

Systematic reviews vs. rapid reviews: What's the difference?

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CADTH Rapid Review Summit

Objectives

- To discuss the difference between rapid reviews and systematic reviews
- To present results from 3 methods projects on rapid reviews
- To select a rapid review approach that will be tested in a diagnostic study

What is a Systematic Review?

Definition of Systematic Review

- Cochrane Collaboration definition:

A systematic review uses systematic and explicit methods to identify, select, critically appraise, and extract and analyze data from relevant research [Higgins & Green 2011]

Systematic review example

CMAJ

RESEARCH

Efficacy and safety of cognitive enhancers for patients with mild cognitive impairment: a systematic review and meta-analysis

Andrea C. Tricco PhD MSc, Charlene Soobiah BSc, Shirra Berliner RN MSc, Joanne M. Ho MD, Carmen H. Ng MSc BSc, Huda M. Ashoor BSc, Maggie H. Chen PhD MSc, Brenda Hemmelgarn MD PhD, Sharon E. Straus MD MSc

CMAJ, November 5, 2013, 185(16)

Conducted for the Drug Safety and Effectiveness Network

A systematic review usually has...

- ✓ Protocol registered with PROSPERO and published in Sys Rev journal
- ✓ Comprehensive and systematic literature search (6 databases)
- ✓ Pre-defined inclusion and exclusion criteria (i.e., study eligibility criteria)
- ✓ Risk of bias appraisal (Cochrane for trials, McHarm for reporting harms)
- ✓ Pre-defined data abstraction form
- ✓ Synthesis based on the totality of evidence
- ✓ Discussion, providing limitations of included studies and review process
- ✓ Each step conducted by 2 reviewers, independently

Limitations of systematic reviews

- Systematic reviews take an average 1,139 hours (range 216 to 2,518 hours) to complete
- Usually require a budget of at least \$100,000 [Petticrew, 2006]
- Very resource-intensive

Example: 1 year to conduct, 6 months to publish, 11 randomized trials included

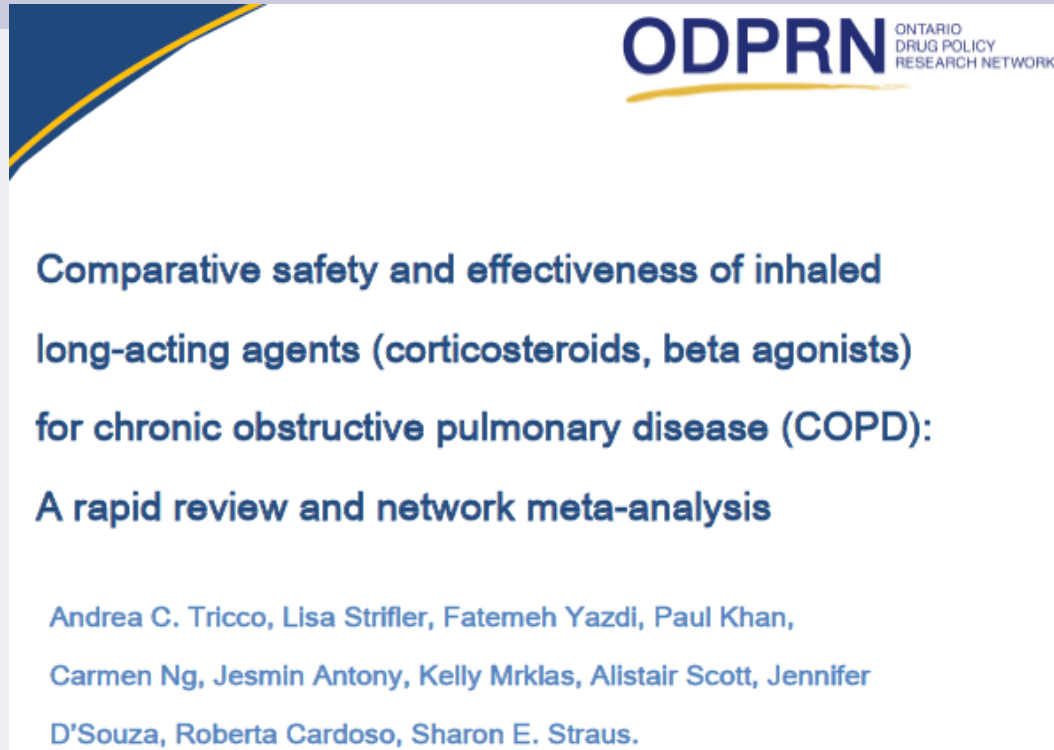
What is a Rapid Review?

