A research program on rapid reviews: where should we venture next?

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Competing Interests

- I have no conflicts of interest to declare
Webinar objectives

- To differentiate between rapid reviews and systematic reviews
- To delineate a research program on rapid reviews and generate ideas for additional methods research
- To describe recommendations on the conduct of rapid reviews from the WHO Alliance Guide to Rapid Reviews
INTRODUCTION
What is a systematic review?

“A systematic review uses systematic and explicit methods to identify, select, critically appraise, and extract and analyze data from relevant research”

(Higgins & Green 2011)

It takes substantial resources to produce a high quality systematic review:
>12 months and $100,000
(Petticrew 2006)
What is a rapid review?

Rapid reviews are a form of knowledge synthesis in which components of the systematic review process are methodologically tailored to produce information in a timely manner for decision-making.

(Khangura et al 2012; Kelly et al 2017)

Rapid reviews are produced, on average, over 3 months and cost $25,000 (Jayakumar 2015)
RAPID REVIEW RESEARCH PROGRAM
Objective:
- To examine rapid review approaches, guidance, impact, and comparisons through a scoping review
Currently, there is no established definition for rapid review

“streamlined traditional systematic review methods to synthesize evidence in a shorter timeframe” (Ganann et al 2010)

“fluid and flexible based on decision-makers’ needs, and an organization’s definition of ‘rapid’, since the definition impacts both the timelines and the conduct of the evidence synthesis” (Polisena et al 2015)

“a streamlined approach to synthesizing evidence, typically for informing emergent decisions faced by decision-makers” (Khangura et al 2012)
Production times

- Although reduced production time is considered a key feature of rapid review, a wide range of timeframes are reported in the literature.

![Graph showing production times with data points:]

- (Reas 2011)
- (Ganann et al 2010)
- (Watt et al 2008)
- 90% took ≤ 6 months (Tricco et al 2016)
- (Jayakumar et al 2015)

Systematic reviews take >12 months to complete
Publication trend

Number of Reviews

Year of Publication

1997 2001 2005 2009 2013*

0 10 20 30 40 50 60

2% 10% 30% 51% 5%

*Until February 2013
Geographic distribution of publications

- North America: 20%
- South America: 1%
- Europe (including UK): 58%
- Asia: 1%
- Australia: 15%

*3% Multiple Continents; 2% Not reported
An international survey and modified Delphi approach revealed numerous rapid review methods
Andrea C. Tricco\textsuperscript{a,b}, Wasifa Zarin\textsuperscript{a}, Jesmin Antony\textsuperscript{a}, Brian Hutton\textsuperscript{c}, David Moher\textsuperscript{c},
Diana Sherifali\textsuperscript{d}, Sharon E. Straus\textsuperscript{a,e,*}

Objectives:

- To solicit experiences with rapid reviews from rapid review producers
- To conduct a consensus-building exercise to select a rapid review approach that will be prospectively tested in a reliability study
<table>
<thead>
<tr>
<th>Review Stage</th>
<th>Most frequent streamlined approach</th>
<th>Count (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying relevant studies</td>
<td>Used previous review(s) as a starting point</td>
<td>79 (92)</td>
</tr>
<tr>
<td>Limitations on search strategy</td>
<td>Limited review by date of publication</td>
<td>75 (88)</td>
</tr>
<tr>
<td>Study selection</td>
<td>Screening conducted by ONE reviewer only</td>
<td>68 (85)</td>
</tr>
<tr>
<td>Data abstraction</td>
<td>Data abstraction performed by ONE reviewer only</td>
<td>67 (84)</td>
</tr>
<tr>
<td>Quality (risk of bias) appraisal</td>
<td>Risk of bias assessed by ONE reviewer only</td>
<td>68 (86)</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Narrative summary</td>
<td>75 (90)</td>
</tr>
</tbody>
</table>
Summary of ranking results by approach

<table>
<thead>
<tr>
<th>Rapid review Approach</th>
<th>Feasibility</th>
<th>Timeliness</th>
<th>Comprehensiveness</th>
<th>Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach 1</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>Approach 2</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Approach 3</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
</tr>
<tr>
<td>Approach 4</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Approach 5</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Ranked based on the distribution of "very" and "extremely" on the 7-point Likert scale, except Risk of Bias was ranked on distribution of “not at all” and “very”

- Search >1 database, published studies only, both date and language limitations, one reviewer screens, one person abstracts data and assesses risk of bias, and another verifies
Objectives:

- To compare rapid reviews (RRs) to same-topic systematic reviews (SRs) for methods, studies included, and conclusions
Retrospective Assessment of Rapid Reviews

Methods

▪ Updated literature search of our scoping review (Tricco 2015) in Medline, Embase, and the Cochrane Library

▪ 2 independent reviewers screened citations to identify pairs of systematic reviews and rapid reviews on the same topic

▪ 2 independent reviewers abstracted data (objectives, characteristics, PICOS, methods, comprehensiveness, results, conclusions, quality using AMSTAR)

