

**ESRC UK Centre for Evidence Based Policy and Practice:  
Working Paper 19**

# **A difficult business: finding the evidence for social science reviews**

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## Abstract

The rise of evidence based policy making in social fields has led to growing interest in the potential of research reviewing as a way of identifying useful lessons about ‘what works’ from existing documented knowledge. The need for change in the practice of reviewing has been accepted, with social scientists drawing on the experience of evidence based medicine to develop a more rigorous approach that includes thorough searching for literature on the defined topic. This paper focuses on searching, identifying some key differences between the social sciences and medicine, namely: a more diverse literature; the greater variety and variability of secondary bibliographical tools; the increasing availability of material on the internet; and a less precise terminology. These factors complicate the process of information retrieval, and experience from the ESRC UK Centre for Evidence Based Policy and Practice suggests that a lack of skills and resources in this vital area may have potentially damaging consequences for review quality. Some of the Centre’s information retrieval activities are outlined, and the paper concludes with suggestions designed to improve the quality of the literature searching phase of research reviewing. These cover training, project funding and timescales, abstracting and indexing, and transparency in the review process.

*Key words:* social sciences; literature searching; research reviews

## Acknowledgements

An earlier draft of this paper has already been circulated to the Centre’s Associates – more than 400 individuals working on, or with an interest in, ‘evidence for policy’ issues. We are grateful for the thoughtful comments of those who have responded so far. Where appropriate, these have been incorporated into this draft which is now issued as a Working Paper for wider circulation.

Further contributions from Associates or others on any of the issues covered by the paper will be most welcome. Please email Alan Gomersall at [a.gomersall@qmul.ac.uk](mailto:a.gomersall@qmul.ac.uk)

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# A difficult business: finding the evidence for social science reviews

## Introduction

Evidence based policy making (EBP), while a relatively new term, is not a new activity. In Britain governments have been collecting data since at least Victorian times, and have commissioned and conducted research of various kinds for decades. What is new, however, is the notion that policy making (and practice) should be based *explicitly* on the best available evidence. This has gained particular currency since the election in 1997 of a Labour government that rejected not just the dogma of its Conservative opponents, but also that of its socialist forebears. EBP has helped to fill the gap – a kind of non-ideological ideology of pragmatism with which no-one can reasonably disagree. It played a central role in the 1999 *Modernising government* White Paper (Cabinet Office, 1999) and a host of successor documents which all push the message – now enshrined on the government’s Policy Hub website<sup>1</sup> – that:

Policy makers should have available to them the widest and latest information on research and best practice, and all decisions should be demonstrably rooted in this knowledge.

This language has permeated all government departments<sup>2</sup> so that EBP now has the kind of mantra status held by concepts like ‘efficiency’ and ‘value for money’. It has led to a significant increase in government funding and commissioning of social research, opening up new opportunities for the research community and offering it the heady prospect of exercising real influence over policy making. Complementing this ‘pull’ factor is the ‘push’ to harness publicly funded UK research to wealth creation and improved quality of life which first appeared in the Conservative White Paper on *Realising our potential* (Office of Science and Technology, 1993) and has been reiterated in its Labour successors. Academic endeavour is no longer valued primarily as a cultural end in itself: it has to be both useful and used (Blunkett, 2000). The last decade has seen a distinctly ‘utilitarian turn in research’ (Solesbury, 2001), and EBP-related activity fits squarely into this new model.

As EBP has developed it has become abundantly clear that the simple notion of policy making based on the rational assessment of research evidence is a naïve one. In the real world there are other, equally compelling kinds of ‘evidence’ to take into account (public opinion, for example). Political expediency retains all its power to influence decisions, and nor is ideology wholly dead. Experts in the field now prefer to talk of ‘evidence informed policy’ or ‘evidence for policy’, phrases which more accurately reflect reality. The weakening of the instrumental role of research evidence in the shift away from EBP might seem like the first step towards oblivion, but the end is clearly not yet in sight. If, as Nutley (2003) argues, ‘neither definitive research evidence nor

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<sup>1</sup> See the Better Policy Making section of <http://www.policyhub.gov.uk>

<sup>2</sup> See, for example, the Small Business Service’s latest research strategy at <http://www.sbs.gov.uk/content/research/External-Version-R-Strategy.pdf> whose aim is ‘to develop evidence based policy and operations through the provision of a timely and relevant programme of research’.

rational decision making are essential requirements for the development of more evidence-informed policy', there is still much to play for.

## The rise of research reviewing

In the policy arena the evidence informed approach embodies several strands of activity, for example the piloting of initiatives, combined with *ex post* or real time evaluation to test their value and effectiveness. However, in recent years there has been increasing emphasis on the review of documented past experience, generally as a guide to 'what works'. The rationale behind this desk- and computer-bound approach to amassing and assessing the evidence is a simple one.

- There is little that is truly new in this world, either problems or solutions.
- A lot of time and effort is wasted on reinventing wheels.
- Too little is invested in making full use of research findings by placing them into context with other similar studies, and identifying strong messages.
- It is sensible to take advantage of past experience and knowledge, not just for lessons about 'what works' and 'what doesn't work', but 'why and in what contexts'.

Add in the powers of advanced technology to mine the knowledge base, and the statistical wizardry of those able to synthesise the results of past studies into a few key messages, and the result is a package of irresistible appeal to policy makers. The reality, of course, is rather messier. Statistical wizardry is not appropriate to all forms of evidence, and additional skills in presentation and dissemination are often needed to turn the results of research syntheses into focused, relevant messages for policy makers. The government is, nonetheless, commissioning and conducting increasing numbers of reviews of evidence in social policy fields, broadly defined. These range from 'scoping' studies which map the literature in a field, to largely descriptive 'narrative' reviews of research, to 'systematic' reviews of evidence which involve the identification, appraisal and synthesis of key research studies using a pre-determined protocol. Particularly active are the Home Office, Department for Education and Skills, and the Department of Health<sup>3</sup>.