Definition of Rapid Review

- Formal definition does not exist

Rapid reviews are a form of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a timely manner [Khangura 2012]

Rapid review example



Conducted for the Ontario Drug Policy Research Network

A rapid review usually has...

- ✓ Protocol registered with PROSPERO and published in Sys Rev journal
- ✓ Comprehensive and systematic literature search (X 3 databases)
- ✓ Pre-defined inclusion and exclusion criteria (i.e., study eligibility criteria)
- ✓ Risk of bias appraisal (Cochrane for trials, McHarm for reporting harms)
- ✓ Pre-defined data abstraction form
- ✓ ~~Synthesis based on the totality of evidence~~
- ✓ Discussion, providing limitations of included studies and review process
- ✓ Each step conducted by X 1 reviewers, independently

Limitations of rapid reviews

- Might be susceptible to bias as a consequence of streamlining the systematic review process
 - Sampling bias, choosing studies bias, obtaining accurate data bias [Tricco, 2008]
- We currently don't know the extent of this bias

Example: 4 months to conduct and submit report, 183 randomized trials included

What are other similarities and differences between systematic reviews and rapid reviews?

Systematic reviews vs rapid reviews

Table 1 General comparison of rapid review versus systematic review approaches ^a

	Rapid review	Systematic review
Timeframe ^b	≤ 5 weeks	6 months to 2 years
Question	Question specified <i>a priori</i> (may include broad PICOS)	Often a focused clinical question (focused PICOS)
Sources and searches	Sources may be limited but sources/strategies made explicit	Comprehensive sources searched and explicit strategies
Selection	Criterion-based; uniformly applied	Criterion-based
Appraisal	Rigorous; critical appraisal (SRs only)	Rigorous; critical appraisal
Synthesis	Descriptive summary/categorization of the data	Qualitative summary +/- meta-analysis
Inferences	Limited/cautious interpretation of the findings	Evidence-based

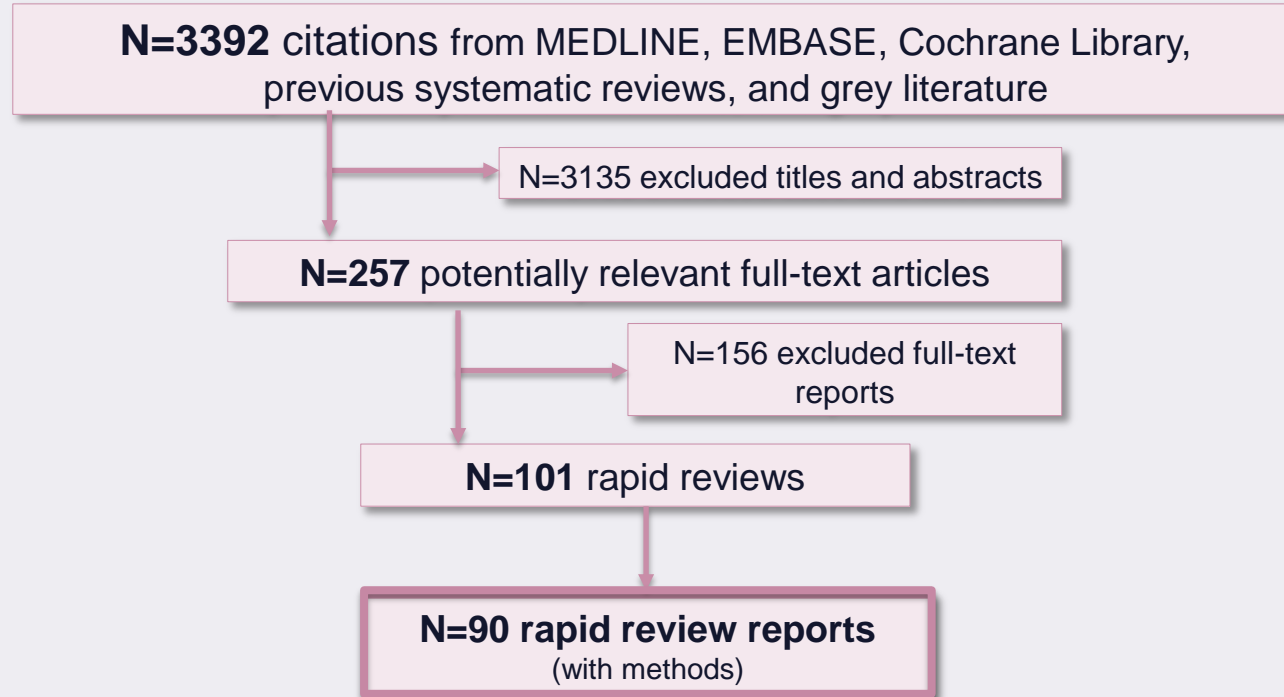
Khangura, 2012

Methods project 1: Update of 2 systematic reviews on rapid reviews

Objective and methods

- Objective:
 - To update 2 previous systematic reviews [Ganann 2010; Watt 2008] on rapid review methods
- Methods:
 - Searched multiple electronic databases and a sample of grey literature
 - 2 reviewers independently screened citations, full-text articles, and abstracted data

