the inability to understand statistical terms and insufficient understanding of the jargon used in research; an inadequate understanding of what constitutes evidence-informed information; limited knowledge or skills regarding how to use electronic databases; and limited ability to appropriately appraise the quality of research studies.[56, 65-68] Besides lack of knowledge and skills, other barriers towards adopting evidence-informed public health, reported by practitioners and decision-makers, include: not having enough funding for continued training in evidence-informed public health; lack of time for engagement in finding adequate evidence; high costs associated with accessing electronic resources; lack of incentives/rewards for engaging in evidence-informed public health; and a perception that decision-makers and organisational managers do not support evidence-informed policies and interventions.[35, 56, 59, 65-70]

These barriers to adopting evidence-informed public health (e.g. lack of funding, time, and incentives) highlight the importance of organisational and system-level factors [1] in supporting practitioners' and decision-makers' capacity to engage in evidence-informed public health. Organisational factors that are barriers to adopting evidence-informed public health are often related to organisational culture that is "marked by inertia" [71]. Hierarchical bureaucratic structures may be restricted by inflexible processes, limited funding, and no incentives to support evidence-informed public health [71]. Adopting evidence-informed public health on an organisational level includes practices that promote evidence informed public-health such as: workforce capacity building (e.g. formal training, workshops, conference attendance); encouraging and motivating staff (e.g. through incentives and rewards); implementing policies and processes that enable adoption of evidence-informed public health (e.g. funding and resource allocation for monitoring and evaluation); and leadership supportive of evidence-informed public health.[1, 71]

System-level factors that are barriers to adopting evidence-informed public health are related to the political, legal, social, and economic context under which the system operates.[1, 71] For example, the government can decide to implement a program or intervention based on its political popularity and not because the best available evidence-base suggests its potential effectiveness.[71] The decision-making in public health is commonly based on bargaining and compromise rather than on systematic analysis, which is generally considered the opposite of the decision-making in research and academia.[71] Promoting evidence-informed public health on a system-level includes practices such as: local, state, and national-level government funding arrangements to support evidence-informed public health; encouraging and funding continuous monitoring and evaluation practices for all public health programs and interventions; advocacy efforts by key decision-makers for the adoption of evidence-informed public health; and the development, implementation, and evaluation of policies that support evidence-informed public health practices.[1, 71]

Box 1. International and national commitment to evidence-informed public health

More than 15 years ago, the World Health Organization (WHO) established a knowledge translation platform called Evidence-Informed Policy Network (EVIPNet) that promotes "systematic use of health research evidence in health policy-making" [72]. As a part of their effort to promote evidence-informed public health, the WHO/Europe's program on evidence, policy, and information facilitates different stages of the following process:

1. *define: clearly define the health problem or issue;*
2. *search: efficiently search for research evidence;*
3. *appraise: critically and efficiently appraise the research sources;*
4. *synthesise: interpret/form options or recommendations for practice or policy based on the literature found;*
5. *adapt: adapt the information to a local context;*
6. *implement: decide whether to use the adapted evidence in practice or policy; and*
7. *evaluate: evaluate the effectiveness of implementation efforts.*[73]

The Australian Government Department of Health's vision is for "better health and wellbeing for all Australians, now and for future generations, achieved through:

- evidence-based policy,
- well-targeted programs, and
- best practice regulation.[74]

The strategic priorities of the National Health and Medical Research Council (NHMRC) affirm the importance of research evidence translation and capacity building for evidence-informed public health:

- *Create knowledge and build research capability through investment in the highest quality health and medical research and the best researchers;*
- *Drive the translation of health and medical research into clinical practice, policy and health systems and support the commercialisation of research discoveries, contributing to an Australian health system that is research-led, evidence-based, efficient and sustainable, and*
- *Maintain a strong integrity framework, which underpins rigorous and ethical research, and relevant and evidence-based guidelines, thereby promoting community trust.*[75]

The evidence

The evidence section presents strategies that can address the three barriers outlined above.

Strategies for producing research evidence that addresses the needs of practitioners and decision-makers

An effective strategy that might lead to actionable research is promoting collaborative research across disciplinary and organisational boundaries.[30] Collaborative research involves researchers from various disciplines working together to tackle complex public health issues, in partnership with people with lived experience, i.e. those who have been affected by the issue, as well as those practitioners and decision-makers, i.e. those who are in a position to do something about the issue. Promoting collaboration between interdisciplinary researchers, practitioners, and decision-makers is considered to increase the relevance, applicability, and impact of research.[16] This approach shifts the paradigm from the researcher being regarded as the expert to researchers, practitioners, and decision-makers being considered as experts who all bring complementary and important skills, experience, and knowledge to the team.[34] Emerging research that supports such collaborations may produce research that is more useful to practitioners and decision-makers; increase the adoption and application of research in practice and policy; and improve population health outcomes.[40, 76, 77] These collaborations can also result in capacity building for evidence-informed public health through positive changes in institutional and individual attitudes towards research and the creation of longer-term connections among researchers, practitioners, and decision-makers.[17]

Creating successful collaboration across disciplines and organisational boundaries can be challenging, but it has been argued that agreement about research needs or other research priority setting activities can be used to stimulate researchers to consider addressing questions of relevance to public health policy.[78] Bringing together discipline experts and working alongside diverse stakeholder groups requires specialist researchers with a particular methodological skill set to effectively harness the contributions of the full team.[79] As such, the inclusion of a ‘System Intermediary’[2] role (known as knowledge broker, boundary spanner, partnership broker, knowledge integration specialists [80-82]) as a part of transdisciplinary teams, is a potential strategy to assist with successful collaboration. These professionals usually have expertise in the integration of disciplinary expertise, research translation and implementation.[79, 83] They assist in bringing together researchers, practitioners and decision-makers to generate new research findings and translating those findings into practice and policy.[82]

A long-term commitment beyond the life of singular projects is needed for collaborations between researchers, practitioners, and decision-makers to be successful in research translation.[17] Institutional support, especially from government, for ongoing collaboration is required, and incentives and financial support for activities that connect researchers,

---

[2] For simplicity purpose, we use the term ‘System Intermediary’ as an umbrella term for various roles found in the literature (e.g. knowledge brokers, boundary spanners, partnership brokers, collective change facilitators etc.; see Table 1) that all share a similar function in supporting knowledge translation. Various terms and roles have emerged from different disciplines and it is beyond the scope of this policy evidence brief to discuss in detail the differences in their names, roles, and functions. Rather, we decided to focus on the common aspects all roles share under umbrella term ‘System Intermediary’.

practitioners, and decision-makers, and enable knowledge translation activities, even after the formal end of projects, are needed.[17]

Finally, increased focus and incentives for implementation research may help overcome the barriers relating to the relevance of research for practice and policy. To maximise research impact, researchers must balance efficacy studies and implementation research [44, 53], giving greater attention to context and local conditions relevant to practice and policy [40]. In 2013, only 6.9% of NHMRC funding was allocated to implementation research [47], and there seems to have been a tendency for some methodologies to be favoured over others.[47,84] Currently, the NHMRC has funding schemes that specifically address research translation (Box 2). In 2021, commitments for the following schemes – Partnership Projects, Partnership Centres, Centres of Research Excellence and Clinical Trials and Cohort Studies Grants – totalled $155.5 million, accounting for 16% of the total NHMRC funding for competitive grants [85].

Other study designs and methods, besides efficacy RCTs, may lead to more translatable research findings. Examples of promising alternative study designs and methods include:

- Time-series analyses, fractional factorial designs, natural experiments, and preference designs offer scientifically rigorous alternatives and generate evidence in study conditions that resemble the real world.[53]
- Community-based participatory research, which can help bridge the gap between research and practice and policy through community engagement and attention to existing relationships, needs, and assets in a community.[86]
- Pragmatic RCTs and hybrid efficacy-implementation studies.

Box 2. Initiatives and funding schemes by the National Health and Medical Research Council (NHMRC) to promote knowledge translation and collaborative research

The main NHMRC initiative to promote knowledge translation and collaborative research in Australia is the Research Translation Centre initiative, comprising the Advanced Health Research and Translation Centres, established in 2014 and Centres for Innovation in Regional Health, established in 2016. The initiative encourages "excellent health research and translation in Australia by bringing together researchers, healthcare providers, education and training to improve the health and well-being of patients and the populations they serve".[87] Furthermore, the NHMRC has the following funding schemes [87] that promote research translation:

1. Partnership Projects foster partnerships between decision-makers, clinicians, researchers, and managers. This scheme provides an opportunity for all team members to work collaboratively throughout the whole research process, from defining research questions and undertaking research to interpreting the findings and implementing them into policy and practice.
2. Partnership Centres aim to enhance the availability and quality of research evidence to decision-makers, managers, and clinicians. They bring together teams of decision-makers and researchers to jointly create better health services.
3. Centres of Research Excellence support researchers in pursuing collaborative research and developing capacity in public health research, health services research, clinical research, and dementia research.
4. Clinical Trials and Cohort Studies Grants scheme support clinical trials and cohort studies that address knowledge gaps and lead to implementable findings that benefit human health.