Bodies like the Social Care Institute for Excellence (SCIE), the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) at the Institute of Education, Research in Practice (RIP), and the Centre for Evidence Based Social Services (CEBSS) at the University of Exeter have been set up to develop review practice, and provide a steady stream of policy-relevant syntheses of evidence. The Economic and Social Research Council has also contributed by funding the ESRC UK Centre for Evidence Based Policy and Practice and its Evidence Network of eight associated research centres, or Nodes, several of which are engaged in research reviewing. Many of those in the forefront of developing social policy review practice in the UK are also active in the international Campbell Collaboration, set up to promote systematic review practice in education, criminal justice and social welfare<sup>4</sup>.

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<sup>3</sup> See <http://www.homeoffice.gov.uk>; <http://www.dfes.gov.uk>; <http://www.doh.gov.uk>

<sup>4</sup> See <http://www.evidencenetwork.org> for details of the Centre and Evidence Network Nodes. The Resources section of the website provides details of many other bodies in the field, including SCIE, the EPPI-Centre, RIP, CEBSS and the Campbell Collaboration.

Like EBP, reviews of evidence are also nothing new. Virtually every PhD thesis embodies a literature review, but these are often neither thorough nor evaluative: it is enough for many examiners (and for the university regulations within which they work) that candidates show a familiarity with the existing corpus of research. Many research papers in the social sciences contain literature reviews, but these are often apparently highly selective, biased or otherwise of inadequate quality. As a result, there is growing pressure to introduce greater rigour into this most routine of academic activities. All types of review can benefit from an objective and methodical approach, but particular attention has been paid to the practices employed in systematic reviews (Boaz et al, 2002). Reviews of this type:

1. use a formal protocol to guide the process;
2. focus on a specific question;
3. identify as much of the relevant literature as possible;
4. appraise the quality of the studies included in the review; and
5. synthesise their findings.

Step 3 of this process is the subject of the rest of this paper. Many researchers remain unfamiliar with the full range of its skills and techniques, and some may still consider it a rather pedestrian, perhaps lower level, activity. Yet it is absolutely crucial to effective research review. Unless as much as possible of the relevant literature is identified, all the subsequent effort put into appraisal – and especially into synthesis – risks being wasted. The results will not be truly reflective of the knowledge base, and may even be misleading if key material has been missed.

## **Why the social sciences are different**

The medical template for review, developed originally by the Cochrane Collaboration<sup>5</sup>, has had a significant impact on the development of thinking about review practice in social policy fields (Smith, 1996). The notion of a hierarchy which ranks evidential quality on methodological criteria, and gives well conducted randomised controlled trials (RCTs) pride of place, is strongly supported within clinical medicine. However, the degree to which this model is feasible or ‘fit for purpose’ within other fields is a major and contentious topic of debate (Boaz and Ashby, 2003). An approach developed specifically to assess quantitative evidence on the effectiveness of clinical interventions has significant limitations when applied to different kinds of evidence – for example, qualitative studies – on different kinds of topic. Although this paper focuses on social policy and practice evidence, much of what it has to say is applicable to other fields including medicine outside the purely clinical sphere. Reviewers in the broader field of health care face many of the same problems and have invested considerable effort in developing review methodologies that can identify and deal with a wider range of evidence from a wider range of sources (CRD, 2001).

Nonetheless, the medical template continues to exert a powerful influence and, in a rather more indirect fashion, it may colour social science reviewers’ assumptions about one of their fundamental activities: the identification of relevant evidence. The

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<sup>5</sup> See <http://www.cochrane.org>.

clinical medical literature is relatively well organised and relatively easily accessible through large scale, sophisticated bibliographical databases such as Medline and EMBASE. It is dominated by the peer reviewed journal format, and has a comparatively well controlled and stable technical terminology that facilitates the retrieval of information on very specific questions. To the casual observer, the identification of evidence for review may seem a straightforward business. In reality this is rarely the case. Medline, for example, covers only about a third of the total output of medical journals, while the limitations of database coverage and indexing can make the retrieval of non-journal material and non-RCT study designs extremely difficult. The problems are even greater in the social sciences. A more diverse literature, a wider range of bibliographical tools of varying coverage and quality, the advent of the internet, and terminological difficulties all serve to complicate the identification of useful information.

### **1. A diverse literature**

One major way in which social science, including social policy, literature differs from the medical template is the variety of media in which it appears. Research and practice in medicine are far more integrated than in the social sciences and this is reflected in the dominance of the peer reviewed journal, the traditional academic vehicle for reporting advances in knowledge. The social sciences do, of course, have a substantial, peer reviewed academic journal literature, but there are other important publication media that reflect the more diverse pattern of knowledge production (Hicks, 1999)<sup>6</sup>. These include:

- Practitioner journals. These may serve a variety of purposes but many report on the knowledge and insights that are gained by ‘doing’.
- Books. These are a significant output of the social sciences, often expanding on previously published academic journal literature or conference papers, but also acting as a primary publication medium.
- Official publications. These can range from the international to the local level, and include outputs from legislatures as well as governments. They encompass a wide variety of knowledge including laws, regulations, survey data, inquiry reports, programme and policy evaluations, reports on effective practice, research studies and policy analyses.
- Grey literature. This is an increasingly ill-defined term that traditionally referred to literature not fully in the public domain. In recent years more and more grey literature has appeared electronically and/or with ISBNs and all the hallmarks of fully published documents. However, it remains distinct from mainstream book and journal material, and might more usefully be called report literature.

All of these media, in addition to the peer reviewed journal literature, can provide useful sources of evidence even if reviewers restrict themselves to material based on formal research. The value of report literature, in particular, is increasingly recognised. For example, the academic working paper on a departmental website may give a fuller picture of research methods and results than the subsequent page-limited,

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<sup>6</sup> The Hicks analysis and review of the literature on the diversity of the social science literature is, however, firmly in the academic mould, identifying books as the main non-journal source of research knowledge.

peer reviewed journal article, putting the reader in a better position to judge the value of the work that is reported. Given extended journal publication schedules, it is also likely to be considerably more current, an important consideration for the reviewer who is seeking to cover the field in as thorough and up-to-date a fashion as possible.

Report literature is not, however, simply a precursor. For many bodies working in social policy fields – independent research organisations, charities, professional bodies, interest groups, think tanks – it is the primary publication medium. UK researchers working in these environments may produce work of high quality but are free from the intense pressure imposed by the Research Assessment Exercise to publish in peer reviewed journals. Although such publication may occur, it is a secondary activity in organisations whose main purpose in publishing is to inform or persuade, not to establish academic status.