Results



Study flow figure

Results (continued)

Study Characteristics		No. of Rapid Reviews (n=101)
Year of Publication	1997-2000	3
	2001-2005	13
	2006-2010	44
	2011	17
	2012	16
	2013	4
	Not Reported	4
Country	Australia	17
	Europe (including UK)	61
	North America (Canada & USA)	20
	Asia	1
	South America	1
	Africa	1

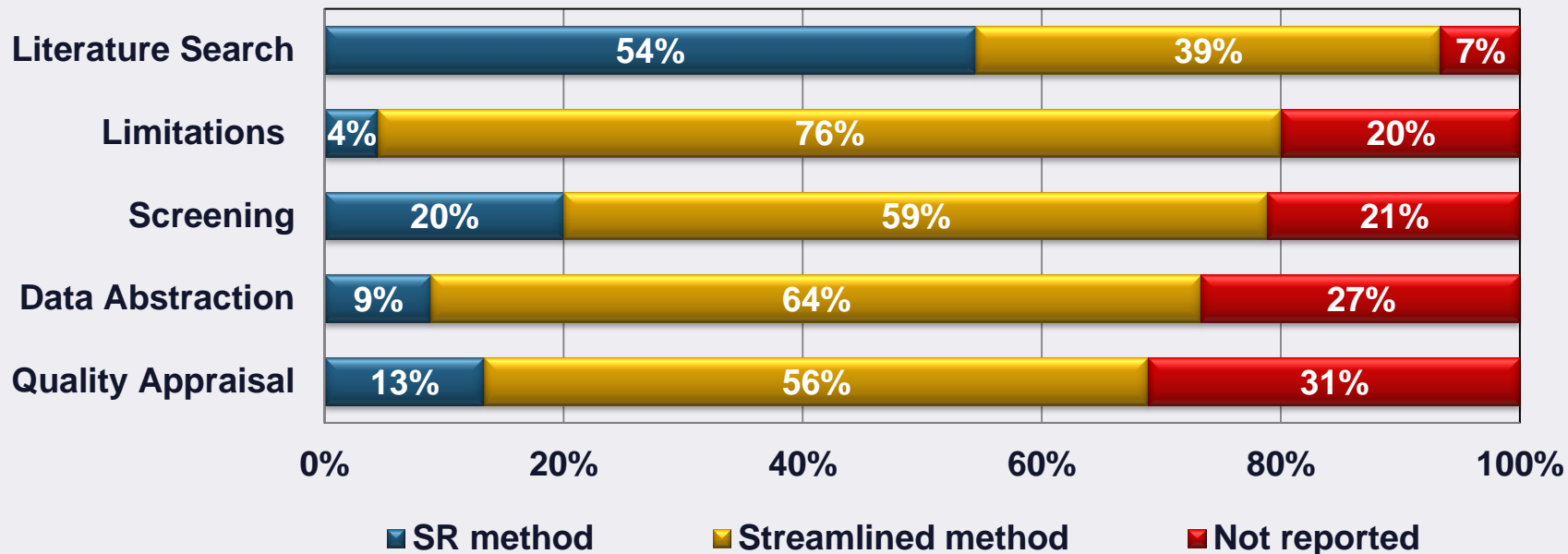
Study characteristics

Results (continued)

Study Characteristics		No. of Rapid Reviews (n=101)
Article Type	Application	84
	Comparison	4
Duration of Review	< 1 month	3
	1-6 months	18
	7-12 months	3
	Not Reported	77
Full Methods Reported	Yes	90
	No	11
Protocol	Protocol published	2
	Protocol not mentioned	99

Study characteristics (continued)

Results (continued)



