The benefits and challenges of using systematic reviews in international development research

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13 December 2012
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Introduction

Sherlock Holmes said that “It is a capital mistake to theorise before you have all the evidence. It biases the judgement.”
Sir Arthur Conan Doyle¹

• ‘what works’ ever more important question

• Value-for-money agenda accompanied by ‘evidence-informed policy making’

• Systematic Reviews (SRs) are one potential tool in ‘evidence-informed policy making’

1. Doyle, Sir Arthur Conan (1979) A study in scarlet Longman: London. 156pp. (Reprint of 1st edition, 1888, with an introduction; quote is in Ch. 1)
What are Systematic Reviews (SRs)?

- SRs examine existing evidence on a particular intervention or programme
  - E.g. Nutrition, education, health, micro-credit, etc.
- NOT a standard literature review - aims to provide unbiased assessment of what works through **systematic identification** of relevant studies, **assessment of validity** of papers/studies and **synthesis** of (quant & quali) evidence
- Not unusual for SRs to conclude that there is limited robust evidence to support the continued application of existing, widely-used interventions (Chalmers, 2008).
- However, doubts about ability of SRs to resolve long standing disputes, e.g. MMR dispute, homeopathy, etc.
Increasing breadth:

• Broad search strategies, pre-defined search strings, uniform inclusion/ exclusion criteria

• Forces researchers to search for studies beyond own knowledge and networks

• Reduces researcher bias

... while retaining focus:

• careful deconstruction of research question (population, intervention, comparator and outcome) ensures review process tightly focused

• In theory: increases likelihood of generating clearer and more objective answer to research question
Empirical evidence, not preconceived knowledge:

• Much stronger focus on evidence, impact, validity and causality

• SRs are effective at assessing robustness of evidence by extracting information on research design, analytical methods and causal chains

• Meta-analyses/cross-study comparisons based on quality criteria can provide valuable evidence for evidence-informed policy making
Transparency and replicability:

• Protocols not only ‘keep researchers on track’ but also improve methodological transparency and enable future replication

• SRs are an objective baseline against which future research and evidence on interventions can be measured
## Our systematic review experience

| Cash transfers & employment guarantee schemes | ODI (SPP) | Rigid | 35,991 | 37 |
| Employment creation | ODI (SPP) | Rigid | 46,177 | 8 |
| Microfinance | UEA | Rigid | 3,620 | 58 |
| School feeding programmes | ODI (SLRC) | Flexible | 128 | 16 |
| Water committees | ODI (SLRC) | Flexible | 1,225 | 6 |
| Social funds | ODI (SLRC) | Flexible | 76 | 9 |
| Seeds-and-tools | ODI (SLRC) | Flexible | 2,372 | 9 |
| Markets for the Poor | ODI (SLRC) | Flexible | 482 | 3 |
• **Objectives:**
  – Assess impact of microfinance on social and economic well-being of people living in developing countries and are poor, excluded or marginalised within their own society.

• **Methods:**
  – Adapted to social science studies from Cochrane and Campbell Collaborations and EPPI-centre guidelines.

• **Results:**
  – 2 RCTs, 9 pipeline studies, remainder w/wo studies.
  – No robust evidence on most economic, social and empowerment outcomes.
  – Negative as well as positive impacts.
  – Many studies based on weak research designs and problematic analysis.
The Process

1. **Scoping to identify relevant topic**: interventions, outcomes, existing literature, theory
2. **Background**: policy relevance, existing evidence, knowledge gaps
3. **Theory**: causal chain, factors influencing behavioural change
4. **Rigorous search** to identify published and unpublished sources; application of strict inclusion criteria set out in protocol
5. **Systematic data extraction** and **validity assessment**
6. **Synthesis** (quantitative or qualitative) depending on data availability
7. **Update** review as new evidence emerges
Following Cochrane and Campbell Collaboration guidelines our assessment of validity initially focused on assessing:

- Intervention
- Measurement of outcome measures
- Contextual factors affecting heterogeneity of outcomes, and
- Potential existence and likely significance of confounding factors

**BUT:** Few MF IEs met the rigorous standards of research design that this approach is based on

- RCTs, pipeline, with/without, natural experiments
- (2) RCTs not very convincing

Most papers did not have well structured and methodologically informative abstracts; nor, was it easy to extract important details of the methodology (combination of design and analysis).

