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policy brief

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Informing policy-making with systematic reviews and evidence gap maps

Summary

This policy brief introduces *systematic reviews* and *evidence gap maps* as two relatively new types of synthesised evidence. It explains why these synthesis tools are particularly valuable for the policy-making processes. It offers a brief history of their development, their main characteristics and procedures, as well as the main resources where they are found. In addition, it describes current production levels and usage of these synthesis tools in South Africa, and concludes with a call for greater attention and use of these tools to improve research evidence availability in the policy-making processes.

Introduction

Information and knowledge production have exploded in the past decade. An IBM study (2011) reports that digital data created every two days now amount to the total amount of data created before 2003. In the more formal knowledge creation landscape, Plume and Van Weijen (2014) note that published articles have grown consistently from 1.3 million in 2003 to 2.4 million in 2013.[1] This explosion makes it impossible for any knowledge user to keep up.

Knowledge is incremental and accumulative. A single study offers only limited insight into either the understanding of the problem or the decision taken to address the problem. It may misrepresent the balance of research evidence, be sample/time/context specific and illuminate only one part of a policy issue (Davies 2015). Therefore, knowledge (evidence) often goes through a synthesised process to reduce the influence of any flaws or errors from single studies, and it is within this backdrop that systematic reviews gain currency.

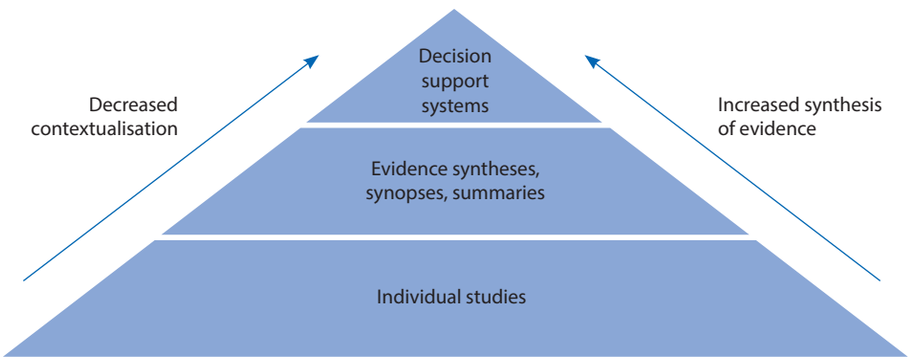
In the 1990s, the Blair government in the United Kingdom (UK) popularised the term 'evidence-based policy-making' (also called evidence-informed policy-making) (Banks 2009), partially as a result of the *evidence-based medicine* movement championed by the Cochrane Collaboration, acknowledging that the policy-making process is driven by multiple rationales and often draws on multiple sources. An important aspect of the *evidence-based policy movement* is to advocate for the increased use of scientifically rigorous studies in order to improve policy-making. Success stories have been recorded, for example the UK's Department for International Development's (DFID) new research strategy includes a 22% reduction in

1 Using data from Scopus.

neonatal mortality in Ghana as a result of helping women begin breastfeeding within one hour of giving birth and a 43% reduction in deaths among HIV positive children using a widely available antibiotic.[2]

This policy brief underscores systematic reviews and evidence gap maps as two relatively new types of synthesised evidence that offer great promise to improve research evidence availability to the policy-making processes. It urges greater use of such tools in the policy-making processes.

Figure 1: Evidence source



Source: Adapted from Haynes (2006)

Levels of evidence

'A range of different approaches to evidence scoping, mapping and synthesis have been developed to support evidence-informed policy-making' (Snilstveit et al. 2013: 3). However, not all evidence is of the same quality, relevance and value to its users.

Various scholars, particularly those in the medical sciences who are the forerunners of the evidence-based/informed decision-making movement, have mapped out the evidence pyramid (or hierarchy of research evidence) to show how knowledge accumulates and progresses. Although details vary, the main thread among the different visualisations is the distinction between primary and secondary information (also called *filtered and unfiltered information)*: the former refers to primary research (these involve data collection) and the latter refers to secondary information that synthesises primary research. One of the widely used pyramids was created by Glover et al. (2006) and provides a detailed description of levels of evidence. Alternatively, *4S to 6S* (studies, synopses of single studies, synthesis, synopses of synthesis, summaries, systems) have also been proposed.[3] Figure 1[4] provides the simplest visual representation of such hierarchy and distinction.