Methods characteristics

Conclusions

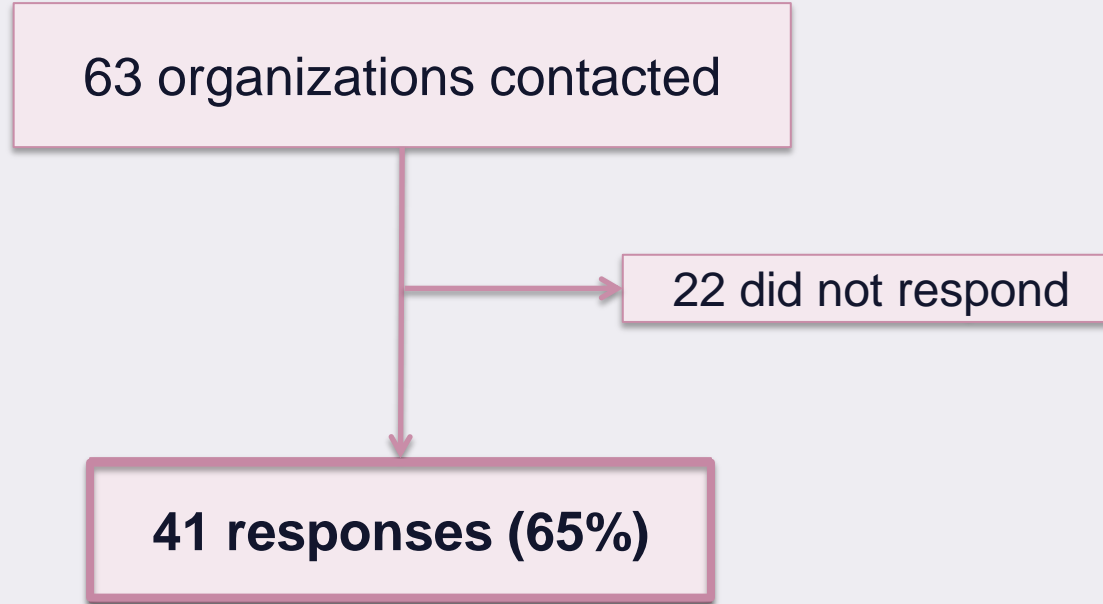
- Several rapid review reports identified
- Little consistency exists in the field
- Methods not well reported in the literature
- Prospective study that compares the results from a rapid review and a systematic review has never been conducted

Methods project 2: Survey of organizations that conduct rapid reviews

Objective and methods

- Objective:
 - To survey organizations conducting rapid reviews
- Methods:
 - International survey of 63 organizations administered via FluidSurvey
 - Survey pilot-tested prior to administration
 - Reminders to non-respondents sent every 2 weeks

