2022

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Kimberley R Isett
Diana Hicks

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Kimberley R. Isett* & Diana Hicks**

*Biden School of Public Policy and Administration
University of Delaware
Newark DE

**School of Public Policy
Georgia Institute of Technology
Atlanta GA

kri@udel.edu
dhicks@gatech.edu

Abstract

Many social science researchers seek to and are increasingly evaluated on their ability to influence public decision makers. However, the literature suggests that making an impact on decision makers is difficult. Yet, that same literature provides guidance on getting research used. In this paper, we take a critical look at one part of this genre – policy use of research in health services.   We find that the literature emphasizes characteristics of knowledge that are under the control of researchers: content salience, effective communication, quality and attending to parameters of use. However, theories of agenda setting and decision making suggest that many aspects of use of research are beyond the control of researchers. Therefore, evaluation of researchers' success in achieving policy use of their results can only rest on effort expended and not results achieved.

Keywords

Agenda setting, decision making, policy, quality, communication, salience

Introduction

The quandary of getting research used in practice is an age-old one. For example, in the health sciences, it takes anywhere between 15 and 20 years before well-evidenced practices are in widespread use in doctors' offices (Isett & Phillips, 2010; Morris, Wooding, & Grant, 2011; Panzano & Roth, 2006). This delay is in a field where there has been a concerted evidence dissemination project for decades. What does that mean for the social sciences where there has been less focus on translation to policy which is a more diffuse and more difficult realm to track?   In this paper, we ask how social science research and the evidence generated by that research comes to be used by public decision makers in the hopes of providing guidance for social scientists who will be evaluated in part on their ability to change the course of public policymaking.

Policy use of research-based evidence is of broad concern, and several leading institutions have developed frameworks to guide the analysis of research impact. In Figure 1, the Centers for Disease Control and Prevention's (CDC) impact framework[a] identifies five "domains of influence" that drive health outcomes: disseminating science, creating awareness, catalyzing action, effecting change, and shaping the future (see figure 1). The graphic is circular with arrows connecting every action, emphasizing looping back and lack of chronological order; therefore, the degree of impact is not a progression. The CDC has identified at least seven indicators for each domain, providing a starting point for those seeking to make the case that their work has had policy impact.

In another example, the Institute of Medicine (IOM) introduced the Degrees of Impact Thermometer (Fineberg, 2013) (Figure 2).   Reminiscent of Knott & Wildavsky's (1980) seven stages of knowledge use, the IOM's five degrees of impact are: spreading the message, receiving recognition, informing the field, inspiring action, and effecting change. The actions are ordered from bottom to top on a graphic of a traditional mercury thermometer, the implication being that while spreading the message is a start, effecting change is a higher level of achievement. Two to five indicators are juxtaposed with each action, from published articles in journals through improved health outcomes.

Both frameworks portray activities, only some of which are the responsibility of researchers. Both suggest data that can be collected to indicate that the activity has been undertaken. Both include policy change among their indicators. In the CDC's framework, we find Congressional hearings (in catalyzing action), legal/policy changes (in effecting change), and implementation of public health programs/initiatives (in shaping the future). On the IOM thermometer, we see subject of Congressional hearing/investigation (by informing the field), legislation introduced (by inspiring action), and policy change, including organizational policy (by effecting change).

Though the CDC and IOM figures articulate actions required to achieve impact and indicators of those actions having taken place, they are silent on what knowledge should look like to enable impact. For insights to guide the work of knowledge production, we look to the well developed literature in health services that examines the translation of research into practice in public decision making. We summarize the myriad of published articles on how knowledge should be configured to be useful to decision makers and present our interpretation of the most common recommendations.

Configuring knowledge to enable use

The literature on health-related evidence translation in public decision making is one of the best developed --more so than that in many other policy related areas. Thus, we

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[a] Found here: http://www.cdc.gov/od/science/impact/framework.html, August 26, 2020

focus primarily on that body of work. We began with two influential articles in the field: Greenhalgh et al. (2004) and Jewell and Bero (2008). We then used a snowball approach to collect review and framework articles cited by or citing these two articles using both PubMed and Google Scholar. Articles were screened for a focus specifically on evidence translation into public decision making. In all, 32 articles are included in this review. We read each article looking for convergence and created a synthesis that presents the most common elements across each of the 32 articles. Where feasible, we leverage cross citations from other domains to illustrate commensurability with work in other substantive areas. The synthesis is organized into the following categories: content salience, effective communication, quality, and parameters of use.