Even though knowledge translation and collaborative research are supported through these NHMRC funding schemes, there is limited guidance on how researchers from diverse disciplinary backgrounds should collaborate with practitioners and decision-makers. Researchers, practitioners, decision-makers and funders may underestimate the time, skills and resources needed to collaborate, especially in complex and multifaceted research areas [88]. The NHMRC guide *Collaborative research, A guide to supporting the Australian Code for the Responsible Conduct of Research* briefly outlines the legal responsibilities of institutions and researchers. However, it does not provide any other practical guidance on forming research teams, good practices for successful Collaborative research, conflict resolution strategies, or methods to guide partnerships.[88]

Strategies for communicating and disseminating research findings in ways that reach decision-makers and practitioners

For research evidence to be effectively disseminated and used in practice and policy, it needs to be relevant, accessible and available in a form that practitioners and decision-makers can use (e.g. webinars, conferences, workshops, advocacy groups, social media, newsletters.[49-52]).[30, 35, 57] For example, research evidence dissemination needs to target practitioners and decision-makers through tailored messages and appropriate mediums, such as summary briefings with clear statements of implications for practice and policy, tools and guidance, interactive educational sessions, and media engagement.[30, 52, 89] For this to occur, researchers need to be trained and to be incentivised to make their research more accessible and disseminate research findings through a range of channels, beyond academic journals and conferences.[30] Besides that, establishing and enhancing partnerships with communication specialists in academic institutions who specialise in the delivery of research messages to the public or employing a project-specific communication specialist may be an efficient way of communicating and disseminating research findings.[90]

An effective strategy to disseminate research evidence may be establishing a national public health knowledge exchange portal. ‘Knowledge exchange portals’ are web platforms that provide practitioners and decision-makers with a single point of access to relevant and evidence-informed resources (see example in Box 3).[91] They allow integrated and user-friendly access to appropriate resources and content in one place, bringing researchers, practitioners, and decision-makers together for knowledge exchange and encouraging the distribution and sharing of tailored, evidence-informed information.[91] As suggested by formative evaluation studies, practitioners and decision-makers need concise and easily accessible information and collaborative features to engage in knowledge exchange.[91] Evidence suggests that ‘knowledge exchange portals’ in combination with other translation strategies (e.g., tailored and targeted messaging, ‘System Intermediaries’) can influence the use of research evidence in public health practice (see examples in Box 4).[91, 92]

Box 3. *Health Evidence^{TM}* knowledge exchange portal – An example from Canada

Health Evidence^{TM} portal was founded in 2005 by Maureen Dobbins, a practising nurse who was struggling to juggle her front-line daily responsibilities with finding time to utilise the best available evidence in her job. In her own words, *Health Evidence*^{TM} "is an attempt to ensure, at a minimum, that public health professionals can quickly and easily access research evidence on the effectiveness of public health interventions".[93]

The mission of the McMaster University's *Health Evidence*^{TM} portal is to make research evidence easily accessible and contribute to developing individual and organisational capacity for evidence-informed public health. All evidence available through the portal is appraised based on both quality and relevance. Besides critically appraised research evidence, the portal contains webinars and practical tools to support practitioners and decision-makers in evidence-informed public health. One of its features, especially useful for the public health workforce, is the availability of high-level synthesis for complex topics for which multiple reviews evaluating public health interventions exist. The funding of the portal is enabled through project-based support from various funders such as: Public Health Agency of Canada, National Collaborating Centre for Methods and Tools, City of Hamilton, and Region of Peel Public Health.

Another effective strategy, used in combination with 'knowledge exchange portals', may be tailored and targeted messages sent directly (via email or other direct communication) to practitioners and decision-makers. 'Tailored' indicates that the message is focused on the specific scope of the practitioner/decision-maker and 'targeted' implies that the content of the message is directly applicable and relevant for practitioners and decision-makers.[92] As previously emphasised, none of the strategies will work as an isolated, standalone intervention. Rather, they need to be regarded as a part of a system-wide approach that uses multiple channels, strategies, and means to address the research to practice and policy gap.

Box 4. Examples of Australian organisations acting as 'System Intermediaries'

Several Australian organisations act as 'System Intermediaries' in public health such as Australian Research Alliance for Children and Youth (ARACY), Australia's National Research Organisation for Women's Safety (ANROWS) and the Australian Prevention Partnership Centre (TAPPC).

ARACY "brings together researchers, policymakers, and service providers from diverse backgrounds from across Australia to work together to improve the wellbeing of children and young people" [94]. It supports a cross-sectoral, collaborative, and cross-disciplinary approach to tackle complex problems Australian children and youth people are facing [94]. It is focused on: catalysing collective action, growing capacity across sectors; and influencing decision making processed [95].

ANROWS was established by the Commonwealth and all state and territory governments as an initiative of Australia's first National Plan to Reduce Violence against Women and their Children 2010–2022.[96] Its main purpose is to produce, disseminate, and support the application of evidence practice and policy related to addressing violence against women and children.[96] Besides undertaking research, ANROWS is focused on effective dissemination and utilisation of research evidence "to build, maintain and promote collaborative relationships with and between stakeholders".[96]

TAPPC was established as one of three NHMRC Partnership Centres that brings together decision makers, researchers, and practitioners to co-create knowledge. It was founded "to trial co-produced partnership research, with the aim of increasing the use of research evidence in policy and practice".[97]

Capacity building strategies for public health organisations, practitioners, and decision-makers to utilise research evidence

Building capacity to support and sustain evidence-informed public health is crucial.[20] Capacity building for evidence-informed public health should address individual practitioner and decision-maker skills and knowledge, as well as organisational-level and system-level factors.[70] Capacity building includes the development of the workforce and “taps into existing abilities of individuals, communities, organisations, or systems to increase involvement, decision making and ownership of issues”.[1] It should be time-efficient; consistent with organisational climate, culture, and resources; relevant to local context; and aligned with the needs and skills of staff members.[98] Capacity building for evidence-informed public health should involve a core set of the following activities: 1. training; 2. use of tools; 3. technical assistance; 4. assessment and feedback; 5. peer networking; and 6. incentives [20]:

1. *Training to support evidence-informed public health*. Putting research into practice and policy requires a range of knowledge and skills: including asking the right questions; searching for the best available research evidence; interpreting the evidence; assessing the quality of the evidence through critical appraisal; determining the relevance of the evidence to practice and policy decisions; and acting on the evidence if and when appropriate.[99] The findings of a systematic review suggest that capacity building interventions can increase practitioners’ adoption and implementation of evidence-informed interventions.[98] Additionally, evidence suggests that ‘train-the-trainer’ is an effective method for broadly disseminating evidence-informed public health principles. ‘Train-the-trainer’ allows for training to be tailored to local issues, thus making it a viable approach to disseminating and scaling up new public health practices [100]. Another useful strategy to increase capacity in evidence-informed public health is an interdisciplinary curriculum for public health students, practitioners and decision-makers that builds knowledge and skills in evidence-informed public health, knowledge translation, and implementation science.[101] Training practitioners and decision-makers in knowledge translation and implementation science has the potential to increase the reach and impact of public health and other health-related research.[76]

2. *Use of tools* includes media or technology resources to plan, implement and evaluate activities related to evidence-informed public health. Several tools have been developed, including free online resources in the following topics: training and planning tools, health surveillance, policy tracking and surveillance, systematic reviews and evidence-informed guidelines, economic evaluation, and grey literature.[20]

3. *Technical assistance* is the provision of personalised and interactive education and skill-building [20], and it can be provided by the ‘System Intermediary’. As shown in Table 1, there are various ‘System Intermediary’ roles and they all share and perform some key functions such as: connecting people (e.g. researchers and practitioners); communicating and sharing knowledge; capacity building of others; facilitating collaborative decision-making and sense-making, which includes “learning how to use evidence as a collective”.[102] They have been identified as key support personnel in knowledge translation [80] as they link researchers, practitioners and decision-makers, enabling their interactions so that they can appreciate each other's goals and professional cultures, influence each other's work, form new partnerships, and integrate research with other forms of knowledge in decision making [103]. These are individuals with the technical research skills and expertise who can help explain and interpret research, and who can facilitate the identification and use of research. They may have a crucial role in spanning organisational boundaries, helping researchers, practitioners and decision-makers to find a common language, facilitating interactive events and dialogues that, when sustained, can increase the likelihood that research evidence is utilised.[17] The inclusion of ‘System Intermediary’ roles in public health organisations may develop a positive culture for evidence-informed public health, improve facilitation of resources and support collaboration between researchers and practitioners and decision-makers.[17, 70] However, although emerging [17], clear evidence of the effectiveness of these roles in facilitating knowledge translation processes and their impact is unclear.[104] Further, even though education and training opportunities for ‘System Intermediary’ roles in Australia are available (see Box 5), training for ‘System Intermediaries’ still appears to be in its infancy.