Results



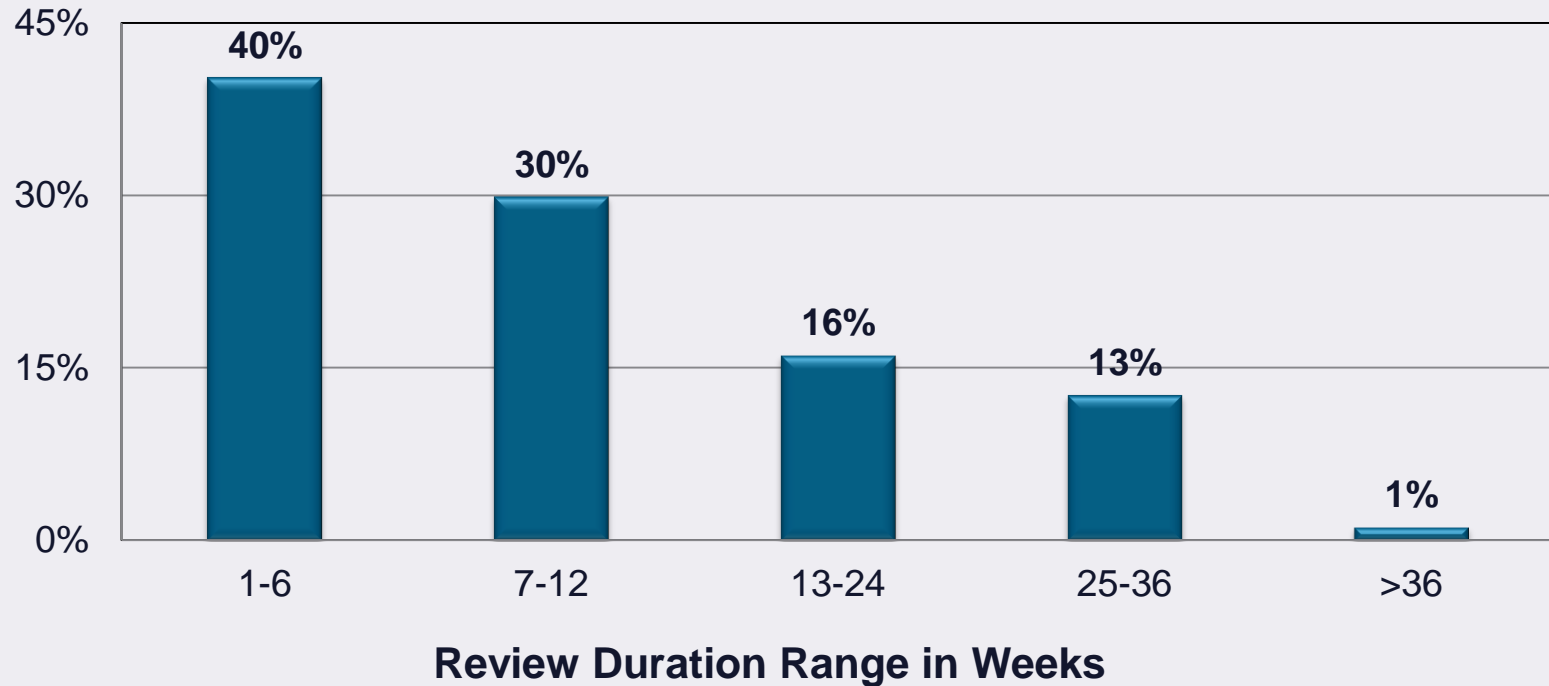
Study flow figure of participants

Results (continued)



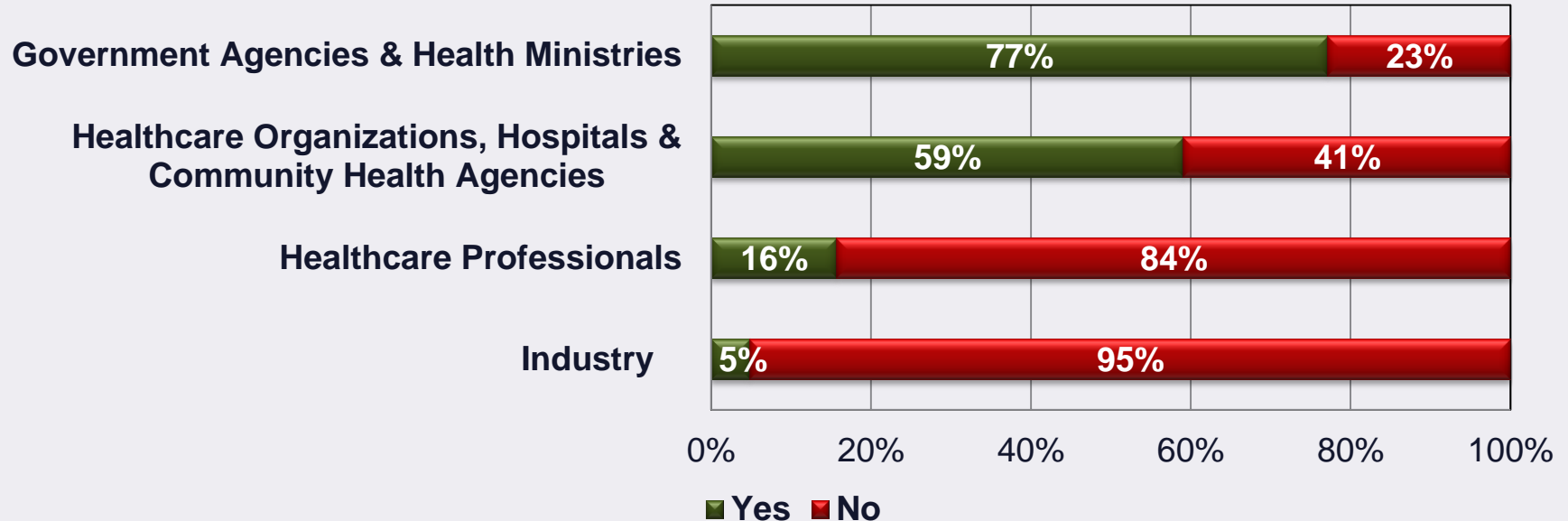
Word cloud figure for the frequency of terms

Results (continued)



Duration of review

Results (continued)



Commissioning agency

Results (continued)

Review Stage	Most frequent streamlined approach	% Yes
Identifying relevant studies	Used previous review(s) as a starting point	94%
Limitations on search strategy	Limited review by date of publication	90%
Identifying relevant studies	Screening conducted by ONE reviewer only	85%
Data Abstraction	Data abstraction performed by ONE reviewer only	83%
Quality (risk of bias) appraisal process	Risk of bias assessed by ONE reviewer only	85%
Synthesis	Narrative summary	90%