Content Salience

The concept of evidence is contested. What constitutes evidence is not at all agreed upon by decision makers or even scientists and scholars – let alone the general public (Drake et al., 2001). In the social sciences, there are different kinds of evidence (qualitative and quantitative, empirical, and personal lived experience) as well as differing levels of objectivity or rigor. So the question becomes, what evidence is "good enough" for a policy decision (Atkins et al., 2005; Isett et al., 2016). The existing literature does not have a definitive answer, but it does contain pointers.

Effective public evidence needs both qualitative and quantitative components (Jewell & Bero, 2008). On the qualitative side, stories provide an emotional hook and an intuitive appeal (Brownson, Chriqui, & Stamatakis, 2009; Troy & Kietzman, 2016). Stamatakis and colleagues (2010) point out that "protagonists [of a story] should reflect an important constituency that could benefit from the proposed policy change." In particular, stories are vital when the benefits to a group are difficult to monetize, such as safety or quality of life (Brownson et al., 2009; Stamatakis et al., 2010).

Arguably, scholarship is not needed to generate stories for policy arguments – individuals are best at relaying their personal stories directly. The strength of scholarship lies in providing quantitative evidence and arguments that can be difficult to generate from other sources. Social scientists are skilled in providing cost-benefit analyses, descriptive statistics, and impact analyses. They may, however, be less aware of or interested in other types of numbers influential with public decision makers. There are three categories of numbers highlighted in the current literature. First, descriptions of a problem that highlight disparities in the population (Stamatakis et al., 2010). How are distinct communities differentially benefitting from or disadvantaged by the status quo? Second, projections are essential. In particular, the number of cases that could be prevented by a given intervention (Hanney et al., 2003), the cost of policy inaction and how these costs are distributed (Stone, 1989), and the distribution of the benefits of the intervention (Hanney et al., 2003; Jewell & Bero, 2008; Stamatakis et al., 2010) are of interest to public decision makers. Finally, for policy areas where outcomes are long term, Fielding and Briss (2006) suggest including intermediate measures of benefits to provide a shorter time to payoff for policymakers forced to work on short policy cycles.

Geography matters for relevance to a policymaker as well. Statements about a general need or a pervasive phenomenon do not distinguish themselves from the information noise that surrounds decision makers (Hanney et al., 2003). Instead, information needs to be specific to policymakers' local jurisdiction and based on data about the people they serve (Brownson, et al., 2016; Fielding & Frieden, 2004; Hanney et al., 2003; Laugesen & Isett, 2013; Murthy et al., 2012; van de Goor et al., 2017). Policymakers also want to see how they compare to their peers (Stamatakis et al., 2010; Stone, 1989)–those jurisdictions that they think are similar or competitors to themselves can compel decision makers to act, not wanting to be the "low man." The connection between causal ideas and responsibility to act (Isett, Laugesen, & Cloud, 2015; Stone, 1989), and a moral obligation to fix an identified problem (Gamble & Stone, 2006) for their constituents is crucial, both objectively and comparatively.

Effective communication

The literature is clear on the need for high-quality communication. This is an area many scholars shy away from, feeling the data should speak for itself (Pisano, 2016). Busy decision makers have limited time and cognitive resources to filter the vast amount of material needed to make decisions. They must rely on both heuristics (about source and content) and the summaries provided to them by others (Cyert & March, 1963; Dagenais, Laurendeau, & Briand-Lamarche, 2015; Ostrom, 1998). While academics often point to the systematic review as a gold standard, these kinds of documents present barriers to uptake (Tricco et al., 2016). So concise, well written summaries are crucial.