4. *Assessment and feedback* includes assessing and providing data-based feedback on performance related to evidence-informed public health.[20]

5. *Peer networking* brings together practitioners and decision-makers to learn from each other.[20] Networking is sometimes achieved through ‘communities of practice’, a group of people brought together by mutual interests and a desire to interact continually.[105] ‘Communities of practice’ that support evidence-informed public health show promise in using analytic tools [20], such as standardised outcome measurement tools that monitor people’s response to service and treatment outcomes [105].

6. *Incentives* are most commonly understood as financial compensation and resources to support progress or build capacity in evidence-informed public health.[20] However, incentives can also be provided in a non-monetary form such as time allocation to ensure ready access to research findings and summaries or relevant attribution/credit for utilising evidence.

Although the development of individual practitioner and decision-maker skills in evidence-informed public health is essential, capacity building for evidence-informed public health requires thinking beyond individual ‘skills’ (see example in Box 6). It requires capacity development at organisational and system levels.[1] Organisational level factors associated with evidence-informed public health include: workforce development (e.g., allocation of financial resources for capacity building activities), leadership, organisational climate and culture (e.g. supervisor expectations for the use of research evidence; performance evaluation based partially on evidence-informed public health), relationships and partnerships, and financial processes.[106, 107] The development of organisational policies for each of these is paramount. For example, policies that give priority to the allocation of funds for capacity building, the inclusion of evidence-informed public health as part of human resource performance expectations and enabling infrastructure (such as access to knowledge portals) are all essential for sustainable changes to practice. Thus, workforce development should be considered for those in public health management and leadership positions, leading to organisation-level changes and helping to create a stronger culture for evidence-informed public health practice within teams.[35]

Broader system support, especially from local, state and federal governments, is critical for establishing organisational and workforce norms that reinforce motivation to use research evidence.[20, 69] System-level considerations include funding, external political influence, and competing priorities.[63] Consideration of system-level factors is essential because support through funding, infrastructure, and timelines can remove barriers to evidence-informed public health and support capacity building for the public health workforce.

Box 5. Current education and training opportunities in Australia for 'System Intermediary' roles

As a part of *Creating Pathways to Prevention: CREATE-ing Pathways to Child Wellbeing in Disadvantaged Communities* program, Griffith University (Queensland, Australia) is providing a four-day training course in collective change facilitation.[108] Throughout the research that preceded the development of the training materials, key skills that collective change facilitators need to have were identified such as: communication skills, experience with community development, and so called 'soft skills'.[108]

A small number of commercial and not for profit organisations currently offer specialised training and consulting services. Some examples of small companies that have emerged and are providing training in Australia are:

- Research Impact Academy, which identifies itself as providing *Specialist Knowledge Translation Training* (for more details see Box 4) curriculum adopted for the Australian context, originally developed by the Hospital for Sick Children (SickKids) in Canada.
- The Knowledge Brokering Group, a commercial provider of courses for individuals and organisations from academia, government, and not-for-profit sector to develop capacities to "work more successfully at the research, policy, and practice interface" [109].
- Partnership Brokers Association is a not-for-profit social business based in the UK that offers a four-day face-to-face Partnership Brokers Training course in Australia as well as a five-week online Brokering Partnership Remotely course. Partnership Brokers Training is focused on theoretical frameworks for partnership brokering, skills development for partnership brokers (e.g. resource mapping, facilitation, negotiation), brokering challenges, and action planning.

Table 1. Description of the key System Intermediary roles identified in the literature[3] [102]

System Intermediary role	Key aspects of the role
Knowledge Broker [63, 104, 110, 111]	• Facilitate processes that support the production and sharing of knowledge • Engage in strategic practices that mobilise action and maintain relationships • Engage in facilitation that strengthens relationships and the conditions for successful partnerships • Encourage a culture of learning • Seek to strengthen the capacity of those they work with, particularly enhancing the ability to engage in evidence-informed decision-making and planning
Partnership Broker [112-115]	• Encourage partnerships for transformational change and, in particular, systems change • Challenge 'business as usual' practice and encourage a culture of learning • Engage in facilitation that strengthens relationships and the conditions for successful partnerships • Encourage innovative solutions to complex-adaptive challenges • Translate between sectors and systems to improve communication and understanding • Create a space where partners feel they can speak openly and honestly • Facilitate coming together activities such as relationship building, relationship maintenance, and role clarity • Engage in collaborative sense-making and decision-making • Shift leaders from 'heroes' to 'hosts' and members from 'me' to 'we'
Critical Friend and Professional Companion [116-123]	• Encourage individual and group reflection and a learning culture • Are independent to those they are working with, in order to offer honest observations and challenge the status quo • Work flexibly and change as the needs of those they are supporting changes • Seek to be transformational and to create lasting change at the individual, group, and system levels • Are explicit about their role (independence is vital to supporting change)
Central Agent and Health Impact Fellow [124]	• Support integrated knowledge translation (IKT) • Focus on strengthening the relationships between decision-makers and others • Promote systems thinking and the use of evidence when planning • Encourage a culture of learning
Boundary Spanner [125]	• Act as a bridge between systems • Focus on capacity and capability-building • Translate, communicate, and mediate across boundaries for shared understanding • Are explicit about their role (independence is vital to supporting change)
Collective Change Facilitator	• Acts as 'change agent' and a 'human bridge' between the prevention and translation support system (research) and the delivery system (practice) • Work flexibly and change as the needs of those they are supporting changes

---

[3] Table reproduced with permission of authors of the *System intermediaries literature review, Pathways in Place: Co-creating community capabilities* [102].

[108, 126, 127]	• Seek to be transformational and to create lasting change at the individual, group, and system levels • Promote a culture of learning • Are explicit about their role (independence is vital to supporting change) • Translate between sectors and systems to improve communication and understanding • Create a safe space where partners feel they can speak openly and honestly • Support two-way communication between systems • Work with community coalitions, coalition leaders, and coalition members • Enhance the functioning of community coalitions and their use of evidence-informed decision-making and planning

Box 6. Capacity building for utilisation of research evidence in SickKids Hospital

A successful example of ongoing capacity building for evidence-informed public health is taking place in SickKids Hospital in Toronto, Canada. The SickKids Hospital offers some of the core activities such as training and use of tools [20] to support capacity building for utilisation of research evidence. The hospital offers three types of trainings:

- *Specialist Knowledge Translation Training* is a workshop for educators, researchers, clinicians, practitioners, knowledge integration specialists, and decision-makers interested in sharing research evidence and other forms of knowledge with audiences beyond the academic community. It was designed to teach unique skillsets necessary for the knowledge translation practice.[128]
- *Knowledge Translation Professional Certificate* is a professional development certificate course for knowledge translation practitioners (such as knowledge integration specialists and knowledge brokers). Since 2013, *Knowledge Translation Professional Certificate* has been recognized as a Leading Practice by Accreditation Canada and is fully accredited by the Continuing Professional Development Office.[128]
- *Planning for Implementation Practice* is designed for researchers, decision-makers, practitioners, implementers and community partners. It supports participants to: enhance their understanding of implementation science and various factors that may affect the success of an implementation endeavour; develop a draft implementation plan for innovation, intervention or other practice they wish to implement; and develop and apply new skills and knowledge for implementation planning.[128]

Besides trainings, SickKids Hospital offers ‘innovative and practical’, evidence-informed tools and resources that assist in addressing ‘research to practice gaps’ such as eLearning modules (e.g. Introduction to Knowledge Translation, How to Prepare a Knowledge Translation Plan), Knowledge Translation Planning Template), the Knowledge Translation Game and the Knowledge Translation Companion Tool.[128]

Policy options

The following section outlines some of the potential policy options to address more effective research evidence translation and increased utilisation of research evidence in public health. However, it is important to note that knowledge translation is a relatively underdeveloped area. More evidence will be required over time to identify strategies that work and contribute to closing the research to practice and policy gap.

Policy options related to research evidence production

1. Examination of the process and outcomes of collaborative research should become a priority area:

- There is a growing need to address current complex problems such as global public health crises, e.g. the COVID-19 pandemic. These complex, or sometimes called “wicked” problems are those for which there is no one, single and straightforward solution [129]. Such problems have the best chance of being addressed through collaborative research [88, 129].
- Even though collaborative research is supported through funding schemes such as NHMRC’s Partnership Projects, there is still limited guidance available on how researchers from different disciplines and practitioners and decision-makers should collaborate. The methods to guide collaborative partnerships are poorly defined, leading to difficulty in context-sensitive replication.[16]
- Although emerging, evidence for the effectiveness of collaborative research on the uptake of research evidence in practice and policy is in its infancy.[43] Therefore, funding needs to be directed at examining the process and outcomes of collaborative research.[130] A focus not just on the uptake of research evidence and health outcomes, but also intermediate outcomes, such as attitudinal change and institutional change in approach to research and long-term connections, should be seen as important in their own right. A good example of such research, funded by the NHMRC, can be found here. Given the increased focus on research impact, there is an opportunity within Excellence in Research for Australia (ERA)’s Engagement and Impact Assessment [131] to provide researchers with evidence-informed tools and guidance for collaboration and designing research for impact.