## **2. Database variety and variability**

The diversity of the social sciences is reflected in the secondary bibliographical tools available to reviewers. Medicine is served by a relatively small number of large scale databases which encompass a wide range of sub-disciplines, and together provide good coverage of the whole field. The world of social science databases is more varied. There are general, largely academic, databases such as Applied Social Sciences Index and Abstracts (ASSIA), Sociological Abstracts and the International Bibliography of the Social Sciences (IBSS), and also discipline-specific services such as ERIC (education) and Criminal Justice Abstracts. There are smaller scale specialised databases such as Caredata and Planex that have evolved primarily as tools for practitioners or policy makers, and there are those that focus on particular document types such as official publications (e.g. UKOP), theses (e.g. Index to Theses) and report literature (e.g. SIGLE (International System for Grey Literature), and Education-line)<sup>7</sup>. Finally, there are library catalogues, especially those of national libraries such as the British Library or the Library of Congress which aim to provide comprehensive coverage of the books published in their respective countries. Thus a reviewer wishing to identify ‘as much of the relevant literature as possible’, especially on a cross-domain topic, may need to search a substantial number of different sources.

Despite the number of services available to the reviewer, coverage of the various social science publication media appears to be patchy. The larger scale, general and discipline-specific academic databases are dominated by the peer reviewed journal literature, with variable coverage of other media such as books, reports, dissertations and official publications. All are heavily dominated by English language material and many are US-based, with a bias towards the American literature. Coverage of UK practitioner journals, official publications and report literature is generally restricted to smaller scale domestic databases, and reflects their often specialist focus. The one general service that includes UK report literature, SIGLE, covers material acquired for the British Library’s National Reports Collection. Although this is the largest such collection in the country it is dependent to a significant extent on the voluntary deposit of material by research institutes, academic departments, charities, local authorities and other bodies, and it is not comprehensive. SIGLE, moreover, lacks abstracts and indexing (apart from broad subject headings), making effective information retrieval difficult.

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<sup>7</sup> See <http://www.evidencenetwork.org> The Resources section of this website provides details of the bibliographical databases noted here, and others of use to the ‘evidence for policy’ community.

To add to the problems facing the reviewer, the search tools and other facilities provided by this mix of large and small, general and specialised databases are extremely variable. The larger, predominantly academic, databases with relatively generous resourcing typically have controlled languages (thesauri), the full range of Boolean search operators, the ability to combine searches, and a range of options for manipulating and downloading searches. Smaller, specialised services, while containing unique and valuable material, are often run on a comparative shoestring with crude thesauri (or none at all) and a more limited set of search tools and operators. Until searchers become well acquainted with the idiosyncrasies of sources relevant to their work, each searching session will have to begin with a time-consuming familiarisation routine.

The technical and indexing limitations of these sources casts into question the preference of some reviewers for finalising a search strategy at an early stage in the process, and applying it across the board to all the sources searched. The complex and highly specific strategies constructed for use with large scale databases are often technically impossible with smaller services. There may be an insufficient range of operators and other tools, and the search screen may sometimes be physically too small. In these circumstances a series of simpler and broader searches, followed by manual weeding, will be required.

### **3. Internet complications**

Contrary to general opinion, the advent of electronic resources, including the internet, has made the reviewer's life potentially more difficult. Technological advance has certainly delivered valuable improvements in the accessibility of some primary sources, with a proportion (but still only a minority) of academic journals, academic working papers, other report literature and official publications available electronically. Increasing numbers of secondary sources including bibliographical databases which were traditionally in print format (or, more recently, CD-ROM) are also now accessible online, occasionally free but more usually on a subscription basis.

However, technological advance has also meant the proliferation of new sources that need to be searched if the reviewer is to fulfil the demand for thoroughness within the defined topic. New, often specialised, web-based collections of material appear regularly – often with yet another set of search conventions to learn – and there is less and less excuse for excluding evidence from, for example, report literature as so much of it is now published, or at least listed, online. Keeping up with all these developments takes time and effort, and the systematic identification of potentially useful material is more likely to be a time-consuming process of trawling an ever increasing list of 'favourites' than typing a couple of words into Google<sup>8</sup>.

### **4. Terminological problems**

Once reviewers have identified the range of sources likely to contain relevant material, they have to contend with the difficulties of searching them effectively. Social science (especially applied social science or social policy) terminology is diffuse, imprecise and constantly changing. It is frequently 'non-technical' in nature

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<sup>8</sup> Most search engines do now include options for Boolean and proximity searching, but these are often well hidden. They require expertise to use effectively, and may still deliver unacceptably large amounts of irrelevant material.

and application, overlapping ordinary everyday language and difficult to distinguish from it. It is consequently hard to index consistently, and efficient and effective information retrieval can require considerable ingenuity. Take, for example, the term ‘gentrification’, meaning the rehabilitation (and subsequent take-over) of run down neighbourhoods by incoming middle class families. To retrieve material on this subject one would, of course, search on:

*gentrification* plus variants such as *gentrified* and *gentrifying*, and, if US material is required, *regentrification* plus variants

However, searches confined to these terms may not be comprehensive. The term gentrification fell somewhat out of favour after the 1970s, appearing less frequently in the academic and policy literature, and thus less frequently in titles, abstracts and indexing terms. But gentrification as a process, and as an overt or covert policy ambition, did not disappear. It became subsumed within combinations of broader and less ‘technical’ terms such as:

*urban* or *local* or *neighbourhood* or *district*  
and  
*improvement* or *renewal* or *regeneration* or *renovation* or *revitalisation* or *renaissance*

It is tempting for reviewers faced with this kind of problem to restrict themselves to the more specific ‘technical’ term, but the resulting product will not cover ‘as much of the relevant literature as possible’ and may be seriously deficient as a review of the subject under consideration. Unless reviewers are fully conversant with the subject in question it may be advisable for them to consult experts in the field to ensure that this risk is minimised.