The ability to summarize and distill information transparently and credibly is key to getting decision makers' attention without contributing to overload (Burris et al., 2010; Cyert & March, 1963; Hanney et al., 2003; Murthy et al., 2012). Information presented straightforwardly (without jargon) that is easy to understand can be absorbed more quickly – and possibly used (Burris et al., 2010; Coffman, Hong, Aubry, Luft, & Yelin, 2009; Gamble & Stone, 2006). Targeted information, with explicit scope and relevance to the decision at hand, shaven of all secondary and tangential information, needs to be inserted into the process at the right time (Brownson, Fielding, et al., 2009; Burris et al., 2010; Coffman et al., 2009; Hanney et al., 2003; Lavis, Oxman, Moynihan, & Paulsen, 2008). Further, the benefits of policy adoption should be visible and unambiguously presented (Atkins et al., 2005; Gamble & Stone, 2006). "Well designed translational materials and strategies that reflect an understanding of the constraints that policymakers face certainly have a greater chance of carrying the day than do research reports that are physically and cognitively inaccessible to policymakers" (Burris et al., 2010, p. 197).

Cognitive inaccessibility is a critical issue and one that social scientists do not necessarily understand. Studies find that quantitative data is inaccessible to most public decision makers (Brownson et al., 2009) who are trained to do other things than sort and

interpret data. At least one leading study has shown that public decision makers confuse cause and correlation (Jewell & Bero, 2008). Moreover, while showing decision makers and their staffs evidence or teaching them how to access it seems like it might address capacity deficits (Redman et al., 2015; VanLandingham & Silloway, 2016), there is limited evidence that this works (Murthy et al., 2012).

Thus, the craft of messaging empirical research is crucial to getting research used. Above all, messages must be tweaked for multiple audiences (Troy & Kietzman, 2016; van de Goor et al., 2017). The details given to a policymaker differ from those produced for agencies, advocacy, or the public and take into consideration their different foci, authority, and scope of operations (Hanney et al., 2003; Lavis et al., 2003; Oliver et al., 2014; Sabatier & Jenkins-Smith, 1993). While multiple messaging artifacts should be internally consistent, the language, highlights, and modes of communication differ.

Because the requirements of multiplex messaging are somewhat at odds with the requirements of scholarly incentives, and because any single study is rarely definitive enough to guide policy by itself, intermediaries play a significant role in facilitating the use of research in policy (Lavis et al., 2003; Meagher & Lyall, 2013). Intermediaries can produce systematic overviews incorporating research-based insights crafted in clear language, targeted to a policy domain. Lemay and Sá (2014) found that aggregated synthesizes produced by the World Health Organization and other public health agencies were most commonly used by those in a Canadian public health agency to learn about new scientific evidence. Users know the organizations in their domains that produce broad syntheses and so can quickly find relevant reviews. The bottom line is that social science findings do not stand alone on their merits. Instead, they must be interpreted for use and comprehension by decision makers and the general public (Stamatakis et al., 2010) so that there is a consensus about the cause and solution to a given issue.

Quality

While social scientists like to think that they know good evidence when they see it, the criteria that public servants use to assess evidence are somewhat different and more nuanced. In scientific circles, the randomized controlled trial and a low p-value are the gold standards indicating quality results. However, public decision makers want to know how good the evidence is that something will affect outcomes in a meaningful way (Atkins et al., 2005) --that is effect size, not statistical significance.

Credibility is the second component of quality evidence. Strictly speaking, credibility "involves the scientific adequacy of the technical evidence and arguments" (Cash et al., 2003, p.8086). However, policy audiences without the requisite specialist expertise to make a technical judgment, instead tend to assess credibility through face validity of the messenger, or the research team (Brownson, Chriqui, et al., 2009; Lavis et al., 2008; Lavis et al., 2003). Professional or known government organizations are often

considered credible sources (Lavis et al., 2003), as are researchers from respected universities.

Parameters of Use

It is a mistake to think that just because evidence points to a problem (or a solution) that something can be done to address it. A public system must have the capacity to do something. Hanney and colleagues (2003) point out that sometimes a system just cannot absorb the findings. Either the system has little to no resources to address the concern, or no technical solution exists.