▪ Descriptive synthesis was conducted
Retrospective Assessment of Rapid Reviews

Preliminary results: study flow

N = 1643 citations

N = 17 potentially relevant full text articles

16 pairs of systematic reviews (n=5) and rapid reviews (n=8)*

* Reviews were published between 2002-2010
## Preliminary results: systematic reviews vs. rapid reviews

<table>
<thead>
<tr>
<th>Systematic Reviews</th>
<th>Rapid Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td># study selection (using ≥ 2 reviewers/1 reviewer &amp; 1 verifier): 10</td>
<td># study selection (using ≥ 2 reviewers/1 reviewer &amp; 1 verifier): 3</td>
</tr>
<tr>
<td># data abstraction (using ≥ 2 reviewers/1 reviewer &amp; 1 verifier): 13</td>
<td># data abstraction (using ≥ 2 reviewers/1 reviewer &amp; 1 verifier): 4</td>
</tr>
<tr>
<td># of included studies (range): 5-14</td>
<td># of included studies (range): 2-24</td>
</tr>
<tr>
<td>Mean AMSTAR score (range): 4.8 (1-9)</td>
<td>Mean AMSTAR score (range): 2 (0-4)</td>
</tr>
</tbody>
</table>
Retrospective Assessment of Rapid Reviews

Discussion

- Quality of reporting higher for systematic reviews compared to rapid reviews
- Comprehensiveness greater for systematic reviews compared to rapid reviews
- AMSTAR scores higher for systematic reviews compared to rapid reviews
Systematic Prospective Assessment of Rapid Knowledge Synthesis (SPARKS) Study

Objectives:

- To prospectively evaluate pairs of rapid reviews and systematic reviews on the same review topics with respect to their results, step-specific process outcomes and usability
  
  1. Evaluate the reliability of conclusions, meta-analysis results of clinical benefits and harms, and implications to inform decisions
  
  2. Compare step-specific process outcomes (e.g., hours spent on tasks and costs)
  
  3. Compare feasibility, timeliness, comprehensiveness, fit-to-purpose, and perceived risk of bias from the broad perspectives of end-users of the rapid reviews and systematic reviews
SPARKS Study

Methods

- Collaboration between 3 Canadian systematic review centers
- For each systematic review that a center is conducting, another center will be randomized to conduct a rapid review, continuing until 25 rapid reviews and 25 systematic reviews are conducted
- Will compare the conclusions, meta-analysis results of clinical benefits and harms, implications to inform decision-making, step-specific process outcomes, including hours spent on tasks
- Adjusted kappa coefficients will be calculated to measure agreement
Population of SR topics for Centre

SR topics randomly selected for study

SPARKS Study Methods Figure

Systematic Review (SR)

Lit Search → Study Selection → Data Collection → Quality Assess → Results Synthesis → Report

12 Months

PICO

Rapid Review (SR)

T-1

Time -1 to T0:
- Scoping, contract, protocol
- Formation of KU panel
- Rapid review centre allocation

T0

Time T0:
- Study start

T1

Time T1:
- RR: surveys

T2

Time T2:
- SR: surveys

3 Months

St. Michael’s

Inspired Care.
Inspiring Science.
Additional research on rapid reviews

• PRISMA extension on rapid reviews
• Survey of rapid review methods manuals
• Updated sample of rapid reviews
• Automation methods for reviews
• Diagnostic rapid reviews
• Identifying and prioritizing methodological uncertainties (questions) in rapid reviews (in partnership with HRB-TMRN)

What other research should we do on rapid reviews?
Two rapid review programs in Canada

- The Canadian government has invested in 2 rapid review programs:
  1. Drug safety and effectiveness network
  2. Strategic Patient Oriented Research (SPOR) Evidence Alliance

- Some of the questions we are answering:
  - Can twitter be used to detect harms from medications?
  - What is the influence of doctors who consult for private companies on their prescribing practice?
  - What is the impact of full service family health teams on the health of the population?
RAPID REVIEWS TO STRENGTHEN HEALTH POLICY AND SYSTEMS: A PRACTICAL GUIDE

EDITED BY:
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ETIENNE V. LANGLOIS
SHARON E. STRAUS
CHAPTER 2:
PERFORMING RAPID REVIEWS

Valerie J. King, Chantelle Garritty, Adrienne Stevens, Barbara Nussbaumer-Streit, Lisa Hartling, Curtis S. Harrod, Jeanne-Marie Guise, Chris Kamel
KEY MESSAGE #1: Engage stakeholders

Early and continuing engagement with the research requester is essential for focusing the rapid review and ensuring that it is appropriate to the needs of stakeholders.
KEY MESSAGE #2: Streamline research process

Methods can be streamlined at all stages of the review process.