2. Funding schemes should recognise the need for a long-term commitment in collaborations between researchers, practitioners, and decision-makers:

- Successful collaborations in research translation between researchers, practitioners, individuals with lived experience and decision-makers require a long-term commitment and financial and institutional support for ongoing collaboration.[17, 130] For example, after the formal end of a collaborative project, a memorandum of understanding can be encouraged between the institutions or other inter-institutional agreements can be established to support post-project research translation events and activities, which will keep researchers, practitioners and decision-makers connected. This may provide a foundation for follow-up research that is co-designed based on mutually identified needs and priorities, which in turn has a potential to further enhance research impact and population health outcomes. Another example would be to include the allowance of funding asks in project applications to support ongoing engagement beyond project delivery. This could be done in the form of resourcing a ‘System Intermediary’ role (or a similar role such as monitoring and evaluation specialist) [132, 133] through the life of a project and up to three years beyond and allowing a proportion of salary funding beyond ‘project’ delivery for lead chief investigators to support this ongoing engagement and continue discussions on implementation success and other opportunities for embedding evidence in practice.

3. Funding schemes should recognise and support ‘System Intermediary’ roles on collaborative teams:

- Recent studies show that activating a ‘System Intermediary’ can be an effective strategy in producing actionable messages for decision-makers [134] and increasing the likelihood of the adoption of evidence-informed policy [135]. To facilitate effective collaborations, funding schemes should recognise and fund ‘System Intermediary’ roles or similar positions such as communication specialists [90], ‘researchers in residence’ [136], or monitoring and evaluation specialists to ensure the contributions of all team members are fully utilised [79, 82, 83, 130] and to increase the chance for successful collaboration.
- Project timelines should reflect the time needed to successfully engage in collaborative research and to disseminate research findings effectively to a range of audiences beyond academia.[88]

4. Alternative research designs and methods should be recognised in funding guidelines and training for reviewers:

- Training should be provided to grant reviewers regarding acceptable study designs beyond RCTs. Reviewers should avoid de-valuing study designs that are not RCTs. [53].
- Ensure expert reviewer panels include sufficient representation of specialists with expertise in study designs beyond RCTs.
- Funding guidelines should specify that study designs should fit the research context and are not limited to RCTs.
- Grant criteria should include, as a critical part of the assessment matrix, issues relating to implementation, such as feasibility and scalability, as much as the potential for efficacy.
- Additionally, as suggested by Scarrow and colleagues, while grant reviewers may be experts in their respective fields, they “may lack the competencies to rigorously assess” the knowledge translation component of the grant applications.[137]

Policy options related to communication and dissemination of research findings

1. Support strategies to encourage researchers to communicate and disseminate research findings beyond peer-reviewed publications:

- Research funding should cover dissemination costs beyond peer-reviewed journals through full funding of knowledge translation plans. Timelines for such activity should be recognised (e.g., dissemination is likely to occur during and after the project's conclusion), and mechanisms for monitoring dissemination activity from funded projects should be examined.

- Incentives for researchers to disseminate research findings beyond peer-reviewed publications and conferences (e.g. prioritising knowledge translation in track records in funding applications) would motivate researchers to disseminate their research to a range of audiences.[30]
- It should be noted that very often discussions on effective dissemination of research findings suggest strategies that solely rely on capacity and skills of researchers who are expected to have a range of additional skills in areas such as mass media and social media communication and marketing, public policy communication, and graphic design.[138] However, besides strategies that focus on individual capacity building of researchers (e.g. education and training for researchers in communication and knowledge translation), barriers to research communication and dissemination on organisational and systemic level could also be addressed using strategies such as: providing support to researchers by communication specialists when communicating/disseminating their research; valuing non-traditional research outputs in researchers' promotion applications and grant applications; advocacy by decision-makers and practitioners for open access journals to improve access to scientific information and reduce their fees; additional funds available for researchers to engage various stakeholders in research process as it may increase effective communication and dissemination of research findings.[139]

2. Establish a national, interactive public health knowledge exchange portal to evaluate, synthesise, and disseminate research evidence that is designed to meet the needs of all public health services and practitioners. The portal would support practitioners', decision-makers', researchers' and public access to evidence-informed literature and resources and be a forum for knowledge exchange across sectors and organisational boundaries:

- Whilst there has been investment in resources to support practitioners and decision-makers, such as online repositories and evidence summaries, the effort has not been systematic. There are limited systems or infrastructure available to the public health workforce in Australia to access evidence-informed resources.[35]
- To overcome fragmentation, consolidate existing knowledge and advance practice, a knowledge bank related to research evidence translation and collaborative research could be integrated within a public health knowledge exchange portal.[79] Such a portal would need to be appropriately resourced to ensure that it is more than a mere repository.

Policy options related to capacity building for public health organisations, practitioners and decision-makers in evidence-informed public health

1. Conduct a pilot of 'System Intermediary' role in public health organisations and examine processes and effectiveness:

- 'System Intermediary' roles have been identified as key supports in knowledge translation.[17, 103, 132-135] They could support public health organisations with collaboration across sectors and the capacity building required to enhance knowledge translation.
- They undertake a range of activities that could be beneficial for public health organisations, including the provision of information, capacity building for research use through training and/or technical assistance, initiating and maintaining stakeholder

engagement, and liaising with partners. Often, 'System Intermediaries' are employed for discrete projects and not for longer-term positions. Longer-term positions are likely to be more effective for increasing organisational capacity for evidence-informed public health.[17]

- Although promising, evidence of the effectiveness of 'System Intermediary' roles in facilitating knowledge translation processes and health outcomes is unclear, and evaluation of this role is required.[104, 132] Therefore, it would be useful to conduct and evaluate a pilot project to assess their effectiveness in public health organisations.
- An alternative option to a standalone 'System Intermediary' position is to upskill existing public health practitioners and/or decision-makers and integrate this into their existing roles.[17, 140]

2. Ensure that public health practitioners and decision-makers have access to training in evidence-informed public health:

- Grants for public health practitioners and decision-makers training in evidence-informed public health should be made available by the Department of Health. Models such as 'train-the-trainer' could be utilised for scaling up training approaches. Training could be complemented with ongoing support for evidence-informed public health, such as support from 'System Intermediary' roles.[141] An alternative option is to promote and prioritise the skill set and functions that 'System Intermediary' roles have (e.g. collaborative skills, efficient communication and knowledge sharing, facilitation skills) in the existing relevant staff in government (e.g. decision-makers and staff engaged in policy development and implementation).

The list of suggested options is not exhaustive and, independently, will not entirely address the issue – the policy options are complementary to each other, and he evidence indicates a systematic approach is likely to be the most effective. In the Australian context, a systematic approach could be achieved through a national framework or strategy that involves all jurisdictions. For public health services, practitioners, and decision makers to consistently access the best evidence and to develop knowledge, skills, culture, and infrastructure to deliver services/policies/programs that are evidence-based, the establishment of a national agency/entity, funded jointly by Australian health budgets or through the Commonwealth, would be an option. In addition to the above policy options, the establishment of a national agency/entity could work with public health organisations and health departments to develop and support systematic application of evidence-informed public health and could:

- Prioritise public health organisations' use of research evidence in the design of services/policies/programs and focus on demonstrating improved health outcomes - rather than the amount of activity.[130]
- Support voluntary public health accreditation requirements to encourage public health organisations to develop policies and infrastructure that support evidence-informed public health, including funding for training and embedding evidence-informed public health in performance measures.
- Train public health leaders and managers in evidence-informed public health and be encouraged to develop and implement organisational policies and strategies to support this, such as: allocating financial resources for capacity building activities; setting expectations for the use of research evidence; and establishing performance evaluation based partially on evidence-informed health.[141]

References

[1] VicHealth, “Capacity building for health promotion.” 2012. [Online]. Available: https://www.vichealth.vic.gov.au/-/media/ResourceCentre/PublicationsandResources/General/Capacity_Building_FactSheet.pdf?la=en&hash=28D731AE5A13A61534865272CF8A3534DAA9954D

[2] R. C. Brownson, J. E. Fielding, and C. M. Maylahn, “Evidence-based public health: A fundamental concept for public health practice,” *Annu. Rev. Public Health*, vol. 30, no. 1, pp. 175–201, Apr. 2009, doi: 10.1146/annurev.publhealth.031308.100134.

[3] Canadian Public Health Association,Health and Welfare Canada, World and Health Organization, “Ottawa Charter for Health Promotion.” 1986. [Online]. Available: https://www.euro.who.int/__data/assets/pdf_file/0004/129532/Ottawa_Charter.pdf

[4] T. Hoke, “Implementation research: The unambiguous cornerstone of implementation science,” *R&E Search for Evidence*, Feb. 06, 2018. https://researchforevidence.fhi360.org/implementation-research-the-unambiguous-cornerstone-of-implementation-science (accessed May 17, 2022).