A second major terminological difficulty in the social sciences is the overlap between ‘technical’ terms and ordinary language. A reviewer may, for example, wish to identify formal evaluations of mentoring programmes in schools. The substantive terms – *mentor\** and *school\** – are reasonably precise although, for safety’s sake, ‘*education\**’ might need to be included to ensure that as much school-based material as possible is retrieved<sup>9</sup>. ‘*Evaluat\**’, in contrast, is in wide general usage by both authors and abstractors, and searches using this term risk picking up a great deal of irrelevant material. Reviewers may attempt to avoid this problem by using a range of more specific ‘evaluation’ terms such as ‘program evaluation’, ‘project evaluation’ ‘*experiment\**’ and ‘*randomised controlled trial\**’. This will, indeed, eliminate irrelevant hits with abstracts of the type

‘Evaluates the concept of peer mentoring as a strategy within inclusive education...’

...but, equally, it will reject

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<sup>9</sup> The asterisk is generally, though not universally, used in bibliographic databases as a truncation device to relieve searchers of the burden of entering all potentially relevant variants of an individual term. Thus *mentor\** will retrieve references including the words *mentor*, *mentors*, *mentoring* and so on.

‘Compares the results of evaluative studies of school-based mentoring programmes using quantitative and qualitative approaches.’

Controlled languages (thesauri) are meant to overcome these kinds of problem by bringing together all instances of a concept under one preferred term. Methodological indexing is, however, rare in some social science databases and inconsistent in others even when terms are quite specific<sup>10</sup>. It is for this reason that information retrieval experts warn against reliance on thesaurus-based searches, and recommend combining them with free text searches. This leaves reviewers who wish to retrieve ‘as much of the relevant literature as possible’ on evaluations of school-based mentoring programmes with two alternatives: manual scanning of the possibly very large searches that result from using ‘evaluat\*’ as a limiting term, or the construction of complex search strategies using every possible technical variant of ‘evaluat\*’ in the hope that these will cover all eventualities.

The latter approach, as already noted, may be technically impossible to implement with some information sources. Where technically feasible, success is dependent on the ability of the reviewer to identify every possible terminological variant of the concept in question, a time-consuming process that can involve reading key papers and talking to experts in the field, as well as thesaurus scanning and small scale trial-and-error searches. Success will depend in part on the degree to which variants are either indexed or appear as free text terms in the titles or abstracts of relevant material. This is limited by several factors including the frequent use of uninformative (and sometimes downright misleading) titles in the social science literature, the generally short and indicative nature of abstracts in databases, the variable quality of indexing, and the variability of social science terminology itself.

In these difficult circumstances, highly specific search strategies, while appealing to the reviewer’s desire for precision, risk inducing what Kennedy et al (1999) call a ‘false focus’. They will indeed retrieve references including the chosen terms, or combinations of terms, but will eliminate other potentially relevant material that uses different language to describe, or allude to, the concepts in question. In order to maximise the retrieval of relevant information, a staged approach may be more effective. This begins with relatively simple, broad searches, followed by manual sifting and reading to identify useful material, build knowledge of relevant terminology, and refine inclusion and exclusion criteria. At later stages, more precise searches – including citation searches of key authors – can fill the gaps if previously unregarded terms emerge during this learning process.

Long et al (2002) provide a valuable guide to this approach to searching in the context of two systematic reviews on social care interventions for bereaved older people, and for people with severe and enduring mental illness. They argue that ‘the process must not be viewed as linear, but rather as iterative, moving down and up and back though the different layers or stages’. Searches conducted in this way can be both systematic and transparent, and may be the only realistic way of achieving the desired end – optimum coverage of the subject in hand.

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<sup>10</sup> In ASSIA, for example, the thesaurus term ‘systematic reviews’ generates 294 hits while a free text search on ‘systematic review\*’ gives 517. Similarly ‘randomized controlled trials’ (thesaurus, exploded with narrower terms) gives 1,066 hits, while a free text search on ‘randomi\*ed controlled trial\*’ gives 1,394.

## Information skills and resources

Information retrieval for research reviewing is not, of course, just about searching online bibliographical databases. It will include a range of other strategies from identifying and contacting experts to hand searching core journals and following up references in papers that have been identified as relevant. Networking with people active in the field can be a particularly powerful way of ensuring optimum coverage of a subject, and this is an approach used frequently by decision makers and those who support them. In science and technology policy, for example, government departments and select committees make heavy use of advice from experts. So, too, does the Parliamentary Office of Science and Technology (POST) when producing its highly regarded reports and briefings<sup>11</sup>. Experts, provided they are carefully chosen to reflect the full spectrum of views and competencies, can not only help to maximise the chances of the review covering all the relevant literature but will contribute up-to-date knowledge and insights from work that has yet to be published.

However, in social policy fields there may be dangers in an over-reliance on this approach. As we have argued, the social policy knowledge base is significantly more diverse than that of the natural sciences or technology. A wider range of organisations and individuals may be contributing potentially relevant information than reviewers – who are generally working within an academic environment and tradition – may appreciate. In order to capture as many of these as possible, and to identify the key documentary sources for subsequent hand searching, the starting point needs to be the published literature. This in turn demands a sound knowledge of the full – and probably expanding – range of bibliographical sources for the topic in question; access to these sources; and knowledge of, and experience in, their differing search conventions and capabilities.

The ESRC UK Centre for Evidence Based Policy and Practice (the Centre), set up in 2000, has placed considerable emphasis on information retrieval as a vital underpinning activity of systematic review. The two authors were appointed as part-time information retrieval staff to provide support in this area for the Centre's own researchers and visiting fellows, and for researchers in the wider Evidence Network it serves. Both have many years' experience of information provision in social policy-related areas, and their initial work at the Centre confirmed a familiar picture:

- Academic (and government) researchers frequently possess a limited knowledge of the range of information sources that might be relevant to their work. In particular, those in universities tend to focus on the major academic databases that are provided 'free' at the point of use via JISC<sup>12</sup>.