Summary results of most frequent streamlined approach

Conclusions

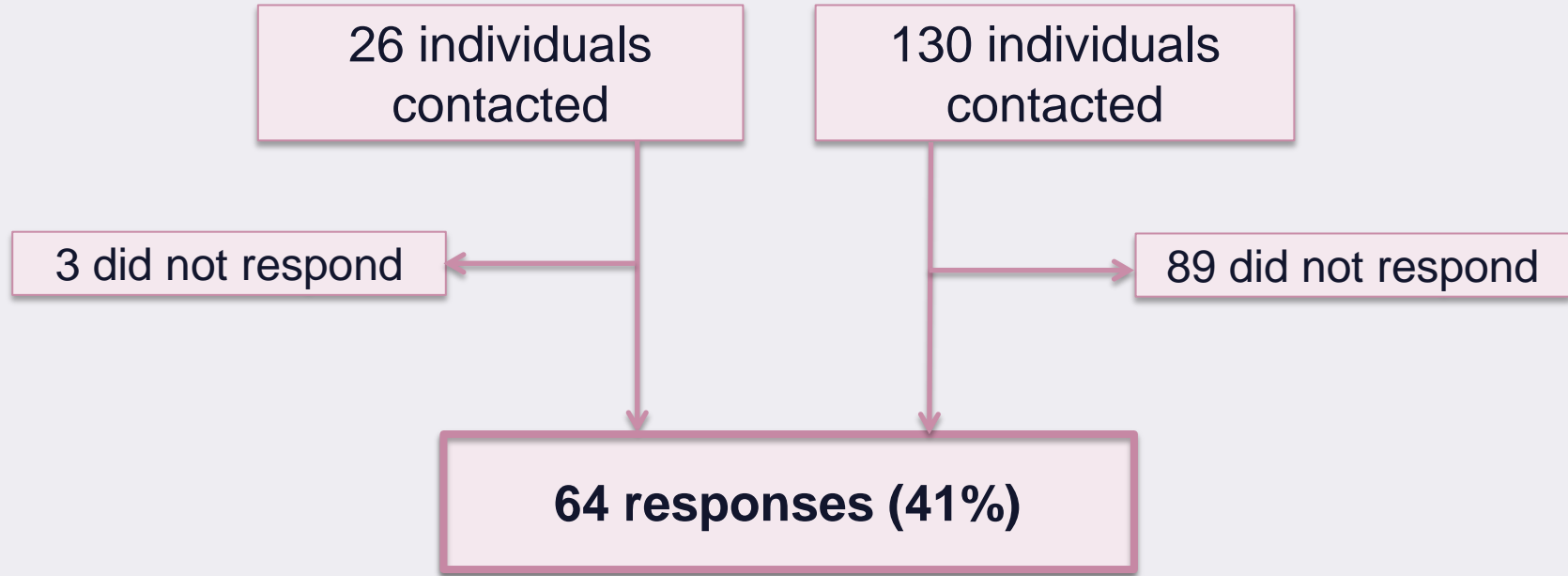
- Varied terminology used to describe a rapid review
- Rapid reviews usually conducted in 1-12 weeks
- Government agencies and health ministries are primary commissioners
- Many different streamlined methods being used

Methods project 3: Delphi to select a candidate review method

Objective and methods

- Objective:
 - To conduct a consensus-building exercise to select a rapid review approach that will be prospectively tested in a diagnostic study
- Methods:
 - Invited editors, healthcare providers, researchers, and policy-makers
 - Participants asked to rank the 6 most frequent rapid review approaches identified in our SR and survey (see handout)
 - Results presented to participants and discussion facilitated
 - Final re-ranking of the survey to follow

Results



Study flow figure of participants

Results (2)

Rapid review Approach	Feasibility	Timeliness	Comprehensiveness	Risk of Bias
Approach 1	1st	2nd	5th	1st
Approach 2	2nd	1st	6th	5th
Approach 3	5th	3rd	3rd	4th
Approach 4	3rd	4th	2nd	6th
Approach 5	4th	5th	1st	2nd
Approach 6	6th	6th	4th	3rd