[5] M. P. Eccles and B. S. Mittman, “Welcome to Implementation Science,” *Implementation Science*, vol. 1, no. 1, p. 1, Feb. 2006, doi: 10.1186/1748-5908-1-1.

[6] S. Bowen, J. Roy, and I. Botting, “Promoting action on equity issues: A knowledge to action handbook,” Canadian Institutes of Health Research, Sep. 2011.

[7] D. Acheson, “Acheson Report: Independent Inquiry into Inequalities in Healh Report.” The Stationery office, London, 1988.

[8] Australian Institute of Health and Welfare, “Public health expenditure in Australia 2008-09. Health and welfare expenditure series no.43. Cat. no HWE52AIHW.” AIHW, Canberra, 2011.

[9] R. Beaglehole, “Challenging the public health workforce,” *Scand J Public Health*, vol. 32, no. 4, pp. 241–242, Aug. 2004, doi: 10.1080/14034940410028118.

[10] E. Jakubowski, H. Kluge, and B. Rechel, “Organization of public health services,” in *Organization and financing of public health services in Europe*, Copenhagen: European Observatory on Health Systems and Policies, 2018. [Online]. Available: https://www.ncbi.nlm.nih.gov/books/NBK535720/

[11] R. C. Brownson, J. E. Fielding, and C. M. Maylahn, “Evidence-Based Public Health: A Fundamental Concept for Public Health Practice,” *Annu. Rev. Public Health*, vol. 30, no. 1, pp. 175–201, Apr. 2009, doi: 10.1146/annurev.publhealth.031308.100134.

[12] R. C. Brownson, E. A. Baker, A. D. Deshpande, and K. N. Gillespie, *Evidence-based Public Health*. Oxford: Oxford University Press, 2017.

[13] European Centre for Disease Prevention and Control, *Evidence-based methodologies for public health : how to assess the best available evidence when time is limited and there is lack of sound evidence*. LU: Publications Office, 2011. Accessed: Mar. 01, 2021. [Online]. Available: https://data.europa.eu/doi/10.2900/58229

[14] S. Frost *et al.*, *The evidence guide: Using research and evaluation in social care and allied professions*. London: Barnardos, 2006.

[15] S. Nutley, A. Powell, and H. Davies, “What counts as good evidence?” Alliance for Useful Evidence, 2013.

[16] I. D. Graham, A. Kothari, and C. McCutcheon, “Moving knowledge into action for more effective practice, programmes and policy: protocol for a research programme on integrated knowledge translation,” *Implement Sci*, vol. 13, no. 1, p. Article 22, Dec. 2018, doi: 10.1186/s13012-017-0700-y.

[17] L. Meagher and C. Lyall, “The invisible made visible: using impact evaluations to illuminate and inform the role of knowledge intermediaries,” *Evidence & Policy A Journal of Research Debate and Practice*, vol. 9, pp. 409–418, Aug. 2013, doi: 10.1332/174426413X14818994998468.

[18]S. R. Makkar *et al.*, “The development of ORACLe: a measure of an organisation’s capacity to engage in evidence-informed health policy,” *Health Res Policy Sys*, vol. 14, no. 1, p. 4, Dec. 2015, doi: 10.1186/s12961-015-0069-9.

[19]G. Banks, “Evidence-Based Policy-Making: What is it? How do we get it?” 2009. [Online]. Available: https://www.pc.gov.au/news-media/speeches/cs20090204/20090204-evidence-based-policy.pdf

[20]R. C. Brownson, J. E. Fielding, and L. W. Green, “Building capacity for evidence-based public health: Reconciling the pulls of practice and the push of research,” *Annu Rev Public Health*, vol. 39, pp. 27–53, Apr. 2018, doi: 10.1146/annurev-publhealth-040617-014746.

[21]S. K. Lhachimi, M. M. Bala, and G. Vanagas, “Evidence-based public health,” *Biomed Res Int*, vol. 2016, p. Article 5681409, 2016, doi: 10.1155/2016/5681409.

[22]S. M. Kansagra and T. A. Farley, “Public health research: Lost in translation or speaking the wrong language?,” *Am J Public Health*, vol. 101, no. 12, pp. 2203–2206, Dec. 2011, doi: 10.2105/AJPH.2011.300302.

[23]I. D. Graham *et al.*, “Lost in knowledge translation: time for a map?,” *Journal of Continuing Education in the Health Professions*, vol. 26, no. 1, pp. 13–24, 2006, doi: 10.1002/chp.47.

[24]L. W. Green, “Making research relevant: If it is an evidence-based practice, where’s the practice-based evidence?,” *Family Practice*, vol. 25, no. Supplement 1, pp. i20–i24, Dec. 2008, doi: 10.1093/fampra/cmn055.

[25]Z. S. Morris, S. Wooding, and J. Grant, “The answer is 17 years, what is the question: understanding time lags in translational research,” *J R Soc Med*, vol. 104, no. 12, pp. 510–520, Dec. 2011, doi: 10.1258/jrsm.2011.110180.

[26]M. S. Bauer, L. Damschroder, H. Hagedorn, J. Smith, and A. M. Kilbourne, “An introduction to implementation science for the non-specialist,” *BMC Psychol*, vol. 3, no. 1, p. 32, Dec. 2015, doi: 10.1186/s40359-015-0089-9.

[27]S. E. Straus, J. Tetroe, I. D. Graham, M. Zwarenstein, O. Bhattacharyya, and S. Shepperd, “Monitoring use of knowledge and evaluating outcomes,” *Canadian Medical Association Journal*, vol. 182, no. 2, pp. 94–98, Feb. 2010, doi: 10.1503/cmaj.081335.

[28]L. Orton, F. Lloyd-Williams, D. Taylor-Robinson, M. O’Flaherty, and S. Capewell, “The use of research evidence in public health decision making processes: Systematic review,” *PLoS ONE*, vol. 6, no. 7, p. Article e21704, Jul. 2011, doi: 10.1371/journal.pone.0021704.

[29]M. S. Bauer and J. Kirchner, “Implementation science: What is it and why should I care?,” *Psychiatry Research*, vol. 283, p. Article 112376, Jan. 2020, doi: 10.1016/j.psychres.2019.04.025.

[30]K. Smith, *Beyond Evidence-Based Policy in Public Health*. London: Palgrave Macmillan UK, 2013. doi: 10.1057/9781137026583.

[31]R.-M. Hämäläinen *et al.*, “Exploring the use of research evidence in health-enhancing physical activity policies,” *Health Research Policy and Systems*, vol. 13, no. 1, p. 43, Oct. 2015, doi: 10.1186/s12961-015-0047-2.

[32]J. M. Tetroe *et al.*, “Health research funding agencies’ support and promotion of knowledge translation: An international study,” *Milbank Q*, vol. 86, no. 1, pp. 125–155, Mar. 2008, doi: 10.1111/j.1468-0009.2007.00515.x.

[33]I. Johnston and Phaa, “Australia’s public health response to COVID-19: what have we done, and where to from here?,” *Australian and New Zealand Journal of Public Health*, vol. 44, no. 6, pp. 440–445, 2020, doi: 10.1111/1753-6405.13051.

[34]A. R. Gagliardi, W. Berta, A. Kothari, J. Boyko, and R. Urquhart, “Integrated knowledge translation (IKT) in health care: a scoping review,” *Implement Sci*, vol. 11, p. 38, Mar. 2016, doi: 10.1186/s13012-016-0399-1.

[35]R. Armstrong *et al.*, “Understanding evidence: a statewide survey to explore evidence-informed public health decision-making in a local government setting,” *Implementation Science*, vol. 9, no. 1, p. 188, Dec. 2014, doi: 10.1186/s13012-014-0188-7.