A standardized set of methods for conducting rapid reviews does not exist, and the consequences of various streamlining choices for the validity of conclusions from a rapid review are uncertain.
KEY MESSAGE #3: Tailor methods to needs

Researchers need to make transparent methodological choices, informed by stakeholder input, to ensure that the evidence review is fit for its intended purpose.
KEY MESSAGE #4: Use information technologies

Information technologies can assist researchers in conducting rapid reviews by making various steps in the process more efficient.

Examples: Abstrackr, OpenMeta, Covidence, etc.
CHAPTER 3:
IMPROVING QUALITY AND EFFICIENCY IN SELECTING, ABSTRACTING, AND APPRAISING STUDIES FOR RAPID REVIEWS

Ba’ Pham, Reid C. Robson, Sonia M. Thomas, Jeremiah Hwee, Matthew J. Page, Andrea C. Tricco
KEY MESSAGE #1: Engage experts

Rapid review teams should consider including content experts and experienced reviewers to increase review rigour and expedite the review process.

- Content experts: e.g., in health policy and systems research
- Experienced reviewers: e.g., in study selection, data abstraction, and quality assessment

Increases review rigour and expedites review process
KEY MESSAGE #2: Increase efficiency

Well-defined eligibility criteria, explanation and elaboration forms, pilot-tests and reviewer training are recommended to support reviewers in study selection, data abstraction, and quality assessment.

Eligibility criteria should be defined clearly and used consistently

Screening, abstracting, and assessment forms should define and elaborate on concepts and terms, ideally with examples

Improving quality & efficiency

Procedures and materials should be pilot-tested by the review team

Training should be provided initially and as needed during the review to ensure consistency
KEY MESSAGE #3: Engage authors

Authors of the studies included in the rapid review should be consulted to gather further information on methods conduct regarding study selection, data abstraction and quality assessment, if time allows.
CHAPTER 4: SELECTING RAPID REVIEW METHODS FOR COMPLEX QUESTIONS RELATED TO HEALTH POLICY AND SYSTEM IMPROVEMENTS

Sandy Oliver, Michael Wilson, G. J. Melendez-Torres, Mukdarut Bangpan, Kelly Dickson, Carol Vigurs
KEY MESSAGE #1: Use two-stage process

A two-stage process of first scoping the literature, then selecting a focus, is an effective approach for conducting health policy and systems reviews under time constraints.

**Stage one**
- Develop review question
- Map of studies
- Discussion with stakeholders to initiate review

**Stage two**
- Refine/narrow review question
- Map of studies
- Exclude studies
- Discussion with stakeholders to tailor review
- Discussion with stakeholders to interpret findings
- Synthesis
KEY MESSAGE #2: Use transdisciplinary collaboration

Inception with stakeholders
- Setting answerable question(s)
- Initial conceptual framework
- Agreeing the format of report, timescale & further meetings

Discussion with stakeholders
- Most relevant type of evidence
- Check conceptual framework

Discussion with stakeholders
- Most relevant aspects of studies
- Check conceptual framework

Rapid review of evidence
- Report to stakeholders

Initial search strategy
Gauge the literature

Final search strategy
Limit or expand initial search
Final search

Cluster, tabulate & summarise studies
Annotated bibliography

Tabulate studies to inform narrative synthesis
Summary of themes

Framework synthesis

Static conceptual framework
Code, appraise & analyse studies

Evolving conceptual framework
Code, appraise & analyse studies

Faster reviews involve
- Fewer stakeholders,
- Fewer discussions,
- Less iteration, and
- Greater use of past accumulative work
KEY MESSAGE #3: Use rapid review frameworks

FASTER, LEAST SOPHISTICATED SYNTHESIS

FOCUSED QUESTIONS & SUB-QUESTIONS
Developed in discussion with stakeholders to guide a targeted, rapid search of the most relevant evidence

STATIC THEMATIC FRAMEWORKS
Applies existing frameworks reflecting acknowledged theory, policy, or practice

Evolving Frameworks
Initial framework can be borrowed from existing theories, or constructed in discussions between the review team and stakeholders

SLOWER, MOST SOPHISTICATED SYNTHESIS
KEY MESSAGE #4: Use prior systematic reviews

PRIOR SYSTEMATIC EVIDENCE AND ANALYSIS CAN REDUCE THE TIME FOR REVIEWING ACTIVITY

- **Reanalysis of Primary Studies From Systematic Reviews**
  - Questions related to complex interventions can be informed by a set of reviews, where the individual reviews address different intervention components.

- **Review-Level Synthesis**
  - Results of the reviews themselves are of interest, but their component studies are not examined.

- **Updates of Systematic Reviews**
  - Existing systematic reviews can be supplemented by updating the literature searches.
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- **Co-investigators:** Dr. Sharon Straus, Dr. David Moher, Dr. Brian Hutton, Dr. Diana Sherifali, Dr. Lisa Hartling, Dr. Tammy Clifford, Adrienne Stevens, Chantelle Garritty, Dr. Jemila Hamid
Thank you for your attention!

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QUESTIONS?