Given this constraint, the extant literature provides insight into how evidence is used, when it is used. First, public decision makers are more likely to use evidence if it comports with their operating realities. Recommendations need to be feasible and consistent with decision makers' jurisdictions, resources, authority, and scope of the problem (Brownson, Fielding, et al., 2009; Lavis et al., 2003). Solutions that fall outside established authorities cannot be implemented and might be illegal. Reversibility is also crucial for public servants. Decision makers might require room to back away from publicly stated positions when implementation or context changes (Jewell & Bero, 2008; Zaltman, Duncan, & Holbek, 1984). Path dependency stemming from a potential decision could lead to risk aversion and maintaining the status quo rather than engaging in needed change.

Getting evidence into the hands of and used by public decision makers can be facilitated by interaction. Interaction, including feedback from the decision makers, is a way to engage and co-opt the decision-making body to take up the evidence from a given investigation. These feedback mechanisms can be as simple as a conversation to inquire about perceived shortcomings - simple knowledge transfer methods are as effective as more complex ones (Dobbins et al., 2009). And active engagement with decision makers is more effective than passive modes of knowledge transmission (Lavis et al., 2003). Cash et al. (2003) established that ongoing interaction is central to providing salient, credible, legitimate information. Projects that involve interaction only at the beginning risk providing solutions to yesterday's problems (not salient) or outdated knowledge (not credible), and excluded parties often question the legitimacy of information resulting from ensuing conversations.

The literature also addresses the purpose of evidence. Over and over, the literature suggests that evidence is *not* used to determine when to intervene (Murthy et al., 2012). Instead, it is used to understand *how* to fix problems (Fielding & Briss, 2006; Lavis et al., 2003; Liverani, Hawkins, & Parkhurst, 2013). Using evidence to illustrate a "new" problem exists is likely ineffective.   Identifying a new problem means that a new program needs to be developed. New programs have high upfront costs and long term benefits, yielding a low powered incentive (Fielding & Briss, 2006; Frant, 1996). Despite reluctance to initiate a new program, evidence is more likely to be used to start a new program rather than replacing an existing one (Fielding & Briss, 2006) – adding to the status quo rather than changing it (Cyert & March, 1963; Downs, 1967).

Configuring the knowledge is not enough

Attending to content salience, effective communication, high quality information and the use context is demanding, but still may not be enough. Complexities of the policy world are outside the control of researchers and also determine whether research is used by decision makers.

The discussion above surfaced many strong points, its focus on the quality of evidence is perhaps the most potent aspect. Well executed analyses that illustrated the extent of a problem generated by a credible messenger are central. The messengers are likely a mix of the scholars themselves and intermediaries that aggregate and interpret the findings for policymakers. This mix is consistent with the policy process where scholars do not necessarily have to participate directly in the policy process to have their work utilized.

Another strength is the discussion of the breadth of quantitative approaches that are used and valued by policymakers. A range of quantitative methods will make a case, but descriptive quantification seems to be more critical than sophisticated modeling. Description is more easily understood and helps with a basic understanding of the problem and an imperative to act. However, the literature reviewed does not assist in understanding which kinds of numbers matter when and whether certain types of numbers have more impact under certain circumstances.

It is unreasonable to expect policymakers to invest in understanding the complicated formulas unique to every study. Intermediaries know this and strive to offer a story of numbers that is uncomplicated, clear, and stripped of unnecessary content except for the credibility of the author of the number. This is why white papers and policy documents contain references. The number is never truly alone. It derives a halo of credibility from its referenced source. Thus staged, numbers can captivate the discussion and motivate change. Despite the power of captivating numbers, policy stories are narratives. Documents that include numbers incorporate them in syntheses deploying a wide range of data.

A final strength lies in the emphasis on a strong narrative. As one author has said, it is the ideas that sell a policy, not the data behind it (Lavis et al., 2003). The ability to weave a compelling story about needs, obligations, and solutions is crucial to the success of the policy. Numbers contribute to narratives supporting the story. A strong narrative is essential; often, that narrative is constructed by an intermediary, not the scholar.