Systematic review and evidence gap map: A brief history

Critical appraisal and syntheses of research findings were conducted as early as the mid-1970s in psychotherapy and class size under the term meta-analysis[5] – a statistical analysis involving combining and analysing the results of various studies on the same issue. The earliest systematic research synthesis started in medicine when Archie Cochrane, in the late 1970s,[6] called for critical summary of all randomised controlled trials (RTCs) in medicine and established a collaborative database of such reviews. Responding to his call, the systematic reviews of RCTs began to appear in publications in the 1980s and the Cochrane Collaboration was formed at Oxford in 1992 (shortly after Cochrane's death). So far, the health sciences remain the pioneer of the systematic views, often involving the usage of meta-analysis.

In the mid-1990s, a series of reviews on broader social welfare issues were commissioned[7] and since 2010/11, systematic reviews of development studies have also been commissioned with 'more than 200 having been published and many more still being conducted' (Stewart 2014: 2). Besides meta-analysis, these fields have experimented with methods of synthesising qualitative studies (including narrative synthesis, thematic analysis/synthesis, qualitative meta-synthesis, qualitative comparative analysis and so on).[8]

2 https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/1730.pdf.

3 4S refers to single studies, systematic review synthesis, appraised publications and synopses, and computerised decision support systems; 5S adds summaries (for example evidence-based guidelines) between synopses and systems; 6S adds synopses of single studies between studies and syntheses. For more information on both 4S and 5S, please see http://guides.library.upenn.edu/content.php?pid=192036&sid=1610308. For 6S, please see http://hsl.mcmaster.libguides.com/ebm.

4 http://www.ebbp.org/course_outlines/searching_for_evidence/. Haynes' original article proposes the 5S diagram.

5 http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=68.

6 http://boringem.org/2013/01/27/a-review-of-systematic-reviews/.

7 http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=68.

8 https://www.york.ac.uk/crd/SysRev/!SSL!/WebHelp/6_5_SYNTHESIS_OF_QUALITATIVE_RESEARCH.htm.

A systematic review synthesises empirical evidence and answers a defined research question by collecting and summarising all the empirical evidence that fits pre-specified eligibility criteria. This is done by:

- having clearly stated objectives with predefined eligibility criteria for studies;
- explicit, reproducible methodology;
- a systematic search that attempts to identify all studies;
- assessment of the validity of the findings of the included studies (for example, risk of bias);
- systematic presentation, and synthesis, of the characteristics and findings of the included studies.

The procedure generally includes the following:

- identification of the need for a review;
- development of a review protocol;
- identification of research;
- selection of primary studies;
- study quality assessment;
- data extraction and monitoring;
- data synthesis.

One of the major differences between a systematic review and the traditional literature review is the former's pre-determined criteria for eligibility, appraisal and synthesis of the literature examined. This predetermined criterion (also called protocol) is not only often documented and published as part of the review, but is also often peer reviewed. This is done to ensure greater rigour as well as for verification purposes.

Evidence gap maps are the family's newcomer, introduced by 3ie in 2010 (Gaarder 2010, cited in Snilstveit et al. 2013). They map out existing and ongoing systematic reviews and impact evaluation in a particular sector and 'present a visual overview of existing evidence using a framework of policy relevant interventions and outcomes, and provide access to user-friendly summaries of the included studies' (2013: 3). The 3ie gap maps show strong, weak and non-existent evidence on the effect of certain interventions. Some evidence gap map producers also show variables such as cost and duration. Most of these maps 'focus on studies assessing intervention effectiveness, as well as systematic reviews of such studies' (2013: 7) and may assist policy-makers in understanding the body of evidence available on a defined area of work and in identifying evidence gaps in existing knowledge. They are often displayed as an interactive platform of all the literature gathered through systematic searching in a framework of interventions in relation to intended outcomes in policy proposals.[9] Because of this focus on effectiveness and inclusion of input variable, they prove valuable as an aid in choosing and deciding among available (studied) interventions. This is particularly useful to policy-makers who often face such decisions.

Mapping systematic review and evidence gap map: The major players

Although systematic reviews are published in journals, the majority are housed in various dedicated libraries. Table 1 on the next page provides an overview of the major systematic review libraries according to theme.