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<sup>11</sup> POST supports both Houses of Parliament by providing 'independent and balanced analysis of public policy issues related to science and technology'. Its website, including all its reports and briefings, is at <http://www.parliament.uk/post>

<sup>12</sup> JISC – the Joint Information Systems Committee – provides 'strategic guidance, advice and opportunities to use ICT to support teaching, learning, research and administration'. Part of its remit is providing access to electronic resources such as bibliographical databases. Further details at <http://www.jisc.ac.uk>

- Where researchers do become aware of smaller, subscription-based specialised databases that cover other types of literature, they are sometimes denied access to them by their departments or university libraries on grounds of cost. At the same time, JISC is understandably unwilling to negotiate individual deals with such databases, and they remain largely unknown and unused in the academic environment. Reviewers working in government departments, independent research organisations, consultancies, charities and other non-academic locations may face even greater difficulty in accessing the full range of databases they need.
- Many researchers lack detailed knowledge and experience of the technicalities of database searching including the use of controlled and free text language systems, Boolean operators and other facilities. Those who are aware of, and have access to, smaller scale or specialised databases, may be deterred from using these potentially valuable resources because the search capabilities are unfamiliar. The variability and/or crudity of retrieval software is a significant cause of difficulty (and complaint) even among information specialists in the social sciences.

In the not too distant past, lack of knowledge was sometimes compounded by an unwillingness to accept that change was necessary. Even during the lifetime of the Centre, peripheral contacts with some senior academics have revealed a familiar pattern in which individuals claim to know all the information sources in their field, typically a handful of peer reviewed journals, a few trusted colleagues and, occasionally, a single ‘mother database’. Some confirmation of the Centre’s experience is provided by the results of the ‘Big Blue’<sup>13</sup> project on information skills training in post-16 education, financed by JISC and managed jointly by Manchester Metropolitan and Leeds University libraries. It notes, diplomatically, that ‘anecdotal evidence suggests that academic staff can be comfortable with a small range of information sources which they use on a regular basis and they may direct their students to use these’. Given the role of academic staff in imparting information skills to students, one of Big Blue’s recommendations is for more research into how university teachers acquire their own knowledge, and ‘the impact that this has on the training they give to their student cohort’.

In respect of undergraduate students, the findings suggest that most libraries provide some kind of induction training, generally in the form of generic, stand-alone, optional courses. However, librarians are generally unaware of the complementary advice or training provided by academic staff, and their courses are rarely integrated into the curriculum. This may well explain a finding from Big Blue’s associated literature review to the effect that many students have low levels of information skills, and that some show little evidence of improvement even after ‘quite significant’ training. A course which bears no obvious relationship to the degree subject, or to what undergraduates are told about information sources and skills in lectures and classes, is likely to be perceived by many as both boring and irrelevant.

Most undergraduates may be able to get by without a wide knowledge of information sources and the ability to search them effectively, but these skills are essential for

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<sup>13</sup> See <http://www.leeds.ac.uk/bigblue/> for the Big Blue report and a range of other project outputs.

those who move on to taught postgraduate degrees, and to doctoral and post-doctoral research. Although some universities are undoubtedly delivering good quality training to undergraduates, many young researchers can embark on their academic careers with only the haziest idea of how to conduct a systematic literature search, or where to look for information. Accordingly, the ESRC's *Postgraduate training guidelines* (2001) require that 'at a suitably early stage in the programme' students are trained in certain 'basic' bibliographical skills including:

the identification of library resources and how to use them; training in other bibliographical sources and methods; techniques for keeping track of the literature; the use of annals, theses, journals and conference proceedings; the maintenance of a personal research bibliography

Experience from the Centre's 2003 summer school for some 30 PhD students in a wide range of social policy subject areas, and from a wide range of universities, suggests that this mandatory training is sometimes scarcely more adequate than that received at undergraduate level. In practical database searching sessions, skills ranged from a total inability to construct a search strategy to the selection of one or two basic keywords. Knowledge of information sources was confined almost exclusively to the mainstream, academic resources provided via JISC. Participants were asked about six specialised databases of potential value to them: ChildData, Caredata, AgeInfo, Planex, ASSIA and Acompline<sup>14</sup>. Of 30 students, 29 had heard of none of these databases, while one reported knowledge and use of Caredata (which is freely available online). Consultation with the students concerning database training in their universities showed enormous variation in provision. Some institutions had offered nothing at all to this particular group of students. Others gave only the most basic help, for example a list of available databases in hard copy or on the library's web pages. Some provided short training courses or practical demonstrations, but these were invariably restricted to databases supplied via JISC.

Relatively few of these young researchers are likely to benefit from professional information retrieval support unless they work in a department with its own specialist provision. Many university libraries, struggling to cope with an ever-increasing undergraduate population, seem able to do little for researchers beyond providing desk-top access to a range of mainstream bibliographical databases, and stocking (or acquiring) some of the literature they need. In the crucial area of information retrieval, researchers have essentially been left to their own PCs and their own devices, perhaps in the mistaken belief that the support of professional librarians has been rendered obsolete by the keyboard and the mouse.

To reiterate, life in the electronic age can be more – not less – difficult for the social science researcher who could benefit not only from help in keeping track of the changing pattern of online resources, but also advice on how to get the best out of them. This applies across the board of research activity but is particularly vital for those engaged in review work. It is significant that the development of evidence based medicine has gone hand in hand with increasing recognition of the difficulties and challenges of effective literature searching. The NHS Centre for Reviews and Dissemination (CRD), for example, employs professional information retrieval

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<sup>14</sup> See <http://www.evidencenetwork.org> The Resources section of this website provides details of the bibliographical databases noted here.

expertise for all searching<sup>15</sup>, and this is increasingly the case elsewhere in the medical and health technology fields. Even with the relatively few, large scale, easily accessible and high quality bibliographical databases that medical research reviewers have to contend with, it is clearly understood that thorough, efficient literature searches are not magically available to all at a click of the mouse. This message is only now beginning to come home to the social science community.

## **Implications for review quality**

In the on-going UK debate about research review quality in the social sciences, it is what happens before and after the literature searches that attracts most academic attention. This may result from a perception of literature searching as a largely mechanical activity, a necessary part of the process to provide the raw material but one that is of comparatively minor relevance in the discussion of review quality *per se*. Although the importance – and the challenges – of searching in the social sciences are beginning to be recognised, it is not clear that researchers fully understand the risks to review quality of limited knowledge of information sources, and limited information retrieval skills. The argument is, however, a simple one. A review may be of impeccable quality in terms of inclusion criteria, data extraction, synthesis of evidence from different research methodologies, and so forth. But if the raw material on which all this work is based is not fully reflective of the topic, the substantive results of the review – which are the sole concern of its potential users – may be at best unbalanced and at worst plain wrong.