There is a clear division of labor in the policy process that harkens back to Oakerson's (1999) division of the production (scholarly output of research) and provision (useful, targeted synthesis of research) of public goods –the good here being policy evidence. This is likely necessary, as studies have illustrated that researchers may not be well

suited to the task (Fiske & Dupree, 2014). Scholars do not feel comfortable lobbying, as being an advocate would reduce their credibility as information providers in the eyes of decision makers. Intermediaries serve as the linchpin between scholarly output and inputs to the policy process. They work to bundle related studies that bear on the topic of interest, contextualize, and interpret the information for salience to and easy processing by the decision making body (c.f. Dutton, 1997).   Intermediaries can also resolve the tensions scholars face when interacting with policy – lack of time, clarity versus complexity in communication, timely input versus in-depth, high-quality assessment (Sarkki et al., 2014). Known intermediaries can be "honest brokers" producing credible syntheses that are useful and unbiased. This aspect of the policy process has been underemphasized in the current literature and ought to be investigated more thoroughly.

Other areas of the discussion seem less relevant. In particular, interaction with policymakers and proposing a solution are not aspects always present. Often scholarship contributes to the agenda-setting phase of policy. This leads to the question of which elements are necessary and which are sufficient to move scholarship into policy use.   We need to understand better which characteristics are required, and if the context matters for when the elements are relevant.

Analytically, the difference between making marginal changes or undertaking a significant overhaul of a program is unclear. Which is within the boundaries of proposing a new program or out of its scope? These differences are essential for understanding the analytical distinctions between "new" vs. "old" programs. Borrowing from classic treatments of agency behavior (Downs, 1967), it is plausible that new programs or staff lines in a programmatic expansion would be welcomed by agency staff as an extension of their turf. How does this comport with the framework and the resistance to new programs asserted in it?

A more general concern could be that this is an overly rational and sanguine way to perceive the policy process (e.g., Cairney et al., 2016) that does not attend to policy areas that necessarily have to lurch due to rapid knowledge development or fast-moving policy windows (Kingdon, 1995). However, there are stable policy areas that change slowly over time because of the nature of the substantive domain. On a deeper level, the use of evidence in policy requires a system committed to openness, transparency, and accountability in decision-making processes, characteristics that should not be taken for granted (Donadelli, 2020).

Another way the discussion is inconsistent with existing theory is in the role of ambiguity in the policy process. The idea that the benefits to society must be presented in unambiguous terms conflicts with classic political science findings that ambiguity is conducive to policy being passed (e.g., Stone, 2002).   This may be one area where the tangibility of the policy domain makes a difference. When may policy domain

ambiguities permit ambiguous language about the benefits and harms of policy proposals and solutions?

Nothing here, on face value, is specific to health, so it is reasonable to assert generalizability. However, further development could determine better scope conditions. Can these lessons be applied only within domains with stable policy arenas, and unambiguous knowledge? At this point, scoping conditions are not clear.

The analysis above presents evidence use in public decision making as a linear, technical issue. These ideas were by and large developed as grounded theory to conceptualize what happened when evidence was used in public decision making. Sometimes, what did happen was combined with what *ought* to happen – as a normative assessment of what leaders believe. These perspectives overemphasize the technical portions of the process (good science that combines stories and numbers) and underemphasize the social and contextual portions of the process.

Within the current paradigm, we know that the existence of high-quality research and providing access to that research does not significantly increase the use of evidence in policymaking (Dobbins et al., 2009; Gamble & Stone, 2006; Hanney et al., 2003; Stamatakis, McBride, & Brownson, 2010). We also know that public decision makers agree that evidence *should* be used in decision making (Brownson, Fielding, & Maylahn, 2009; Newman et al., 2016). However, what public decision makers and researchers consider to be evidence may differ.

Empirical evidence is just one input into the socio-political process of making public decisions. Public decision makers necessarily combine values and evidence when making decisions (Atkins, Siegel, & Slutsky, 2005; Cairney et al., 2016) –that is their job. If public decisions were purely technical affairs, there would be less debate on the "best" course of action (Hanney et al., 2003; Jewell & Bero, 2008; Lavis et al., 2003). Evidence does not eliminate debate but is simply one input into that debate (Atkins et al., 2005; Troy & Kietzman, 2016). Any conception of the public decision-making process that posits a purely technical approach to evidence's influence is naïve and misguided.