[36]A. V. Diez Roux, “Complex Systems Thinking and Current Impasses in Health Disparities Research,” *Am J Public Health*, vol. 101, no. 9, pp. 1627–1634, Sep. 2011, doi: 10.2105/AJPH.2011.300149.
[37]L. V. Bertalanffy, *General System Theory*. New York: George Braziller, 1968.
[38]L. W. Green, R. E. Glasgow, D. Atkins, and K. Stange, “Making Evidence from Research More Relevant, Useful, and Actionable in Policy, Program Planning, and Practice: Slips ‘Twixt Cup and Lip,’” *American Journal of Preventive Medicine*, vol. 37, no. 6, pp. S187–S191, Dec. 2009, doi: 10.1016/j.amepre.2009.08.017.
[39]A. Ammerman, T. W. Smith, and L. Calancie, “Practice-Based Evidence in Public Health: Improving Reach, Relevance, and Results,” *Annu. Rev. Public Health*, vol. 35, no. 1, pp. 47–63, Mar. 2014, doi: 10.1146/annurev-publhealth-032013-182458.
[40]D. Kneale, A. Rojas-García, and J. Thomas, “Obstacles and opportunities to using research evidence in local public health decision-making in England,” *Health Res Policy Sys*, vol. 17, no. 1, p. Article 61, Jun. 2019, doi: 10.1186/s12961-019-0446-x.
[41]M. Aymerich *et al.*, “Barriers and Facilitators to Research Translation into Health Care Decision Making: A Scoping Review,” *Ann Transl Med Epidemiol*, vol. 4, no. 1, 2017.
[42]K. Oliver, S. Innvar, T. Lorenc, J. Woodman, and J. Thomas, “A systematic review of barriers to and facilitators of the use of evidence by policymakers,” *BMC Health Services Research*, vol. 14, no. 1, p. 2, Jan. 2014, doi: 10.1186/1472-6963-14-2.
[43]L. Boland, A. Kothari, C. McCutcheon, and I. D. Graham, “Building an integrated knowledge translation (IKT) evidence base: colloquium proceedings and research direction,” *Health Res Policy Sys*, vol. 18, no. 1, p. Article 8, Dec. 2020, doi: 10.1186/s12961-019-0521-3.
[44]A. J. Milat, A. E. Bauman, S. Redman, and N. Curac, “Public health research outputs from efficacy to dissemination: a bibliometric analysis,” *BMC Public Health*, vol. 11, no. 1, p. Article 934, Dec. 2011, doi: 10.1186/1471-2458-11-934.
[45]D. H. Peters, T. Adam, O. Alonge, I. A. Agyepong, and N. Tran, “Implementation research: what it is and how to do it,” *BMJ*, vol. 347, p. f6753, Nov. 2013, doi: 10.1136/bmj.f6753.
[46]L. W. Green and R. E. Glasgow, “Evaluating the Relevance, Generalization, and Applicability of Research: Issues in External Validation and Translation Methodology,” *Eval Health Prof*, vol. 29, no. 1, pp. 126–153, Mar. 2006, doi: 10.1177/0163278705284445.
[47]Y. Perry and J. Bennett-Levy, “Delivering the ‘H’ in NHMRC: the case for implementation research in mental health,” *Australian and New Zealand Journal of Public Health*, vol. 38, no. 5, pp. 411–413, 2014, doi: https://doi.org/10.1111/1753-6405.12275.
[48]Australian Government National Health and Medical Research Council, “Partnership projects 2019 Guide for Peer Reviewers.” 2019. [Online]. Available: https://www.nhmrc.gov.au/sites/default/files/documents/attachments/grant%20documents/partnership-projects-2019-guide-for-peer-reviewers.pdf
[49]A. B. McVay, K. A. Stamatakis, J. A. Jacobs, R. G. Tabak, and R. C. Brownson, “The role of researchers in disseminating evidence to public health practice settings: a cross-sectional study,” *Health Res Policy Syst*, vol. 14, no. 1, p. 42, Jun. 2016, doi: 10.1186/s12961-016-0113-4.
[50]R. P. Fields, K. A. Stamatakis, K. Duggan, and R. C. Brownson, “Importance of scientific resources among local public health practitioners,” *Am J Public Health*, vol. 105 Suppl 2, no. Suppl 2, pp. S288–S294, Apr. 2015, doi: 10.2105/AJPH.2014.302323.
[51]A. G. Pizzuti *et al.*, “Healthcare practitioners’ views of social media as an educational resource,” *PLOS ONE*, vol. 15, no. 2, p. e0228372, Feb. 2020, doi: 10.1371/journal.pone.0228372.
[52]M. Dobbins, S. Jack, H. Thomas, and A. Kothari, “Public health decision-makers’ informational needs and preferences for receiving research evidence,” *Worldviews Evid Based Nurs*, vol. 4, no. 3, pp. 156–163, 2007, doi: 10.1111/j.1741-6787.2007.00089.x.

[53]R. Kessler and R. E. Glasgow, “A proposal to speed translation of healthcare research into practice: dramatic change Is needed,” *American Journal of Preventive Medicine*, vol. 40, no. 6, pp. 637–644, Jun. 2011, doi: 10.1016/j.amepre.2011.02.023.

[54]M. W. Kreuter and R. J. Wray, “Tailored and targeted health communication: strategies for enhancing information relevance,” *Am J Health Behav*, vol. 27, no. Suppl. 3, pp. 227–232, Dec. 2003, doi: 10.5993/ajhb.27.1.s3.6.

[55]D. M. Campbell, S. Redman, L. Jorm, M. Cooke, A. B. Zwi, and L. Rychetnik, “Increasing the use of evidence in health policy: practice and views of policy makers and researchers,” *Australia and New Zealand Health Policy*, vol. 6, p. Article 21, Aug. 2009, doi: 10.1186/1743-8462-6-21.

[56]S. Majid *et al.*, “Adopting evidence-based practice in clinical decision making: nurses’ perceptions, knowledge, and barriers,” *J Med Libr Assoc*, vol. 99, no. 3, pp. 229–236, Jul. 2011, doi: 10.3163/1536-5050.99.3.010.

[57]D. Contandriopoulos, M. Lemire, J.-L. Denis, and É. Tremblay, “Knowledge Exchange Processes in Organizations and Policy Arenas: A Narrative Systematic Review of the Literature,” *Milbank Q*, vol. 88, no. 4, pp. 444–483, Dec. 2010, doi: 10.1111/j.1468-0009.2010.00608.x.

[58]N. S. Jessani, A. Valmeekanathan, C. M. Babcock, and B. Ling, “Academic incentives for enhancing faculty engagement with decision-makers—considerations and recommendations from one School of Public Health,” *Humanit Soc Sci Commun*, vol. 7, no. 1, pp. 1–13, Nov. 2020, doi: 10.1057/s41599-020-00629-1.

[59]N. Serrano *et al.*, “Building the capacity – examining the impact of evidence-based public health trainings in Europe: a mixed methods approach,” *Glob Health Promot*, vol. 27, no. 2, pp. 45–53, Jun. 2020, doi: 10.1177/1757975918811102.

[60]R. Thomas, M. J. Zimmer-Gembeck, and M. Chaffin, “Practitioners’ views and use of evidence-based treatment: positive attitudes but missed opportunities in children’s services,” *Adm Policy Ment Health*, vol. 41, no. 3, pp. 368–378, May 2014, doi: 10.1007/s10488-013-0471-y.

[61]M. R. Despard, “Challenges in implementing evidence-based practices and programs in nonprofit human service organizations,” *Journal of Evidence-Informed Social Work*, vol. 13, no. 6, pp. 505–522, Nov. 2016, doi: 10.1080/23761407.2015.1086719.

[62]A. M. Bach-Mortensen and P. Montgomery, “What are the barriers and facilitators for third sector organisations (non-profits) to evaluate their services? A systematic review,” *Syst Rev*, vol. 7, no. 1, p. Article 13, Dec. 2018, doi: 10.1186/s13643-018-0681-1.

[63]R. Hardwick, R. Anderson, and C. Cooper, “How do third sector organisations use research and other knowledge? A systematic scoping review,” *Implementation Sci*, vol. 10, no. 1, p. Article 84, Dec. 2015, doi: 10.1186/s13012-015-0265-6.

[64]J. P. Leider, E. Harper, K. Bharthapudi, and B. C. Castrucci, “Educational Attainment of the Public Health Workforce and Its Implications for Workforce Development,” *J Public Health Manag Pract*, vol. 21, no. Suppl 6, pp. S56–S68, Nov. 2015, doi: 10.1097/PHH.0000000000000306.

[65]N. R. LaPelle, K. Dahlen, B. A. Gabella, A. L. Juhl, and E. Martin, “Overcoming inertia: increasing public health departments’ access to evidence-based information and promoting usage to inform practice,” *Am J Public Health*, vol. 104, no. 1, pp. 77–80, Jan. 2014, doi: 10.2105/AJPH.2013.301404.

[66]N. R. LaPelle, R. Luckmann, E. H. Simpson, and E. R. Martin, “Identifying strategies to improve access to credible and relevant information for public health professionals: a qualitative study,” *BMC Public Health*, vol. 6, p. 89, Apr. 2006, doi: 10.1186/1471-2458-6-89.

[67]D. Revere *et al.*, “Understanding the information needs of public health practitioners: a literature review to inform design of an interactive digital knowledge management system,” *J Biomed Inform*, vol. 40, no. 4, pp. 410–421, Aug. 2007, doi: 10.1016/j.jbi.2006.12.008.

[68]C. Twose, P. Swartz, E. Bunker, N. K. Roderer, and K. B. Oliver, “Public health practitioners’ information access and use patterns in the Maryland (USA) public health

departments of Anne Arundel and Wicomico Counties," *Health Info Libr J*, vol. 25, no. 1, pp. 13–22, Mar. 2008, doi: 10.1111/j.1471-1842.2007.00738.x.

[69] J. A. Jacobs, E. A. Dodson, E. A. Baker, A. D. Deshpande, and R. C. Brownson, "Barriers to Evidence-Based Decision Making in Public Health: A National Survey of Chronic Disease Practitioners," *Public Health Rep*, vol. 125, no. 5, pp. 736–742, Sep. 2010, doi: 10.1177/003335491012500516.