The only way to be clear about the validity of results would have required replication.
Challenge: Our Solution

- Development of alternative validity assessment
- Scoring of papers by self-proclaimed research design and analytical method
- Combined scores into an index and applied a fuzzy cut-off point
- General principle underlying scoring: weak research design requires more sophisticated methods of analysis in order to reach similar levels of validity
- The final selection of papers was based on a ranking compiled from the scores for design and analysis which varied from 0.0 (low threat to validity) to 2.78 (high threat to validity), and we used a cut-off at 2.
- This led to inclusion of 58 papers.
What have we learnt?

• Searching was very tedious
  – Large number of papers potentially interesting but had to be discarded often with only cursory attention because more was infeasible

• Data extraction and validity assessment
  – Also very time consuming and demanding
    • Very careful reading of paper to understand methodology and results
    • Generally many outcome variables and many estimations producing large number of “(intermediate and final) outcomes” to be assessed and synthesised

• Difficult to “synthesise” (within resources) except around a rather vague conclusion –”neither confirm nor deny”
Practical challenges

• Searching academic databases
  – Need access to academic databases and journals
  – Can be problematic for non-academic institutions and southern research organisations
  – Conflicts with donor interest in developing southern research capacity

• Searching institutional websites can be very important but undermine objectivity of search process due to:
  – having to adjust search strings
  – excluding relevant websites (unintentionally or due to time and resource constraints)
Practical challenges

• Classifying included studies can be hard as data and methodology are often poorly described
  – Researchers rely on self-proclaimed research design and results
  – Statistical significance was often missing

• Meta-analysis is rarely possible due to non-availability of data and methodological diversity
  – This makes it difficult to draw meaningful conclusions
Practical challenges

- Findings are often ...
  - ... too broad,
  - too incomparable, and
  - too research-oriented ...
- ... to draw useful policy conclusions (more of interest to academic than policy audience)
- SR process is resource-intensive
Fundamental concerns

- Articles in development field not written in same uniform fashion as in natural sciences
  - Practical concern: makes it harder to screen & do meta-analysis
  - More fundamental concern: attributes required for peer-reviewed journal article (context) different to those for SR (detailed description of data & methodology)
Fundamental concerns

• How to assess different types of evidence
  – SRs come from natural sciences where dominant methodologies are quantitative – scales often used to assess quality
  – In development field, qualitative evidence just as common
  – Harder to assess qualitative evidence (e.g. quality) and to compare to quantitative evidence
  – Could have serious long-term policy implications with donors becoming unwilling to fund interventions with tangible, less measurable outcomes
Quantitative methodologies measure impact and establish causality by controlling for confounding factors

- Want to understand ‘WHAT’ works

But understanding context and process can be just as or even more important in development research

- The question of ‘WHY’ things work is just as policy-relevant → see rise of theory-based IEs
Conclusions

• SRs have the potential to enhance and promote evidence-informed policy making by
  – using broader evidence base
  – prioritising empirical evidence
  – being transparent

• However, not as objectives as they appear and a number of practical and fundamental limitations
  – Practical problems involves searching, screening and synthesis stages
  – Fundamental concerns includes writing styles of peer-reviewed articles, favouring quantitative evidence and the importance of context and process
Conclusions

• Need to adapt methodology to make SRs work for international development

• Rather than follow rigid SR methodology, use a mixture of compliance & flexibility:
  – Compliance with broad SR principles (rigour, transparency and replicability)
  – Flexibility to tailor process towards improving quality of the overall findings
Recommendations

• SRs can be used to identify knowledge gaps & highlight methodological inconsistencies and weaknesses → identify future research priorities
• Carefully consider whether full SR justified and required, given the resources required
• SR methodology can be further adjusted or developed if it helps to get a more useful answer to the research question
• More work is needed to find better ways of assessing qualitative work and comparing it to quantitative research
• Researchers should pay more attention to the way we write titles and abstracts to make them more user-friendly
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