Some reviewers, perhaps especially those who are aware of searching difficulties, argue that what matters is transparency. If, to take an earlier example, a review on gentrification is based on searches conducted using only the term ‘gentrification’ (plus variants such as ‘gentrified’), it can still be described as a useful and systematic exercise if this limitation is made clear. Readers can come to their own conclusions about the results because they are in full possession of the facts about how, and from where, the evidence was identified.

Although the commitment to transparency is admirable, such an argument is disingenuous. Few readers of a review who are not both subject experts and information specialists will be able to judge whether the full range of potentially relevant sources has been searched in the most effective way, or what the impact of a particular search strategy might be on the credibility of the subsequent synthesis of evidence. Most – and especially hard pressed policy makers and practitioners – will focus on the substantive results, taking on trust that this vital preliminary step has been conducted as thoroughly as possible. In a significant number of cases, they will have no alternative because full details of search strategies and sources are not routinely included in reports of research reviews. Either they are squeezed out by the page limitations of peer reviewed journal publication, or authors choose to provide no more than a very generalised account. Judging the quality of a review, even if the reader has the necessary information retrieval and subject knowledge, thus becomes impossible.

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<sup>15</sup>The Information Service Manager at CRD (<http://www.york.ac.uk/inst/crd>) is an Associate Director, and eight information officers are employed.

The emphasis on rigour and quality in research review is still relatively new in the social sciences and those who work in this field face challenges at all stages of the process, including literature searching. Few have the benefit of advice from information professionals to identify the full range of bibliographic sources that might be of value, and few have received any formal training in the techniques of information retrieval. Financial or administrative barriers to accessing particular information sources, and acquiring often large numbers of documents for review purposes, seem common. All of these factors may prejudice the quality of the final review, and require attention to the funding, training and support of those engaged in review work.

As information professionals, we are particularly concerned at the sometimes limited scope of the sources used to identify information for research reviews. In many cases this may result from lack of knowledge and/or barriers to access but it is clear, however, that some reviewers in social fields have a tendency restrict their searching to mainstream information sources that focus on the academic peer reviewed literature. They argue that peer review delivers a basic guarantee of quality – a possibly dangerous assumption (Grayson, 2002)<sup>16</sup> – and that the only reputable evidence is that produced using a defined set of research methodologies, properly applied. Although others are beginning to champion more elastic and inclusive definitions of what counts as relevant evidence (e.g. Pawson, 2002), the narrow focus on formally conducted, peer reviewed research remains a strongly defended viewpoint within sections of the review community.

However, it is arguably not a justification for the complete exclusion of other kinds of information during searching. Research reviews are not simply academic exercises. They are meant to be of use in the real world, either to policy makers or practitioners. If reviewers focus solely on the ‘scientific’ evidence pertaining to often very narrowly defined questions, without considering the broader context in which the review is being conducted and may be utilised, their work is unlikely ever to be of interest beyond their own community. Contextual information from report literature of all kinds, policy documents, practitioner journals, even the press is a major feature of the smaller and/or less well known databases referred to in this paper. Many have developed to serve the needs of practitioners and/or policy makers rather than academic researchers, and their ‘real world’ focus is strongly reflected in their coverage.

## **Changing views – the Centre’s role**

The three years of the Centre’s existence have seen increasing interest in, and understanding of, the importance of information retrieval issues among the UK’s social science review community. It has run a series of one-day basic and advanced information retrieval skills courses for staff in the Evidence Network Nodes, and for some of its Associate members, and information retrieval formed an important element of the 2003 postgraduate summer school. The Centre has also contributed to

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<sup>16</sup> The Royal Society is currently (December 2003) conducting an inquiry into the quality of peer review in the natural (especially life) sciences. See <http://www.royalsoc.ac.uk/comm> for details. Concerns about peer review in the social sciences have been publicly aired less frequently, but the experience of evidence based medicine suggests they are likely to grow with the development of more rigorous research reviewing in this discipline.

courses for government researchers organised by the Centre for Management and Policy Studies (CMPS)<sup>17</sup>, with most delegates demonstrating initial levels of knowledge and skills comparable with those of the summer school participants. Information retrieval training has proved popular, with positive feedback from many participants.

Provision of direct information support to the Nodes has also served to raise awareness of the potential breadth of information sources available to social policy researchers and reviewers beyond those traditionally supplied within the academic environment. The Centre has negotiated privileged access to a large scale general database (Inside web) and a specialised database (Planex), and conducts searches on specific enquiries using the extensive social science database resources of the British Library. A significant proportion of these, including most of those discussed in this paper, are subscription-based, not widely available within universities and thus often little known.

In addition to these services, the Centre has made financial resources available to the Nodes for document supply. Terminological difficulties, and the often poor quality of abstracting and indexing in social science databases mean that reviewers may need to scan many full text documents in order to decide on their relevance to the review question. Again contrary to widespread belief, much literature remains available only in hard copy and must be acquired as photocopies or loans, often from the British Library's Document Supply Centre (DSC). DSC fees and copyright charges can become a significant financial burden, and restrictions on the number of documents that can be acquired are often imposed by university libraries. By providing resources, and enabling the Nodes to deal direct with DSC, the Centre has helped to overcome a significant practical difficulty facing reviewers.

All of these initiatives have been welcomed by participating Nodes, and by others who have attended information retrieval training courses. Information horizons have been broadened and reviewers are now searching a wider range of sources more effectively, or commissioning searches from the Centre where they do not have access to relevant databases<sup>18</sup>. Review quality is expected to benefit as a result. For example, one Node, which had been commissioned by the Home Office to carry out a review on the involvement of communities in area based initiatives, asked the Centre to carry out searches on a number of specialised UK databases including Planex, Acompline and CommunityWise. Using a range of search strategies all three databases produced a substantial number of unique (although not necessarily relevant) references that had not been found on the mainstream bibliographical databases available to the review team. Acompline alone produced 253 references of which over half were reports.

The Centre is also seeking to improve knowledge of, and access to, these specialised but often small-scale bibliographical databases on behalf of the wider review community. Most have limited resources and/or expertise for technical development, marketing and promotion, and are individually too small to be of interest to commercial database hosts or vendors, or to JISC. However, their content is

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<sup>17</sup> CMPS (<http://www.cmps.gov.uk>) describes itself as 'Europe's leading provider of training and development for public sector managers'.