[70] A. A. Mallidou, P. Atherton, L. Chan, N. Frisch, S. Glegg, and G. Scarrow, "Core knowledge translation competencies: a scoping review," *BMC Health Serv Res*, vol. 18, no. 1, p. Article 502, Dec. 2018, doi: 10.1186/s12913-018-3314-4.

[71] K. Singh, "Evidence-based public health: Barriers and facilitators to the transfer of knowledge into practice," *Indian J Public Health*, vol. 59, no. 2, p. 131, 2015, doi: 10.4103/0019-557X.157534.

[72] World Health Organization, "Evidence-Informed Policy Network." https://www.who.int/evidence/about/en/

[73] World Health Organization, Regional Office for Europe, "About us, Evidence-informed policy-making," 2021. https://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/about-us (accessed May 14, 2021).

[74] Australian Government, Department of Health, "About us, What we do," 2019. https://www.health.gov.au/about-us/what-we-do (accessed May 14, 2021).

[75] National Health Medical Research Council, "About us, Who we are," 2021. https://www.nhmrc.gov.au/about-us/who-we-are (accessed May 14, 2021).

[76] R. G. Tabak *et al.*, "Dissemination and implementation science training needs: Insights from practitioners and researchers," *American Journal of Preventive Medicine*, vol. 52, no. 3, Suppl. 3, pp. 322–329, Mar. 2017, doi: 10.1016/j.amepre.2016.10.005.

[77] J. Jagosh *et al.*, "Uncovering the Benefits of Participatory Research: Implications of a Realist Review for Health Research and Practice: A Realist Review for Health Research and Practice," *Milbank Quarterly*, vol. 90, no. 2, pp. 311–346, Jun. 2012, doi: 10.1111/j.1468-0009.2012.00665.x.

[78] S. Ross, J. Lavis, C. Rodriguez, J. Woodside, and J.-L. Denis, "Partnership experiences: involving decision-makers in the research process," p. 10, 2003.

[79] G. Bammer *et al.*, "Expertise in research integration and implementation for tackling complex problems: when is it needed, where can it be found and how can it be strengthened?," *Palgrave Communications*, vol. 6, no. 1, p. Article 5, Jan. 2020, doi: 10.1057/s41599-019-0380-0.

[80] B. Albers, A. Metz, and K. Burke, "Implementation support practitioners – a proposal for consolidating a diverse evidence base," *BMC Health Serv Res*, vol. 20, no. 1, p. 368, Dec. 2020, doi: 10.1186/s12913-020-05145-1.

[81] R. Lengnick-Hall, N. A. Stadnick, K. S. Dickson, J. C. Moullin, and G. A. Aarons, "Forms and functions of bridging factors: specifying the dynamic links between outer and inner contexts during implementation and sustainment," *Implementation Science*, vol. 16, no. 1, p. 34, Apr. 2021, doi: 10.1186/s13012-021-01099-y.

[82] R. G. Gerrits, D. S. Kringos, M. J. van den Berg, and N. S. Klazinga, "Improving interpretation of publically reported statistics on health and healthcare: the Figure Interpretation Assessment Tool (FIAT-Health)," *Health Research Policy and Systems*, vol. 16, no. 1, p. 20, Mar. 2018, doi: 10.1186/s12961-018-0279-z.

[83] G. Bammer, "A Systematic approach to integration in research." Australian Government, Land & Water Australia, The Australian National University, 2006.

[84] F. Baum, M. Fisher, D. Trewin, and A. Duvnjak, "Funding the 'H' in NHMRC," *Australian and New Zealand Journal of Public Health*, vol. 37, no. 6, pp. 503–505, 2013, doi: https://doi.org/10.1111/1753-6405.12165.

[85] NHMRC, "Summary of the results of the NHMRC 2021 Grant Application Round – Updated 02/02/2022," *Outcomes of funding rounds*, 2022. https://www.nhmrc.gov.au/funding/data-research/outcomes (accessed May 17, 2022).

[86] N. Wallerstein and B. Duran, "Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health

Equity," *Am J Public Health*, vol. 100, no. Suppl 1, pp. S40–S46, Apr. 2010, doi: 10.2105/AJPH.2009.184036.

[87]National Health Medical Research Council, "Research Translation," *nhmrc.gov.au*. https://www.nhmrc.gov.au/research-policy/research-translation-and-impact (accessed Apr. 05, 2021).

[88]M. E. Nyström, J. Karltun, C. Keller, and B. Andersson Gäre, "Collaborative and partnership research for improvement of health and social services: researcher's experiences from 20 projects," *Health Res Policy Sys*, vol. 16, no. 1, p. 46, Dec. 2018, doi: 10.1186/s12961-018-0322-0.

[89]S. Woolf *et al.*, "Translating Evidence into Population Health Improvement: Strategies and Barriers," *Annu. Rev. Public Health*, vol. 36, pp. 463–482, 2015, doi: 10146/annurev-publhealth-082214-110901.

[90]E. Marín-González, D. Malmusi, L. Camprubí, and C. Borrell, "The Role of Dissemination as a Fundamental Part of a Research Project: Lessons Learned From SOPHIE," *Int J Health Serv*, vol. 47, no. 2, pp. 258–276, Apr. 2017, doi: 10.1177/0020731416676227.

[91]E. Quinn, C. Huckel-Schneider, D. Campbell, H. Seale, and A. J. Milat, "How can knowledge exchange portals assist in knowledge management for evidence-informed decision making in public health?," *BMC Public Health*, vol. 14, no. 1, p. 443, May 2014, doi: 10.1186/1471-2458-14-443.

[92]M. Dobbins *et al.*, "A randomized controlled trial evaluating the impact of knowledge translation and exchange strategies," *Implementation Sci*, vol. 4, no. 1, p. 61, Dec. 2009, doi: 10.1186/1748-5908-4-61.

[93]M. Dobbins, "History of Health Evidence," 2021. https://www.healthevidence.org/history.aspx

[94]A. Sanson and A. Stanley, "Improving the wellbeing of Australian children and youth: the importance of bridging the know–do gap," in *Bridging the "Know-Do" Gap: Knowledge brokering to improve child wellbeing*, ANU E Press, 2010, pp. 3–17.

[95]ARACY, "About us," Sep. 03, 2021. https://www.aracy.org.au/about-us (accessed Mar. 09, 2021).

[96]Australia's National Research Organisation for Women's Safety Limited, "Who we are," 2021. https://www.anrows.org.au/about/ (accessed Mar. 09, 2021).

[97]The Australian Prevention Partnership Centre, "Outcomes Report 2013-2018. Challenging the system. A partnership approach to chronic disease prevention," The Australian Prevention Partnership Centre, 2018. Accessed: Dec. 16, 2021. [Online]. Available: https://preventioncentre.org.au/wp-content/uploads/2021/10/Outcomes_Report-2013_2018-Changing-the-system.pdf

[98]J. Leeman *et al.*, "What strategies are used to build practitioners' capacity to implement community-based interventions and are they effective?: a systematic review," *Implementation Sci*, vol. 10, no. 1, p. 80, Dec. 2015, doi: 10.1186/s13012-015-0272-7.

[99]D. Ciliska, H. Thomas, and C. Buffett, "A Compendium of Critical Appraisal Tools for Public Health Practice." National Collaborating Centre for Methods and Tools, 2008.

[100]L. Yarber *et al.*, "Evaluating a train-the-trainer approach for improving capacity for evidence-based decision making in public health," *BMC Health Services Research*, vol. 15, no. 1, p. 547, Dec. 2015, doi: 10.1186/s12913-015-1224-2.

[101]R. Ramaswamy, J. Mosnier, K. Reed, B. J. Powell, and A. P. Schenck, "Building capacity for Public Health 3.0: introducing implementation science into an MPH curriculum," *Implement Sci*, vol. 14, Feb. 2019, doi: 10.1186/s13012-019-0866-6.

[102]Pathways in Place, "System Intermediaries Literature Review, Pathways in Place: Co-Creating Community Capabilities_unpublished (available on request)." Victoria University, Victoria and Griffith University, Queensland, 2021.

[103]J. Lomas, "The in-between world of knowledge brokering," *BMJ*, Jan. 2007.

[104]C. C. Bornbaum, K. Kornas, L. Peirson, and L. C. Rosella, "Exploring the function and effectiveness of knowledge brokers as facilitators of knowledge translation in health-related settings: a systematic review and thematic analysis," *Implementation Science*, vol. 10, no. 1, p. 162, Nov. 2015, doi: 10.1186/s13012-015-0351-9.

[105]M. Barwick, J. Peters, and K. Boydell, “Getting to uptake: do communities of practice support the implementation of evidence-based practice?,” *J Can Acad Child Adolesc Psychiatry*, vol. 18, no. 1, pp. 16–29, Feb. 2009, Accessed: Mar. 07, 2021. [Online]. Available: https://europepmc.org/article/PMC/2651208

[106]R. C. Brownson, P. Allen, K. Duggan, K. A. Stamatakis, and P. C. Erwin, “Fostering More-Effective Public Health by Identifying Administrative Evidence-Based Practices,” *Am J Prev Med*, vol. 43, no. 3, pp. 309–319, Sep. 2012, doi: 10.1016/j.amepre.2012.06.006.