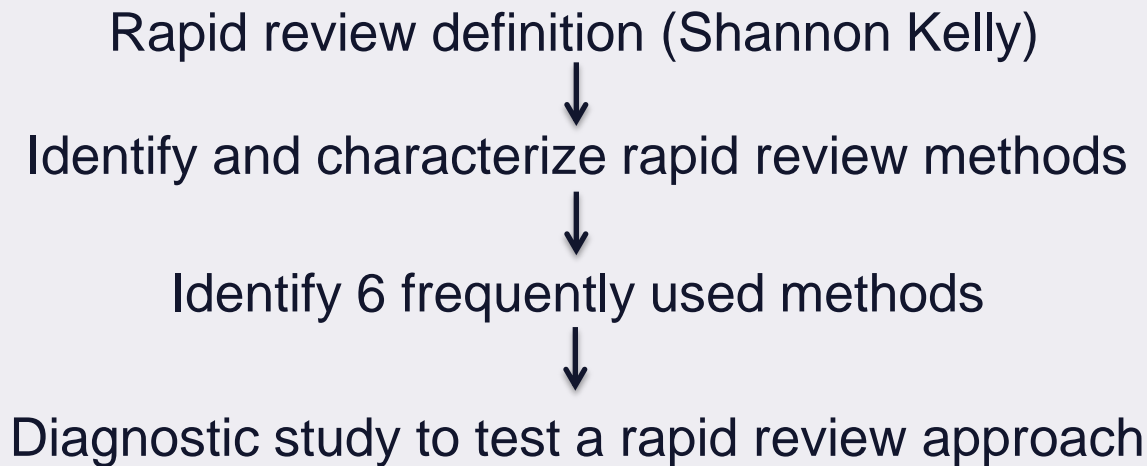
*Ranked based on the distribution of "very" and "extremely" on the 7-point Likert scale, except Risk of Bias was ranked on distribution of "not at all" and "very"

Summary of ranking results by approach

Conclusion

- The highest ranked method was: Approach 1
 - 1st in feasibility and risk of bias,
 - 2nd in timeliness
- We will use the information from the e-delphi alongside the in-person delphi from today to select the rapid review approach for our study

Ultimate goal of this research



“We can give you results within 4 months, but the meta-analysis estimates will be biased by 35%”.

Proposed diagnostic study

- Will use these results to inform a diagnostic study:
- Index test: Rapid Review Approach
- Reference standard: Systematic Review
- 3 Canadian Knowledge Synthesis Centers
- Targeting CIHR and PCORI (need US partners)

Diagnostic Accuracy of Rapid reviews compared To
Systematic reviews (DARTS)

Summary

- Rapid reviews differ from systematic reviews because short cuts are taken to make the process more efficient
- Rapid reviews are particularly attractive to policy-makers
- Bias resulting from these short cuts is unclear
- Research is being conducted to address this gap

Rapid Reviews Series in the Systematic Reviews Journal

The screenshot displays the homepage of the Systematic Reviews Journal. At the top, the journal's logo is on the left, and a search bar is on the right. Below the logo is a navigation menu with links to Home, Articles, Authors, Reviewers, About this journal, and My Systematic Reviews. The main content area is titled 'Articles' and features a sub-navigation bar with 'All articles', 'Most viewed', 'Archive', and 'Article collections'. Below this is a search filter section with a 'Show' button, a dropdown menu set to 'Research', and input fields for 'Vol.' and 'Art. No.' with a 'Jump' button. A pagination bar shows 'Page 1 of 3' and 'Articles per page: 25 | 50 | 100'. Two article listings are visible, each with a 'Research' label, an 'Open Access' icon, and a title. The first article is 'PCR-based specific techniques used for detecting the most important pathogens on strawberry: a systematic review' by Seyed Mirmajlessi et al. The second article is 'Better duplicate detection for systematic reviewers: evaluation of Systematic Review Assistant-Deduplication Module' by John Rathbone et al. On the right side of the page, there is a vertical sidebar with buttons for 'Submit a manuscript', 'Register', 'Sign up for article alerts', 'Contact us', 'Follow BioMed Central', and 'Support'. Below these buttons is a section titled 'Explore Systematic Reviews' with links to the 'Editorial Board' and 'Instructions for authors'.

SYSTEMATIC REVIEWS

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Seyed Mirmajlessi, Marialaura Destefanis, Richard Gottsberger, Marika Mänd, Evelin Loit
Systematic Reviews 2015, **4**:9 (15 January 2015)
[Abstract](#) | [Full text](#) | [PDF](#) | [PubMed](#)

Research **Better duplicate detection for systematic reviewers: evaluation of Systematic Review Assistant-Deduplication Module**
John Rathbone, Matt Carter, Tammy Hoffmann, Paul Glasziou
Systematic Reviews 2015, **4**:6 (14 January 2015)
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Acknowledgements

- Canadian Institutes of Health Research/Drug Safety and Effectiveness Network
 - Operating grant to update 2 systematic reviews, international survey, delphi
 - New investigator award
- Research team: Jesmin Antony, Wasifa Zarin
- Co-investigators: Drs. Straus, Moher, Hutton, Sherifali

Questions?