<sup>18</sup> The Centre has carried out some 300 searches on individual databases for its Evidence Nodes and Associates over the last two-and-a-half years.

invaluable, and together they comprise a significant information resource not just for the social science research community in government and academia but for others – including the NHS, voluntary organisations and the private sector – with an interest in social matters. In particular, they go some way towards offsetting the significant US bias of many of the mainstream bibliographic databases, providing access to UK research and contextual material of potential value to reviewers both in this country and overseas.

One solution appears to be the creation of a single UK social and public policy database comprising the merged outputs of Acompline, AgeInfo, Caredata, ChildData and Planex which could be included in the portfolio of a major database vendor and marketed world-wide. If such an arrangement were non-exclusive these smaller database producers would retain their identities and ability to supply their products to their current customers under their existing titles and terms, but would also gain valuable additional income from royalties. Such a database would also be attractive to JISC, ensuring the wider accessibility of these information resources to the academic research community. The Centre has been active in bringing interested parties together to develop an approach that would be mutually beneficial to database producers, vendor and information end-users.

## **Future developments**

With only two part time information staff, and limited financial resources, the Centre can have only a modest impact. Action on a wider scale is needed to reinforce the importance of information retrieval knowledge and skills within the social science research and review communities. All stakeholders have a part to play, and we offer the following for consideration.

### **1. Training**

The ESRC should ensure that the bibliographical element of general research skills training provided to postgraduates is adequate. Research identified by the literature review conducted as part of the Big Blue project emphasises that information skills training is most effective when integrated into the curriculum, rather than provided as a stand-alone generic course. This may also apply at higher educational levels and, in an ideal world, postgraduates would receive training in skills and sources that are directly relevant to their thesis topics, provided by professional library staff in association with academic subject experts.

At the very least, students should be given a basic introduction to search techniques and, where appropriate, training should extend beyond the mainstream, academic resources that are currently made available within the universities through JISC. They should be made aware of (or trained in how to identify) a wider range of sources, and how they might be accessed from other locations such as the British Library or specialist institutions. They might also usefully be given a general understanding of the complexity of the social science literature including the variety of media in which it appears, and the variable nature and quality of its secondary bibliographical search tools. Such a grounding will enable all young researchers to conduct more effective literature searches for their theses. Those who subsequently engage in review work will also be better prepared to act as ‘intelligent customers’ of external information

experts, or to work in multidisciplinary review teams that encompass research, information, dissemination and other kinds of skills.

Proposals made by university departments for research training recognition in the current (2003) exercise are unlikely to provide such depth and rigour. The Centre is, however, contributing to the development of a new MRes degree in Evidence for Policy to be offered by its host institution, Queen Mary, University of London. This will include a suitably extensive information retrieval element, and is likely to be a requirement for Queen Mary's forthcoming professional doctorate programme. As such, it will go some way towards training a new cadre of practitioner-researchers who are competent in the techniques of finding evidence for policy and practice.

For existing researchers, the ESRC might consider supporting the call in the Big Blue report for research into the acquisition, and level, of information skills among academic staff in the social sciences. The authors' experience suggests that university library provision for researchers is generally limited to supplying documents and facilitating access to mainstream, online bibliographical databases. There seems little evidence of more tailored support, for example to alert researchers to new and potentially useful information resources, or provide advice on search strategies for reviews and other research projects. A range of basic questions could usefully be explored. For example, if limited library and information support for researchers is indeed the case, does this arise from constraints on supply, or on demand: do libraries lack the necessary resources to provide services, or do researchers believe they are unnecessary?

The answer may well be a combination of the two. The authors' experience at the Centre and elsewhere suggests that few academic researchers are aware of the benefit that can be gained from professional information support, including information retrieval skills training, until they have been exposed to it. Thus there may be a case for the ESRC to take a proactive approach by commissioning and marketing pilot refresher and/or advanced retrieval and database awareness courses for post-doctoral researchers and more senior academics. The most appropriate initial target group would be researchers who have received awards to carry out systematic or other kinds of review.

## **2. Project funding and timescales**

The ESRC, government departments and other research funders should make realistic financial provision for both information retrieval and document supply within all awards and contracts to carry out research reviews in the social sciences. The true costs of conducting systematic or other types of review may often be significantly higher than commissioners realise. For example, the 'real cost' of each of the first tranche of reviews of education research published by the EPPI-Centre is estimated to be close to £75K (Oakley, 2003). Among the contributory factors are the difficulties associated with the literature searching and selection phases. Several of the Evidence Network Nodes have used part of their awards to employ staff with information skills, and this is likely to be a continuing trend within social science research review. Funding provision should also recognise the significant burden of acquiring and scanning literature that is likely to result from the retrieval and selection problems posed by terminological imprecision and inadequate abstracting and indexing in some social science databases.

The routine use of information experts as advisers in the commissioning process could help improve understanding of these issues and ensure more realistic specifications and funding allocations. They could, for example, provide an informed estimate of the relative costs of a range of approaches to a review question, beginning with the comprehensive search that attempts to capture everything of potential value, but is likely to involve considerable expenditure of time and resources in identifying and acquiring material, much of which turns out to be irrelevant. If the classical, comprehensive approach is ruled out on the grounds of cost-effectiveness, a range of different strategies that explicitly limit searching could be costed, with an estimate of the broad implications for review quality. Such strategies might, for example, restrict searching to particular document types (e.g. peer reviewed journal articles), bibliographic sources or time periods.

The difficulties of searching, and the likely need for significant manual scanning, also have implications for project timescales. Full scale systematic reviews cannot realistically be carried out within the timescales characteristic of some contracts which may be for as little as three months. For example, a 'medium sized' systematic review on a quasi-medical topic (fluoridation of the public water supply) by the NHS Centre for Reviews and Dissemination took six months and involved a team of ten including an information officer, a dissemination officer, several reviewers and subject experts. If a quick response is needed on a pressing topic, commissioners should not expect to receive a full scale systematic review, and researchers should not claim to provide one. A different kind of product – perhaps a scoping review of the literature, or a briefing on key recent research – may be more realistic. Such exercises can be of considerable benefit in improving the knowledge base of policy making or practice, and can still be conducted in a systematic and transparent fashion.