As a founder, 3ie is the most important supplier of evidence gap maps on various social policy issues (http://www.3ieimpact.org/en/evidence/gap-maps/). However, a few other players have emerged in recent years. These include the International Rescue Committee which conducted 10 gap maps in 2014,[10] using the systematic reviews from some of the above databases, and two members of the UK What Works Network for their respective themes (education https://educationendowmentfoundation.org.uk/toolkit/toolkit-a-z/ and crime interventions http://whatworks.college.police.uk/toolkit/Pages/Toolkit.aspx).

Evidence-based policy-making and the use of systematic reviews and evidence-gap maps in South Africa

Some 22 years into democracy, the South African government has made substantial progress in improving the social wellbeing of its citizens; however, many challenges persist. In recent years, the Presidency – under the leadership of the Department of Planning, Monitoring and Evaluation (DPME) – endorsed the concept of evidence-based policy-making and initiated a number of awareness and capacity-building initiatives to assist policy-makers in incorporating evidence in their decision-making process.

The extent to which systematic reviews and evidence gap maps have been conducted and used in South Africa is not known. However, the past two years have seen a number of systematic review workshops, mainly under the Building Capacity to Use Research Evidence (BCURE) project led by the University of Johannesburg's Evidence-Informed Policy Team and funded by the Department for International Development (DFID).

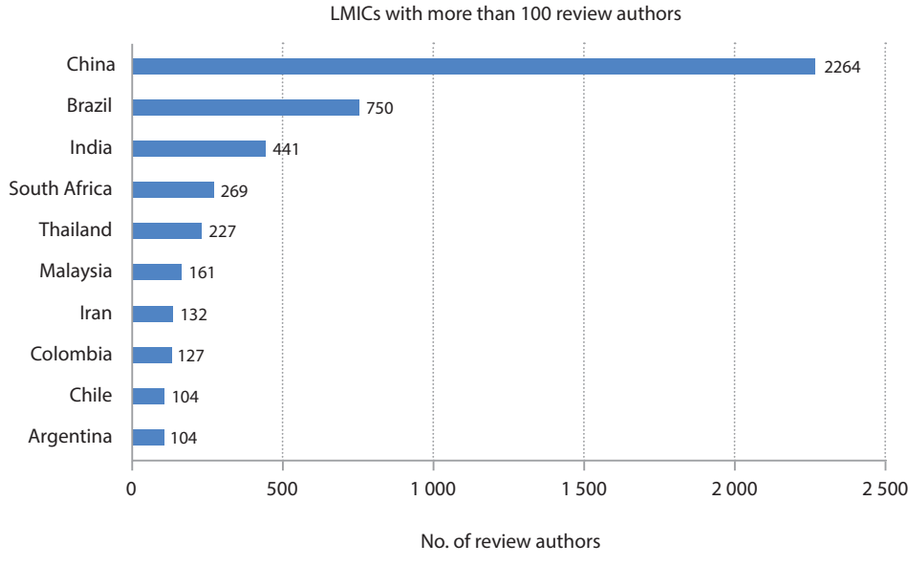
9 http://www.evidenceconference.org.za/.cm4all/iproc.php/Programme/Evidence_Conference_2016_Programme2.pdf?cdp=a&cm_odfile.

10 http://www.rescue.org/blog/mapping-evidence-base-conflict-and-post-conflict-contexts. They also show that these gap maps can be done fairly quickly – 10 maps over 2 months.

Table 1: Major systematic review libraries by theme

Theme	Libraries	Website
Health	Cochrane Library	www.thecochranelibrary.com/
	Joanna Briggs Institute	http://joannabriggslibrary.org/index.php/jbisrir
	University of York's Centre for Reviews and Dissemination (CRD)[11]	http://www.crd.york.ac.uk/CRDWeb/
	Systematic Review Data Repository (SRDR)	http://srdr.ahrq.gov/projects/published
	Prospero: International Prospective Register of Systematic Reviews	http://www.crd.york.ac.uk/PROSPERO/
	Pubmed Health	http://www.ncbi.nlm.nih.gov/pubmedhealth/finding-systematic-reviews/
	Evidencemap.org	http://evidencemap.org/
	National Guidelines Clearinghouse	https://www.guideline.gov/syntheses/index.aspx
	Physiotherapy Evidence Database	http://www.pedro.org.au/
Social policy (education, development, social welfare, crime and justice …)	Campbell Library	http://www.campbellcollaboration.org/lib/
	3ie Database of Systematic Reviews	http://www.3ieimpact.org/en/evidence/systematic-reviews/
	Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre)	http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=56
	Department for International Development (DFID)	http://r4d.dfid.gov.uk/SystematicReviews.aspx#aEnvironmentReview
	Best Evidence Encyclopedia (education only)	http://www.bestevidence.org/
	What Works Network[12]	https://www.gov.uk/guidance/what-works-network
Environmental research	Collaboration for Environmental Evidence	http://www.environmentalevidence.org/completed-reviews
	DFID	http://r4d.dfid.gov.uk/SystematicReviews.aspx#aEnvironmentReview