[107]A. A. Eyler, C. Valko, R. Ramadas, M. Macchi, Z. Fershteyn, and R. C. Brownson, “Administrative Evidence-based Practices in State Chronic Disease Practitioners,” *American Journal of Preventive Medicine*, vol. 54, no. 2, pp. 275–283, Feb. 2018, doi: 10.1016/j.amepre.2017.09.006.

[108]S. Branch, R. Homel, and K. Freiberg, “CREATE-ing Pathways to Child Wellbeing in Disadvantaged Communities - Phases 2 and 3 (2016-2020): The Collective Impact Facilitator Role,” Griffith Criminology Institute, Brisbane, Australia, 2020.

[109]Knowledge Brokering Group, “Knowledge Brokering, Transfer and Exchange, Translation and Mobilisation Training and Facilitations,” 2021. https://www.knowledgebrokeringgroup.com.au/kbtraining/ (accessed Aug. 17, 2021).

[110]V. Ward, A. House, and S. Hamer, “Knowledge brokering: the missing link in the evidence to action chain?,” *Evid Policy*, vol. 5, no. 3, pp. 267–279, 2009, doi: 10.1332/174426409X463811.

[111]C. Clavier, Y. Sénéchal, S. Vibert, and L. Potvin, “A theory-based model of translation practices in public health participatory research,” *Sociology of Health & Illness*, vol. 34, no. 5, pp. 791–805, 2012, doi: 10.1111/j.1467-9566.2011.01408.x.

[112]L. Stott, “The case for partnership brokering,” *Shaping sustainable change: The role of partnership brokering in optimising collaborative action*. Routledge, New York, pp. 11–19, 2019.

[113]L. Stott, “Introduction,” in *Shaping sustainable change: The role of partnership brokering in optimising collaborative action*, L. Stott, Ed. New York: Routledge, 2019, pp. 1–8.

[114]R. Tennyson, *The Brokering Guidebook: Navigating Effective Sustainable Development Partnerships*. London: The Partnering Initiative: International Business Leaders Forum, 2005.

[115]M. Warner, “Partnerships for sustainable development: Do we need partnership brokers?,” Overseas Development Insitute, London, 2003.

[116]M. Artigliere and L. Baecher, “Complexity in coaching: A self-study of roles and relationships,” *International Journal of Evidence Based Coaching and Mentoring*, vol. 14, no. 2, pp. 66–86, 2016.

[117]D. Bambino, “Critical Friends,” *Educational Leadership*, vol. 59, no. 6, pp. 25–27, 2002.

[118]A. Costa and B. Kallick, “Through the lens of a critical friend,” *Educational Leadership*, vol. 51, no. 2, pp. 49–51, Jan. 2020.

[119]A. Fletcher, “An Invited Outsider or an Enriched Insider? Challenging Contextual Knowledge as a Critical Friend Researcher,” in *Educational Researchers and the Regional University: Agents of Regional-Global Transformations*, M. Green, S. Plowright, and N. F. Johnson, Eds. Singapore: Springer, 2019.

[120]M. Huerta Villalobos, “The role of the critical friend in leadership and school improvement,” The University of Melbourne, Melbourne, 2014.

[121]J. Pieratt, “Critical Friends: Building a Culture of Collaboration,” *TCHERS’ Voice Blog*, 2015.

[122]S. Swaffield, “Critical friendship, dialogue and learning, in the context of Leadership for Learning,” *School Leadership and Management*, vol. 28, no. 4, pp. 323–336, 2008, doi: 10.1080/13632430802292191.

[123]The Glossary of Education Reform, “CRITICAL FRIEND,” Oct. 28, 2013.

[124]S. M. Sim *et al.*, “CIHR health system impact fellows: reflections on ‘driving change’ within the health system,” *International Journal of Health Policy and Management*, vol. 8, no. 6, pp. 323–328, 2019, doi: doi:10.15171/ijhpm.2018.124.

[125]H. D. Safford, S. C. Sawyer, S. D. Kocher, J. K. Hiers, and M. Cross, “Linking knowledge to action: the role of boundary spanners in translating ecology,” *Front Ecol Environ*, vol. 15, no. 10, pp. 560–568, Dec. 2017, doi: 10.1002/fee.1731.

[126]S. Branch, K. Freiberg, R. Homel, and C. Stubbs, “The importance of access, time and space – developing the collective change facilitator role as part of a multi-partner research program,” in *Community-based research with vulnerable populations*, Lesley Wood, Ed. Springer, 2006.

[127]R. Homel, S. Branch, and K. Freiberg, “Implementation Through Community Coalitions: The Power of Technology and of Community-Based Intermediaries,” *J Primary Prevent*, vol. 40, no. 1, pp. 143–148, Feb. 2019, doi: 10.1007/s10935-019-00541-8.

[128]SickKids Hospital, “Knowledge Translation Training and Resources,” 2021. https://www.sickkids.ca/en/learning/continuing-professional-development/knowledge-translation-training/#pip

[129]E. Yeung, L. Carlin, S. Sandassie, and S. Jaglal, “Transdisciplinary training: what does it take to address today’s ‘wicked problems’?,” *Innovation and Education*, vol. 3, no. 1, p. 4, Jun. 2021, doi: 10.1186/s42862-021-00011-1.

[130]B. Holmes, G. Scarrow, and M. Schellenberg, “Translating evidence into practice: the role of health research funders,” *Implementation Science*, vol. 7, no. 1, p. 39, Apr. 2012, doi: 10.1186/1748-5908-7-39.

[131]The Australian Research Council, “ERA EI Review Final Report 2020–2021.” Commonwealth of Australia, 2021. [Online]. Available: https://www.arc.gov.au/excellence-research-australia/era-ei-review

[132]L. Rycroft-Smith, “Knowledge brokering to bridge the research-practice gap in education: Where are we now?,” *Review of Education*, vol. 10, no. 1, p. e3341, 2022, doi: 10.1002/rev3.3341.

[133]A. M. Hoens, W. D. Reid, and P. G. Camp, “Knowledge brokering: An innovative model for supporting evidence-informed practice in respiratory care,” *Can Respir J*, vol. 20, no. 4, pp. 271–274, 2013, Accessed: May 17, 2022. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3956337/

[134]P. Bastani, J. Bahmaei, E. Kharazinejad, M. Samadbeik, Z. Liang, and C. H. Schneider, “How COVID-19 affects the use of evidence informed policymaking among iranian health policymakers and managers,” *Archives of Public Health*, vol. 80, no. 1, p. 16, Jan. 2022, doi: 10.1186/s13690-021-00757-3.

[135]T. Combs *et al.*, “Simulating the role of knowledge brokers in policy making in state agencies: An agent-based model,” *Health Services Research*, vol. 57, no. S1, pp. 122–136, 2022, doi: 10.1111/1475-6773.13916.

[136]M. Marshall, “Researchers-in-Residence: a solution to the challenge of evidence-informed improvement?,” *Primary Health Care Research & Development*, vol. 15, no. 4, pp. 337–338, Oct. 2014, doi: 10.1017/S1463423614000310.

[137]G. Scarrow, D. Angus, and B. J. Holmes, “Reviewer training to assess knowledge translation in funding applications is long overdue,” *Research Integrity and Peer Review*, vol. 2, no. 1, p. 13, Aug. 2017, doi: 10.1186/s41073-017-0037-8.

[138]T. Ross-Hellauer *et al.*, “Ten simple rules for innovative dissemination of research,” *PLoS Comput Biol*, vol. 16, no. 4, p. e1007704, Apr. 2020, doi: 10.1371/journal.pcbi.1007704.

[139]R. C. Brownson, A. A. Eyler, J. K. Harris, J. B. Moore, and R. G. Tabak, “Getting the Word Out: New Approaches for Disseminating Public Health Science,” *Journal of Public Health Management and Practice*, vol. 24, no. 2, pp. 102–111, Apr. 2018, doi: 10.1097/PHH.0000000000000673.

[140]M. R. Thompson and D. Schwartz Barcott, “The Role of the Nurse Scientist as a Knowledge Broker,” *Journal of Nursing Scholarship*, vol. 51, no. 1, pp. 26–39, 2019, doi: 10.1111/jnu.12439.

[141]R. Kislov, H. Waterman, G. Harvey, and R. Boaden, “Rethinking capacity building for knowledge mobilisation: developing multilevel capabilities in healthcare organisations,” *Implement Sci*, vol. 9, p. 166, Nov. 2014, doi: 10.1186/s13012-014-0166-0.

Mitchell Institute for Education and Health Policy,
Victoria University
300 Queen Street, Melbourne, Victoria 3000
+61 3 9919 1820
mitchellinstitute.org.au