Thus, in Table 1 we reconfigure the elements discussed above and combine them with a theoretical lens to produce a blended framework emphasizing four elements: technical, jurisdictional, social, and scientific context.

Table 1. Characteristics of knowledge and policy context affecting policy use

Technical	Jurisdictional	Social	Scientific Context
Analysis Solutions	Constituents affected	Problem recognition	Synthesis
	Administrative feasibility	Solution acceptability	Gaps
	Authority	Government intervention	Best available solution

Technical. Here we see the empirical prowess of the research community. The entirety of the quantitative and qualitative elements of content salience is contained here. Problems are given shape through numbers and words but are established empirically. Solutions, also modeled empirically, fit here. These are the methodological findings produced from systematic investigation and are devoid of the constraints of operating realities and social parameters of public decision making. Technical elements can determine the possible – although those solutions can sometimes be improbable.

Jurisdictional. In this component are all the elements that address the internal constraints and pressures public decision makers face. The extent to which the problems exist or will soon exist in their jurisdiction is vital here. Public decision makers are not very likely to allocate scarce resources to issues, no matter how real, that are not affecting significant or widespread constituencies they serve. Additionally, public organizations must be able to implement policies and programs that solve issues. This is related to both the administrative feasibility and whether there is the authority to implement such programs.

Social. The fact that constituents help to determine what is a problem in their communities, and which issues deserve public attention is almost absent from the existing characterizations. Social movements can, and do, provide powerful momentum for public attention allocation. Further, while those in the field know that a lack of social acceptability can derail even the most important (Gaines 2014[b]) and impactful (Piorkowski 2017[c]) public initiatives, this aspect has been neglected. Finally, part of acceptability is the broader question of whether the government is the appropriate entity to solve problems that are agreed to exist. While at times, these social aspects have been acknowledged, current frameworks do not incorporate them. We not only see this component as critical, consistent with Heikkila and Isett's (2004) external institutions, but we believe it should carry more weight than the technical and jurisdictional components in any evidence uptake framework.

Scientific Context. Like the social component, our model places a heavier weighting and emphasis on the scientific context of evidence use in public decision

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[b] http://www.macon.com/news/local/article30150015.html

[c] http://healthpolicy.unm.edu/sites/default/files/Navajo%20Nation%20Soda%20Tax%20Expansion%20Brief%20-%20Final.pdf

making. How science is packaged and placed into its knowledge context can be crucial to its chances of being used. There are three elements to this: evidence ought to be synthesized and contextualized, gaps identified and explicitly stated to suggest the limitations of knowledge, and a conclusion drawn that provides the best available solution given the evidence. The last part – a conclusion drawn is a piece that makes most researchers uncomfortable.

The discomfort with drawing conclusions and making recommendations combines with information synthesizers' role to underscore information intermediaries' importance. There are different kinds of information intermediaries in the knowledge ecosystem. Here we limit our discussion to third party organizations that are not lobbyists. Intermediaries play a crucial role in brokering the massive corpus of empirical research in a digestible and targeted way for a policy problem. These organizations have high credibility, and their long-term engagement in an area leads to visibility, thus garnering attention from public decision makers. We posit that intermediaries play a central role in the uptake of evidence in public decision making, a role outsized to existing characterizations of them.

Implications for Research Assessment

This chapter examines what is required for social science to have a policy impact. We identified some elements researchers could control, for example, content salience, effective communication, quality, and attending to parameters of use. However, within the broader classical theory of agenda setting and public decision making, we see much that is relevant to the use of knowledge in policy is beyond the control of social science researchers. Assessment of contributions to policy making made by social science research must engage with the full complexity discussed above, see Table 1. Researchers can only be accountable for their effort because the results achieved depend on complex policy contextual factors.

Researchers need to remember that overall, quantitative work wrapped in a compelling narrative wins the day. Dazzle them with ideas, not the technical details of the data behind it. Tell a story that is bolstered by empiricism, but tell the story. Most of all, help individuals understand the salience of the solution to them and how it comports with their daily lives or how change will make daily lives better. Policy solutions are not technical. They are human.

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Figure 1 Five domains of CDC influence

Figure 2 Institute of Medicine Degrees of Impact