Figure 2: Number of review authors from low-income and middle-income countries (LMICs)



Source: Global Evidence Synthesis Initiative (2015)

Reviewing the production of systematic reviews, it is encouraging to note that the number of South African researchers who have or are currently working on systematic reviews is considerable. Figure 2 below shows the number of systematic review authors from South Africa compared to those from other countries in the Global South.

In terms of the sectors, health seems to have taken the lead and made encouraging progress (particularly in terms of systematic reviews). A number of these reviews have emerged in recent years and subsequently were used to feed into various government policies. For example, the Evidence to Inform South African Tuberculosis Policies (EVISAT) Project (2014) has seen the production of a series of systematic reviews commissioned by the WHO to support and inform the South African Department of Health.[13] In 2011, the following systematic review was conducted at the University of Cape Town: The Utility of an Interferon Gamma Release Assay for Diagnosis of Latent Tuberculosis Infection and Disease in Children: A Systematic Review and Meta-Analysis.[14] This review was subsequently included in the WHO's recommendations for use of QuantiFERON for diagnosing tuberculosis in children in high-burden tuberculosis settings. In August 2016, Cochrane announced the establishment of the Cochrane Nutrition Field (Cochrane Nutrition), under the leadership of Cochrane South Africa, the South African Medical Research Council and Stellenbosch University's Centre

11 In collaboration with the National Institute for Health's Research Centre for Reviews and Dissemination.
12 It consists of many theme-based What Works centres, although not all focus only on synthesis or systematic reviews.
13 http://www.afro.who.int/en/south-africa/country-programmes/4247-tuberculosis-b.html.
14 http://www.ncbi.nlm.nih.gov/pubmed/21427627.

for Evidence-Based Health Care, along with international partners. This further embedded the production and use of systematic reviews in South Africa.

Apart from health, other sectors are increasingly working on systematic reviews and gap maps. For instance, in 2016 the Institute for Poverty, Land and Agrarian Studies at the University of the Western Cape published *A Systematic Review of the Literature on 'Informal Economy' and 'Food Security': South Africa, 2009–2014*.[15] The University of Johannesburg team, under the leadership of Ruth Stewart, conducted a number of systematic reviews in development studies and education. In early 2016, they collaborated with the DPME to co-produce an evidence gap map on human settlements. This is the first gap map co-produced with a government department. It was a pilot to understand whether evidence mapping is a viable research synthesis tool to inform policy.[16] Overall, the production and use of evidence gap maps in South Africa is still in its infancy.

Conclusion

Given the systemic challenges that South Africa is experiencing in implementing various policies and that systematic reviews are described as 'the most reliable and comprehensive statement about what works' (Mallett et al. 2012: 445), it seems logical that South African policies will gain considerably if the use of systematic reviews and evidence gap maps are increased. The strides that the health sector is making in terms of production and the use of systematic reviews are particularly encouraging. It is time that these tools are explored more in other government sectors.

15 http://www.plaas.org.za/plaas-publication/wp35-informalsector.

16 http://www.evidenceconference.org.za/.cm4all/iproc.php/Programme/Evidence_Conference_2016_Programme2.pdf?cdp=a&cm_odfile.

Recommendations

Initiate and organise more workshops to alert government officials of the availability of these tools.

Initiate and organise more workshops to train government officials how to use these tools (including how to evaluate and choose them).

Initiate and commission more systematic reviews and evidence gap maps to create a better knowledge base to assist decision-making.

Build capacity of researchers in the 'soft sciences' to start producing and using systematic reviews and evidence gap maps in knowledge production processes.

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