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In-person discussion: Ranking the most frequent rapid review methods

Objective

To conduct an online survey and consensus-building exercise (Delphi) to select a rapid review approach that will be tested in a study called DARTS (Diagnostic Accuracy of Rapid reviews compared To Systematic reviews)

Chatham House Rule:

Participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed

Vote now!

- www.slido.com
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Rapid Review Approach 1

Literature search: searched more than one database, limited to published sources only

Search limit: limited by **both** date and language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: one person abstracted data, while another person verified

Risk of bias assessment: one person assessed for risk of bias, while another person verified

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	2	3	2	5	17	11



Rapid Review Approach 1

Literature search: searched more than one database, limited to published sources only

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Risk of bias assessment: one person assessed for risk of bias, while another person verified

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	3	1	8	11	12	6

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Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	5	6	8	11	10	0

Rapid Review Approach 1

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Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: one person abstracted data, while another person verified

Risk of bias assessment: one person assessed for risk of bias, while another person verified

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	11	9	5	10	5	1

Rapid Review Approach 2

Literature search: used previous systematic review(s) as a starting point to identify relevant studies; no grey literature search was conducted

Search Limit: search *not* limited by language or date

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	0	2	1	10	18	9



Rapid Review Approach 2

Literature search: used previous systematic review(s) as a starting point to identify relevant studies; no grey literature search was conducted

Search Limit: search *not* limited by language or date

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	1	6	8	16	9

Rapid Review Approach 2

Literature search: used previous systematic review(s) as a starting point to identify relevant studies; no grey literature search was conducted

Search Limit: search *not* limited by language or date

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	6	11	6	15	2	0

Rapid Review Approach 2

Literature search: used previous systematic review(s) as a starting point to identify relevant studies; no grey literature search was conducted

Search Limit: search *not* limited by language or date

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	4	2	13	14	7

Rapid Review Approach 3

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	1	3	4	9	17	6



Rapid Review Approach 3

- Literature search:** searched more than one database, searched both published and grey literature
- Search limit:** limited by both date and language
- Screening:** title/abstract and full-text screening performed by one reviewer only
- Data abstraction:** data abstraction performed by one reviewer only
- Risk of bias assessment:** not performed

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	2	2	6	13	14	4



Rapid Review Approach 3

- Literature search:** searched more than one database, searched both published and grey literature
- Search limit:** limited by both date and language
- Screening:** title/abstract and full-text screening performed by one reviewer only
- Data abstraction:** data abstraction performed by one reviewer only
- Risk of bias assessment:** not performed

Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	7	3	14	14	2

Rapid Review Approach 3

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	2	6	2	13	13	5

Rapid Review Approach 4

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by either date or language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	0	3	4	11	18	5

Rapid Review Approach 4

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by either date or language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	2	2	5	20	10	2

Rapid Review Approach 4

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by either date or language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	6	7	10	16	1

Rapid Review Approach 4

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by either date or language

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	7	1	15	14	2

Rapid Review Approach 5

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by date only; no language limit

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: risk of bias assessed by one reviewer only

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	4	5	7	20	4



Rapid Review Approach 5

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by date only; no language limit

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: risk of bias assessed by one reviewer only

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
1	2	3	11	14	8	2

Rapid Review Approach 5

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by date only; no language limit

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: risk of bias assessed by one reviewer only

Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	1	5	3	14	16	2

Rapid Review Approach 5

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by date only; no language limit

Screening: title/abstract and full-text screening performed by one reviewer only

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: risk of bias assessed by one reviewer only

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	8	9	8	11	5	0

Rapid Review Approach 6

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by two independent reviewers

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Feasibility

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	3	2	5	10	18	3

Rapid Review Approach 6

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by two independent reviewers

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Timeliness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	3	6	8	15	7	1

Rapid Review Approach 6

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by two independent reviewers

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Comprehensiveness

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	2	2	3	23	9	1

Rapid Review Approach 6

Literature search: searched more than one database, searched both published and grey literature

Search limit: limited by both date and language

Screening: title/abstract and full-text screening performed by two independent reviewers

Data abstraction: data abstraction performed by one reviewer only

Risk of bias assessment: not performed

Risk of Bias

1 Not at all	2 Low	3 Somewhat	4 Neutral	5 Moderately	6 Very	7 Extremely
0	3	11	5	11	10	1

Thank you for participating!