Funding for document supply and, possibly, access to specific bibliographic databases, may also be an issue for postgraduate students engaged on review work as part of an MRes degree or doctorate. University libraries frequently place restrictions on the number of documents that can be requested, and special provision may need to be made for this category of student.

### **3. Abstracting and indexing**

Research reviewers in the social sciences are drawing attention to the information retrieval difficulties caused by inadequate indexing and abstracting in bibliographical databases, and some are calling for structured abstracts along the lines of those now widely provided in medical journals (Sheldon et al, 2001). Such abstracts are organised in pre-determined sections covering, for example, background, objectives, methods, results and conclusions. They have obvious attractions for searchers both in improving retrieval and enabling preliminary judgements about relevance to be made without acquiring the full paper. Research commissioned by the British Library (Hartley, 1997) suggests that structured abstracts are feasible in the social sciences, at least in the research literature. Although they are not necessarily any more accurate than traditional abstracts, they are significantly longer, more readable and more informative (Hartley, 2000, 2003). Fears among journal editors that such abstracts will take up too much space seem misplaced (Hartley, 2002) and there is growing support for their introduction, not just in the psychology journals covered by Hartley's research, but in social work and social care (Taylor et al, 2003).

There may well be a case for encouraging more editors of social science research journals to require authors to provide structured abstracts as a service both to their readers and to users of bibliographical databases. Bodies such as the Association of Learned and Professional Society Publishers, and the Academy of Learned Societies for the Social Sciences, might usefully take the lead in this area<sup>19</sup>. However, such journals form only a proportion of the social science knowledge base. Structured abstracts, where appropriate, for books, reports, official publications and practitioner journal papers would certainly be more difficult to introduce. At present, where abstracts are absent or inadequate, unique – and usually short – indicative abstracts are created for bibliographical databases. In the case of mainstream services this work is often carried out by freelance staff working on relatively low rates of pay, while smaller scale databases such as Caredata or Planex rely on in-house staff who may also have other duties. Any requirement for these staff to create structured abstracts could produce a marked increase in workloads, with attendant resource implications for the database producers.

Nor will the problems of inadequate indexing be easily overcome. Better quality control on the part of database producers, large and small, could help ensure more consistent indexing, and consideration could be given to improving coverage of the methodological terms that are of particular interest to many reviewers. However, the difficulties posed for indexers, and for thesaurus compilers and editors, by the imprecise and shifting nature of social science terminology should not be underestimated. It is extremely unlikely that the social sciences will ever see the equivalent of the highly structured, controlled languages used in medical databases<sup>20</sup>.

Improvements to the retrieval performance of bibliographical databases through better abstracting and indexing will inevitably require investment by database producers in training and, possibly, staffing numbers and remuneration. It seems unlikely that many will currently judge this to be in their economic interests. At least one social science database is already experimenting with a new, and cheaper, approach in which freelance staff will no longer be required to create full bibliographical records, including index terms and abstracts where the latter are missing or inadequate in the original document. This traditional mode of production involves posting copies of journals to the abstractor, and paying a fee for each record created (in the case of this database, about £4.65). Instead, freelance staff will be supplied with author abstracts via email, and will create index terms from these alone – at a projected fee of 75 pence per record. The economic case may be a powerful one, but there is clearly a risk of deteriorating retrieval performance from relying solely on often inadequate author abstracts for indexing purposes.

#### **4. Transparency and accuracy**

Reviewers themselves also have responsibilities. It may be, as we have argued earlier, that very few readers of a research review will be able to make a truly informed judgement on the quality of the literature searches that underpin it. However, it should be incumbent on all reviewers and their publishers to provide full details of the

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<sup>19</sup> Websites at <http://www.alpsp.org> and <http://www.the-academy.org.uk> respectively.

<sup>20</sup> It should be remembered that terminological difficulties are also evident in the natural sciences, including medicine. Indexing problems may be particularly severe in social science but they are by no means unique to it.

sources they have searched, and the search strategies they have used. This information can be included in an appendix or, if limits are imposed on report length, posted on an institutional website or made available via a corresponding author. Reviewers might also consider the value of routinely including within their reports an account of any difficulties encountered in the searching process, and any deliberate limitations of search terms and sources, with an assessment of their implications for the substantive results of the review. Some reviewers already attempt this, and ‘health warning’ information of this kind is of value both for readers and other reviewers in the field. Effective delivery of health warnings can, however, be difficult and this is an area in which reviewers may need to call on the skills of dissemination experts who can communicate both the message of the research and any important qualifying information.

Finally, reviewers – and social science researchers generally – have a responsibility to ensure that their readers can follow up the information they have uncovered by providing full and accurate citations, not just of the studies included in a research synthesis but also background, contextual information. This is by no means always the case, even in peer reviewed journals where citation rules apply, and the Centre’s information staff have encountered numerous examples of inaccurate or incomplete references that are difficult, sometimes impossible, to trace<sup>21</sup>. For researchers who see references as a device for supporting an argument rather than transmitting information this may seem a minor sin, but in the world of research review – which is centred on the literature and the lessons it has to offer – it matters. This is another area which the Association of Learned and Professional Society Publishers, and the Academy of Learned Societies for the Social Sciences, might consider addressing.

## **Conclusion**

The rise of research reviewing in social policy fields is a welcome trend for those who believe that the analysis and synthesis of past experience has much to offer current policy making and practice. Experience from the world of evidence based medicine can also be of value in teaching the social science community the importance of greater rigour and objectivity in review activity. However, it is vital that the very different nature of the social sciences literature and its associated bibliographical tools is clearly understood, and that all reviewers appreciate the importance of considering the context in which social policy reviews are commissioned, conducted and may be utilised. Both demand a higher level of information retrieval skills, and a wider knowledge of information sources, than seems currently apparent in much of the review community. The ESRC UK Centre for Evidence Based Policy and Practice will continue to raise awareness of these issues, and tackle the problems in practical ways. We hope that the research community, research funders, database providers and others with a stake in better informed policy making and practice will join the debate, and help take up the challenge of finding the evidence.

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<sup>21</sup> See the citation guidelines on <http://www.evidencenetwork.org> for advice on this vital information skill.

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